INTRODUCTION

This research examines the circumstances and impacts of the technological transition of Thailand's television broadcasting industry in the area of national communication policy and TV station business operation. This introduction, that precedes nine chapters, outlines the statement of purpose of the thesis, summarises TV development in Thailand and the main theoretical foci, and explains the objectives and broad premises of the thesis. It outlines the structure of the thesis, including an introduction to the methodology under the appropriate chapter description.

STATEMENT OF PURPOSE

The purpose of this study is to throw light on the policy context of the digitalisation of the Thai TV industry by seeking the views of members of key groups of stakeholders. In doing so, I will be addressing an area that has not been researched adequately in Thailand to date. Thailand is a particularly apt case to study because it is a developing country that has had a history of being selectively open to exogenous innovation. I chose Thailand's TV industry as a case study because Thailand is a developing country that is one of the main technology adopters in the Asia Pacific region, and has an open engagement with global technological transition. The country has a vibrant press and an enormous quantum of democratic energy, but also it has experienced an inordinately large number of military coups. The Military continues to have considerable ownership over television stations and assigned control over broadcasting frequencies. The new communication technologies are seen as democratising (de Sola Pool 1983; 1990). What then is the policy context in which new technologies associated with digitalisation are absorbed by the Thai TV industry?

More specifically, the main focuses of the study are to explore (1) major factors influencing Thai TV broadcasting shifting from analogue to digital, (2) prospective key benefits and disadvantages of adopting and launching Digital TV (DTV) technology in relation to TV station business operators and audiences, (3) the worthiness of investment and public interest, (4) supporting factors and obstacles of launching DTV, (5) recommendations for establishing a national DTV policy, (6) future trends, and (7) current circumstances of Thai TV stations regarding technological employment in TV station operation, as well as the preparation and readiness of Thai TV stations for migrating to digital.

SUMMARY OF TV DEVELOPMENT IN THAILAND

Thai television has five decades of history. Thailand can claim to be one of the pioneers of TV in the Asia Pacific region (after Japan). Bangkok was the first capital city to found a TV station in continental Asia (Katz and Wedell 1977: 11). The first Thai television station, Channel 4, ran its maiden broadcast on June 24, 1955. The station, owned by the Thai Television Company, is under the regulation of the Public Relations Department of Thailand. The second TV station, the Royal Thai Army Television Station, was established on January 25, 1958. The first colour television transmission was launched by Royal Thai Army Television, Channel 7, on November 27, 1967. In 1978, Channel 7 was the first TV station to transmit a TV signal to the network stations via an INTELSAT Satellite. TV was completely regulated by the state authorities in the first decade. Subsequently, since the late 1960s, the TV broadcasting system in Thailand was shifted into a concession scheme. Some TV stations were converted into concession TV stations, for example Channel 7 in 1967 and Channel 3 in 1970. In 1977, Channel 9 was established and operated under the management of the Mass Communication Organisation of Thailand (MCOT). The establishment of Thai TV stations was strongly related to foreign corporations and overseas technology imports.

TV broadcasting in Thailand has been strongly connected to the elites, militaries, and state authorities since the early days of its foundation. In other words, TV station operations were absolutely under the control of the state. The military and state authorities had power to intervene directly and indirectly in TV station administration, as well as to mandate and/or censor the station's content presentation. In addition, many media scholars and social activists argue that the leaders, state authorities, and interest groups (military, politicians, and businessmen) used television for political agenda, propaganda, and financial benefits (Siriyuvasak 1999, 2001; Sittirak 2000). There have been accusations of conflicts of interest and corruption in the broadcasting media business since the first decade, and this greatly increased in the period of giving privileged concessions to the private sector from 1965 onwards.

There were three free Terrestrial TV stations established between 1981 and 2008: Channel 11, ITV (TITV), and Thai PBS. Channel 11 was established according to the approval of the cabinet on January 15, 1985. Channel 11 can be called a government station. The main mission of the station is to distribute news and information about government policy and campaigns to the public. ITV (Independent Television) was established in 1996; however, ITV's license was finally terminated as the station violated the contract. Thai PBS was a newly established station in early 2008. True Visions is the only dominant subscription TV service provider in the country. Since 2000, Satellite TVs have become alternative information channels for Thai audiences. One of the most prominent satellite TV channels in Thailand is ASTV (Asian Satellite Television, launched in 2005). ASTV and its news channels play an outstanding role in criticising and disclosing corruption and misconduct of politicians and state authorities. Another distinct TV channel is the Nation Channel, run by the Nation Broadcasting Corporation. Nation Channel is a 24-hour TV news station and declares itself to be a "content provider", since at present it produces TV news and programs for many free TV stations in Thailand. In Chapter Three I provide a discussion of the historical periods related to TV policy development and policy characteristics in those periods.

SUMMARY OF CONCEPTUAL FRAMEWORKS OF THE STUDY

I draw on theories of globalisation and network society, digital television, and communication policy, in developing my conceptual frameworks for this research project, to be drawn on in the discussion in the final chapter.

Globalisation, Network Society

Since the global community has been consciously responding to the paradigm of globalisation variously through reformation or rejection, all members of the "global village" (McLuhan 1962), that is nation states and other actors around the world, have been unavoidably related, connected, and unified with each other in terms of economic, political, and cultural factors. Globalisation is a principal driving force of social change and reform; it has a wide range of consequences, and changes people's lives. All states have become interdependent and have been drawn into a network society. In Chapter 1, I reviewed interdisciplinary discourses and conceptual frameworks on globalisation and network society drawing on leading contributors such as Bhagwati (2004), Nayyar (2002), Ritzer (1996; 1998), Wallerstein (1987; 2004), Chomsky (2006), Giddens (1990), Albrow (1990), Tomlinson (1994), Hirst and Thompson (1995), Griffiths and O'Callaghan (2002), Baber (1995), Latouche (1996), Appadurai (1998), Rantanen (2005), Bisley (2007), McGrew (2005), O'Brien and Williams (2004), Kirton (1993), Cox (1994), Castells (1996, 1997, 1998), Cardoso (1979), Sen (2002), Schiller (1969; 1976; 1985; 1989), Freidman (2008), Castells (1996; 1997; 1998), Virilio (1986; 1991; 1997; 2000) Agger (1998; 2004), Havey (1989), and Thussu (1998).

Digital Television

A significant factor contributing to the development of network society is telecommunication technology, including television technology. The accelerated convergence of telecommunication, broadcasting and print technologies through computerisation and digitalisation beginning in the 1990s resulted in the integration of television and other forms of telecommunication and informatics. The global TV industry has subsequently migrated into a digital environment and is part of larger network of telematics and informatics, a movement that has had a significant impact on TV content and formats, production practices and distribution systems. This digital revolution has generated media hybridisation and interactivity in television. I present a discussion of global digital television and digital communication technology in Chapter 2, drawing on contributors to the discourse such as Kawamoto (2003), O'Driscoll (2000), Galperin (2004), Straks (2007), Straubhaar and LaRose (2000), Papathanassopoulos (2002), Hart (2004), Castells (1996) Given (2003; 2007), Kenyon (2007), Cave and Nakamura (2006), Castells, Orava and Perttula (2006), Levy (1999), Steemers (1998), Bird (2002), Atkin and LaRose (1994), Wilzig and Avigdor (2004), Shirley (1999), Palvik (1996), McQuail (2000), Lister et al (2003), Barr (2000), Negroponte (1996), Flew (2005), Lievrouw (2002), Manovich (2001), Compaine (1984), Biocca (2000), Adams, Anand, and Fox (2001), Book (2004), O'Leary (2000), Karyn Lu (2005), Orlebar (2002), Griffiths (2003), and Van Tassel (2001).

Communication Policy & Thai Policy Development

As global television has been technologically migrating, national communication authorities are expected to be key players in the transition. In this study, Thailand's national communication regulator, the National Broadcasting Committee (NBC), would be expected to be a key agent in facilitating the entry of Thailand's TV broadcasting industry into a digital environment. Therefore, I reviewed a conceptual framework of policy in Chapter 3 Part 1, drawing on contributors to the discourse such as Easton (1953), Lasswell and Kaplan (1970), Dye (1992), Jenkins (1978), Hogwood and Gunn (1984), Howett and Ramesh (1995), Colebatch (2002). In addition, there are a number of literatures and concepts of policy and communication policy from some international scholars presented in Chapter 3, such as Hamelink (1983), Van Cuilenberg and McQuail (2003), McQuail (2000), Hallin and Mancini (2004), Melody (1990), Hood (1986), Howell (1986), McChessy (2001), O'Sullivan et al. (1994), Schiller (2000), Reinicke (1998), Sarikakis (2002), Javanovic (1998), Chkravartty and Sarikakis (2006), Raboy (2002), Mosco (1989), Murdock (2000), Katz (2005), Goldsmith et al (2002). In Chapter 3 Part 2, I discuss the historical periods of Thai TV policy development and the characteristics of policy in different periods. I draw on historical accounts by Katz and Wedell (1977), Sittirak (2000), Siriyuvasak (1999; 2001), Phanpiphat and Thanasathit (1983), Sothanasathien and Ploysirichon (2007), Thaiyadham (1971), and Tangkitvanich and Sutharattanakul (2003) for my periodisation and on the discussion on policy for identification of characteristics.

ABOUT THE RESEARCH PROJECT

Objectives of the Thesis

My objectives are as follows:

(1) To explore the major pushing factors influencing the Thai TV broadcasting industry to go into technological transition, shifting from analogue to digital.

(2) To investigate the prospective key benefits and disadvantages of adopting and launching DTV technology in the Thai TV broadcasting industry in relation to TV audiences and TV station business operators.

(3) To obtain views from thesis participants regarding whether a national investment in implementing DTV technology in Thailand is worthwhile and can serve public interests.

(4) To discover prospective supporting factors and obstacles of launching DTV in Thailand.

(5) To obtain thesis participants' recommendations vis-à-vis establishing a national DTV policy.

(6) To explore future trends of DTV in Thailand.

(7) To scrutinise the current circumstances of Thai TV stations regarding technological employment in TV operation (production and broadcasting protocols), as well as the preparation and readiness of Thai TV stations for migrating to digital.

Outline of the Thesis

Following this short introduction, this thesis is divided into nine chapters. The main concepts of each chapter are as follows:

Chapter 1: Globalisation and Network Society. In this chapter I provide an outline of globalisation, an interdisciplinary discourse on globalisation, definition and characteristics of globalisation, and a debate on globalisation and network society.

Chapter 2: Digital Television. In this chapter I provide an outline of global digital television, digital communication technology and a summary of DTV technology.

Chapter 3: Communication Policy and Development of Thai Television. This chapter presents theoretical frameworks of policy, two paradigms of policy making, development of communication policy, broadcasting regulation and system, the contemporary concept of communication policy, and trends of communication policy in the 21st century. In addition, I present the historical periods of development of Thailand's television broadcasting industry and an identification of characteristics of policy in the different periods.

Chapter 4: Research Design. This chapter begins with my detailed research questions and premises, and discusses the research design and methodology employed in the study. It details the research design, the techniques employed in the study to answer the research questions and examine the premises. It details the research design, the techniques employed in the study, procedures (including adherence to Macquarie University Human Ethics Committee requirements), data resources and collection, and analysis of data. For the purposes of the thesis I employ two research methodologies, i.e. in-depth interviews examining views from 26 experts (Thai TV station administrators and Mass Communication scholars), and observations at nine prominent TV stations in Thailand. This research project was conducted between October 2006 and October 2007 in Bangkok, Thailand. The results of the in-depth interviews are presented in chapters 5 and 6 and the findings from the observations are presented in chapters 7 and 8.

Chapter 5: DTV: Thailand at the Crossroads. This chapter reveals the findings from the in-depth interviews according to answers provided by thesis participants to the questions in Sections 1 to 3 of the questionnaire, i.e. Section 1: major driving factors of technological transition; Section 2: benefits and disadvantages of DTV technology; and Section 3: DTV and public interest.

Chapter 6: National DTV Policy and Trends. Chapter 6 discloses the results from the in-depth interviews in relation to responses of thesis participants to the questions in Sections 4 to 5 of the questionnaire, i.e. Section 4: national DTV policy and regulation; and Section 5: future trends of DTV in Thailand.

Chapter 7: Thai TV Stations in Technological Transition (Part 1). Chapter 7 gives the results from the observations at four TV stations: True Visions, Channel 3, Channel 7, and MCOT 9.

Chapter 8: Thai TV Stations in Technological Transition (Part 2). This chapter presents research results from observation protocols at five TV stations: Channel 5, ASTV, Nation Channel, Channel 11, and TITV.

Chapter 9: Discussion and Conclusion. This chapter, which revisits the research questions, summarises the main discussion of the research results and the significance of the premises and limitations of the study. In addition, it includes a summary of all issues, ideas, findings, the conclusions of the study, and my own recommendations for future study.

Summary

This introduction provides a map of the thesis project for the reader, drawing attention to the purpose of the study, its theoretical underpinnings in terms of broad areas of literature reviewed and its objectives and premises. The next chapter introduces the first broad theoretical area on which I draw, globalisation and network society.

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CHAPTER 1

GLOBALISATION AND NETWORK SOCIETY

In this chapter, I present a review of literature on the concepts of globalisation and network society, which will be employed as theoretical frameworks for a discussion in the final chapter vis-à-vis the premises of this study on whether globalisation is a major driver of transition in the Thai TV industry.

AN INTERDISCIPLINARY DISCOURSE ON GLOBALISATION

In this part, I present an interdisciplinary discourse on globalisation, together with a definition, attributes, and a conceptual framework, from the perspective of international scholars, economists, and sociologists.

Discourse on "Globalisation" has become one of the most highly controversial issues in international dialogues for decades. Smith and Smith (2002) write: "'Globalisation' is a favourite catchphrase of journalists and politicians. It has also become a key idea for business theory and practice, and entered academic debates. But what people mean by 'globalisation' is often confused and confusing." I therefore present here a review of definitions and attributes of globalisation according to different perspectives and academic areas in order to obtain a clear understanding of this contemporary notion, followed by my own reflections and definitions of this term for use as a foundational initiative of the thesis.

The term “Globalisation” has only become commonplace in the last two decades. It is difficult to specify who is/are the inventors of this term and the origin remains ambiguous. However, Scheuerman (2006) argues that the origin of globalisation (as a phenomenon) is highly related with (1) the emergence of modern technology (transportation and communications) since in the 19^{th} century, and (2) the prosperity of capitalism. The initiative of globalisation can be traced back to 1848, in Marx’s “*Communist Manifesto*”. Marx (1988 [1848]), a German socialist theorist, presents some key words that visualise a futuristic scenario in the following century. For example, he asserts that the essential nature of capitalist production will inevitably drive the bourgeoisie to nestle everywhere, settle everywhere, and establish connections everywhere. As well as this, the new world will be driven by capitalism as technology will become a key mechanism. He predicts that capitalism and technology will associate in every direction and the new world will become universal interdependence of nations.

In everyday English, according to the *Oxford English Dictionary*, the term “Globalisation” is defined as “the fact that different cultures and economic systems around the world are connected and similar to each other because of the influence of large multinational companies and of improved communication. (2006: 633)” In the *Cambridge English Dictionary*, “Globalisation” means “(1) the increase of trade around the world, especially by large companies producing and trading goods in many different countries, and (2) when available goods and services, or social and cultural influences, gradually become similar in all parts of the world. (2005: 540)”

In the bigger picture, Noam Chomsky (2006), a well-known American scholar, claims that globalisation is a certain form of international integration. In the aspect of macro economics, globalisation can be defined as an integration of international economics and world business. In his "*In Defence of Globalization*", Professor Jagdish Bhagwati explains that the amalgamation includes "the integration of national economies into the international economy through trade, direct foreign investment (by corporations and multinationals), short term capital flows, international flows of workers and humanity generally, and flow of technology" (2004: 3). Similarly, in "*Governing Globalisation: Issues and Institutions*", Professor Deepak Nayyar (2002) writes:

> ...national economies have become ever more closely integrated through cross-border flows of trade, investment, and finance. The technological revolution in transportation and communications, which has eroded the significance of barriers implicit in distance and time, has facilitated this process. (2002: 3)... More precisely, it [globalisation] can be defined as a process associated with increasing economic openness, growing economic interdependence, and deepening economic integration between countries in the world economy (2002: 6).

From the perspective of cultural studies, Block claims that many "cultural scholars adopting the stance that Globalization will mean one world culture, generally believe that homogenising forces will eventually leave everyone in the world living, thinking and acting in very similar ways. (2004: 24)" Ritzer (1996, 1998) defines globalisation as a "homogenisation" of global consumption in a globalisation era, which he calls "McDonaldization". He writes: "the principles of the fast-food restaurant are coming to dominate more and more sectors of American society as well as the rest of the world" (Ritzer 1996: 1). Ritzer (1996) also contends that the mainstream culture of globalisation is a culture of consumerism and materialism. In a similar vein to Ritzer's critique, Barber (1995) argues that globalisation refers to a single global culture, which can be called as "McWorld". Barber (1995) defines this as "an entertainment shopping experience that brings together malls, multiplex movie theatres, theme parks, spectator sport arenas, fast food chains (with their endless movie tie-ins) and television (with its burgeoning shopping networks) into a single vast entertainment..." (Barber 1995: 97). Schiller (1985), Latouche (1996), and Ritzer (1996) all consider that globalisation is a mechanism of Americanisation, Westernisation or Western Hegemony, and Cultural Imperialism in which Americans and Westerners try to establish "worldwide standardization of lifestyles" (Latouche 1996: 3).

From a sociological perspective, Thompson (1995) emphasizes the increase of "interrelation, interaction, and interdependency" of all members of society. He writes: "globalisation... refers to the growing interconnectedness of different parts of the world, a process which gives rise to complex forms of interaction and interdependency" (1995: 149). Albrow (1990) stresses the unification of people into "a single world and society". He states: "globalisation refers to all those processes by which the peoples of the world are incorporated into a single world society, global society" (1990: 45). Giddens (1990) describes it as a togetherness society, which is driven by advanced media and communication technology. He writes: "... as the intensification of world-wide social relations, which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa" (1990: 64). Castells (1996; 1997; 1998) defines globalisation is a network of world society.

From the aspect of international relations and political economy, globalisation can be defined as a paradigm shift pushing all nations into a new global mechanism of interconnection and interdependency. Griffiths and O'Callaghan write: "Globalisation refers to the acceleration and intensification of mechanisms, processes, and activities that are allegedly promoting global interdependence and perhaps, ultimately, global political and economic integration" (2002: 126-127).

Orakzi (2006) claims:

> Globalisation refers to the worldwide economic, political and cultural exchange of ideas among the states in the modern world. It is used to describe how the world is becoming economically and politically one. The economic aspects of globalisation include trade, investment and migration across the countries.

Similarly, Ostry (1990) maintains:

> In its most general sense 'globalisation' refers to the upsurge in direct investment and the liberalization and deregulation in cross-border flows of capital, technology and services, as well as the creation of a global production system - a new global economy. It is in this sense that the term was apparently coined in 1986, in the context of the eighth round of the General Agreement on Tariffs and Trade (GATT) negotiations. (Ostry 1990, cited in Veltmeyer 2003: 12)

In a publication on “World-System Analysis”, Wallerstein (2004) argues that world has become united as a single global economy with multiple social, cultural, and political systems. In other words, all nations or states are highly related to each other or integrated into modern world society and international state system. Freidman similarly argues that globalisation is “the impact of the flattening of the globe” (2008: 49), in which all nations in the world are interconnected through transnational corporations.

As presented above, “Globalisation” has become a very common term these days. However, the definitions are various and widely used in a wide range of areas. Cowen writes: “Commentators invest this term with many meanings, including the growth of world trade and investment, world government, international terrorism, imperialist conquest, International Monetary Fund (IMF), technocracy, the global arms trade, and the worldwide spread of infectious diseases” (2004: 1).

In short, considering all the aspects I have presented above, including the similarities and key terms of the discourse, it can be concluded that globalisation is a globally dominant paradigm strongly related to the following terms: “integration”, “interconnection and interaction”, “interdependency”, “international”, “oneness and togetherness”, “transnational governance, international regimes, and co-operation”, “capital”, “intercultural”, “global socio-economic mechanism and system”, “technology and innovation”, and “international communication”.

To be more specific a propos the main attribute of globalisation, Appadurai divides the facets of globalisation into five scapes (Appadurai 1998: 33-36): (1) ethnoscape, (2) mediascape, (3) technoscape, (4) financescape, and (5) ideoscape. According to Ratanen (2002), “Ethnoscape” refers to human migration: in the globalisation era, people are free to travel interstate, internationally, and intercontinentally as travelers, tourists, guest workers, immigrants, refugees, business persons, overseas students, etc. “Mediascape” refers to the omnipresence and significance of media and communication in the modern world in the role of distributing information which has a strong influence in conveying ideology and cultural values, connecting people throughout the globe. “Technoscape” refers to technology, in particular Information Technology, digital communication technology, which becomes a central driving force of socio-economic development. Technology can be conveniently transferred, transplanted, and commercially distributed in the globalisation era. The technology owners or nations can also hold strong economic and political power in the international arena. “Financescape” refers to contemporary global economic systems, e.g. currency markets, international stock exchanges, transnational firms, and commodity speculations, that can move at high speed. “Ideoscape” refers to all key contemporary and mainstream ideologies that dominate the world, such as democracy, capitalism, liberalism, human rights, commercialization, individualism, and cosmopolitanism, etc(Appadurai 1998, Ratanen 2002).

In regard to the key role of globalisation, Scheuerman (2006) claims that globalization often functions as the following phenomena: (1) the pursuit of classical liberal (or free market) policies in the world economy, or “economic liberalization”; (2) the growing dominance of western or even American forms of political, economic, and cultural life, “westernization” or Americanisation”; (3) the proliferation of new information and communication technologies digital new media and the “digital communication revolution”; as well as (4) the notion of “global integration” in which humanity stands at the threshold of realizing one single unified community.

After consideration of the interdisciplinary approaches to a discourse on “Globalisation”, and its attributes, I define the term for the purposes of this study as follows:

Globalisation is a dominant paradigm and mechanism driving global society into an integrated and unified world. All states and nations are interdependent in terms of economy, politics, culture, and society. International regimes and transnational corporations become influential agents and dominating forces over states. Individual state autonomy is weakened and challenged. All nations become borderless and, as a consequence, a circumstance or phenomenon (economic, political, socio-cultural changes) that occurs in one part of the world can be heard and can directly and/ or indirectly affect others (as a domino or butterfly effect). Technology, innovation, communication, and money are the major drives of globalisation and can be transferred conveniently under commercialisation, liberalisation, and the free trade market system. Wealthy superpower nations and developed countries completely control and manipulate all other states (developing and under-developed countries) not directly by military force as it used to be in the colonialist and imperialist era but through overseas capital, international government, and technological forces.

In summary, as shown in Table 1, Bisley (2007) classifies major concepts and features of globalisation into three academic areas: economic, sociology, and politic.

Table 1: Classifications of Globalisation's Core Features

Conception	***Key features***	***Examples***
Economic	Globalisation is essentially about economics. The integration of markets and productive processes is reducing the influence of geography in the distribution of resources. This process drives subsequent changes, for example, in practices of governance, statehood and sovereignty.	Bhagwati (2004), Wolf (2004), Amin (1997), Callinicos et al. (1994), Luard (1990), Strange (1996)
Sociological	Globalisation is changing the fundamental structures of social life by recasting the role that territory plays in organising social structures, such as political institutions and sovereignty. The central feature is produced by a complex interaction of changes in economic, political, and cultural relations.	Giddens (1990), Camilleri and Falk (1992), Albrow (1996), Held et al. (1999), Scholte (2005), Waters (1995), Castells (1996, 1997, 1998), Beck (2000)
Political	Globalisation is not a phenomenon but a mean of (a) advancing a political project; and (b) changing the way people think about the world.	Hoogvelt (1997), Gary (1998), Kolfman and Youngs (1996), Germain (2000)

Source: Bisley (2007: 23)

Pros versus Cons: An Internationally Controversial Debate on "Globalisation"

McGrew asserts that the main argument between pro-globalisationists and anti-globalisationists is whether globalization is a better way to construct world order. Globalisation advocates often suggest that when states become more integrated, political and economic agendas in each country would be similar to the others which make world order easier to control. On the other hand, those who reject the phenomenon of globalisation see global interdependence as a means of weakening state sovereignty. They propose that world order should be arranged based on comprehensible territory and power of each state (McGrew 2005: 20). The controversial concept of globalisation is the matter of boosting political, economic, social and cultural integration as people around the world are affected by the impact of globalisation different ways. Some political economy theories, as well as world-system theory, dependency theory, liberalization, and capitalism, are useful in explaining whether world trade, the transnational spread of information and communication technology, cultural exchange, and the promotion of democracy through globalisation groundwork should be implemented or even brought to an end. According to Bisley (2007), the evolution debate of the globalisation debate can be categorised into five phases.

Table 2: Evolution of Globalisation Debate

Phase of debate	Characteristics	Examples
1) Late 1980s	Globalisation identified as a process driving radical change in the social realm.	Giddens (1990), Harvey (1989), Featherstone (1990), Luard (1990)
2) Early to mid 1990s	Claims about globalisation amplified, they become increasingly mainstream and key lines of contestation emerge.	Ohmae (1995), Giddens (1994), Camilleri and Falk (1992), Albrow (1996), McGrew and Lewis (1992), Scholte (1993)
3) Late 1990s	Central claims about globalisation are theoretically, empirically and politically challenged.	Weiss (1998), Garrett (1998), Hirst and Thompson (1996), Rodrik (1997), Hoogvelt (1997)
4) Early 2000s	Consolidation of globalisation through parameter setting studies and as a site of political contestation.	Held et al. (1999), Scholte (2000), Castells (1996, 1997, 1998), Klien (2000), Stiglitz (2002)
5) Mid 2000s	Merits of Globalisation overtly defended in the face of the critics.	Bhagwati (2004), Wolf (2004), Legrain (2002), Friedman (2005)

Source: Bisley (2007: 17)

In this section, I demonstrate arguments and analyses on the notion of globalisation in a wide range of aspects. There are strong views both for and against globalisation. On one hand, some people, especially those in the world dominant countries and huge enterprises, claim that globalisation generates great benefits for the world economy, providing an opportunity for greater prosperity, supporting the development of democracy, and becoming a channel for freedom of humanity. On the other hand, many people, such as social activists, NGOs, and scholars believe that globalisation is a concept of global selfishness, taking advantage, fake democracy, and devaluation of human rights and freedom. Therefore, in order to justify whether or not globalisation provides a great advantage for the world economy, democracy, and freedom of humanity, both dimensions the pro and con arguments on globalisation should be considered and discussed.

Pro Arguments

The impacts of globalisation cover a wide range of dimensions. In terms of investments, labour, and international business, during the 1980s and 1990s, liberalization and capitalism, which are major factors of globalisation, dominated the World economy. Transnational companies and investments from industrial countries established and expanded their operations in developing countries. In the aspect of supporting globalization, the notions of liberalism and capitalism are relevant to describe the positive perspective. Hirst and Thompson (1995) claim that

> the new globalised economy allows companies and markets to allocate the factors of production to greatest advantage, without the distortions of state intervention. Free trade, trans-national companies and world capital markets have set business free from the constraints of politics, able to provide the world's consumers with the cheapest and most efficient products… for the Right in the advanced industrial countries; the rhetoric of globalisation is a godsend (1995: 414).

Liberals emphasize the principle of cooperation because they take for granted the fact that the world would be a better place if states and people could utilize positive-sum game rather than "zero-sum game" (O'Brien and Williams 2004: 14). It can be said that liberalism is a major theoretical foundation of globalisation as it sees a greater opportunity in the free movement of world market. In particular, free trade provides a comparative advantage where industrialized countries can put enormous investment into states that have reduced trade barriers for accessing low cost labour and raw materials. Consequently, every party gains more from the cooperation. This means that huge monetary investments are widely distributed around the globe. In addition, the 1980s democratization changed the landscape of business, trade and industry, connecting every country in the world through globalisation. Orakzi (2006) maintains that international investments provide people with greater opportunities to access a wide range of goods and products ranging from cheap labour in third world countries to bigger overseas investments. In addition, some economic scholars and entrepreneurs believe that globalisation brings prosperity to the world economy. Luttwak, for example, claims: “Privatization + Deregulation + Globalisation = Turbo-capitalism = Prosperity” (Luttwak quoted in Frank 2002: 17).

In addition, globalisation causes borderless communities. It provides greater opportunity for international economy collaborations. In other words, globalisation generates an atmosphere of international/regional collaboration. Many neighbouring nations, which share common geography, region, and/or interests, have agreed to become partners in economic, social, and political development. Griffiths and O’Callaghan support this idea, and stress that after the decline of superpower nations, “regimes exist because they facilitate negotiations between states and allow states to overcome barriers to collective action such as uncertainty” (2002: 29). This concept transforms the idea of trade enemies to trade partners. This can be seen from the establishment and collaboration of international organisations and regional alliances. This current phenomenon strengthens members of the community in favour of negotiation power in global trade and political organisations, for example European Union (EU), Organisations of the Petroleum Exporting Countries (OPEC), International Monetary Fund (IMF), and World Trade Organisation (WTO).

A remarkable feature of global collaboration is the determination to promote and advance world economy, as can be seen through the forming of the ‘group of eight’ (G8) (Griffiths and O’Callaghan 2002: 134). This group consists of the world’s leading capitalist and industrial powers, United States, United Kingdom, France, Italy, Germany, Japan, Canada and Russia. This intergovernmental institution was established with strong political and economic objectives and common purposes in mind, which are the economic integration, regional security, and policy on environment. These common purposes make G8 a powerful institution (Kirton 1993: 338-389). In particular, the member countries gather to discuss economic issues and policies among themselves, and also support the “spread of liberal democracy and capitalism” (Griffiths and O’Callaghan 2002: 25). In addition, Cox (1994: 50) underlines a strong linkage between democracies with free market. He notes that the discourse of globalization focuses on freedom of global trading for comparative advantage between rich and poor countries, and that human rights and freedom also lie under the same ideology, which is for the states to loosen up regulations so people have more choices.

Con Arguments

Globalisation does not just promote interconnectedness, but also disintegration for those who are left out of the system. Osvaldo Sunkel, a Chilean sociologist, maintains that “integration into the international economy [globalisation] leads to disintegration of the national economy” (Sunkel, cited in Bhagwati 2004: 9). Isaak asserts a contrasting meaning of globalization: “Globalisation encourages the well-positioned to use tools of economics and politics to exploit market opportunities, boost technological productivity, and maximize short-term material interests in the extreme. The result is a rapid increase in inequality between the affluent and poor” (2005: 4). This is a clearly distinctive point of view, and many groups of people have a similar opinion, such as those who are trapped in the gap between the ‘haves’ and the ‘have-nots’. The intensified process of globalisation is the result of rich or industrialized countries who look for ways of making more while poor countries are locked in false promises and are exploited, according to Issak (2005).

From the perspective of world system theory, Wallerstein (1974; 1979; 1982; 2004) argues that in the integration of all states in the modern world of globalisation, the nations can be categorized into three subdivisions: (1) the core, (2) semi-periphery, and (3) periphery. In world system theory, these basic categories of state are used to give explanations of the global dominance paradigm and the interrelation of each of the world's members. "The core" includes independent states that hold absolute power in terms of economic, military, and political forces. The "semi-periphery" is the nations or states that are partially dependent on the core. The "periphery" is the nations that are totally dependent on the "core" and/ or the "semi-periphery". The contemporary world is constructed to be a "World Empire" under the concepts of neo-colonialism and neo-imperialism, where the weak nations are manipulated or under the socio-economic and politic domination of superpower nations or "the core". Based on this notion, therefore, modern countries or states are interrelated with each other state. Some are influencers; some play a role as agents, stakeholders, or representatives of the power; and some are dependent and influenced nations.

Fernando Henrique Cardoso (1979), a Brazilian sociologist, the inventor of the *"dependencia"* (or dependency) theory, asserts that capitalism is the main mechanism of the modern world system, in which the flow of financial and technological penetration is distributed by the developed capitalist centers (the cores) to the countries of semi-periphery and periphery (Cardoso 1979, cited in Wallerstein 1987: 45). In regard to national autonomy, Hirst and Thompson (1999: 281) argue that the globalisation force lessens the capability of the state authorities to determine their own national economic policy, or that states's own supremacy has been diminished as globalization allows international regimes and the core to intervene in state affairs, in particular national economic and political policy and decisions. In "Globalisation and the Future of the Nation State", Hirst and Thompson (1995) write:

> The nation state has ceased to be an effective economic manager. It can only provide those social and public services international capital deems essential and at the lowest possible overhead cost… Nation states in this new perspective have become the local authorities of the global system. They can no longer independently affect the level of economic activity or employment within their territories; rather, that is dictated by the choices of internationally mobile capital (1995: 414).

Similarly to Hirst and Thompson, Nayyar (2002) states:

> Privatization, liberalization, and globalization have gathered momentum. This process has placed new players centre stage in the world economy. There are two main sets of economic players in this game: transnational corporations which dominate investment, production, and trade in the world economy, and international banks or financial intermediaries which control the world of finance. This has induced a strategic withdrawal on the part of the nation state in some important spheres. They remain the main political players but no longer the main economic players (2002: 4).

Many scholars and sociologists criticize globalisation, therefore, as a major mechanism of neo-imperialism and neo-colonialism, as the core or super nations can manipulate other states by using economy, technology, and transnational corporations as major forces. Smith and Smith (2002) maintain:

> With increased economic interconnection has come deep-seated political changes – poorer, 'peripheral', countries have become even more dependent on activities in 'central' economies such as the USA where capital and technical expertise tend to be located. There has also been a shift in power away from the nation state and toward, some argue, multinational corporations. We have also witnessed the rise of globalization of the "brand". It isn't just that large corporations operate across many different countries – they have also developed and marketed products that could be just as well sold in Peking as in Washington. Brands like Coca Cola, Nike, Sony, and a host of others have become part of the fabric of vast numbers of people's lives.

Regarding international investments, it is undeniable that the worldwide distribution of international and transnational investments (from international firms in developed countries to developing and newly industrial countries in Asia, Latin America, Africa, and Eastern Europe) can accelerate domestic economic growth at the macro level. Yet, there are a number of threats which have weakened local or community businesses. Moreover, protesters against globalisation believe that globalisation accelerates the gap between the rich and the poor, the 'haves' and the 'have-nots'. Amartya Sen (2002) contends that globalisation accelerates disparity and injustice among the rich and the poor nations, and that the poor countries will be more and more deprived. Sen argues that

> … the inequity in overall balance of institutional arrangements—which produces very unequal sharing of the benefits of globalization. The question is not just whether the poor, too, gain something from globalization, but whether they get a faire share and a fair opportunity (Sen 2002).

Investments from international firms, in particular in developing countries, can boost the GDP; however, these transnational business operations may destroy self-dependency systems of domestic business operation. In other words, these may weaken local or community industries' productive capability, especially in many agricultural countries. Bigman concretely illustrates that

> ... money can be made by growing foreign-owned commercial farms… No money can be made by a villager working her own land when she cannot afford the few bags of fertilizer, the seeds and insecticides, courtesy of the structural adjustments, the liberalization, the removal of support systems and the massive devaluation (Bigman 2000).

In short, Bisley (2007) asserts the most significant changes (driven by globalisation) relate to:

> (i) the international trade of goods and services, and specially, the increased importance of trade to wider range of sectors;
> (ii) international movements of capital, and most particularly to the wider distribution, more diverse and dynamic sectors receiving global investment and, of course, the rise of high volume short-term speculative capital movements;
> (iii) the huge increase in the ability of knowledge and ideas to move rapidly around the world;
> (iv) the consolidation of political spread of the sovereign state (2007: 54).

Network Society and Fast Capitalism

Since the late 1980s, the overwhelming flow of capitalism and the spread of information and communication technologies have been accelerating factors for rapid social change in the global society. The world has been transformed into "an interdependent system working as a unit in real time" (Castells1996: 2). In this section, two conceptual frameworks: (i) Network Society, and (ii) Fast Capitalism are reviewed.

Network Society: The core concept of the network society according to the trilogy publications of Manuel Castells "*The Rise of the Network Society*" (1996), "*The Power of Identity*" (1997), and "*The End of the Millennium*" (1998), and other relevant information resources will be discussed. According to Manuel Castells, the “Network Society” is defined as follows:

> …a society where the key social structures and activities are organized around electronically processed information networks. So it's not just about networks or social networks, because social networks have been very old forms of social organization. It's about social networks which process and manage information and are using micro-electronic based technologies (Castells 2001: Manuel Castells’s response, interviewed by Harry Kreisler, May 9, 2001).

Based on the notion of network society, one of a major dynamic of social and individual change is the ubiquitous use of networked communication media and information technology. The main composition of modern society can be divided into two sections, i.e. the Net and the Self. Castells writes: “our societies are increasingly structured around the bipolar opposition of the Net and Self” (1996: 3). The Net stands for the network of communities, organizations, and social movements. The Self means each individual unit of society. The Self or a member of society tries to reaffirm its identity under the changing circumstances in the modern world. However, the social changes caused by the Net or the network, have impacts on an individual’s adjustment and/or adaptation. Derived from this principle, at the macro level, I analysed that each individual nation state around the globe can be defined as “the Self”, which are nowadays interconnected to each other in terms of economic, social, and political aspects, as well as being a member of the global community or the Net. Each nation state maintains its autonomy; however, in many circumstances, the state has to comply with international agreements or has been dominated by global trends. Individual states cannot resist external dominance and extensive pressure from the global force since the world has become a global network society (Castells 1996).

The global economy is characterized “by its interdependence, its asymmetry, its regionalization, the increased diversification within each region, its selective inclusiveness, its exclusionary segmentation, and, as a result of all those features, an extraordinarily variable geometry that tends to dissolve historical, economic geography” (Castells 1996: 106). The global economy system has been constructed under the dynamic push of capitalism since 1970s, and extensively and continuously intensified for three decades. Trends of global economic reform (such as privatisation, deregulation, and liberalisation) as well as fast advancement of communication technology have influenced all nation states to comply with and follow up as each individual state member, which is socio-economically interrelated to each other. State's policy and decision making in many issues have been influenced by global dominance, as Castells comments:

> economic policy, economic autonomy of governments, and, ultimately, the relationship between the governments and the economy -- are only possible because of deregulation and liberalization that took place in the 1980s in most countries, and because of the existence of an infrastructure of telecommunications, information systems, and fast transportation systems that provide the technological capacity for the system to work as a unit on a global scale (Castells 2001: Manuel Castells's response, interviewed by Harry Kreisler, May 9, 2001)).

Nevertheless, individual states will not totally disappear; the nation states remain sovereign, but the degrees of freedom of nation states have shrunk to an extraordinary degree (Castells 2001). The modern form of the nation state will be classified as a member of international regimes and/or regional governments such as the European Union which is formulated as a continental governance system based on census of each autonomy state (Castells 2001). In other words, the significant decision has been shifted from an individual level into a supranational and/or regional level. Castells explains that Europe decided to unite so that together they could have some level of bargaining power and some leverage to control global flows of wealth, information, and power including a series of non-federal state institutions. However, it remains nation states, as supranational institutions which share decentralized sovereignty to local-regional governments (Castells 2001). Castells defines the new form of governance as the "Network State" (Castells 1998: 311).

Regarding the connection of technology and society, Castells asserts that "technology is society and society cannot be understood or represented without its technological tools" (1996: 5). Mega drives of social change in the modern world are "the globalization of economy, technology, and communication" (Castells1998: 311). Considering the Network Society theory on the communication perspective, Castells (1996: 327-375) maintains that the new communication technology enhances the concept of the network society. The world society is unified by the networked information system. The barrier of nation states, culture differences, and geographic distances are no longer obstacles of human interaction. Virtual community networks in cyberspace are a practical example for the global "Electronic Networks" (Castells 1996: 362).

Considering the relationship between information technology and capitalism, Castells asserts that "the information technology revolution has been instrumental in allowing the implement of fundamental process of restructuring of the capitalist system from the 1980s onwards. (1996: 13)" The new global economy uses information and communication technology as infrastructure for creating information and financial networks in interlinking and facilitating capital flows throughout the globe (Castells 1996: 93). Therefore, the new characteristic of economy in the information age can be categorised as "Informational Capitalism" (Castell 1996: 18). According to Bar and Borrus (1993), "information networking technology jumped by quantum leap in the early 1990s, due to the convergence of three trends: digitalization of the telecommunications network, development of broadband transmission, and a dramatic increase in the performance of computers connected by the network, performance that was in turn determined by technological breakthrough in microelectronics and software" (Bar and Borrus 1993 cited in Castells 1986: 170).

In terms of the global electronic and communication technology industry, currently there are three giant groups of technological manufacturers, i.e. the United States of America, Europe, and the Asia Pacific countries (Japan, China, and South Korea) (see a discussion on global communication industry in the next section). Castells argues that high technology firms are all dependent on global networks of technological and economic exchange (1998: 321-324). He also defines the term of interdependence network of global industry as the "Network Enterprise" (Castells 1998: 321). The network enterprise can be established in forms of (1) alliance of industrial manufacturers, groups of R&D (Research & Development), networks of distributors, and (2) alliance of transnational investment and overseas production bases. Therefore, the modern business corporations can extensively expand "networking of trade and investment across national boundaries" (Castells 1998: 322). Under the theme of network enterprise, each member of the association gains collaborative interests, and economises on costs of investment from technological development, marketing, and production since the expenditures are shared by the members. Furthermore, in terms of international trade, the alliance of manufacturers will become more influential in negotiating with the technology adoption nations, for example, the persuasion of launching DTV technology by three major groups of DTV innovation manufacturers: DVB (Europe), ATSC (US), and ISDB (Japan).

Castells further gives an example of two types of Japanese network enterprises, i.e. (i) horizontal networks, based on intermarket linkages among large Japanese firms, and (ii) vertical networks, built around a large specialized industrial corporation, comprising thousands of suppliers and their globally related subsidiaries. These networks are interlinked in terms of financial interdependency, marketing activities, personnel, and information sharing (Castells 1996: 174). According to Ernst, there are five categories of international business networks in the world economy: (a) supplier networks, (b) producer networks, (c) customer networks, (d) standard coalitions, and (e) technology corporation networks (Ernst 1994: 5-6 cited in Castells 1996: 191). Contemporary business firms expand the network from domestic to multinational enterprises and transnational corporations, e.g. international network enterprises of digital communication, information technology, telecommunications, and media business. The central control unit of the global network system can "coordinate, innovate, and manage the intertwined activities of networks of firms" (Castells 1996: 378) by using networked information technologies.

Fast Capitalism: The rapid change of the world economy and society since the last quarter of the 20th Century has been influenced by the globalisation of capitalism. Capitalist nations, in particular the western countries, have emphasised capitalism's ability to promote economic growth as measured by Gross Domestic Product (GDP) and standard of living. In the perspective of social development, under the pushing of the capitalist paradigm, society has been shifting from modernisation into postmodernity (see Havey 1989). Becks, Giddens, and Lash describe modernity as "the high-speed industrial dynamism sliding into a new society" (Becks, Giddens, and Lash 1994: 2). In other words, industrialisation and capitalisation are the main drivers of the modern society.

Ben Agger points out that in the development of capitalism scheme in the contemporary society, "postmodernity hasn't surpassed capitalism, but we are in a postmodern stage of capitalism in which information technologies like the Internet change the relationship between the self and society. Selves are increasingly invaded be culture industries that seek to keep them shopping and conforming” (2004: 98). In addition, Agger argues that the process of moving the world into the postmodern era is still in progress. He writes: “our moment in civilization is perhaps less postmodern than meets the eye – I call it fast capitalism” (Agger 2004: 8). In short, fast capitalism is a concept providing contemporary explanation of a rapid change of the modern world, in which capitalism and advanced information technology overwhelmingly influence individuals, communities, and states, and become accelerating forces pushing human society into transition. However, some sociologists, theorists, and scholars may use different terminologies to explain the world’s rapid change. For example, Paul Virilio defines such as “Dromology” (applied from “Dromos” in Greek), which means the science (or logic) of speed” (Virilio 1986: 47). Manuel Castells (1996; 1997; 1998) defines it as “Network Society”. David Havey (1989) defines this change as “Time-Space Compression”.

Virilio, a prominent French urbanist, asserts that the emergence of electronic media and communication, as well as modern transportation revolutionises the society and human interaction (Virilio 1986). According to Virilio’s notion on “dromology”, speedy information, which is distributed through new communication technology makes the gap of individuals, cultural groups, and global communities less momentous (Virilio 1986). The invention of advanced digital communication technology, such as digital signal compression, causes transmission revolution (Virilio 1997: 49-57). Global information flow is intensified because of “instantaneous propagation of electromagnetic radiation in the form of radio and video” (Virilio 1997: 51). Philosophically, Virilio (1986; 1991; 1997; 2000) asserts that speed is associated with real-time data transmission moving at the speed of light, and giving rise to what is now recognised as instantaneity. A key driver of time is the shift to an instantaneous mode of production and consumption. By utilising modern communication technology, members of global society, organizations, industrials, and firms can have real-time interaction, which will hasten economic development and social networking. In relation to globalisation, Virilio states: “the speed of light does not merely transform the world. It becomes the world. Globalisation is the speed of light” (Virilio 2000).

Regarding the interrelationship of information and communication technology and fast capitalism, new information technologies provide the means for accelerating turnover times of capital in production (Harvey: 1989). Babe (2006) stresses that the dynamic force of fast capitalism depends on volume, speed, and territorial expanse of digitised communication, high speed communication networks and information flows. Similarly, Castells emphasises that the real-time information technology has become the heart of contemporary business operations and activities. Castells writes:

> Capital works globally as a unit in real time; and it is realized, invested, and accumulated mainly in the sphere of circulation, that is as finance capital…. capital accumulation proceeds, and its value-making is generated, increasingly, in the global financial markets enacted by information networks in the timeless space of financial flows. From these networks, capital is invested, globally, in all sectors of activity: information industries, media business, advanced services, agricultural production, health, education, technology, old and new manufacturing, transportation, trade, tourism, culture, environmental management, real estate, war-making and peace-selling, religion, entertainment, and sports (1996: 471-472).

In practice, the real-time feature of information technology generates a new scheme of real-time electronic commerce to the global economic system. Purser demonstrates:

> Emerging real-time technologies remove the friction of the real world, by promising ever more "user-friendly" interfaces. E-commerce, for example, collapses the distance between producer and consumer, eliminating the need for intermediaries in the supply and distribution chain. Real-time consumption holds the promise of "instant gratification," where consumers can buy practically anything, anytime, anywhere. The one-click order feature pioneered by Amazon.com is but one example of how real-time technologies produce the sense of instantaneity. Indeed, the medium of cyberspace enables images to be copied, circulated, exchanged and consumed at a far more frequent and faster rate than the consumption in the material economy (Purser 2006).

With respect to business operation under the concept of fast capitalism, technology is used to accelerate capacity and speed of production, distribution, logistics, communications, financial transactions, customer services, technological transfers, etc. An example of using information communication technology to enhance the competence of the instantaneous communication networking system in global business is the “Digital Nervous Systems” (see Gates 1999). The idea was raised by Bill Gates, the founder of Microsoft, at Microsoft’s annual CEO summit in 1998. The digital nervous system enables business operators to act faster and process business more rapidly, as well as get closer to the customers because the technology will enable individual computer users to obtain minute-to-minute access to business information and applications (Kelly 1998).

GLOBAL COMMUNICATION INDUSTRY

One of the main attributes of globalisation is the spread and connectedness of communication and technologies across the world. Globalisation involves the diffusion of ideas, practices, and technologies (Smith and Smith 2002). These innovations have become lucrative commercial export products. At present, the modern notions of “global standard”, “internationalization” and “universalization” are familiar. On the one hand, these standards can assure consumers of the high quality of the products. On the other hand, some critics argue that these standards become barriers and limitation for the newcomers. The technological innovators and large manufacturers establish “global standards” in order to take control of the market.

Daya Kishan Thussu (1998: 2-5) asserts in “Electronic Empires: Global Media and Local Resistance” that the global dominance enterprises, especially Western-based transnational media empires, play a significant role in influencing global media business in both aspects of content and technology. In terms of technology, information technology and digital communication technology, which are invented and developed by huge global electronic enterprises, have become essential products in the worldwide markets. Since 1990, transnational corporations in electronics, media, communication, telecommunications, and IT have developed into the most highly valuable in the world markets. Thussu reveals:

> TNCs[1] figure prominently in the world’s top companies listed in the Financial Times 500 at the end of 1997, with Microsoft Corporation being placed at number three, Disney at number 40, Sony at 75, Time Warner at 96, Reuters at 183, and News Corporation at 408 (Financial Times 1998). Electronics is the most important industry as far as the largest TNCs are concerned, accounting for some 16 percent of all firms’ foreign assets (UNCTAD 1997: xviii) (Thussu 1998: 3).

I reproduced Thussu’s investigation of global electronics empires in order to see if there has been any significant change in a recent decade. According to the United Nations Conference on Trade and Development (UNCTAD), in the “World Investment Report 2007: Transnational Corporations, Extractive Industries and Development”, in 2005 there were 21 communications, telecommunications, and IT international firms in “the World’s

[1] TNCs stands for Transnational Corporations.

top 100 non-financial TNCs, ranked by foreign assets, 2005” (2007: 229-230), in which GE (General Electric) (US-Electrical & electronic equipment) was at number one (with a foreign asset of US $412,692 million), Vodafone (UK-Telecommunications) at 2 (with a foreign asset of US $196,396 million), and France Telecom (France-Telecommunications) at 11(with a foreign asset of US $196,396 million).

Table 3: The World’s Top 100 Non-financial TNCs, Ranked by Foreign Assets, 2005 (Communication and Electronic Equipment Industry)

Ranking by Foreign Assets	**Corporation**	**Home Economy**	**Industry**	**Foreign Assets** (Millions of US Dollars)
1	General Electric	United States	Electrical & Electronic Equipment	412,692
2	Vodafone Group PLC	United Kingdom	Telecommunications	196,396
11	France Telecom	France	Telecommunications	87,186
17	Deutsche Telekom AG	Germany	Telecommunications	78,378
18	Siemens AG	Germany	Electrical & Electronic Equipment	66,854
21	Hutchinson Whampoa	Hong Kong, China	Telecommunications	61,607
30	IBM	United States	Electrical & Electronic Equipment	45,662
31	Telecom Italia Spa	Italy	Telecommunications	45,494
39	Sony Corporation	Japan	Electrical & Electronic Equipment	38,559
41	Hewlett-Packard	United States	Electrical & Electronic Equipment	36,243
44	Philips Electronics	Netherlands	Electrical & Electronic Equipment	32,926
53	Telefonica SA	Spain	Telecommunications	27,556
61	Liberty Global	United States	Telecommunications	22,377
66	Hitachi Limited	Japan	Electrical & Electronic Equipment	21,219
76	Thompson Corporation	Canada	Media	18,999
82	Singapore Telecommunications	Singapore	Telecommunications	18,000
85	Matsushita Electric	Japan	Electrical & Electronic Equipment	17,891
87	Samsung Electronics	Republic of Korea	Electrical & Electronic Equipment	17,481
88	Nokia	Finland	Telecommunications	17,264
92	LG Corp.	Republic of Korea	Electrical & Electronic Equipment	16,609
94	Telenor ASA	Norway	Telecommunications	16,244

Source: UNCTAD (2007)

Communications have become one of the most significant areas for TNCs in the contemporary world, as the figure reveals that it holds ranking numbers 1 and 2, leaving the motor and petroleum industry to be the followers.

In 2007, the Financial Times Global 500 demonstrated that giant global media and IT corporations were still very strong in the world market.

Table 4: The Giant Global Media and IT Corporations in 2007 (Adapted from Financial Times Global 500)

Ranking	**Corporation**	**Home Economy**	**Market Value** (Millions of US Dollars)
3	Microsoft Corporation	United States	272,911
84	Comcast	United States	80,801
85	Apple	United States	80,076
93	Time Warner	United States	75,242
94	News Corporation	United States	74,635
102	Walt Disney	United States	70,527
154	Sony	Japan	50,867
167	Vivendi Universal	France	47,014
191	Yahoo!	United States	42,446
254	Time Warner Cable	United States	33,794
293	Liberty Media	United States	29,699
310	Viacom	United States	28,451
313	Direct TV	United States	28,366
314	Reed Elsevier	Netherlands	28,352
333	Thomson	Canada	26,670
375	CBS	United States	24,015
402	McGraw-Hill	United States	22,318
484	British Sky Broadcasting	United Kingdom	19,390

Thailand, the selected case study of this research, can be classified as a technological adopter nation, or a peripheral country in the world system, which mainly adopts innovation, in particular media and telecommunication technology and IT, from the “core industries” through global trade from the TNCs. According to Organisation for Economic Co-operation and Development (OECD) (1989), among the developing nations in Asia, Thailand is categorised as a member of the Second-tier[2] Asian NIEs (Newly Industrialising Economies)[3]. The OECD asserts that despite the fact that Thailand has had rapid growth in domestic economic development, at the macro level, Thailand remains dependent on foreign investment and technology. The main characteristics of the Second-tier Asian NIEs in regard to technological importing and adoption are as follows:

[2] The First –tier Asian NIEs are South Korea, Taiwan, Singapore, and Hong Kong. The Second-tier Asian NIEs are Malaysia, Thailand, and the Philippines.

[3] According to the OECD, the main factors for classifying countries into NIEs are (i) key markets, including the size and structure of markets and the relative focus on internal versus external markets; (ii) production structures, including industry structure and firm size, extent of inter-industry linkages, and “core industries”; (iii) degree and form of reliance on foreign technologies; (iv) role of the state in industrial and technological development; (v) state of development of indigenous scientific and technological capabilities; and (vi) institutional, social, cultural and political factors, which are often specific to a single economy but nonetheless may have an important bearing on technological capabilities (OECD 1989: 29-30).

> All [the Second-tier NIEs] depend very heavily on foreign direct investment and have limited absorptive capabilities for unbundled technologies, especially highly sophisticated ones. In the more technology-intensive export sectors (e.g. electronics), foreign firms predominate. Technology access is also a problem since they lack the leverage of large economies… in negotiating favourable agreements (OECD 1989: 29).

A report by the Department of Foreign Trade of Thailand (February 2008) on the situation of the electronic equipment industry of Thailand in 2007-2008 discloses that in 2007, Thailand imported electronic equipment and accessories to a total amount of US $ 19,451 million. The top three importing resources are from (1) Japan (US $3,917.5 million), (2) China (US $3,125.2 million), and (3) the United States of America (US $2,348.7 million). It is forecast that Thailand will increasingly import electronic equipment and accessories into the country from 2008 onwards.

In terms of exporting electronic equipment and accessories, Thailand can generate great income into the country. In 2007, Thailand reached a total amount of US $30,355.1 million from exporting this kind of product to overseas countries. However, majority of the electronics manufacturers in Thailand are TNCs or business nominees from Japan, South Korea, China, Taiwan, Singapore, and the US. A large number of elite electronic companies and global brands (such as SONY, IBM, HP, GE, TOSHIBA, SAMSUNG, and LG) establish their factories and companies in the central and eastern regions of Thailand. Through the globalisation mechanism, these international firms use Thailand as their own production base, which can provide them with cheap labour as well as natural resources and materials.

Summary on Conceptual Framework of Globalisation and Network Society

It is very clear from the literature reviews that the modern societies have been driven by globalisational force. Despite the fact that there are dissimilar perspectives on globalisation (Pros versus Cons), there are a number of similar key concepts, in which sociologists, economists, thinkers, and scholars from different schools of thought agree to identify as a general definition of this term, e.g. interdependency, interconnection, internationalisation, global flow of capitalism, etc. These concepts reflect that contemporary world has been shifted into the oneness of world society under the mainstream force of globalisation. However, there are still big gaps and divisions among each nation state in terms of cultures, governing systems, and levels of socio-economic development. The major change that occur in one place may cause alteration or impact to others, since all members and nation states of the world are socially, politically, and economically interrelated and networked (Castells 1996; 1997; 1998).

Considering the communication study perspective, I summarise that there are two of foremost mechanisms of globalisation that dominate global media industries, i.e. (i) capitalism and/or fast capitalism (Agger 1989; 2004), and (ii) advanced information and communication technology (Virilio 1986). It is argued that the technological changes caused by the dominance states/the cores (Wallerstein 1974; 1979; 1982; 2004) or the world capital leaders in electronic manufacturing and media industry have become irresistible force influencing all members of the global media industry, in particular, influence on the periphery states (under-developed and developing nations) or technological adopting nations. In this aspect, Robinson criticises:

> With the apparent triumph of global capitalism in the 1990s, following the collapse of the old Soviet bloc, the defeat of Third World nationalist and revolutionary projects, and the withdrawal of the left into postmodern identity politics and other forms of accommodation with the prevailing social order, many intellectuals who previously identified with resistance movements and emancipatory projects seemed to cede a certain defeatism before global capitalism (2005: 15).

Based on the literature review in this Chapter, I analyse that the globalisational force intervenes into a nation state in forms of global capitalism, global economic system, international regimes, network enterprises, technological transfers and trades. Therefore, the circumstance of Thailand and its TV broadcasting industry can be synthesised as follows:

(1) Thailand (as a developing country/a periphery state) is a member of global society, therefore; Thailand is influenced by the globalisation force and the world economic and innovation dominance states (the cores).

(2) Thailand’s TV industry cannot resist the global trend of change. As the dominances (the cores/developed countries) have shifted into technological transition from analogue to digital, Thai TV broadcasting, inevitably follow the global trend.

(3) Thailand’s media and information technology industry has been highly dependent on foreign technology as it can be seen from the great amount of imported hardware and software products. This makes Thailand a foreign technology dependent country; consequently, Thailand’s TV industry is not capable of mandating the direction of its domestic technological development. In other words, global electronic network enterprises dominate the technological trend of the Thai TV business.

(4) However, as nation states in a globalisation era remain autonomy (Castells 1996), it is argued that besides the global push, it would have a local drive of the transition in Thailand’s TV industry, which will be presented in Chapter 3.

This Chapter presents the conceptual framework of globalisation as a key drive of change in the global society. In the next Chapter, I present a current situation of global digital television in brief, as well as a review on digital communication and digital television technology, which will be used as a fundamental knowledge for conducting field research and discussion in the final Chapter.

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CHAPTER 2

DIGITAL TELEVISION

In the modern world, since the time television was invented, there is little doubt that it has continuously played a very significant role as a medium of information, entertainment, and education. From black and white to colour, television has become a key platform for human beings to express emotions, portray arts, cultures, and values, communicate and exchange information, and reflect the realities and illusions of the world. As digital technology was progressively developed in the second half of the twentieth century, it contributed to a 'digital revolution' that has affected all aspects of society. From a media and communication perspective, digitalisation has been leading all forms of media and communication devices towards being digital, computer driven, and interactive According to Kawamoto, digitalisation is the procedure of data and information processing in which various categories of information such as text, sound, moving images, photographs, or graphics are converted to a similar 'language' (coded as binary digits, in this case "1"s and "0"s) that can be quickly read and exchanged by computers, and then decoded, again by computers, and presented in a form that people can comprehend (2003: 10).

In the world of broadcasting, according to O'Driscoll, this spectacular evolution has not only changed the way of media business operation and media production but also the patterns of media consumption of hundreds of millions of television households around the world (2000: 3). Seabright and von Hagen claim: “New technology is revolutionising [global] broadcasting markets. (2007: i)”

Galperin (2004: 13-24) suggests the basic research questions for conducting a study vis-à-vis the TV industry in transition in a certain country or conducting a comparative study. The enquiries are: (1) why digital TV?, and (2) what transition strategies have governments adopted? In this study, therefore, I apply these basics questions in an attempt to find the primary drive or reason for digital transition in the Thai TV industry (a case study), and the recommendations for a transition strategy and national DTV policy. The following review presents the background, significance, and overview of global TV in transition.

What is digital television? In investigating this term and the main characteristics and significance of technological transition, Michael Starks (2007), the founder Chairman of the UK Digital TV Group, maintains that “digital television” is a “buzzword” and is variously defined. He describes the main differences between analogue and digital television:

> …most obviously distinguish digital from traditional analogue communications are coding and compression. In digital television the video and audio signals are encoded into a stream of ones and zeros and this provides a robust format which avoids loss of quality between the transmitter and the receiver. The signals are also compressed, which brings the additional benefit of increased transmission capacity. This extra capacity can be used either for a technically richer signal providing superior technical quality (high definition), or for additional programme services (more channels). From the consumer standpoint, therefore, digital television is potentially ‘bigger and/or better’ (2007: 6).

Why does the TV broadcasting industry need to change the system and have an analogue switch-off and digital switch-over? From a technical perspective, the Federal Communication Commission (FCC) of the United States claims that one of the main reasons for switching broadcasting technology from analogue to digital is that the latter provides better quality, and flexibility, and is more efficient than the former.

> …[R]ather than being limited to providing one analogue programming channel, a broadcaster will be able to provide a super sharp "high definition" (HDTV) program or multiple "standard definition" DTV programs simultaneously. Providing several program streams on one broadcast channel is called "multicasting." The number of programs a station can send on one

> digital channel depends on the level of picture detail, also known as "resolution," desired in each programming stream. DTV can provide interactive video and data services that are not possible with “analogue” technology. Converting to DTV will also free up parts of the scarce and valuable broadcast airwaves. Those portions of the airwaves can then be used for other important services, such as advanced wireless and public safety services (FCC 2005).

From the broadcasters’ point of view, digital development affords great benefits because of its decreasing “bandwidth utilisation per channel (O’Driscoll 2000: 3)”. In other words, it offers channel abundance in which digital compression technology omits redundant information from media content to allow multiple channels to be carried where only one was possible before (Straubhaar and LaRose 2000: 20-26). In addition, digital technology facilitates more means for the broadcasters to distribute programmes via various new digital platforms such as Internet Protocol Television (IPTV), and Asynchronous Digital Subscriber Line (ADSL), for example, to their audiences. These technologies open the door to great opportunities in the broadcasting business. The progression of digital technology has allowed producers to generate new forms and genres of programs by employing a wide range of computer software and digital hardware. In this new era of television, digital technology is offering the great benefit of interactive and multifunctional services to viewers, e.g. providing audiences with the opportunity to involve themselves in their favourite TV game shows in their living rooms; shopping and banking; programming personal viewer schedules; gaming and betting; messaging services (email, SMS, instant messaging); video on demand (VOD; hiring movies and programmes directly from television stations or service providers); interacting with sporting events (switching camera angles, commentary and statistics); interacting with programme guides; and voting in polls and surveys (SEVEN Digital TV 2005).

In terms of broadcasting technology, Papathanassopoulos (2002: 35) maintains that there are four main extra features of digital transmission technology that have reshaped TV into modern characteristics as well as provide benefits to TV station business operators. These are electronic programme guides, conditional access and application programme interfaces.

> - Electronic programme guides (EPGs) are navigational aids similar to browsers in PC world. EPGs will become increasingly important for users as the number of digital channels increases. In other words, EPGs allow operators to ‘guide’ viewers through the maze of programmes and services, including moving from one channel to another…

> - The *conditional-access* mechanism unscrambles the signal, but is not standardized. This will prevent hackers from developing systems to circumvent the mechanism. Broadcasters need to maintain control over their conditional access and prevent competing broadcasters from using the same set-top box[1]. In other words, the owner of the conditional access can decide which pay-TV programme to encode and provide to viewers…
>
> - The *application programme interface* (API) is the software platform of the set-top box. The API can be either the proprietary system of the operators or embedded as an integral part of the other components of the set-top box… The API also plays an essential role in on-demand services and electronic commerce services running on the set-top boxes (2002: 35-36).

As regards the viewers, the new generation of television in the digital age offers a greater range of attractive features to audiences, more so than in the past. The features include: the improvement of image (a clearer and sharper picture) and sound quality; an increased number of channels, including more free-to-air channels and multi-channel programming[2]; wider-screen broadcasts[3]; new and improved text services and programming guides; interactive and multifunctional services integrated with multimedia and internet features (such as e-mail, web browsing, online services, and interactive mode); and multi-camera views[4] and enhancements[5] during selected programs (Australian Broadcasting Authority (ABA) 2005 and Digital Broadcasting Australia (DBA) 2005).

In considering on the primary driving factor of transition in the TV industry, therefore, on the one hand the technological can be attributed to the progress of "technology" or "technology" itself. In other words, the transition is driven by technological determinism; the benefits of digital television technology can persuade the nation to go digital. On the other hand, many scholars may assert that this judgment may be too feeble and

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[1] Set-top box (STB): The receivers (named because they typically sit on top of a television set) convert and display broadcasts from one frequency or type-analogue cable, digital cable, or digital television to a standard frequency for display on a standard analogue television set (Silbergleid and Pescatore 2000: 319)

[2] A digital signal can carry much more data than an analogue signal. Therefore more than one channel of television programs can be broadcast in digital TV at the same time. This is known as multichannelling.

[3] Digital television will be broadcast in widescreen mode. Widescreen television has a different aspect ratio (ratio of width to height) from traditional analogue 4:3; the aspect ratio of a widescreen is 16:9.

[4] Multi-view lets the viewer select from a variety of camera angles or may provide additional information related to an event. Multi-view is particularly suited to sporting events. On additional channels to the main program, the viewer can select, via remote control, a different full screen view of the event, alternative audio commentary or related information.

[5] Viewers of digital television will have a wide choice of 'enhancements' to regular programming. Enhancements are separate channels of video, data or audio, which are related to the program on the primary channel. Sports programs may offer the choice of a different camera angle, alternative audio commentary, action replays, player profiles or other information.

academically superficial as the globalising world has become very complex (Castells 1996: 5)[6], interconnected, and interdependent. Therefore, the transition cannot be considered separately from other aspects and/or purely focused on a particular assumption such as technological drive[7].

Considering the transitional drive from an International Communication perspective, DTV technology can be regarded as a contemporary stream of transnational communication technology overflowing throughout the globe. This technology is transferred among developed nations, as well as commercially conveyed from the innovating countries (by international media corporations, manufacturers, and technology traders) to the adopting nations (more detail regarding international communication domination, see Schiller 1969; 1976; 1989). The US, European countries, and Japan have played a significant role as global DTV technology leaders, and they have been in a crucial fight to occupy the world's DTV technology and equipment market shares since late 1990s (for more details regarding the development and competition of global DTV technology leaders, see Hart 2004; Papathanassopoulos 2002; Galperin 2004; Cave and Nakamura 2006).

Regarding the economic impact of technological transition, digital communication technology develops into a lucrative product, and the owner of the technology benefits from distributing, transferring, and trading innovative hardware and software in the world market. Technology inventor nations have critically competed to be the winner in a global TV marketing war to launch to the adopters their new DTV technology standards, i.e. Digital Video Broadcasting (DVB; Europe), Advanced Television Systems Committee (ATSC; USA), Integrated Services Digital Broadcasting (ISDB; Japan), and Digital Terrestrial Multimedia Broadcast (DTMB; China), as well as TV hardware and software products.

[6] Castells (1996: 5) argues that "… technology does not determine society… since many factors, including individual inventiveness and entrepreneurialism, intervene in the process of scientific discovery, technological innovation, and social applications, so that the final outcome depends on a complex pattern of interaction.

[7] See also the debate on this issue in Smith and Marx. (eds) (1994), as well as in MacKenzie and Wajcman (eds) (1999)

Politically, the technological transition has been pushed into the political arena and become one of the most controversial issues, as it is highly related to the huge investment in domestic technological conversion as well as the impacts on governments' decisions and national policies. Socially and culturally, there are a number of social changes caused by adopting and employing this novel technology. In terms of a conceptual framework of political economy of communication policy, major forces of the technological transition in the TV industry are highly involved with many factors: political, economic, and socio-cultural dynamics, as well as a wide range of key players such as state authorities, international trade organisations, transnational regimes, politicians, policy makers, broadcasting entrepreneurs and manufacturers, broadcasters, TV producers, audiences, and internal economic influencers (Galperin 2004). According to Castells (1996: 171), the technological change is driven by the gigantic innovation firms (informational/global economy or the network enterprise). The diffusion of information and communication technology, particularly microelectronics, computers, digital equipment, and telecommunications, and the fast distribution of innovation are driven by the new information economy under capitalist ideology. In a political economy of digital television, Galperin (2004) argues that besides the technology, socio-economic and political mechanisms, information flow, and communication paradigm shift in the modern world can be counted as the main force of the transition. He writes:

> The forces that challenge the broadcasting industry, however, are not only technological. The transition to digital TV is part of a larger process of change in the way information is produced, aggregated, and distributed in contemporary societies. This involves fundamental changes in the economics of the communications industry that has created new competitive advantages, eroded others, and altered the balance of power between different market actors. It also involves new ways of thinking about the implications of information infrastructure for economic growth, for cultural development, and political participation… I suggest that the transition to digital TV is much more than a tale of technological innovation. It is a story about large scale changes in the normative modes as well as the institutions that shape television as economic and social force and, ultimately, about the politics of the information society. (2004: 4)

GLOBAL DIGITAL TELEVISION IN BRIEF

At the international level, the transition of 'analogue switch-off' and 'digital switch-over' is a global phenomenon and significantly brings about a dramatic change in the global TV broadcasting industry. The transition started in the 1990s in the United States and in some western European countries. Since then, many countries around the world have launched the digital broadcasting system in order to replace the analogue system (DTI 2005). Galperin maintains that "digital TV involves a major reordering of the broadcast sector and requires governments to rethink the legal apparatus for communications industry" (2004: i). In other words, governments and national communication regulators have issued new broadcasting policies and plans in order to manage and employ this new broadcasting technology effectively, given that it is an important tool for national communication, and to accelerate technological transition from analogue to digital, as it is a means of gaining more socio-economic benefits and boosting technological competitiveness.

According to Jock Given (2003: 5), the launch of DTV terrestrial services started in 1998 in the USA and UK. Until now (June 2008), in the big picture of transition, there have been only a few nations in Europe that have completely switched off the analogue and fully switched over to the digital television system. The deadlines of analogue switch-off have been deferred in many countries, for instance the US and Australia, because the procedure of transition is complex and concerns a wide range of factors and stakeholders: legislation, politics, economy, TV business operators, and readiness of consumers (see more details regarding impediments of DTV transition in Given 2003). In general, the target date of global digital switch over has been set for between 2006 and 2015 (see the details in Table 1). Therefore, it can be assumed that, internationally, the transition has been in progress or in an introductory stage.

I gathered information regarding the target date of analogue switch-off from a wide range of resources, i.e. from websites, conferences attendance, documents of official state authorities, governments, national broadcasting regulators, private sectors, broadcasters, news agencies, as well as from European Broadcasting Union (EBU) 2008; Cave and

Nakamura 2006; Orava and Perttula (2006); and MECDIACAST (2005). I present in Table 5 the target dates for analogue switch-off and digital introduction in a number of countries.

Table 5: The Status and Timelines for 'Analogue Switch-off' in Listed Countries

Region/ Country	**Plan/Status (Analogue Switch-off)**
North America	
- USA	To be completed by February 17, 2009
- Canada	Switch to ATSC digital by August 31, 2011
Central America	
- Mexico	To be completed by 2022
Latin America	
- Brazil	To be completed by 2016
Europe	
- Luxembourg	First country to complete migration to digital on September 1, 2006.
- Finland	Transition completed on September 1, 2007
- Andorra	Transition completed on September 25, 2007
- Switzerland	Transition completed on November 26, 2007
- UK	The first analogue switch-off was on March 30, 2005. Analogue TV will be switched off in the rest of the UK by the end of 2012. - By 2010 all BBC programmes will be produced in HD (High Definition) Format and broadcast in the digital system. - B Sky B accomplished its digital project in 2006.
- Ireland	To be completed by 2012
- Germany	Berlin switched off in August 2003 Rest of Germany 2008 - 2010
- Belgium	To be completed by 2012
- Netherlands	Process ongoing from 2004 with no confirmed end-date
- Norway	To be completed by 2009
- Finland	To be completed by 2010
- Czech Republic	To be completed by 2017
- Ireland	To be completed by 2010
- Denmark	To be completed by 2011
- Austria	To be completed by 2010
- France	To be completed by 2011 TPS and Canal+ launched their digital broadcasting project in 2005
- Spain	To be completed by 2010
- Italy	To be completed by 2010
- Belgium	To be completed by 2012
- Bulgaria	To be completed by 2012
- Denmark	To be completed by 2009
- Greece	To be completed by 2010
- Russia	To be completed by 2015
- Portugal	To be completed by 2012
Australia	
- Australia	To be completed by 2009 (metropolitan cities); 2012 (regions)
- New Zealand	To be completed by 2012
Asia	
- Japan	To be completed by July 24, 2011
- China	To be completed by 2015
- Hong Kong	To be completed by 2012
- South Korea	To be completed by 2012
- Malaysia	To be completed by 2015
- Philippines	To be completed by 2015
Africa	
- South Africa	To be completed by 2011

At the national level, switching off the analogue television system in the nation is a complicated, complex, and controversial issue as the transition is highly concerned with state authorities' decisions, national public interest, laws and national communication policy. Starks (2007: 3) writes: "the whole development of digital television - from its early experimental stage through to completion of the planned technology substitution – involves a complex interplay between technology, commerce, and politics." In regard to the adoption of digital television into a country, it is highly concerned with national decisions and consensus regarding public policy, media regulation and management, which related to the significant issues of importing technology and global standards. Dunn (2008) maintains:

> The country will have to decide what technical standards will be used, when we enter into switchover. There are different technical standards related to the geographical regions of the world. It may well be that our technical choice has to do with our geographical location, but it is something that needs to be discussed and something that we need to arrive at for a national consensus.

In regard to national communication policy, Levy (1999) argues that switching into a digital television environment has a dramatic impact on national broadcasting policy and regulation: "Digital television may also lead to moves to reconsider both the utility and practicality of existing broadcasting regulation and continued value of nationally organized regulation (1999: 14)." According to a study on technological transition in TV broadcasting industry in Europe, in particular in the Scandinavian countries, by Aslama and Syvertsen, the transition periods from analogue to digital broadcasting are quite long in many countries (2006: 32). In addition, the regulatory frameworks established digital televisions vary greatly from country to country. There are different strategies in technological transition. Some countries use an obligation scheme to move the broadcasting industry into a digital environment, while in some countries implement a supporting strategy to encourage domestic TV industries. For example, in Germany and the UK, the governments raise the annual fee of TV license in order to increarse financial support for public service broadcasting TV stations migrating into digital environment (Aslama and Syvertsen 2006: 32).

In addition, the convergence[8] of communication technology impacts and changes the TV broadcasting regulation landscape. The regulators need to issue up-to-date policies and measurements to administer the contemporarily integrated communication industry since "digitalisation contributes to the blurring of boundaries between different media" (Fagerjord and Storsul 2007: 27). Steemers states:

> Where television was once a discrete industry sector with its own set of regulatory norms, the technological possibilities of digital content creation and delivery are bringing it closer to other forms of communication content and to the computing and telecommunications sectors. This is adding a new complexity to regulation and policy, as industry convergence… With the introduction and application of digital technologies, television is likely to undergo further transformation both as a technology and as a cultural form (1998: 1).

In considering the impacts of technological transition on radio and TV broadcasting spectrum policy, Cave and Nakamura (2006) maintain that governments and broadcasting regulators need to revise public policy in broadcasting frequency allocation, since the transition into digital broadcasting makes communication engineering management become complex. The regulators need to focus on three key factors (3Is): Interference, International co-ordination, and Investment in order to orchestrate national communication system effectively. They write:

> This regulatory task involved an inherently complex balancing act in a range of dimensions, in each of which there are many conflicting considerations. Key factors include:
>
> - **Interference.** Transmissions interfere unless sufficiently separated in terms of frequency, geography and time. Regulators must strike a balance between reducing the extent of harmful interference, through careful planning, and enabling potentially valuable new services to enter market.
> - **International co-ordination.** The effective use of radio spectrum in one county will typically require careful co-ordination with neighbouring countries, to avoid the extent of harmful interference.
> - **Investment** in equipment. Most equipment can operate over only a limited range of frequencies, and so relies on predictable access over time to defined frequency bands. Stability in spectrum assignments to encourage investment in equipment can slow the pace of spectrum re-use. Increasingly, technical specifications are determined internationally to reap economies of scale in production. National regulators need to balance stability and international harmonisation with responsiveness to new technologies (2006: 9-10).

[8] According to Fagerjord and Storsul, the convergence of contemporary media sphere can be categorized into six categories, i.e. (i) network convergence, (ii) terminal convergence, (iii) service convergence, (iv) rhetorical convergence, (v) market convergence, and (vi) regulatory convergence (2007: 25).

Considering the impact of technological transition on the big picture of the television industry, Bird (2002) maintains that technological transition not only affects government aspects, but also the TV broadcasting industry, including TV station business operators and viewers. He writes:

> Today the international broadcasting community is on the verge of a revolution in television content creation and transmission, brought about by a range of stunning digital technologies. Digital television, High Definition television… as well as Interactive TV are all technologies that will have far reaching consequences for the television industry, affecting program producers, broadcasting entities, advertisers, electronics manufacturers, as well as television viewers. It is a technological environment complicated by legal issues, competing acquisition and transmission formats, revolutionary new methods of content creation and delivery, as well as a whole host of emerging content consumption structures that threaten the established order of television communication (2002: 12).

In the process of changing to digital, television broadcasting operators require the conversion of all software and hardware, not only in television production but also in broadcasting transmission systems. Jeffrey Hart (2004) asserts that digital communication technology and DTV technology give a great impact on the whole TV broadcasting industry. Hart maintains:

> The deployment of HDTV technologies would involve major shifts all along the well-developed chain of production of video images. Video producers would have to convert their equipment and techniques to the new HDTV formats. Signal deliverers – the network and local over-the-air broadcasters, cable operators, satellite operators, and video rental stores – would have to do the same. Consumers would have to buy new televisions, VCRs, video cameras, etc., to take advantage of the new format. In short, the television production, transmission, and reception systems would have to be transformed to deal with the new TV images (2004: 8).

In the area of TV consumption, analogue television sets need to be replaced by digital receivers or fitted with supplementary devices (e.g. a set-top box) in order to completely decode the digital signal and receive programs and additional services from DTV stations. From both perspectives (TV station operators and TV consumers), the conversion requires a huge budget, an effective conversion plan, technical knowledge and support, and nationwide cooperation. In other words, the conversion is a challenging issue to the governments, state authorities, business sectors, and the public.

Considering global DTV technology adoption and penetration, nowadays there are four main platforms for transmitting the digital signal to the digital television receiver, i.e. satellite, cable, terrestrial, and broadband Digital Subscriber Line (DSL) (DCMS-Digital Television Project: 2005). IMG's 2004 study 'Global Digital TV' (Informa Media Group: 2004) reveals that digital cable will become one of the dominant digital delivery platforms by 2010. It has been forecast that by 2010 digital terrestrial and satellite TV will be widely available to global households in many countries throughout the world, especially the developed countries. In addition, it is estimated that digital television broadcast via DSL will be an alternative channel for both watching and interacting with. Its programmes will prove a popular platform for the younger generation.

A television marketing research project conducted by Tandberg Television (2004) revealed that globally there were more than 50 million digital satellite and 30 million digital cable subscribers up to and including 2005. In 2007 there would be more than 200 million digital TV homes (25 per cent of global television penetration). Worldwide subscribers to cable Video on Demand (VOD) services would increase from approximately 5 million at the end of 2003 to almost 14 million by 2007. Broadband penetration in the USA and Europe will grow from 25 million in 2002 to 290 million in 2008; and, by 2008, 20 million homes worldwide will subscribe to IPTV services (Tandberg Television 2004).

In the major countries of the world, from late 1998 onward, the expansion of digital TV penetration has risen continually. In the United States of America, the National Association of Broadcasters (NAB 2005) reveals that the number of digital television stations has dramatically increased from 66 stations in June 1999 to 1,497 digital television stations in 2005, which are fully operational, broadcasting programs in digital format and serving 99.98 per cent of US TV households. The first target date for switching off analogue, set by the US Congress, was 31 December, 2006 (FCC). However, the penetration of DTV reception in the United States could not reach 85% by the end of December 2006, despite the high progression in converting TV stations into digital. The US Congress, therefore; has recently deferred the target date of switching off the analogue system to February 17, 2009 (FCC 2007).

In the United Kingdom, in 1998, digital television was launched formally, with both digital terrestrial and digital satellites broadcasts (Starks 2007: 2). The UK can claim to have one of the highest rates of DTV penetration among the nations of Europe. According to the Office of Communications (OFCOM) (2007), by the end of December 2007, there were 524,500 net UK household conversions to digital television (DTV), which means the number of UK households with digital television has risen to 22.2 million homes. This means that 86.7% of households receive digital television services. The number of BSkyB[9] subscribers reached 8.3 million. There were over 9.3 million free-to-view satellite homes by the end of 2007. Digital cable subscribers increased to nearly 3.3 million and 94% of all these cable subscriptions in the UK were digital (see more details regarding DTV in UK in Cave and Nakamura 2006; Starks 2007).

In Japan, a leading nation in the field of digital technology, according to Nakamura and Tajiri, the official launch of "the digitalisation of terrestrial broadcasting began in 2003 with the three large metropolitan areas of Tokyo, Osaka and Nagoya… It is estimated that a total investment of 1.2 trillion yen (about US $10 billion) is needed for terrestrial broadcasters to set up digital terrestrial broadcasting facilities throughout the nation (2006: 121)." The population coverage of Digital Terrestrial Television Broadcasting in 2003 was approximately 12 million households (25 per cent of total household in Japan). It is predicted to reach 17 million (35 per cent) in 2004, 23 million (48 per cent) in 2005, and approximately 38 million households (80 per cent) in 2006 (Asami 2004: 4). O' Leary (2000: 4) asserts that the Japanese Ministry of Post and Telecommunications officially began a DTV project in 1994 by establishing the Digital Broadcasting Development Office to be in charge of technological development. In addition, the Japanese Digital Broadcasting Experts Group (DiBEG) was established to formulate a strategy for developing digital broadcasting on various transmission media and platforms. Japan has produced Integrated Services Digital Broadcasting (ISDB) as its own standard, succeeded in developing a DTV technology, and became the first nation to launch public digital satellite broadcasting in 1996 (see more details regarding DTV in Japan in Cave and Nakamura 2006).

[9] BskyB (British Sky Broadcasting) is a British satellite television station that broadcasts in digital system.

In Australia, digital television commenced on 1 January, 2001 in the five major capital cities of Sydney, Melbourne, Brisbane, Adelaide and Perth (DBA 2005). Since that time, Australian terrestrial television station networks, i.e. ABC (Australian Broadcasting Corporation), Channels 7, 9, 10, and SBS (Special Broadcasting Service), have launched digital and interactive television projects to serve domestic media consumption, a service that has rapidly increased in demand. DBA estimates that 777,000 digital TV receivers had been sold by the end of March 2005 (DBA 2005) (see more detail regarding DTV in Australia in Given 2007; Kenyon 2007).

Given (2007) gives a summary regarding the progression of transition of digital terrestrial TV in three nations: USA, UK, and Australia. Information is presented in the following table.

Table 6: Digital Terrestrial TV: Plans, Experience, Future

Country	**Policy settled**	**Services commence**	**Initial switchover deadline**	**Current switchover deadline**	**Current digital terrestrial TV take-up (%)**	**Other multi-channel TV take-up (%)**	**Multi-channel TV take-up at DTTV launch (%)**
UK	1996	November 1998	2006-10	2007-12	33.0 (Q1 2007)	48 (Q4 2006)	26.4 (1998)
United States	1996	1998	31 December 2006	17 February 2009	3.3 (December 2004)	86 (June 2005)	78.2 (June 1998)
Australia	1998	1 January 2001	2008-11	2010-12	29.6 (October 2006)	26.1 (Q2 2007)	20

Source: Given (2007: 287)

In conclusion, this technological transition has become a global trend in a globalising world, in which each state, as a member of global society, can hardly avoid and resist the change. In addition, this transition involves highly controversial issues in many countries as it requires a national consensus and expensive monetary investment, and it is concerned with a wide range of stakeholders. Therefore, it is crucial that media academics, policy makers, and professionals give importance to studying the circumstance and consequences of this technological revolution in the TV broadcasting sphere. In this way, they will arrive at a clear understanding of how to manage and employ this new technology in the country effectively and beneficially to the national public interest.

DIGITALISATION OF COMMUNICATION TECHNOLOGY

In this part of the chapter, I explore the background of the digital revolution in media and communication, the emergence and attributes of new digital media, and the trends of technological development. I divide the content of this section into two sub-sections: the revolution of communication technology from Analogue to Digital, and the contemporary concept of digital television.

THE REVOLUTION OF COMMUNICATION TECHNOLOGY FROM ANALOGUE TO DIGITAL

As the world enters the modern era, it has seen the rapid acceleration of communication technology and media development. The swiftness of this process can be attributed to a number of factors. Kawamoto (2003: 11) states that the mechanism that has transformed communication and media technology and led to a digital media environment comprises ten main factors:

1) Increased digitization of information (text, audio, video, photos, and graphics)
2) Growth and mass penetration of powerful personal computers
3) Development of user-friendly interfaces and miniaturization of computer hardware
4) Development of networking software and hardware
5) Government support for the building of an interoperable global information infrastructure and revision of antiquated telecommunications laws
6) Corporate consolidations in the media and telecommunications industries
7) Technological convergences
8) Broader bandwidth capabilities and compression technologies

> 9) Diffusion of computer technology in many sectors of daily life, including education (and libraries), business, government, health, and civil communication
> 10) Demonstrated market demand for news, information, and entertainment (Kawamoto 2003:11).

As regards the evolution of media, a focus on the natural and chronological framework of technological development finds that the majority of modern digital forms of media are either continuous innovation development or the direct descendants of previous analogue media that may have lacked some features or functions (Atkin and LaRose 1994). “[E]very new medium is influenced by older media and vice-versa; moreover, every new medium incorporates elements of previous: physical and/or functional” (Wilzig and Avigdor 2004: 711).

New forms of media could be described simply as what is clearly not old media. Old media would be defined as the seven traditional media: Print (newspapers, magazines and books); Audio (radio and recordings); Video (television and movies) (Shirley 1999: 206). In this sense, new media is all formats of new emerging communication media that may combine text, graphics, sound and video, using computer technology and IT to generate a product or work that is comparable to - but clearly different from - old/traditional media.

Considering the historical aspect of media development, there are four stages of media development, listed as follows: (1) inauguration – new type of medium introduced to the public; (2) institutionalization – new media are extensively adopted and utilised by the public; (3) defensiveness – medium is challenged by a new medium/ new media; (4) adaptation – adaptation between old and new medium (Caspi 1993, cited in Wilzig and Avigdor 2004: 709). Wilzig and Avigdor (2004: 712) assert that there are three possible transformations and statuses of the established medium. These include: (1) *Adaptation*: The traditional medium adapts to the new situation by developing a different function and/or preserving (finding) its (new) audience. (2) *Convergence*: The traditional medium cannot survive on its own but preserves its function by merging with or incorporating into a new medium. (3) *Obsolescence*: The traditional medium does not successfully adapt to change; it declines/ disappears.

Expressing a view similar to that of Wilzig and Avigdor, Fidler (1997, quoted in Shirley 1999: 212) maintains that “when newer forms of communication media emerge, the older forms usually do not die, they continue to evolve and adapt.” Shirley states that the history of media evolution demonstrates that the introduction of a new medium does not mean the end of the old medium, and gives the following example:

> When television was introduced, for example, radio did not disappear. Instead, radio adapted to its new place in the media mix, delivering music, news and talk. Today, radio exists very comfortably alongside television… Movies, which also were threatened by the introduction of television, responded by delivering more spectacular and still play an important role in the business of media (1999: 211).

However, not every new form of media and communication device proves acceptable for public use. Palvik (1996: 65) suggests that the public adoption of new media and communication devices is dependent on a confluence of circumstances including price, reliability, simplicity – sometimes called ‘user friendliness’ – and clear use or application.

It is clear that new digital media and communication technologies have been transforming the communication paradigm. McQuail (2000: 28) stresses this point; he argues that new digital media and communication technologies have shifted the balance of power from the media institution or producer to the audiences. Digital media provide the audiences or users with more and various options from which to *choose, control, and actively participate* in communication and the media sphere. Whereas traditional mass media was essentially one-directional, the new forms of digital communication are essentially interactive (McQuail 2000: 28). In addition, the emergence of new digital media has created new patterns of media use.

The main and unique attributes of digital media are illustrated by Lister et al in *New Media: A Critical Introduction*, who describe in detail key concepts of the new digital media. They consider the fundamental nature of technology, stating that the new digital media have three unique attributes: (1) Digitality and (2) Interactivity (Lister et al 2003: 13-37). These attributes are outlined below.

(1) *Digitality*. Technically, most new digital media process and transfer all input data, texts, photos, video and audio into digits. This procedure is called ‘digitalisation’, a process that converts any type of information into a compressed form. Digitalisation enables the transmission of all kinds of communication signals - not only voices, but also data, video, graphics and music (Barr 2000). In other words, these sources of information and data are converted into a common computer-readable, digital format (Baldwin, McLoy and Steinfield 1996; Negroponte 1996; Cairncross 1997; Dizard 1997, Straubhaar and LaRose 2000). All transferred data can be compressed into very small spaces, accessed at very high speeds and in non-linear ways, processed, and stored as digital form (Lister et al 2003). Digital media encompasses forms of media content that combine and integrate data text, sound, and images of all kinds, which are stored in digital formats and are increasingly distributed through networks such as those based on broadband fibre-optic cables, satellites, and microwave transmission systems (Flew 2005). As well, it can be output, decoded, and displayed as hard copy and or other kinds of digital and analogue formats.

To clarify the term ‘digital information’ and/or ‘digital format’, which is the principal component of digital media and communication devices, Flew (2005: 3) explains that digital information has the characteristics of being:

(a) ‘*Manipulable*’ – Digital information is readily changeable and adaptable, at all stages of creation, storage, delivery, and use;

(b) ‘*Networkable*’ - Digital information can be shared and exchanged among large numbers of users simultaneously, and across enormous distances;

(c) ‘*Dense*’ – Very large amounts of digital information can be stored in small physical spaces (for example, compact discs) or on network servers;

(d) ‘*Compressible*’ – The amount of capacity that digital information takes up on any network can be reduced dramatically through compression, and it can be decompressed when needed; and

(e) ‘*Impartial*’ – Digital information carried across networks does not differ according to what form it represents, who owns or created it, or how it is used.

(2) *Interactivity*. A marked characteristic and key value added attribute of new digital media is 'interactivity'. It is this attribute that makes new digital media different from traditional media, which usually offer passive consumption. In other words, this unique feature shifts the status of the consumer from passive audience, viewer and reader in the traditional media world to active user in the digital media sphere.

Kawamoto (2003) proposes a different the model to explain the dissimilarity between the traditional and new digital media: the "Push" versus "Pull" technology. In *Media and Society in the Digital Age* he writes:

> Traditional media push news and information (and entertainment) to mass audiences, without much regard for personal preferences in terms of what particular members of the audiences want to see it. Digital [new] media are audience driven. Content is pulled by the individual user at his or her own discretion. Users can access news and information based on their personal preferences and get that content when they want it, in the order that they want it, and in the amount that they want it. Often, users can also manipulate that content (e.g., save it in a file on their local computer hard drive; e-mail it to themselves, friends, or an electronic discussion group; cut and paste parts of the information for various applications, such as writing reports or collecting research material) (2003: 33-34).

Table 7 presents general comparisons between traditional (analogue) media and new (digital) media.

Table 7: General Comparisons between Traditional (Analogue) Media and New (Digital) Media.

Traditional (Analogue) Media	**New (Digital) Media**
***Geographically Constrained*: Content is geared to geographical markets or regional audience share; market specific.	***Distance Insensitive*: Content can be geared more toward the needs, wants and interests of readers, regardless of physical location; can be topic specific.
***Hierarchical*: News and information pass through a vertical hierarchy of gatekeeping and successive editing.	***Flattened*: News and information have the potential to spread horizontally; nonprofessional online news organisations still reflect traditional media practices.
***Unidirectional*: Dissemination of news and information is generally one way, with restricted feedback mechanisms.	***Interactive*: Feedback is immediate and in many cases uncensored or modified; potential for more discussions and debate (or flame wars) rather than editorials and opinions.
***Space/Time Constrained*: Newspapers are limited by space ("Newshole"); radio and TV by time.	***Less Space/Time Constrained*: Information is stored digitally; hypertext allows large volumes of information to be "layered" one atop another.
***Professional Communications*: Trained journalists, reporters, and "experts" tend to qualify as traditional media personnel.	***Amateur/Non-professional*: Anyone with requisite resources can publish on the Web, even amateur and non-trained communicators.

High Access Costs**:** The cost of starting a newspaper, radio, or TV station is prohibitive for most people.	***Low Access Costs*****:** By comparison, the cost of electronically publishing/broadcasting on the Internet is much more affordable.
General Interest**:** Many mainstream mass media target large audiences (sometimes pejoratively referred to as the "lowest common denominator") and thus offer coverage of interest to a broad audience.	***Customized*****:** With fewer space/time restraints and market concerns, digital media can "narrowcast" in-depth stories to personal preferences and interests.
Linearity of Content**:** News and information are organised in logical, linear order; news hierarchy.	***Nonlinearity of Content*****:** News and information are linked by hypertext; users navigate by interest and intuition rather than by logic.
Feedback**:** Letters to editor, phone calls; slow, effort heavy, moderated, and edited; time/space limited.	***Feedback*****:** Electronic mail, posting to on-line discussion groups; comparatively simply and effortless; often unedited, unmoderated.
Advertising Driven**:** Need to deliver big audiences to advertisers to generate high ad revenues; "mass appeal."	***Diverse Funding Sources*****:** While advertising is increasing, other means of support permitting more diverse content; small audiences OK.
Institution Bound**:** Much traditional media are produced by large corporations with centralized structure.	***Decentralized*****:** Technology allows production and dissemination of news and information to be "grass-roots efforts" and dispersed.
Fixed Format**:** Content is produced, disseminated, and, depending on particular medium, relatively "fixed" in place and time.	***Flexible Format*****:** Content is constantly changing, updated, corrected, and revised. In addition, multimedia allows the integration of *multiple* forms of media in one service.
News Values, Journalistic Standards**:** Content produced and evaluated by conventional norms and ethics.	***Formative Standards*****:** Norms and values obscure, in formation; content produced and evaluated on its own merit and credibility.

Source: Kawamoto (2003: 32-33)

The principle of traditional media lies in the core concept of 'one to many', with the main resources and centre of communication remaining in the control of media institutes. By contrast, new digital media have dramatically transformed distribution patterns of information from centralised media/information distribution to dispersed media/information distribution.

In relation to the academic aspects of communication and media, Lievrouw (2002) notes that numerous media scholars and professionals define new digital media according to characteristics of integration and development of computing technology, or convergence of computing and telecommunications, and the sense of interactivity that digital media provides to the user. Moreover, some significant features and characteristics of new digital media tend to de-massify: they are different from the traditional mass media characteristics and the flows of information and communication that massify both message and information that emanate from the one-to-many or one-way information flows of the traditional mass media.

A propos of these ‘newness’ attributes, Lievrouw (2002) suggests that new digital media comprise computer-mediated communication; electronic publishing; and video conferencing; systems that support computer-supported cooperative work and enhance telephone services and personal communications services; broadcast or narrowcast satellite services (video on demand, for example); hypertext literature; web pages; cyber cafés; and virtual reality systems for work and leisure.

McQuail maintains that the fundamentals of new digital media are based upon two main communication technologies: “one is satellite communication and the other is the harnessing of the computer. (2000: 29)” ‘Digitalisation’ enables all kinds of formats and massive information to be transmitted and amalgamated efficiently. McQuail (2000: 29) further suggests that the manifest characteristics of new digital media include the following features:

(1) Computer-based technologies;
(2) Hybrid, non-dedicated, flexible character;
(3) Interactive potential functions;
(4) Private and public functions;
(5) Low degree of regulation; and
(6) Interconnectedness.

Nowadays, computer and information technology has become the essential component of a great number of highly technological communication devices. Manovich claims that “… the computer [digital] media revolution affects all stages of communication, including acquisition, manipulation, storage, and distribution; it also affects all types of media – text, still images, sound, and spatial constructions” (2001: 19).

Digital communication technology has brought with it a number of significant improvements: (1) Quality – transmission quality is improved because the digital signals are less susceptible to interference and disorder; (2) Channel Abundance – digital compression technology facilitates the subtracting of redundant information from media content to allow multiple channels to be carried where before only one was possible; and (3) User Control – provides great benefit to the user: content that meets user information needs and purposes can be selected (Straubhaar and LaRose 2000: 20-26).

The digital communication revolution has gradually, sometimes immediately caused change across the full spectrum of communication devices and media. According to Compaine (1984: 349), the various indicators that signal the development that has resulted from switching from analogue to digital include:

(1) Telephone – nowadays telephone is no longer just for verbal communication: it enables people to connect to the Internet. In addition, digital technology provides a very high quality of video, image, text, and audio via landline and wireless technology;

(2) Print Media – the computer greatly benefits publication; today's large numbers of newspapers and magazines are available through the World Wide Web;

(3) Film – digital technology has become a principle technology in every stage of film production;

(4) Recordings – CD (Compact Disc) and other digital recording materials are currently replacing all forms of analogue recording materials;

(5) Computers –have become among the most significant devices in the twenty-first century as they integrate all kinds of information in digital codes and signal;

(6) Cable and Satellite Television – many cable companies transmit their video signal in digital form, thus providing on increased number of channels and interactivity. In addition, many stations provide DBS (Direct Broadcast System), a service that permits audiences to receive broadcast signals directly from satellite. Currently, these satellites are used to transmit digital signals from program originators and cable operators to audiences; and

(7) Broadcasting – DTV (digital television) and DAB (digital audio broadcasting) have been launched to the audiences. These novel technologies have achieved greater quality of signal transmission.

This form of computer-based technological development has provided digital media devices with unique features and configurations that combine three principal elements: "(a) multi-sensory content, (b) various types of interfaces to access and present the information, and (c) various transmission systems for delivering the information to the interface and the user" (Biocca 2000: 23).

Besides computer-based technology, the development of new methods of broadcasting and transmission by satellite, cable, fibre optic, and radio frequency, has worked to enlarge the capacity of new digital media to transmit vast amounts of information in various formats; for example, still and motion images, sounds, and texts are transmitted effectively. A further unique attribute of these communication technologies and new digital media is their high capacity of information storage and retrieval.

CONTEMPORARY CONCEPTS OF DIGITAL TELEVISION

Marc Adams, Parul Anand, and Sebastien Fox argue that "television has remained relatively unaltered over the past several decades. The methods of broadcasting content, the business models, and the roles of the players have remained stable and have been resistant to change. (2001: 3)" The emergence of digital television promises to considerably alter the television industry. In the following sections I will introduce the concepts related to digital television.

Book (2004: 10) maintains that "a digital signal is superior to an analogue television signal because it is more *versatile* (supporting a variety of applications), more *efficient* (in that information can move at faster rates) and has *interoperability* with computers and other digitally based media. This simplicity of binary data provides the opportunity for continuous upgrades within the data bit itself, so that receiving equipment, such as a television receiver, could stay the same, while the quality of the information (digital data feeds) is improved." Table 8 below demonstrates some examples of how development of the medium/device into digital format can provide more benefit or digital advantage to the user.

Table 8 Analogue to Digital: Digital Advantage (adapted from Book 2004: 11)

Analogue Television		Digital Television	Digital Advantage/Benefit
Analogue Television	→	Digital Television	- audio and video quality enhancement - an increased number of channel - EPG (electronic program guide) - text service and on-screen data - interactive and multifunctional services integrated with multimedia and internet features - multi-camera views - multicasting

BASIC PRINCIPLE OF DIGITAL BROADCASTING TECHNOLOGY

The main principle of digital technique in broadcasting is that all input and output data, images, and sounds are decoded, transferred, input, and compressed into digit form and then output into digital format.

O'Leary (2000: 1-2) maintains that the apparent benefits of using digital technology in broadcasting and production are that

(1) digital technology enables the broadcaster to deliver vast amounts of information at low cost to the maximum number of viewers and more programs than traditional analogue,

(2) digital information can be manipulated and treated in ways never possible with the analogue system,

(3) digital images and sound can be easily stored in digital format and played or transmitted continuously over digital networks without signal degradation,

(4) images and sounds can be edited and enhanced,

(5) images and sounds in digital format can be integrated with other forms of telecommunication resources and then transmitted over various types of telecommunication networks and send to distant broadcasting sites and receivers,

(6) programs can be stored on computer hard discs and retrieved instantly for broadcast to a single viewer on demand,

(7) the delivery of multimedia material (audio, video, and data) in digital format to the consumer creates the opportunity to store content using inexpensive computer-based technology and digital recording devices.

Karyn Lu argues that television is increasingly shifting away from a broadcast, passive, linear, entertainment viewing experience; instead it is fast becoming an on demand, participatory, non-linear, infotainment, advertising targeted, broadband, two-way communications platform (Swedlow 2001). As viewers become accustomed to the “lean forward” (active) model of viewing instead of the traditional “lean back” (passive) model, as well as to the habit of processing more information simultaneously (e.g. using computers or mobile devices while watching television), they are beginning to gain and demand more control over their viewing experiences than ever before (Karyn Lu 2005: 2).

Figure 1 presents assumptions of traditional television and digital television, according to Adams, Anand, and Fox (2001: 3)

Figure 1: Assumptions of Traditional Television versus Digital Television

Assumptions of Traditional Television	**Assumptions of Digital Television**
- Passive Viewer	- Active Participant
- Push Model	- Pull Model
- Advertising Driven Revenue Model	- Commerce Driven Revenue Model
- Broadcast Programming Model	- Library Programming Model
- Linear Programming	- Participatory Programming
- Device Centric	- Ubiquitous
- Usage Primarily for Entertainment	- Usage Expands to Include Shopping, Communications, Social Interaction, and Education
- One-way Communications Platform	- Two-way Communications Platform
- Role of the Players is Well Understood	- Role of the Players is Fluid and Requires Significant Integration

Source: Adams, Anand, and Fox (2001: 3)

THE CORRELATION OF CONTEMPORARY TV VIEWER AND MODERN DTV STATION

In regard to TV business operation aspect, Alan Griffiths (2003: 15-16) asserts that DTV technology adds extra dimensions lacking in analogue TV that can change perspectives of TV business operation on the following issues:

(1) *Relationship between Broadcasters and Viewers*: In the analogue TV world, there is a distant relationship between TV stations and viewers. In the other words, TV stations do not have very good systems of customer relationship management to

communicate and obtain personal feedbacks and data from the viewer. However, it is crucial for a TV station in the digital world to generate and manage a very good customer relationship system. When the viewers interact with and use the return path of digital devices such as set-top-box and/or data/program encoding and decoding equipment, this enables broadcasters to obtain personal data and instant feedback from the viewers. “This is the first time broadcasters have had such a direct relationship with their viewers” (Griffiths 2003: 16). Stations can have records from all DTV subscribers and viewers and keep them on a computer system. Therefore, stations can track the viewers’ actions and purchasing records, which will benefit the station in terms of promotion and marketing and offering a program and additional services that can serve individual preferences.

(2) *Digital technology opens a chance for broadcasters to establish various channels of business service* by operating new additional features that will gain profitable income for stations, such as pay-per-view and VOD for special events, programs, and movies which the conditional access system then allows the audience to view; TV direct shopping; internet access; sending and receiving text messages and e-mails, playing games on the TV; and voting on panels or in polls related to TV programs.

(3) *New characteristics of modern viewers*: A new generation of viewers is emerging. This stems from the fact that nowadays people are accustomed to computer technology, digital media, and modern electronic devices. Griffiths maintains that this modern circumstance creates a concept of smart viewing. People “who use screens at work to *‘work smart’* will come home and demand to *‘view smart’* as well” (Griffiths 2003: 28-29).

In addition, there will be a shift in media consumption paradigm from media institution determinism or control to the concept of audience-oriented media exposure. In this new paradigm, viewers will be the ones who decide when to view, and programs and events will be received and re-scheduled virtually on demand. Viewers will watch “exactly what they want when they want it” (Griffiths 2003: 29). Griffiths also predicts that the youth or younger generations of TV consumers will become one of the dominant audience groups in the future who will create modern attributes of television consumption. He claims that “the young have started to use it [television] in ways that would never have occurred to previous generations" (Griffiths 2003: 33). There are several noticeable modern TV consumption trends, which are as follows: (1) young generation viewers tend to not be attached to television schedules; (2) they obtain information from several resources and various kind of media simultaneously; (3) they are attracted by things in which they can be actively involved electronically; and (4) they prefer to store (legally and illegally) their preferred content and program, and pass it on to others (Griffiths 2003: 34).

These contemporary patterns of TV consumption will challenge broadcasters in various aspects: (1) Formats, (2) Advertising, and (3) Interactivity (Griffiths 2003: 38-41). In light of these changes, Negroponte argues that "the key to the future of television is to stop thinking about television as television" (1995: 48). According to Orava and Perttula (2005: 160-161), the development of technology creates many new opportunities for industry operators but also there are a number of impacts and changes on the TV business operation, such as (a) new pattern of program viewing or 'time-shifted viewing', and (b) emergence of 'new delivery channels'.

(a) Emergence of 'Time-Shifted Viewing': The development of the digital TV program recorder and technology generates a modern form of program viewing. In particular, the evolution of VCR (Videocassette Recorder) has moved towards the PVR (Personal Video Recorder)[10]. PVR enables users to record a program in digital format in digital storage (hard disk and/or other digital recording materials such as DVD). However, the most important feature of PVR is that it provides audiences with controlling power for three main reasons: (1) 'Time Shifting' mode, which the advent of the digital personal video recorder (PVR) has made easy. This feature allows a viewer to record a television

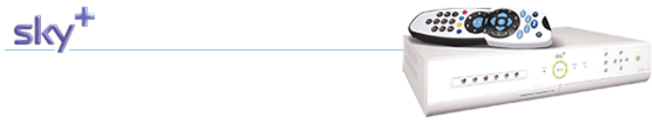
[10] PVR - The personal video recorder (PVR) or digital personal video recorder is a device that records television shows and video to a digital storage medium (a hard disk) in digital format. This Personal Digital Video Recorder can store approximately 30 - 60 hours of television programs, which allows a viewer to instantly view these recorded programs at any time. The number of hours a user can record will vary depending on the type of programming recorded, model and capacity offered by manufacturers or DTV operators. However, there are some restrictions for recording the program that may be of concern to commercial rights and copyrights. In particular, some Box Office movies cannot be recorded. Or the DTV operators will allow audiences to conditionally record and store these movies for a few days before they are automatically deleted. These restricted programs and movies that cannot be recorded or have a limited condition of recording will include a notification that the program or movie is not available for recording when a user attempts to record it through the EPG.

program (shown in an electronic program guide, by recording it onto a hard disk) to be viewed at a time more convenient to the consumer (to watch it when they want); (2) feature allowing pausing of live TV and instant replay of interesting scenes; and (3) feature allowing advertising/commercial skipping (recently, these PVR features have been already integrated and added into some new models of set-top box). These digital features create a concept of 'flexible TV usage' for consumers, which give wide ranging effects in current and future broadcasting operations.

The figure 2 illustrates the contemporary concept of TV consumption generated by digital PVR and new features, functions, and models of digital set-top box.

Figure 2: A Contemporary Concept of TV Consumption: 'Smart Viewing' and 'Time-Shifted Viewing' Offered by Digital PVR and New Models of Digital Set-Top Box

(a1)



(a2)

(a) The integration of technology allows viewers to receive digital television signals and record their preferred program, therefore, the viewing schedule of the modern TV audience becomes flexible. Image (a1) on the left is FOXTEL's digital set-top box and Personal Video Recorder. Image (a2) on the right is Sky TV's digital set-top box and PVR. Sky TV claims that it offers an average of 40 hours of recording time.

(b1) recording


(b2) pausing


(b3) rewinding

(b) 'Record, Pause, and Rewind' are the new features that PVR offers contemporary viewers**.** FOXTEL says that it allows viewers to record two shows on Foxtel Digital at once while watching another pre-recorded show at the same time.

Source: Images from Sky TV[11] and FOXTEL iQ[12]

[11] Images were retrieved from Sky TV. Available at http://www.sky.com/ordersky/equipment/skyplus (14 December 2005)

[12] Images retrieved from Foxtel (Australia). Available at http://www.foxteliq.com.au/experience/ (15 December 2005)

(b) *Emergence of 'New Delivery Channels' and Modern TV Business*: Technological development of digital channels eliminates the limitation of content offering platforms. It offers media producers and operators the possibility to transmit content in various platforms under the concept of 'content everywhere'. This means consumers can get access to information in any place and by any methods, and that contents are easily available for audiences.

Orava and Perttula (2006: 166-169) explain how digital technology will change TV into a new business scheme distributing and integrating content and services into a wide range of digital media as follows:

> TV content broadcasting is from one to many, and it is only one-way delivery channel. Digitalisation enables new, more advanced services like electronic program guide (EPG), digital teletext, and applications. Utilising these news services require advanced set-top boxes.
>
> The mobile channel can be used both as a return channel and as a two-way interactivity enabler between a media company and the end user. The return channel is linked to digital TV content and services, whereas two-way interactivity enables digital TV independent but context-related content and services.
>
> Internet access also can be used as a return channel or as a two-way interactivity enabler. Advanced set-top boxes have either modem or Ethernet connection enabling internet access. From both return channel and two-way interactivity, Internet access is used in the same way as the mobile channel…
>
> The mobile devices can also be used as a TV content as services receiver when utilising IPDC (Internet Protocol Datacast) for broadcasting.
>
> …What is new in the radio world is so-called visual radio. Visual radio uses traditional FM radio for broadcasting content, and for services, it utilizes mobile channel for both return are interested in the program… (2006: 166-169)

In short, there are a number of modern delivery channels for TV content have been introduced to the consumers:

- TV programs on mobile handheld devices, for example PDA (Personal Digital Assistant) and mobile phone. The key technologies that make possible the transmission of multimedia such as moving image, sound, text, and digital data to handheld electronic devices are 3G and DVB-H.

3G stands for third-generation wireless communication technology, which is particularly developed for mobile phone and handheld communication devices. This technology provides the ability to transfer both voice data (telephone calls) and non-voice data (text, video, and audio). The third generation, as its name suggests, follows the first generation (1G) and second generation (2G) of wireless communications. The first generation period started in the late 1970s and lasted through to the 1980s. This system, known as “cellular mobile radio telephone”, used an analogue voice signaling system. The 2G phase began in the 1990s and much of this technology is still in use. The 2G mobile phone features digital voice encoding, and can provide basic multimedia services such as text messaging. 3G is a recent technology that offers a great benefit to communication and allows media operators to provide enhanced multimedia for consumers.

According to DVB (2005), DVB-H is short for Digital Video Broadcasting-Handheld. DVB-H is a technical specification and technology for bringing broadcast services to battery-powered handheld receivers, which is the key enabling technology for mobile television. It is the latest development within the set of DVB transmission standards.

- <u>TV programs via Internet or Internet Protocol Television (IPTV)</u>. IPTV is an alternative platform that offers producers, broadcasters, and telecommunications service providers the potential to distribute content and TV programs via Internet to both PCs and se-top boxes that are connected to the Internet. IPTV is a system where a digital television service is distributed to subscribers by employing the Internet Protocol over a broadband connection.

The main benefits of IPTV are that (a) it provides two-way capability, which is lacking in traditional TV broadcasting technology; (b) it offers point-to-point distribution, allowing each viewer to view individual broadcasts; and (c) it enables viewers to control viewing (skip, pause, forward, and rewind) and has a free selection of programming.

Another attractive feature of IPTV service is that many broadband/telecommunication service providers often integrate this service with VOD and may also include Internet services such as Web access and VOIP in their marketing package, which is called 'Triple Play' (voice, video, and data service), due to the fact that all of these services use the same broadband technology infrastructure. Nowadays, many of the major telecommunications operators are operating IPTV as a new revenue opportunity from their existing markets. Many operators cooperate with media production firms and TV stations to provide content for IPTV. As the convergence of technology and business become a push factor for shifting into a modern business model, many foremost IT service providers, telecommunications operators, and broadcasting and media firms will merge globally to operate this lucrative business.

According to IPTV Asia Forum (2005), the IPTV market in the Asian region overall is predicted to grow to a value of US $300 million during 2005. The number of IPTV subscribers in the Asia/Pacific region (excluding Japan) is expected to grow from nearly half a million subscribers in 2004 to over 20 million subscribers by 2009. Internationally, there were a number of successful IPTV businesses that reached a large number of subscribers in 2005, such as NOW Broadband TV (Hong Kong), launched in 2003, which had approximately 500,000 subscribers in 2005. FastWeb TV (Italy), launched in 2000, had 650,000 subscribers. Maligne TV (operated by France Telecom) started in 2003 and had 125,000 subscribers in 2005.

IMPACT OF DIGITAL TELEVISION ON TV BUSINESS

Digital technology has many benefits for broadcasting. Griffiths (2003: 42-55) identifies five main benefits:

(1) *Gateway for newcomers*: Digital technology provides opportunities and opens a gateway for newcomers to operate TV stations and broadcasting business because it eradicates the limitations of the airwaves and offers more new and various channels through which the newcomers can distribute content and programs.

(2) *Cost reduction*: Digital technology becomes a push factor for operating broadcasting business because it reduces the transmission costs of television and the costs of actually running a channel. Griffiths claims that “these two costs used to form significant barriers to starting television channels. It is six times more expensive to transmit a channel from a satellite using analogue technology than it is to use a digital signal” (2003: 42).

(3) *Elimination of channel management complexity and reduction of personnel employment*: Utilising digital technology in broadcasting assists broadcasters to eliminate complexity of channel management and procedure, and it reduces the cost of hiring personnel to run program. Griffiths (2003: 42-43) presents the example of running TV programs on schedule, which in the analogue transmission system involves a number of intricate procedures for manually scheduling and managing a program on air. TV administrators need to follow complex procedures and the programmers need to be sure that (a) all tapes are ready and present for the complete day’s schedule, (b) these tapes are all run in the correct order, (c) they are playing without faults, and (d) all TV commercials are inserted and played out in the correct places and times. Moreover, in the analogue transmission world TV stations are required to employ a number of people to be in charge of this duty.

In the digital world, all of these complicated functions are eliminated because digital technology is ‘server-based transmission technology’, and all program materials can be automatically assembled, broadcast, controlled, and scheduled by computer. Also modern TV stations can employ fewer numbers of personnel for scheduling and running programs than are required in analogue TV station operation.

(4) *Increased value/income for business operations*: All digitally input content and programs, which are made up of images and sounds, can be easily transferred and transformed into various types of digital forms using computer software. This provides TV stations with a business opportunity to use these contents in many ways, e.g. create program promotion materials, create commercial souvenirs, and distribute in other channels such as websites. In addition, it offers a chance for integrating extra business applications such as e-commerce and commercial services with TV station operation.

(5) *Emergence of new TV channels and adaptation of conventional networks*: In contrast to the main national TV networks that operate a TV business for mass audiences, many newcomers in the TV business will run modern TV stations by identifying who are the main target audience and what these viewers want to see. Many new TV channels will operate their business to serve a specific audience group in a niche market. Griffiths (2003: 43) claims that this factor will generate 'themed channels' which will generate their own character and themes in order to ensure and grab attention from the target audience, create and maintain distinction from mass audience TV stations, and increase ease of promotion and marketing activities, and business operations.

To defend against losing viewers to the themed channels, however, the national/conventional TV networks have also established new strategies to compete with the new competitors in high competition markets by "(1) producing themed segments in their schedules, and (2) creating digital channels of their own which are complementary to the brand of the main channel" (Griffiths 2003: 54).

CHALLENGES OF DTV FOR TV BROADCASTING INDUSTRY

The advent of digital television and the utilisation of digital technology impacts and challenges each industry section in the United States of America, i.e. broadcasting firms, consumer electronics manufacturers, and the computer industry. Van Tassel (2001: 13-14) gives an analysis of how the emergence of DTV brings advantages and disadvantages to every sector of TV industry, as presented in Table 9 below.

Table 9: Advantages and Disadvantages of Emergence and Employment of DTV Technology in Broadcasting Firms, Consumer Electronics Manufacturers, and the Computer Industry

Industry Segment	Advantages	Disadvantages
Broadcast Networks	- Increase audience share	- Cost new equipment - Higher cost of some programming - Increased revenue unlikely
Local Stations	- Maintain audience share and parity with competition from cable, DBS - Potential new revenue streams from added capacity	- Cost of transition to digital - Uncertain business models
Cable Networks	- Greater picture quality - Potential for new revenue	- Higher cost of video-originated programming
Cable Operators	- Parity with competitors, DBS, and local stations - Potential for new revenue	- Very high cost of system upgrade
Satellite Operators	- Increase viewership and revenue through greater capacity to offer more digital channels	- Take away key competitive advantage of higher-quality picture
Consumer Electronics Manufacturers	- Give consumers incentive to buy new generation of TVs	- Will cause short-term decline in home theatre sales - Higher cost of R&D and manufacturing
Computer Industry	- PCs can become digital TV receivers - Hastens convergence of PC and TV	- Some formats difficult for PCs to decode - Digital TVs can compete with PCs to receive digital material

Source: Van Tassel (2001: 113)

Van Tassel (2001, 419) suggests also a notion for modern TV broadcasting operators and producers to consider in order to achieve success in business and to create an attractive TV channel in digital and interactive world of television. She defines this concept as the '6 Cs' which are: '*Choice*': provide many different kinds of programming that are easily accessed; '*Convenience*': make it ease to use and modify, always on 24/7; '*Control*': provide the ability to navigate and personalise access to content as a way of exercising choice in a megachannel environment, and provide opportunities for outputting material to email, local storage, reuse, and repurpose; '*Community*': enable people to communicate with one another, and offering content that has contextual relevance to the group so they want to talk about it; '*Customisation*': enable people to personalise content for themselves, their systems, and their circumstances; and '*Cool*': make customers feel good about themselves or believe that others will think well of them.

Summary on Conceptual Framework of Digital Television

In this Chapter, I present a review on a development of DTV in brief. As discussed in the first part of the Chapter, global TV industry has been in technological transition. Many countries around the world have announced to shift their TV industries into a new digital environment. Since the first launch of digital television in the late 1990s, there have not been many nations that could accomplish switching off the analogue TV broadcasting systems. Therefore, the global TV industries' technological transition can be considered as in a preliminary stage.

Based on the literature reviews, converting the TV system from analogue technology to digital TV broadcasting system is not only a matter of technological change, but also a transition that gives impacts on a wide range of perspective of TV sphere because TV has become a principle medium of mankind for many decades. The new attributes of DTV, such as interactive features, extra information and integrated media services, etc. will shift the concept of TV into new facet. In the macro scale, I have found that there are five main issues concerning an introduction of DTV technology into the country that need to be clarified. These are as follows:

(1) Potential advantage and disadvantage of launching DTV in Thailand.

(2) Worthiness of investment in national TV technology conversion.

(3) Strategy of technological transition (analogue switch off/digital switch over).

(4) Trend of DTV in Thailand.

(5) Readiness of current TV stations in technological transition.

The following Chapter, theoretical frameworks of communication policy, and a brief history of Thai TV broadcasting industry and policy development will be discussed. This information provides background knowledge of selecting TV industry of the study.

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CHAPTER 3

COMMUNICATION POLICY AND DEVELOPMENT OF THAI TELEVISION

In this chapter, I provide a review of conceptual frameworks and development of communication policy. The Chapter is divided into two parts. Part 1 is concerned with a conceptual framework of ‘communication policy’ and the development of communication policy. Part 2 discusses the development of Thailand’s television broadcasting industry.

PART 1: COMMUNICATION POLICY

Defining ‘Policy’

The word ‘policy’ is not a tightly defined concept but a highly flexible one, used in different ways on different occasions. In this study, therefore, I intentionally focus on the term ‘policy’ and emphasise the sense of ‘policy’ as a set of decisions made by governments or state authorities, rather than considering the term ‘policy’ in its broader meaning. In its broader meaning, for example, this term may be widely used in the business area and or any other aspects. In addition, as mentioned in Chapter 1, one of the focus issues of this study is to consider the role of Thai broadcasting regulators and state authorities as key players in establishing DTV policy.

In a support to my focus, Colebatch (2002: 11) asserts that while the term "'policy' tends to be used to refer to what happens in government, its application outside government is less apparent... Certainly, the term 'policy' is less common in business settings than in government... The term 'policy' is not widely used in non-commercial non-government organizations."

To begin with, I present a wide range of key definitions of the term 'policy' from various perspectives, followed by a number of theoretical frameworks of policy. Merriam-Webster states that "(1) policy is a definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions, and (2) a high-level overall plan embracing the general goals and acceptable proceduress especially of a governmental body." Van Cuilenburg and McQuail define that policy "in general refers to conscious (public) projects for achieving some goal, together with the proposed means and time schedule for achieving them. (2003: 182)"

Academically, scholars and political scientists define the term 'policy' from a wide range of perspectives. Easton defines policy as "the authoritative allocation of values for the whole society. (1953: 129)" Lasswell and Kaplan define policy as "a projected program of goals, values, and practices. (1970: 71)" Jenkins asserts that policy is "a set of interrelated decisions taken by a political actor or group of actors concerning the selection of goals and the means of achieving them within a specified situation where those decisions should, in principle, be within the power of those actors to achieve. (1978: 15)" Dye explains that "policy is whatever governments choose to do or not to do. (1992: 2)" McQuail maintains that "policy refers specifically to projects of government and public administration which have particular goals and a certain legitimation in terms of the wider 'public interests'… policy projects are characterized by deploying certain means in the form of regulatory or administrative measures that are legally binding, nationally or internationally. (2000: 21-22)" Taken together, many of these definitions are related to the political process. From a Linguistics perspective, Streeter maintains that most European languages, i.e. French, Italian, Spanish, Portuguese, German, Russian, and Greek, use the same words "politic" and "policy" to express "decisions and the decision-making process as inspirable from politics” (1996: 125). In the same logic, Hanada (cited in Raboy 2002: 5) describes that “policy as a medium of control acting upon politics and at the same time a product of political process.”

ILRI (1995: 264) further illustrates and compares the terms ‘policy’ and ‘decision’: policy is ‘made’ and ‘implemented’ in the same way that a decision is ‘made’ and ‘implemented.’ Yet it is possible to have policy that is not or cannot be implemented, so that, conceptually, actions that implement policy need not necessarily be part of policy itself. Although a policy is like a decision, it is not just a ‘one-off’, independent decision. A policy is a set of coherent decisions with a common long-term purpose. When a decision is one-off, incoherent or opportunistic, complaints are made that a government or minister ‘does not have a policy’. Government policies are often supported by special legislation.

Van Cuilenburg and McQuail (2003) consider that there is a relationship between the terms ‘policy’ and ‘public interest’. They assert that the origins of “policies lie in the interaction between the pursuit of national interests by states and the operations of commercial/ industrial enterprises” (2003: 182). They stress that policy is “generally guided by a notion of ‘public interest’, which democratic states are expected to pursue on behalf of their citizens. In general, a matter of ‘public interest’ is one that affects the society as a whole (or sections of it) rather than just the individuals immediately involved or directly affected” (2003: 182).

Despite different perspectives on definitions of policy, there are some core principles and attributes proposed by Hogwood and Gunn (1984: 13-18) for considering “policy”:

(1) ‘Policy’ as a label for a field of activity: In general, policy will be identified as a specific area of concern, such as a government’s economic policy, heath policy, monetary policy, education policy, and media policy. Hogwood and Gunn explain that the ‘field’ or ‘area’ of the policy “suggests a degree of boundary definition and self-containment” (1984: 14) of the policy.

(2) *'Policy' as an expression of general purpose or desired state of affairs*: Policy, in general, indicates a clear general target for itself. It embodies "a typical statement of policy in that it expresses the broad purposes (or 'ends') of governmental activity in one field and also describes the state of affairs which would prevail on achievement of those purposes" (Hogwood and Gunn 1984: 14).

(3) *'Policy' as specific proposals*: Policy is often established for a specific aim, in which policy makers and/ or governments are influenced by interest groups, political parties, the cabinets, NGOs, civil movements, etc. This proposal 'may have to be related to other proposals, or may represent the means of achieving the larger ends or purposes discussed above" (Hogwood and Gunn 1984: 15) .

(4) *'Policy' as decisions of government*: Policy can be described as a kind of decision of the government or state authorities, which is normally "embodied in legislation or otherwise receiving formal authorization. (Hogwood and Gunn 1984: 15)"

(5) *'Policy' as formal authorization*: Policy is usually related to legislation as stated above, therefore, government sectors can implement policy or regulate activities to take place, as approved by Acts, laws, administrators, congress, and/or other state authorities.

(6) *'Policy' as a program*: Policy can be defined as a specific project or program of government activity involved in a particular issue or campaign.

(7) *'Policy' as outcome*: Policy, in general, indentifies prospective outcomes, which should be evaluable.

(8) *'Policy' as a theory or model*: In some cases, policy can be used as a model or a theoretical framework for implementing a specific project. In addition, Hogwood and Gunn claim that "all policies involve assumptions about what governments can do and what the consequences of their actions will be. These assumptions are rarely spelt out, but policies nevertheless do imply a theory (or model) of cause and effect. At its simplest this theory takes the form 'if X, then Y will follow'. (Hogwood and Gunn 1984: 18)"

(9) *'Policy' as process*: Policy involves a process, which may indicate the timeframe and details of work protocols.

In regard to key personnel in the policy process, Howett and Ramesh (1995: 52-59) assert that policy actors can be divided into the following five categories: (1) elected officials, (2) appointed officials, (3) interest groups, (4) research organisations, and (5) mass media. Theses personnel fall into two groups: *Policy Formulators*; policy makers and policy analysts, and *Policy Implementers* ILRI (1995)**.** These are not necessarily different people. The same person may analyse policy, make it and then implement it. However, in doing so, he or she or a specific group is carrying out distinct roles. Awareness of these roles, and an ability to separate them, are important for everyone involved in policy work.

The policy process itself can be described in terms of six stages (Dye 1992: 328):

(1) The *identification* of policy problems through public demand for government action;

(2) *Agenda-setting*, or focusing the attention of the mass media and public officials on specific public problems, deciding what will be decided;

(3) The *formulation* of policy proposals through the initiation and development of policy proposals by policy making organisations, interest groups, and government bureaucracies;

(4) The *legitimation* of policies through political actions by parties, interest groups, and state authorities;

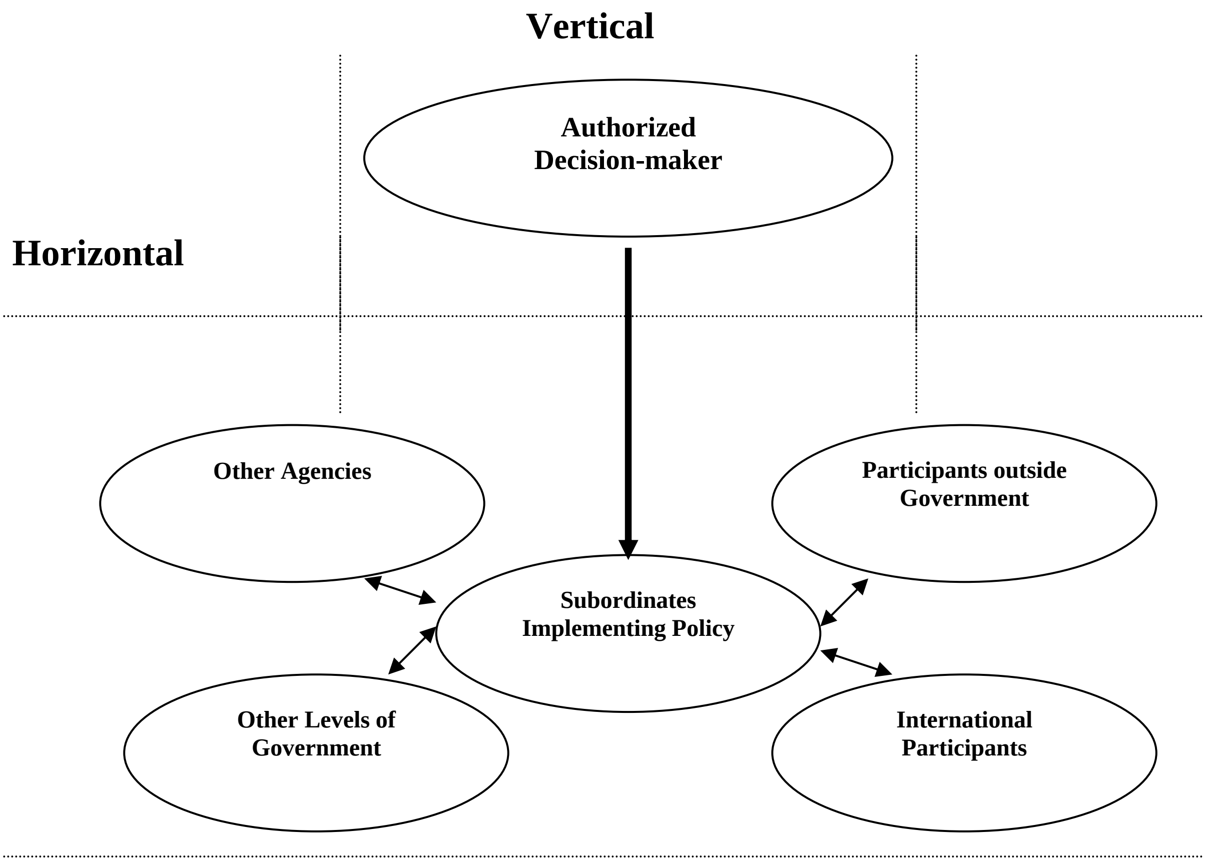
(5) The *implementation* of policies through organised bureaucracies, public expenditure, and the activities of executive agencies;

(6) The *evaluation* of policies by government agencies themselves, outside consultants, the press, and the public.

'Vertical' and 'Horizontal' Paradigm of Policy Making

Colebatch (2002: 9-12) claims that policy, in general, consists of three central elements: (1) order, (2) authority, and (3) expertise. In other words, public policy making is highly concerned with a chain of command, authorization or (legal) approval or consensus, as well as nominated persons, and/ or authorized officers, and/ or actors who are involved with the policy. "Governments decide what policy objectives are, and policy is what governments decide to do… policy highlights hierarchy" (Colebatch 2002: 9). Colebatch claims that people or a group of people who take significant roles in issuing and conducting policy can be viewed fromo two perspectives: a vertical dimension and a horizontal dimension (2002: 23). According to Colebatch (2002: 23), the **"Vertical Dimension"** defines policy as a *"rule"* or discipline. This means that it is concerned with command flowing downward from the top authority, who is a person or a group of authorized people who decides and takes responsibility for issuing the policy. The other stakeholders and/ or concerned personnel take the action response on the policy and decision. In the vertical dimension, the top authorities hold an absolute controlling power and orchestrate the main mechanism. Colebatch explains that "the authorized decision-makers select courses of action which maximize the values they hold, and transmit these to subordinate officials to implement. It may be that the subordinate officials sent courses of action up for endorsement, but the decision-makers still had to give their authority" (2002: 23). The **"Horizontal Dimension"** sees policy as *"the structuring of action"*. Colebatch clarifies that "it is concerned with relationships among policy participants in different organizations – that is, outside of the line of hierarchical authority. It recognizes that policy work takes place across organizational boundaries as well as within them, and consists in the structure of understandings and commitments among participants in different organizations as well as the hierarchical transmission of authorized decisions within any one organization" (2002: 23). A model of these two dimensions is shown in figure 3.

Figure 3: The Vertical and Horizontal Dimensions of Policy



Source: Adapted from Colebatch (2002: 24)

In conclusion, Colebatch asserts that in the vertical dimension, it is taken for granted that there are “policy makers”: the focus is on rules, so they must be rulers. In the horizontal dimension, however, it is evident that hierarchical authority is not enough, that there are many participants in policy process, and that negotiation and consensus are important. The “policy-makers” and “policy-takers” sometimes cannot be defined clearly.

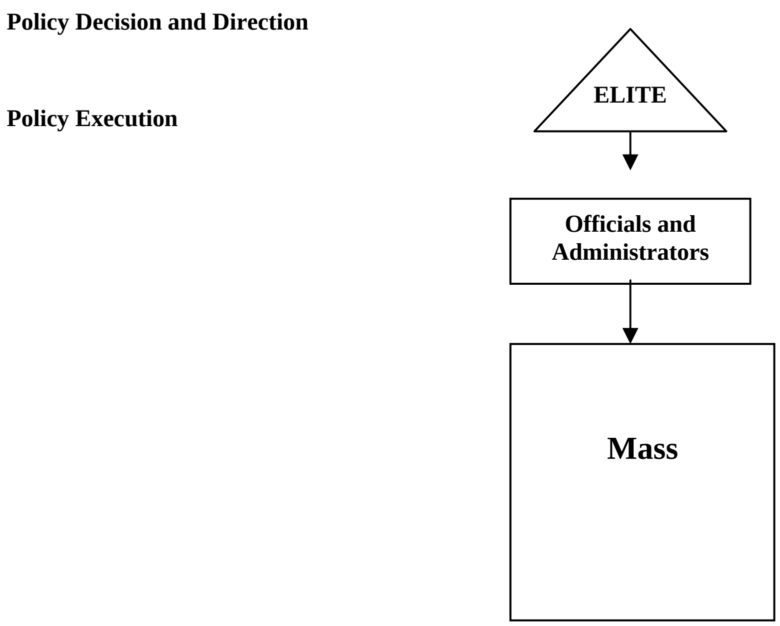
Elite Theory: Policy as Elite Preference

The hierarchy of the vertical dimension is reflected in another theory of policy, the Elite Theory. Dye asserts that “policy may also be viewed as the preferences and values of a governing elite” (1992: 28). According to Dye the main principles of the theory can be briefly outlined as follows:

> (1) Society is divided into the few who have power and the many who do not. Only a small number of persons allocate values for society; the masses do not decide public policy.
> (2) The few who govern are not typical of the masses who are governed. Elites are drawn disproportionately from the upper socioeconomic stratum of society.
> (3) The movement of nonelites to elite positions must be slow and continuous to maintain stability and avoid revolution. Only nonelites who have accepted the basic elite consensus can be admitted to governing circles.
> (4) Elites share consensus on the basic values of the social system and the preservation of the system.
> (5) Public policy does not reflect the demands of the masses but rather the prevailing values of the elite. Changes in public policy will be incremental rather than revolutionary.
> (6) Active elites are subject to relatively little influence from apathetic masses. Elite influence masses more than masses influence elites (Dye 1992: 28).

These basic elements of these principles are modelled in Figure 4.

Figure 4: The Elite Model



Source: Adapted from Dye (1992: 29)

Dye summarizes the elite theory thus: "first of all, elitism implies that public policy does not reflect demands of "the people" so much as it does the interests and values of elites. Therefore, change and innovations in public policy come out as a result of redefinitions by elites of their own values… Secondly, elitism views the masses as largely passive, apathetic and ill-informed… communication between elites and masses flows downward…. Elitism also asserts that elites share in a concensus about fundamental norms underlying the social system"(Dye 1992: 29-30).

Conceptual Framework and Development of 'Communication Policy'

Hamelink defines 'communication policy' as "a systematic, organic and specific set of principles of organization, action, control, evaluation, and reorientation, intended to direct the public planning of systems and social communication processes with a specific political framework and according to a model of economic and social development. (1983: 61)" Collins argues that communication policy can be applied at all levels, from state policies to a wide range of media and communication industries, including the print media, broadcasting, telecommunication, and the IT sector. "More specifically, it concentrates on government policies in relation to the media, especially broadcasting, usually the regulation of media content and ownership and control" (Collins, cited in Lewis and Slade 2000: 239).

Concerning the main elements of communication policy, Van Cuilenburg and McQuail maintain that there are five foundations of national communication and media policy: (1) the goals or objectives to be pursued; (2) the values and criteria by which goals are defined or recognized; (3) the various content and communication services to which policy applies; (4) the different distribution services; and (5) the appropriate policy measures and means of implementation (2003: 183-184).

Historically, communication policy can be considered to have developed in three phases (Van Cuilenburg and McQuail 2003) Van Cuilenburg and McQuail identify these phases as (1) from the mid 19th century to the beginning of the Second World War, (2) from 1945-1980/90, and (3) from 1980/90 onwards (2003: 181-207). These periods will be explained in turn.

The first period, from mid nineteenth century to 1939, can be called a transition phase from the time of "no policy" (2003: 186). The preliminary communication policy emphasized *'state interest'* and *'financial corporate benefits'* (2003: 181) and *'promoting the development of communication systems'* (2003: 186). In this period, communication policies were concerned with pioneer communication innovations; telegraph, telephony, film, cable transmission, wireless radio, and television.

The common features of policy in the pioneering phase into three main issues. State authorities and governments (1) treat communications media as branches of industry with strategic importance, (2) separate out different sectors for medium-specific regulation (different regimes based on technology), and (3) subordinate communication to imperative of national interest (economic and military) (Van Cuilenburg and McQuail 2003: 188). Regarding communication policy regimes, according to Van Cuilenburg and McQuail (2003: 190-191), primary regulatory regimes were basically established varied on three categories of preliminary communication technology; (1) print media-governed by guarantees of freedom of speech subject to the law, (2) telegraphy and telephony-administered with strong ownership, but not of content, and accompanied by certain rights of general public access and of privacy, (3) wireless and broadcasting-strong regulation control of access and content, restricted freedom of expression, some from of monopoly.

The second period was between 1945 and 1980/90. Communication policy was defined as *"public service media policy"* dominated by the sociopolitical and shaped according to political and normative values. In addition, communication policy, in particular in broadcasting media, were reconstructed for promoting democracy and providing public services, especially in Europe. Subsequently, the ideal of public service broadcasting was spread throughout the world. In addition, in the United States of America, freedom of press and social responsibility were made into significant agenda and were raised to be fundamental journalists' ethics. Formal communication regulators and media professional associations were established such as the FCC (Federal Communication Commission). Communication policies, regulations, and measures were placed into national legislation systems.

According to Van Cuilenburg and McQuail (2003: 194-195), policy during this phase (1) was primarily shaped by normative concerns deriving specifically from the needs of democratic politics; (2) was largely bounded by the limits of the national territory and focused on 'national interest'; (3) legitimated government intervention in communication market for social purposes; and (4) generally required active and continuous policy making and revision. In addition, in the 1980s the emergence and progression of new communication technology, such as communication satellites, as well as the rapid expansion of commercial media and broadcasting business, challenged the state regulation and administration. A higher demand and public request for deregulation and privatization arose in this period. Governments in many countries responded to the appeals, since the governments considered it an opportunity to gain economic benefits offered by new communication technology (Van Cuilenburg and McQuail 2003: 197).

Finally, <u>the third period</u>, *"new communications policy paradigm"*, began in the 1980s/90s with a communication technology revolution and continues in the present. This technological evolution or 'convergence' can be described as follows:

> [T]he boundaries between information technologies and communication networks are technologically blurring: computer and telecommunications are converging to telematics; personal computers and television become more similar; and formerly separated networks become more and more connected to render the same kind of services. Multimedia, integrating text, audio and video, is also an example of technological convergence. Along with technological convergence, we currently see economic convergence in the communication and media sector that is the merging of branches of computing, communications and content (Van Cuilenburg and McQuail 2003: 197).

As a result of this convergence, contemporary communication policy is strongly related to and dominated by technological trends and economic drive, which fundamentally changed the context of policy (Van Cuilenburg and McQuail 2003: 181). A change in communication technology in the late 20th century has brought about a number of contemporary communication regulatory regimes and standards. For instance, ministries of communication, media, telecommunication, and information technology have been founded in this decade in many countries around the world. New media and IT laws have been issued by governments, and new regulation and policy on media, broadcasting, IT, and telecommunication have been merged and implemented.

Furthermore, the main ideology of TV broadcasting has shifted from public services to commercial operations. There has been a wide range of commercial stations established since the mid 1980s, in particular in Europe. Hallin and Mancini assert that public communications and state-owned media operations are impacted by “a broad range of consequences that flow from the commercialization of media. Commercialization, in the first place, is clearly shifting European media systems toward the world of commerce” (2004: 275). They argue that the commercialization ideology has occupied and changed the social function and main focus of media and broadcasting from public interest to commercial purposes. Media and TV broadcasting mainly “produce entertainment and information that can be sold to individual consumers” (Hallin and Mancini 2004: 275).

In relation to media regulation and ownership, in many countries around the world state authorities and communication regulators have decided on privatization or breaking monopolies in media and communication. “Governments are retreating from regulation where it interferes with market development” (Van Cuilenburg and McQuail 2003: 198).

In this period, developed and industrialized nations emphasize research and development in IT and telecommunication products and promote these hardware and software products as one of the major export products for a worldwide distribution.

Broadcasting Regulation and System

The terms ‘policy’ and ‘regulation’ are sometimes used interchangeably. However, they do differ in scope, LeDuc explains: “regulation is that form of government that compels those entities over which it has legal jurisdiction to act or refrain from acting in the manner in which they would otherwise tend to act”, whereas policy is “a continual process of legal guidance towards a clearly defined communication goal” (Howell citing Don LeDuc, 1986: 14).

In terms of restrictions of media regulation and control, the broadcasting media, TV and radio are much more extensively constrained than other media genres. McQuail asserts that “there is strict regulation of access to communicators by way of licensing or franchising supervised by some government-appointed agencies, restricted freedom of expression, usually some form of monopoly of organization of provision, often rights of intervention and control retained by the state” (2000: 23). In other word, radio and TV broadcasting have been highly controlled and regulated by governments, state authorities, and regulators. There are a number of claims about the public authorities’ restrictions. These claims include: technical sense, for example Melody, writing about the development of communication regulation in the early 1990s, observed that “radio and television required use of a public resource, i.e. the radio and telecommunication spectrum. Effective communication required at least a system of licensing and technical regulation that specified frequency, power and other characteristics of broadcast signals, and restricted entry to the industry” (Melody, 1990: 21). In the analogue era, broadcasting media are highly restricted because of the limitation of the spectrum for public use; therefore, this technical limitation can be defined as “a natural monopoly” (Hood 1986: 57).

In regard to broadcasting systems, Howell categorizes global broadcasting systems into four types according to the typology of possession, management, and funding. These are (1) government or state-owned, (2) public corporation, (3) private enterprise, and (4) hybrid arrangement. In addition, he further illustrates that the broadcasting operation can be divided into (1) state-operated directly by a government authority, (2) public corporation operated autonomously under state license, (3) public partnership operated by legally chartered private corporations with state stock interests, and (4) private enterprise operated by private individuals or companies under government license.

In the countries that still primarily have state-owned TV broadcasting or public service broadcasting, the strategies of regulation can be described according to four models(Hallin and Mancini 2004: 30-32): (1) the government model, in which broadcasting is directly controlled by government sectors. (2) The professional model, in which broadcasting is run by professionals, but supported and/ or funded by governments, for example the BBC (British Broadcasting Corporation) and the CBC (Canadian Broadcasting Corporation). (3) The parliamentary model, in which broadcasting is formally under the authority of parliament and not directly supervised by the governments, such as some public broadcasting stations in Spain and Italy. (4) The civic or “corporatist” model, in which is run by “socially relevant groups” – trade unions, business associations, religious organizations, ethnic associations, etc. This model is comparable to that of community radio and broadcasting.

In relation to financing, the funding resources for broadcasting operations can be classified into five genres: (1) state subsidization through taxes, (2) annual license fees levied on receivers, (3) the sale of airtime to advertisers, (4) direct payment from individuals and corporations in terms of memberships, subscriptions, donations, and grants, and (5) any combination of the above (Howell 1986: 10-11).

From a political perspective, the role of the state authorities and regulators in media regulation can be defined as a “state intervention” (Hallin and Mancini 2004: 41-43), particularly in public service broadcasting, state-owned stations, and concessional operators. Hallin and Mancini argue that the state can take direct and indirect action intervening in broadcasting media in many forms, such as financial intervention (supporting, decreasing, and cutting funds), issuing laws regarding media ownership and competition, employing media for political campaigns or purposes, and controlling the issue of broadcasting licenses or concessions.

Contemporary Concept of Communication Policy (1990s – Present)

As mentioned above, there has been a remarkable shift in communication policy since the early 1990s. In this section I discuss an overview of the paradigm shift in communication policy by considering three major forces shifting communication policy in the 21st century, which are (i) global trends of communication and media deregulation, privatization, and communication reform, (ii) influence of transnational communication regimes, and (iii) the advancement of communication technology.

(i) A Global Trends of Deregulation, Privatization, and Communication Reform

Internationally, the broadcasting system was highly controlled in its structure and content under the state monopoly system for decades after the Second World War (McQuail 2000: 28-29). In Europe, state-owned broadcasting stations were established throughout the continent. Broadcasting regulations in the third world nations and communist countries were also highly restricted and controlled under a state-monopoly system. Broadcasting policy began to significantly change from the mid 1980s until the 1990s, and McQuail asserts that the key steps of transition can be classified as follows:

- a process of deregulation spreading from the USA to Europe and further;
- the commercial exploitation of significant new media and key elements of old media (broadcasting in particular);
- deregulation and privatization of telecommunications monopolies;
- ramifying tendencies of globalization of media structures and flows (McQuail 2000: 29).

The new conceptualisation and controlling power of broadcasting policy and regulation has been shifted from state monopoly to liberalization and privatization. McQuail (2000) asserts that the wave of transition in broadcasting system and regulation pushed by developed countries has been hard to resist because of the fall of communism during the

1980s and 1990s, and the Third World countries have had insufficient power to resist to a global trend of the capitalist media. McChesney (2001) also asserts that the rise of the notions of “free market”, “deregulation”, “privatization”, and “communication reform” which started in the 1980s in western countries have become dominant ideology for modern media, communication, and telecommunication businesses. This trend can be referred to as “neo-liberalism”, which McChesney defines as “the set of national and international policies that call for business domination of all social affairs with minimal countervailing force. Governments are to remain large so as to better serve the cooperate interests, while minimizing any activities that might undermine the rule of business and the wealthy” (McChesney 2001: 1). In accordance to Chakravartty and Sarikakis also explain that “historically, national governments have regulated communication and media industries, assuming that communication goods represent some kind of ‘public good’ both as technological resource and as culture” (2006: 7).

O’Sullivan et al (1994) give a concise meaning of “deregulation” explaining that it is a paradigm shift of power in regulation and control from state authorities to commercial and private sectors under the concept of “commercial competition” (O’Sullivan et al 1994: 81). Deregulation “refers to the systematic restructuring of forms of public provision and control and their replacement with those derived more directly from commercial, market operations. In other national contexts, deregulation has been part of the influential rhetoric which has been used both to describe and to effect the privatization of major public sector industries” (O’Sullivan et al 1994: 80). Governments around the world have been requested and pressured by the media and telecommunication entrepreneurs to deregulate the domestic communication systems. Thompson argues that “the deregulation of media was part of general attempt to increase competitiveness in a variety of industrial sectors and to remove legislation which was thought to restrict unduly the pursuit of commercial interests” (Thompson 1994: 204). Tumber claims that the global trend of deregulation and privatization in communication and media began to emerge “in the early and mid-1980s as the deregulation policies of the Regan presidency spread to Britain and the Europe” (Tumber 2000: 3-4) then to the rest of the world.

Deregulation and privatization are dominant paradigms of capitalist ideology from the super power nations or more specifically the dominance of the “American Model” (Schiller 2000: 116-126). Schiller suggests that this model has been dominating the world, in particular in Third World nations. According to Schiller the key strategies of this dominant paradigm are as follows: (1) privatization of the main industries, especially communication; (2) concessions to foreign capital; (3) opening of commerce and culture to free trade; and (4) the free flow of information (2000: 120). Moreover, Schiller claims that the capitalist media system, deregulation, and “Americanization” have lessened the significance of national interest and state autonomy and power. He writes:

> The banner of capital, in its push toward total social unaccountability, proclaims ‘deregulation.’ With deregulation, one sector of the economy after another is ‘liberated’ to capital’s unmonitored authority. The very existence of a reality called ‘the public interest’ is contested. Public functions are weakened or eliminated... The combination of deregulation industry, concentration of capital and worldwide instantaneous communication are the essential pillars of a massive globalization of capital in recent decades. It is also the source of the ever-diminishing power of the nation-state, excluding - for the time being only - the most powerful nation-state, the United States (2000: 116-117).

Key principles for contemporary communication policy under the concept of deregulation and privatization include (i) emphasizing *openness and transparency* for public control and regulation, (ii) enhancing public *access and participation*, (iii) offering *choice* for users/ consumers, (iv) supporting *competition and innovation* in technology and services, and (v) protecting *privacy* (McQuail 2000: 30). Another key ideology of modern world is “communication reform”, which has been raised as national agenda throughout the globe, in particular in the countries where the state authoritarian system still regulates domestic media and communications, especially in Third World nations.

The preliminary international movement on global communication reform was publicly launched in 1980 in the report of MacBride’s committee (UNESCO’s International Commission for the Study of Communication Problems) “Many Voices One World: Communication and Society Today and Tomorrow towards a New More Just and More Efficient World Information Order”. The report revealed the imbalance of international information flow, and the dominance of developed countries over the developing countries. This report was well-recognized and become controversial at that time. The committee (1980) raised the issue that the dominant ideology and models of communication policy and communication development derived from industrialized and western nations are not suitable for implementation in developing countries as there are significances different in socio-economic and cultural aspects. The committee asserted that “the model which brought the developed countries to their position not only prevailed throughout the world for decades but was imitated by a large number of developing countries… the models which seemed capable of answering the needs of some countries, and which were subsequently imitated by others, have mainly failed to yield the expected results” (1980: 203-204). The committee was not totally rejecting the modernization model and/ or the western paradigm of development, rather, they emphasized the ideology of promoting the use of communication technology in social communication and communication development in order to “improve the quality of life”, “promote social, educational, scientific, and other services” and reduce commercialization in media and communication (1980: 204).

Furthermore, the committee maintained that national communication policy needs to be revised and reformed as “communication systems are increasingly complex; because new technological advances require more planning and oversight” (1980: 206). The revision of national communication policy on innovation and technology aims to “(a) develop new technologies and encourage their uses; (b) facilitate the extension of telecommunication networks; (c) identify and select the technical means best suited to the conditions and potentials of each country; (d) foresee and neutralize certain potential disadvantages of technological development; and (e) create training facilities in the use of new technologies, in management techniques, maintenance, utilization of various equipment, etc” (1980: 206-207).

In summary, the MacBride committee’s recommendations for the ideology of national media and communication policy reform were (1) strengthening independence and self-reliance, (2) integrating communication into social and cultural development, (3) enhancing responsibility of journalists and professional standards, (4) promoting democratization of communication rights, public participation, diversity and alternative choice, and (5) fostering international cooperation (1980: 253-272). It is difficult to evaluate the success of the UNESCO’s effort to drive communication reform from two decades ago; however, there has been some evidence that this ideology has been implemented in many countries around the world, particularly the Third World nations. This can be seen from the fact that government, public sector, local organizations, and NGOs employ communication and media for social and community development. For example there have been, community broadcasters operating in many countries under UNESCO's conceptual framework.

(ii) Influence of Transnational Communication Regimes

Entering into the globalization era, governments, state authorities, regulatory bodies, policy makers in each country have been influenced by the globalizational trend (more details and discussion regarding globalization are provided in Chapter 1). Each nation around the world is economically, politically, culturally, and socially connected to the others. There have been a wide range of transnational and regional organizations established and these hold a strong negotiation power and dominance over states. National decisions and policies these days are highly related with and influenced by these international institutions. Therefore, the contemporary notion of policy has been shifted into "global public policy" (Reinicke 1998).

Transnational regimes have been regularly established under pressure of the superpower nations and/ or international governances, and/ or by international consensus, international or regional collaboration, and/ or members' agreement. These international regimes have a purposive mission and play a significant role in driving the world. UN (United Nations), IMF (International Monetary Funds), WTO (World Trade Organization) World Bank, GATT (General Agreement on Tariffs and Trade), and EU (European Union) are well-known examples of current transnational regimes. The regimes provide an international forum for the negotiation of multilateral agreements that would then produce a form of policy (Sarikakis 2002: 78). In other words, in many cases nowadays, national policies are not mandated by governments or parliaments, but are either directly or indirectly dominated by inter-governmental agreements and transnational regimes.

From a positive perspective, since the world has become highly complex, global issues and problems cannot be solved by countries acting in isolation, especially in a world of continuous changes in technology and economy (Javanovic 1998: 179). Sarikakis (2002) defines this contemporary paradigm as global interdependence and governance. In agreement with Javanovic, Sarikakis asserts that since the problems of single nation states cannot be solved in the midst of such complexity and contemporary socio-economic and technological development, "at an international lrvel, an attempt to recapture a sense of control and facilitate a further expansion of the markets, several [transnational] organizations were developed" (2002: 78).

On the other hand, these international regimes could be considered a new form of neo-imperialism, or a tool for the super nations to protect their interests as well as politically and economically intervene in other nations. The regimes can be formed by inter-governmental approval, inter-business agreements, inter-civic movements, etc. Some are endorsed by international or regional legal systems, while many of them operate as an informally collaborative institution. However, these international organizations may directly and/ or sometimes indirectly manipulate the domestic verdict on many issues and occasions. Chakravartty and Sarikakis (2006: 5) support the notion that national policy and state decision-making nowadays are highly related to and dominated by various layers of influential policy actors and authorities. They state:

> [T]he actors involved in decision-making are located not only at the national level but also at the supranational, regional and local, transnational (institutional bases spanning more than one nation) and translocal (institutional bases spanning more than one city across nations) levels. This means that influential policy actors are based not only in national governments but also in supranational bodies, regional and local administrations as well as transnational and translocal networks and corporations (2006: 5).

Raboy (2002: 7-8) gives an overview of a "global policy map", in which he refers to the many contemporary stakeholders and key players in global policy making. These are as follows:

(1) *Global Organizations*, encompassing bodies that have traditionally been part of the United Nations family, such as the International Telecommunication Union (ITU), UNESCO, etc. Most politically-constituted nations belong to these organizations.

(2) *Multilateral Exclusive Clubs* such as the Organization for Economic Co-operation and Development (OECD) and the G8, which collectively exercise enough economic clout to influence global affairs without having to deal directly with lesser economies politically.

(3) *Regional Multi-State Groupings*, the most important of which are the European Union (EU) and the North American Free Trade Agreement (NAFTA).

(4) *National States*, regardless of their weakened condition, nation states continue to be the main site of some policy making such as cultural aspect.

(5) *Transnational Private Sector*, which has organized itself to achieve representation in official fora. No longer merely restricted to lobbying, transnational corporations and their associations are increasingly present at the tables where policy discussions are made. Groups such as American Business Forum and the Global Information Structure Commission have become a powerful force in setting the global policy agenda.

(6) *Civil Society Organizations*, much less well-resourced and generally further from the centers of power, civil society organizations are less present in policy debates, but media issues are becoming, an important rallying point of grassroots mobilization (Raboy 2002: 7-8).

Communication and media policy is included in this current paradigm. In the words of Sarikakis, “supranational, regional organizations, with predominantly economic agendas, have come to be major players in the field of communications policy in the last 20 years” (2002: 77). Raboy (2002) asserts that “the terrain of media policy-making is shifting… national legislative and regulatory frameworks… is now subject to a complex ecology of interdependent structures… communications policy is no longer “made” at any clearly definable location, is increasingly the result of vast array of formal and informal mechanisms working across a multiplicity of sites” (Raboy 2002: 6). For example in Europe, the Commission for European Communities (2000) proposes six basic principles as a direction for communication policy and regulation, which members have adopted as a framework for policy making. These guidelines are: (1) competition rules should be the prime vehicle for regulating the electronic communication market; (2) there should continue to be separate sector-specific regulations, although infrastructure should be dealt with together; (3) obligations should be kept to a minimum; (4) universal service should be maintained or extended; (5) regulations between member states should be harmonized; and (6) there should be independent and impartial national regulatory authorities (CEC 2000).

From the perspective of the media sphere, the dominance of the transnational regimes can intervene and dominate the domestic communication industry in various forms.

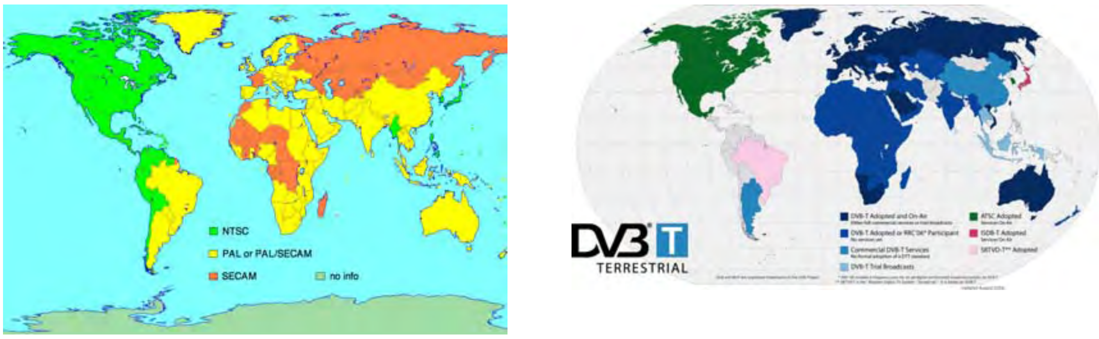
UNESCO's International Commission for the Study of Communication Problems (1980) writes:

> the transnationalization of communications… production, financing and marketing of communication is a factor which affects not only the media-publishing, broadcasting, cinema and advertising-but also data banks, informatics, telecommunications, the manufacture of electronic equipment and components, etc. *This process has reached such proportions that transnationalization has become in many countries a factor largely, if not wholly, beyond the control of the policy-makers* (1980: 212).

In the digital era, there are four main dominances in the area of global digital TV broadcasting systems: ATSC (Advanced Television System Committee; USA), DVB (Digital Video Broadcasting; EU), and ISDB (Integrated Services Digital Broadcasting; operated under ARIB (Association of Radio Industries and Businesses in Japan)), DMB (Digital Multimedia Broadcasting; South Korea). According to Raboy's categorization of key influencers of modern policy making, I justified these technological traders as part of "transnational private sector". However, it can be argued that especially in the case of ATSC, ISDB, and DMB, they are supported by or have a close relationship to their governments and that DVB can be defined as a part of "regional multi-state groupings" as the main establishers and benefactors are residents of the EU. However, the main operators of these organizations are run by the private sector and/or business alliances.

Besides these organizations inventing new digital TV broadcasting for use in their own countries and/ or regions, the newly invented systems have been distributed throughout the world as commercial technology products. The United States, EU, Japan, and South Korea are competing for dominance in the world broadcasting market. The selection and adoption of new TV broadcasting technology in a country is unavoidably related to national policy and decision making. Therefore the decision of each nation is either directly or indirectly influenced by transnational and regional regimes. For example members of the EU have adopted DVB as their new standards, majority of Asian nations have also adopted DVB as persuaded by the ABU (Asian Broadcasting Union), and North America and some countries in Central America have adopted ATSC as guided by the NABA (North American Broadcasters Associations).

Picture 1: The Changed Landscape of Global TV Broadcasting Technological Standards; Analogue World versus Digital World



Source: DVB (2006)

(iii) The Advancement of Communication Technology

In aspect of technological determinism, communication technologies foster social transformation (Mosco 1989). Babe asserts that “technological causation” provides a rationalization for governments and supranational institutions for deregulation (1990: 18). He maintains that deregulation enhances the rights of some while lessening the rights of others. Murdock (2000: 39-41) argues that technological determinism is therefore ideologically significant in relation to the marketization of broadcasting, including the general reorientation of intervention from the public interest to corporate interests.

The wide spread of new communication technology, digital communication in particular, and the integration of communication and information technology has influenced a dramatic change in communication and media policy throughout the world. The advancement of communication technology has been dominating all media systems, with the integration of broadcast, new media, and communication policy. Katz (2005), for example, asserts that:

> The impact of new technology can be seen in the change of perspective from the ‘old structure’ to the ‘new structure’ of broadcasting. In the old structure, each technology and

> medium had different goals and policy and the development of cultural perceptions dominated media policy and market. In the new structure, all new media and telecommunication services are interlinked and an integrated policy is required to deal with technological policy changes (2005: 2).

The European Commission, in recommending principles and guidelines for digital communication, writes: "digital technology is already bringing about important social, cultural and educational changes and will bring about even greater changes in the future… changes which will very likely require the adaptation of both regulatory framework and the various national and community support mechanisms in this sector" (1999: 5).

Katz (2005) asserts that there are three stages of influence on media policy by communication technology development. He argues that the advancement of communication technology has played a significant role in the TV broadcasting industry. His hypotheses are based on his study of changes in media policy in the USA and Western Europe. Katz illustrates relations of adoption and utilization of communication technology in the broadcasting industry and changes in prototypes of communication policy. The three stages, (1) 'CATV Systems', (2) 'Open-Skies Policy', and (3) 'The Digital Age' (Katz 2005: 3-9), are introduced below.

<u>The first period: "*CATV Systems*".</u> Katz claims that CATV (Community Antenna Television) technology has been considered a primary driving factor of an altered paradigm of TV broadcasting policy. He maintains that, technically, CATV exemplifies the limited capability of terrestrial TV broadcasting transmission. At the beginning of implementing CATV, the cable system was simply used for providing a solution to the technical limitations of terrestrial TV transmissions, which presented difficulties for distributing the signal in remote or mountainous areas. Later, starting from the late 1960s and 1970s, CATV operators increasingly imported foreign TV programs and there was an increasing number of CATV business operators and subscribers in the market. This could be claimed as the first challenge to government control and regulation because the authorities and terrestrial TV stations were challenged by the newcomers and private TV business operators. The notions of deregulation and reconstruction of TV broadcasting systems were initially made public in this period.

The second period: *"Open-Skies Policy"*. During this period, Satellite technology brought about a revolution into a global TV industry. Satellite TV started in the USA in the 1970s and in Europe in the 1980s, then spread extensively throughout the world in the late 1980s and in the early 1990s. The fast development of satellite TV was initiated "only after permission for commercial operation was given in the United States as part of an *open-skies policy*. In this period, low-powered communications satellites provided new broadcasting entrepreneurs with the means of access to an expanding cable market" (2005: 4). Furthermore, DBS (Direct Broadcasting Satellite) services were established and gained acceptance from consumers in a short period of time. DBS became an alternative information resource alongside terrestrial TV and state-owned channels.

Satellite communications technology also enhanced TV transmission capability and quality. TV operators could have a larger footprint for TV coverage, shifting TV business to a global scale. Katz claims that "satellite transmissions reach beyond national frontiers and create large international broadcasting markets" (2005: 4). As a result, transnational satellite communication technology pushed governments, state authorities, and communication and broadcasting regulators to reconsider communication policies and measures as the new technology facilitated information flow across borders, with the potential to influence political, economic, and cultural aspects.

The third period: *"The Digital Age"*. This period, which is now dominant, began in the late 1990s and continues to the present, as the digital communication technology has been progressively developing. The convergence of communication and media technology, information technology, and telecommunication technology has diversified the media landscape. As a result, it is necessary for governments and communication regulators around the world to issue new media policy to catch up with the rapid change in the world of digital technology. Communication policies and measures used in the analogue world have become obsolete and can not be implemented effectively.

Katz asserts that digital communication technology causes "digital revolution". "Digitalization" is considered the most significant factor of the new structure of media policy (2005: 9). In regard to TV broadcasting, Katz maintains that digitalization has dramatic impacts on TV station business operation and management, and TV has been shifting into new fields. The progression of digital television technology provides the operators with an opportunity to integrate IT and internet features providing extra services to consumers, including, for example, search engines and electronic commerce.

At present, governments and communication regulators in many countries have been pushed into communication and telecommunication deregulation and privatization as a national agenda to lessen the power of control from state authorities to commercial sectors. In practice, *'Open-Skies Policy'* in the USA can be claimed as evidence that the USA intends to influence the rest of the world to follow up. In addition, multi services, integration features and services that come up with digital technology have made the regulators refine the national communication policy into a competitive structure in order to usefully employ digital technology in the social and economic development of the nation.

Trends of Communication Policy in 21st Century

In conclusion, Katz (2005: 269-273) illustrates the development and trend of communication and media policy into four major chronological stages: (1) First Stage: The 'Old Structure' of Broadcasting; (2) Second Stage: New Media Policies; (3) Third Stage: Global Media Policy; and (4) The Digital Age. These stages are outlined in Table 10 in terms of policy trend, scope, structure, technology, newmedia, and public policy.

Table 10: The Development and Trend of Communication Policy in 21st Century

Characteristics	**First Stage of Media Policy: The 'Old Structure' of Broadcasting**	**Second Stage of Media Policy: New Media Policies**	**Third Stage of Media Policy: Global Media Policy**	**The Digital Age**
- Policy Trend	Early perceptions of broadcasting were	A new approach to dominate in the United	A global course of change. New media	Transformation into digital technology is

	dominated by social and cultural values, as part of a national structure for broadcasting and telecommunications services aimed at endorsing public service objectives and monitoring the development of new technologies.	States and the largest media countries in Europe, with national media policies based on the adoption of new technologies and addition of commercial television outlets.	policy has been adopted around the world, based on three main principles: deregulation and privatization, policy convergence, and competition of all media and telecommunication services.	progressing, with a new global policy for new technology, television services, and programming. The new structure is changing the way local societies use media and telecommunications services in the 21st century.
- Time Range	From the early 1940s until the early 1970s in the United States and until the early 1980s in Europe.	From the early 1970s in the United States and the early 1980s in Europe, until the late 1980s in both continents.	Since the early 1990s in the United States and Europe, spreading around the world in the 21st century.	The digital age will dominate media policy for the 21st century.
- Structure	A local structure. Dominance of public service principles, encouraging the social and cultural role of broadcasting.	A mixed structure. Deregulation of media system and development of cable systems with new services delivered through satellites.	A global structure. Media policies have become global and commercial. Multi-channel services led to adoption of free-market competition.	The 21st century is dominated by transformation into digital technology and competition of all media and telecommunications technologies.
- Technology	Off-air television transmissions with limited channel capacity dominated broadcasting markets. Media policy gave prominence to a quality of programming which only national organizations could guarantee, and the development of other technologies was not permitted.	Initial changes in media policy were made possible with the advent of new technologies. Technological advancement was adopted through competition between the old media technology of off-air broadcasting and new media technologies of cable and satellite.	New technology is spreading globally, with competition of all media and telecommunications services. A new competitive environment influenced by deregulation, privatization, and convergence policies leads to technological advancement.	The transition into digital technology combines a variation of advanced services: digital terrestrial television, digital satellite, broadband cable, telephone companies, wireless communications, the Internet, and interactive applications.
- New Media	New media was restricted in the U.S. and generally prohibited in Europe. New technologies were defined by policy-makers as having a secondary role to broadcast television. Their main role was to enhance the quality of local and national transmissions.	Permission was given for new technologies to operate alongside the old structure of terrestrial broadcasting. Multichannel services by cable and satellite provided the most important development in media policy in the last century.	Uniform and global policy thinking with new media and telecommunications services spreading around the world. Market forces have taken center stage, displacing social and cultural policies initiated by governments and creating new policy objectives common to all nations.	The transition into digital technology is spreading globally. All new media and telecommunications systems are capable of carrying a variety of sophisticated services, with a significant increase in the number and quality of the channels and the services offered.
- Public Policy	The role of public authorities was decisive in developing national broadcasting systems and ignoring new technology and multichannel services. In Europe, public broadcasting dominated, aimed at exploring the social and cultural aspects rather than the commercial capabilities of broadcasting. In the U.S., media policy favored broadcast television, and local multichannel services were limited because of	The government role shifted as the media transformed from a regulated media system with public goals into a deregulated industry with commercial perceptions. Policy shifted tremendously with the adoption of a market model. The role of governments was particularly substantial in the development of new media policy and technologies and permission for commercial television and new technologies.	Competition is the alternative to regulation. Political decisions have changed the course of media policy by diminishing the role of governments, converging media and telecommunications policies, and enhancing competition within the broadcast media. A global structure has been developed, in which all technologies participate in the competition for provision of advanced services on a global scale.	Market forces and global regulatory authorities dominate today's policies. Regulatory moves concentrate on enhancing competition among all services, removing competitive restrictions and integrating all technologies. Media policy is a global process that applies to all countries, with deregulation, privatization and convergence policies dominating the

	restrictive public policies.			development of media and telecommunication sectors.

Source: Katz (2005: 270-273)

Goldsmith et al (2002: 93-94) maintain that there has been the convergence of communication, innovation of digital communication technology, and commercial developments in media business. They also argue that communication policy in the 21st century is strongly related to and dominated by the following concerns:

- Transition to digital encoding and transmission
- More efficient and extensive use of spectrum
- A more competitive and market-driven environment
- Multi-channeling programming
- Interactive Services
- Rapid application and content development and innovation
- The growth of subscription and pay-per-view media, and continuing relative decline of free-to-air broadcasting
- New economies of scope in the provision of broadcast and telecommunications systems
- The erosion of distinctions between conventional systems

In addition, Goldsmith et al argue that entering into the new media environment, in particular the transition to digital broadcasting, “presents a range of political, economic, and technical challenges for policy makers” (2004: 94) as the digital technology causes a significant change in national media governance and communication policy. The focus of contemporary broadcasting governance and policy making will be shifted from an operator-oriented perspective toward an audience/viewer perspective. They argue that “regulatory systems will need to be responsive and flexible enough to accommodate changes to industry shape, structure and output, all influenced by the ways in which readers, listeners, and viewers take up new services” (2002: 94). The authors predict that the new form of broadcasting tends to be “discretionary services” as the technology augments the ability of signal transmission, program production, and content distribution through a wide range of digital and multimedia platforms or “multiple windows”. The increase of newcomers will result in “fragmentation of audiences and revenue, [and] they may well increase competition for local audio-visual product” (2004: 94).

In regard to broadcasting regulation, Goldsmith et al (2004: 95-98) maintain that there will be a number of challenging issues for the national communication regulators which will lead to the need for revision of current regulation. These are as follows.

(1) A revision of *content regulation and new principles of licensing*. As the digital conversion and compression technology promises to free up the spectrum, the regulators cannot be more restrictive on broadcasting licensing because there will be higher domestic demand on radio frequency usage and socio-economic and political pressure will push the regulators to give the permission to the newcomers. Therefore, effective broadcasting administration becomes necessary.

(2) A revision of the *role of public service broadcasting*. As digital broadcasting technology promises multi-channeling, datacasting, and multimedia services, the communication regulators and governments need to enhance the capacity of domestic public communication services to use the technology for public uses, in particular providing education and generating useful content on new platforms for national development and community development in each region.

(3) A revision of *access and interoperability*. As digital broadcasting technology adds to new features and extra services on screen and return path, such as navigation aids and EPG (Electronic Program Guide), it “will require regulators to develop mechanisms (standards and must-carry requirements, for example) to ensure that viewers are not prevented from accessing the full range of channels and services” (Goldsmith et al 2004: 96).

(4) A revision of *regulatory convergence*. As the digital technology generates convergence of communication technology and telecommunications, there tends to be more integration of both technologies on regulation, policy, law, and even the regulatory body. "There are some features of telecommunications policy that bear a resemblance to broadcasting policy. (Goldsmith et al. 2004: 96)"

(5) A revision of *governmental and non-governmental responses to liberalizing trade in services*. There are many transnational, regional, and bilateral agreements, for example the GATS (General Agreement on Trades and Services) liberalization agreement on the communication and telecommunication sectors, that the regulator needs to manage and keep balancing between the national interests and the international commitments from dominant transnational regimes.

(6) A revision of the *changing structure of audio-visual production*. As business convergence, privatization, and deregulation have become the new global media system, it is apparent that transnational media production firms are invited into the domestic broadcasting industry. Therefore, the regulators need to have careful management of the interface between the domestic and international production industrial development policies to keep balancing, protecting, and promoting cultural and diversity.

In regard to policy strategies on technological transition, Goldsmith et al (2004: 95-98) maintain that the transition of the global communication sphere from analogue to digital is still complex and uncertain. However, they suggest that the regulators consider these issues: (1) Use multi-channeling technology to fulfill public services that might be neglected in the analogue world. (2) Support availability of interactive feature to fulfill the communication process. (3) Regulators and government should consider if the state subsidy (for broadcasters and consumers) is necessary for the technological conversion. (4) Emphasize marketing mechanisms, although the support from the regulators, governments, and other stakeholders e.g. government or manufacturer subsidy of set-top digital receivers, will be helpful in nationwide up take of technological transfer. This measure "may be necessary to achieve a final analogue switch-off in under-served areas where the value of the spectrum may not be sufficiently high to induce market-based spectrum clearance” (2002: 106).

PART 2: THAI TELEVISION DEVELOPMENT AND POLICY IN BRIEF (1950-2008)

This part is divided into three sections, i.e. the establishment of television in Thailand (1950 – 1980), the contemporary Thai television broadcasting industry (1981 – May 2008), and TV broadcasting policy and regulation in Thailand

THE ESTABLISMENT OF TELEVISION IN THAILAND (1950-1980)

According to Sinith Sittirak (2000), the initial idea of establishing a TV station in Thailand was on October 29, 1950. At that time Surajit Jaruseranee, the Deputy Director of Kosanakarn Department (now called the Public Relations Department of Thailand) received a letter from Marshal Plak Pibulsongkram, the supreme military commander and the Prime Minister of Thailand. The statement on the note became the inspiration and order for launching a TV station in Thailand (2000: 17). The Prime Minister wrote:

> I would like you to consider establishing a TV station and broadcast television in our country for the educational benefit of Thai citizens. It should be a mobile operation unit, as we discussed a few days ago. Then you may consider setting a small TV station for trials. Study the possibility of establishment and proceed with the project. Set up an operation budget proposal requesting for the 1951 national fund. (Public Relation Department 1983: 120)

The historic letter of Prime Minister Plak in 1950 and the project proposal for establishing a TV station presented by Kosanakarn Department to the government can be considered an initiative of official TV broadcasting policy in Thailand. The cabinet approved the project proposal and budget for the TV station without reluctance (Sittirak 2000: 41). Sittirak points out that the original idea from the national leader is very remarkable, since his inspiration for founding TV came just five years of the end after World War II, in the period of recovering from national economic regression caused by the warfare (2000: 17). Many Thai media scholars and socio-political analysts claim that the real intention of General Plak was mainly to use television as a tool for his nationalist political campaigns and for modernising the country under his ideology (Siriyuvasak 1999: 150).

Approximately five years after the initiative of Thai leader in 1950, the first Thai television broadcasting station “HST-TV Channel 4” ran its first broadcast on June 24, 1955 (Sothanasathien and Ploysirichon 2007: 14; UNSECO 1953: 110) using a 525-line 60-field system. The station was owned by the Thai Television Company under the regulation of the PRD. The Thai TV Company was endorsed by legislation in 1953 to operate the first television channel. The company was formed by the Thai Government and state authorities including the PRD, which owned 55 percent of total shares, the Lottery Bureau, the Thai Tobacco Monopoly, the three armed services, and the Department of Industrial Workshops (Katz and Wedell 1977: 93) with a registered capital of 20 million baht or about US $1,232,000 (UNESCO 1953: 110). The transnational corporation RCA (the Radio Corporation of America) was requested and commissioned by the Thai Government and Thai Television Company to be in charge of system installation, technical training, and transmission trials.

The establishment of Channel 4 was strongly opposed and criticised by a group of representatives of the parliament from north eastern provinces, as well as journalists and members of public. The critics argued that it was improper and wrong to use the national budget for such an unnecessary investment (Siriyuvasak 1999: 140-142), which was only for the pleasure of some people and groups. They also argued that the establishment of the TV station was just for fulfilling the leaders’ aspirations (Sothanasathien and Ploysirichon 2007: 14).

Two and half years later, the Royal Thai Army Television Station was established by Marshal Sarit Thanarat (the coup d’état leader who defeated Marshal Plak

Pibulsongkram's regime). The HSA-TV[1] Channel 7 started its broadcasting operations on January 25, 1958 (Siriyuvasak 1999: 143). The founding aim was mainly to be used for military benefit and public service.

Colour TV was introduced to Thailand in the late 1960s. The first colour television transmission was launched by Royal Thai Army Television, Channel 7, on November 27, 1967, using CCIR 625-lines, PAL, with 500 watt transmission power (Sothanasathien and Ploysirichon 2007: 26). According to Katz and Wedell, "colour TV was introduced in Thailand to coincide with the Miss Thailand beauty contest" (1977: 12) at Saranrom Palace in Bangkok (Sothanasathien and Ploysirichon 2007: 26). In 1970, the Thai Television company established two new colour TV stations: Channel 3, with 625-lines and 50-fields with 50 kilowatt power; and Channel 9 (now MCOT 9), 625-lines and 50-fields, with 20 kilowatt power.

By May 1970, according to the Radio Engineering and License Division of the PRD (Public Relations Department of Thailand: 1970) there were nine main TV stations in Thailand (five main stations in Bangkok-Thon Buri, and four main regional stations), and 33 translator stations in provinces (27 stations owned by Thai TV Company, and 6 stations belonging to the Army). In 1978, Channel 7 was the first TV station to transmit TV signal to network stations via an INTELSAT Satellite (Sothanasathien and Ploysirichon 2007: 26-27).

In regard to TV reception manufacturing and penetration at the early stage of TV in Thailand in the first decade (1955-1965), Thaiyadham asserted that "Thailand has not yet produced television receivers on a large scale. A few are assembled locally, but most are imported. From the establishment of the first television system in 1955, the number of annually imported television sets has increased steadily from 2,556 sets in 1955 to 39,052 sets in 1965" (1971: 6). According to the Preliminary Report on Nationwide Radio and Television Survey in 1969, conducted by the National Statistical Office (NSO) (1969: 14),

[1] HSATV stands for His Majesty Station; Army Television broadcast in 525 lines, black and white (http://www.tv5.co.th/about/history/).

the accumulated number of imported TV sets in Thailand from 1955 to 1969 was approximately 241,375 sets (89.6 % in central area, 5.3% in northeast area, 3.2 % in north area, and 1.9% in south area). By the end of April 1975, according to Katz and Wedell (1977: Appendix A, Table A.4), the estimated number of television sets in use was approximately 650,000 or 17 sets per 1,000 people (a population of 37,410,000 in 1975).

Considering on the regulation, TV, the new medium at that time, was completely regulated by the state authorities. Sothanasathien and Ploysirichon explain:

> The television broadcasting structure in Thailand was founded under the philosophy of state monopoly operating the station business by special units or state-owned corporations. In practice, governments and authorities have regularly intervened and taken absolute control of the operation. For the first decade of television station establishment in Thailand, there were two dominating authorities playing the role of regulating the stations: (1) Thai Television Company (Channel 4), and (2) Royal Thai Army (Channel 7). In addition, there was a critical legal control on a request for operating TV station business in Thailand, for instance, the establishment of TV station required legislation approval from the parliament or cabinet, as well as a frequency license from the state authority [Department of Post and Telegraph] (2007: 14-15).

Subsequently, since the late 1960s, the TV broadcasting system in Thailand was shifted into a concession scheme. In the era of Marshal Thanom Kitikajorn and Marshal Praphas Jarusathien, Channel 7 was converted into a concession TV station. The Bangkok Broadcast Television Company (BBTV) obtained a privilege from the army and government to operate Channel 7 in 1967 (with a 15 year concession, then a second renewal valid until 1995, and a recent renewal valid until 2015). Then in 1970, Bangkok Entertainment Company (BEC) obtained the license to run Channel 3 from the Thai Television Company. Channel 3 first broadcast on March 26, 1970, and the station was opened by Marshal Thanom Kitikajorn (Channel 3 2007: 28-29). In 1977, Prime Minister Thanin Kraivichien founded a new communication authority “Mass Communication Organisation of Thailand” (MCOT) under the regulation of the Office of the Prime Minster to administrate government media business. The MCOT was authorised to take over all businesses and assets of the Thai Television Company. Soon after, the company was terminated. Subsequently Channel 4 was changed to Channel 9 under management of the MCOT (Sothanasathien and Ploysirichon 2007: 14-31).

CONTEMPORARY THAI TELEVISION INDUSTRY (1981 - MAY 2008)

There were two free Terrestrial TV stations established between 1981 and 2000: Channel 11 and ITV. Channel 11 was established according to the approval of the cabinet on January 15, 1985. Channel 11 can be called a government station. The main mission of the station is to distribute news and information about government policy and campaigns to the public. The Japanese Government gave direct assistance via Japan International Cooperation Agent (JICA) funds to the Thai Government in the amount of 2,062,000 yen or 300,000,000 baht for technical support in establishing the station. Channel 11 has operated under the regulation of PRD, obtaining financial support directly from government funds (Sothanasathien and Ploysirichon 2007: 33).

ITV (Independent Television) was established in 1996, after a public request for an independent TV station after the tragic events of May 1992. As all TV stations were manipulated by state authorities, news and information was frequently censored, distorted, and reconstructed, in particular, during a political crisis. The Prime Minister Annan Panyarachoon’s interim government responded to the public request by proposing two broadcasting frequencies (UHF) for founding new TV stations (Siriyuvasak 1999: 179). The new approval aimed to provide an opportunity for the public to access news and information without intervention from the state authorities. One frequency was auctioned by the Siam TV Group (Siam Infotainment Company under financial support from the Siam Commercial Bank), the founder of ITV. The entrepreneur obtained a 30 year contract with a promise of 25,200,000,000 baht (or approximately US $1,000,000,000 as of 1996) for the concession fees paid to the government (the highest charge in the Thai broadcasting history). ITV first broadcast on July 1, 1996 (Sothanasathien and Ploysirichon 2007: 39-40), and gained acceptance from the public in a short period. The prominent stand of ITV, in its early years of operation, was rapid news reporting, as well as qualitaty and exclusive content.

The extravagant concession fee became a problem several years later. As a result of the 1997 economic crisis, ITV was taken over by Shin Corp. in 2000 (Thaksin Shinnawattra's firm, with 55.53% of total share) (Sothanasathien and Ploysirichon 2007: 39-40). The new investor committed to restructuring the station by presenting extra entertainment programs, providing new features, and integrating with Shin Corp's telecommunication services as well as inviting new business alliances to join the TV business operation. Since the occupation of Shin Corp, there were a lot of criticisms from scholars and the public on the obvious change of ITV's standpoint. For example, some scholars and social activists claimed that ITV became a political tool of Shinnawatra's Government (Thai Rak Thai Party) and Prime Minister Thaksin's Business Empire (Shinawatra's affiliated companies). Moreover, some accused ITV of holding bias in news reporting and information presentation.

Despite ITV's business recovery plan and political intervention by the Shinnawattra regime, the financial crisis of the station was not resolved. ITV violated the contract by omitting an annual fee payment to the state. After the September coup d'état in 2006, therefore, ITV was temporarily converted to TITV in 2007. (TITV was a temporary operation, which is regulated by the PRD). ITV's license was finally terminated and all ITV's assets were seized and transferred to the Government in the period of Prime Minister Surayuth Julanol's interim government in early 2008.

At present, most TV stations in Thailand mainly operate under a commercial scheme. Major revenue comes from advertising and airtime leasing. According to AC Nielson Media Research, Media Index 2008, the overall value of TV advertising revenue in Thailand in 2007 was 53,484,000,000 baht (or approximately AUD $1,782,800,000). This budget could build two metropolitan train lines in Bangkok. Only two channels, Channel 11 (NBT) and TPBS, obtain financial support from government funds and taxes. In the big picture, major TV station operators in Thailand between 2000 and June 2008 can be categorised by distribution platforms as follows:

(1) <u>6 Terrestrial Free TV.</u> The terrestrial TV networks are by far the most popular information and entertainment resources in Thailand. All six main terrestrial TV stations are located in Bangkok and are relayed to all parts of the country through repeaters located in the provinces. According to the Manager Weekly (2007: A2), advertisments are the main source of revenue for free TV, annually bringing around 40,000,000,000 baht (or approximately AUD $1,350,000,000).

(a) Channel 3: The station is owned by MCOT. Channel 3 is in a fully commercial operation under the administration of the Maleenon family, who occupy 56.68% of total shareholders of BEC World. The BEC World public company holds a concession to operate until 2020. The station changed from broadcasting in VHF to UHF on March 25, 2005. In February 2007, Channel 3 installed news transmission towers and broadcasting equipment (by Rohde & Schwarz) into its 5 main regional network stations to enhance the capability of transmissions, and prepare for shifting into digital broadcasting in the future (Channel 3 2007: 28-35). In terms of marketing, Channel 3 was ranked 2nd in a share of TV advertising incomes (13,382,000,000 baht) in 2007 (AC Nielson Media Research, Media Index 2008). This indicates that Channel 3 has been closed to the leader of the TV market, Channel 7. According to Pravith Maleenon, Managing Director of Channel 3, the success comes from Channel 3's marketing strategies, i.e. (i) creating a balance of news programs and entertainment programs, and (ii) increasing brand loyalty through marketing campaigns such as "Channel 3's News Family". In recent years, Channel 3 has focussed on target audiences who are middle class in capital and urban areas (Positioning Magazine: 94-98).

(b) Channel 5 (RTA 5): Channel 5 is fully controlled by the Royal Thai Army. The army set up the RTA 5 Company for running its media and TV businesses. There are 35 RTA 5 network stations established all over the country. The station partially produces the programs through its in-house TV production department, and also leases airtime to external production agencies. Majority of income is from broadcast fees and advertisements and the profit grants for an army subsidy. RTA 5 has expanded its service to the satellite platform, Thai TV Global Network (TGN), which provides transcontinental TV coverage. According to TGN, there are 170 countries in North America, South America, Europe, Asia, Africa, and Australia which can obtain the satellite signal from TGN.

(c) Channel 7: The station is owned by the Royal Thai Army. Channel 7 has been controlled by two families: the Rattanarak family (CKS Holdings) 59.02% and the Prempre family 20.46% (Tangkitvanich and Sutharattanakul 2003: 156-160). Recently, there has been a big change in administration since the adjustment of shareholders and the coming of a new investor. The BBTV Company receives a privilege for running the business until 2015. Channel 7 has been a leading TV station in Thailand in terms of high popularity for many decades. Its prominent focus is on presenting soap opera TV dramas and a wide range of sport and entertainment programs, which gains recognition from the masses, especially TV audiences in rural provinces of Thailand. Channel 7 receives the highest advertising revenue share, to the amount of 14,681,000,000 baht of an over all 53,484,000,000 baht of TV advertising incomes in Thailand in 2007, according to AC Nielson Media Research, Media Index 2008.

(d) MCOT 9: MCOT 9 or Modern 9 is owned and operated by MCOT. The station developed from Channel 4, the first TV station in the country. These days MCOT reforms its business by modernising TV station operation, investing in transferring the station to fully digital and providing integrated communication services with new media. MCOT 9 has been recently privatised to be a public company, with government sectors as the major shareholders. Recently, MCOT has distributed contents via mobile TV platform, IPTV, and cable through the new TV projects MCOT 1 (news station), MCOT 2 (variety station), and MCOT 3. Also, MCOT has been in a trial digital video broadcasting system in collaboration with SK Telecom Company (South Korea) (Positioning Magazine 2008: 84). In addition, MCOT owned a wide range of media and contracts including 62 radio stations and cable TV licenses. These give MCOT an advantage in expanding its services to the integrated and digital new communication business operations.

(e) Channel 11 (NBT): The PRD’ s station has recently been reconstructed and renamed “NBT” (National Broadcasting Television) since April 11, 2008 under the regulation of the Minister of Prime Minister’s Office, Jakraphob Penkae. According to

Positioning Magazine (2008: 78-79), the first phase of strategy for reforming the station was to give a privately owned TV production agency, Digital Media Holdings Company[2], a two-year concession for taking control of producing TV news programs for the NBT. Following this the NBT will welcome and provide airtime for external media agencies from July 11, 2008 onwards. In addition, in the opening speech at the station rebranding launch, the Minister of Prime Minister's Office promised to build the new building with digital and hi-technology equipment. However, the opposition in the House of Representatives proposed an appeal to the National Budget Examination Office, claiming that the Minister's reform plan could be illegal. Besides, the opposition criticised the fact that the annual return of 45,000,000 baht (or approximately AUD $1,500,000) from the concession holder (DMH) to the state was very low.

(f) ITV and TITV. ITV was owned by the PRD, concession-operated by Siam TV Group, then ITV Public Company. The channel began services in 1996 and was terminated in 2007 as for violating the contract with the government. TITV began operation in 2007 by a temporary operation group under a contract with the PRD. This substitute TV station of ITV broadcast for a short period and was subsequently terminated at the end of 2007.

(g) Thai PBS (Thai Public Broadcasting Service): This newly established station was founded according to the PBS Act in 2007. The station is owned by an independent public organisation (an independent state authority). All main equipment was transferred from ITV and TITV. The main aim of the establishment is to provide public information services. The Thai PBS foundation committee, which comprises media scholars, journalists, civil services, and public representatives appointed by Prime Minister Surayuth Julanon's cabinet, philosophically aims to generate a non-political intervention station. Thai PBS is a non advertisement TV station. It obtains an annual subsidy of funds to the amount of 2,000,000,000 baht, retrieved from tobacco and alcohol taxes. This new station first broadcast on February 1, 2008. Thepchai Yong, a TV journalist and former Nation Group administrator, has been appointed as the first TV station director of Thai PBS (Positioning Magazine 2008: 80-82).

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[2] The Digital Media Holdings Company was founded by former ITV personnel; TV crews are also from the ITV.

(2) Subscription and Cable TV. There are approximately 400 nationwide cable and subscription TV operators (local and national), according to a report of Manager Weekly (2007: A5). Subscription and cable TV in Thailand obtains concessions from the two main state authorities, i.e. MCOT and PRD.

True Visions is the only dominant subscription TV service provider in the country. True Visions (formerly UBC – United Broadcasting Corporation) originated in 1998 through a business integration of IBC (International Broadcasting Corporation) and UTV (United Television) the two biggest operators. True Visions (owned by the Jierawanon family which is one of the top ranking tycoons in Asia) holds a concession from MCOT to run the business until 2019. The station has transmitted the signal via various methods such as Multi-channel Multipoint Distribution Service (MMDS), satellite in Kurtz-under Band (KU Band) since 1995, coaxial cables, and fibre optics. According to a True Visions annual report, there were 618,288 subscribers in the final quarter of 2007.

(3) Satellite TVs. Satellite TV in Thailand has been steadily developing in the years since 2000. The investment required for establishing a terrestrial TV station is very high and it is extremely difficult to obtain a broadcasting frequency and approval from state authorities. The cost of establishing TV stations in this sector varies from 50–100 million baht (or approximately AUD $ 1,600,000 – 3,300,000), together with approximately 3-4 million baht (or approximately AUD $ 100,000 – 130,000) per month for hiring a satellite transponder (Manager Weekly 2007: A2). It is a lot different compared to the billions of baht cost for setting up a terrestrial TV station. In addition, digital technology facilitates the ease of TV production and program distribution. These reasons persuade media entrepreneurs to open business in satellite TV. Majority of satellite TV stations are niche stations, such as news channels, entertainment channels, education channels, music channels, etc.

In addition, the cost of satellite receivers has become very cheap in recent years. The price of a satellite dish has fallen to less than 1,500 baht (approximately AUD $50). The affordability of the devices drives a group of viewers to watch the niche content provided by the satellite TVs. In addition, many major business operators and product manufacturers who have ever paid millions of baht a year for the advertising through the terrestrial TVs, turn to investing and generating their own TV satellite channels for publicising their manufactured goods and services. For instance, Sahapatra Manufacturer opened its own channel early this year (2008), and TV Direct plans to invest 80,000,000 baht to establish a satellite TV station (Positioning Magazine 2008: 102-103).

The most prominent satellite TV channel in Thailand in recent years is ASTV (Asian Satellite Television). The station was launched in 2005 by Sonthi Limthongkul (a journalist, media businessman, and political activist, who plays a significance role in protesting Thaksin Shinnawatra' regime). ASTV and its news channels have an outstanding role in criticising and disclosing corruption and misconduct of politicians and state authorities. ASTV encompasses 5 sub channels, i.e. NEWS: 24-hour news station, TOC (Thailand Outlook Channel): English news station, E-San Discovery: north eastern culture channel, Happy Variety Channel: music, variety, and entertainment channel, Suvannabhumi: contemporary lifestyle channel and ASTV Radio: radio broadcast on TV (Pienrach 2007: 249-250). Another distinct TV channel is Nation Channel, run by the Nation Broadcasting Corporation (an affiliation of Nation Multimedia Group, owner of the English newspaper in Thailand "The Nation" and other media businesses). Nation Channel is a 24-hour TV news station. Nation Channel also broadcasts on TTV1 (a satellite TV station owned by PRD). In addition, Nation Channel declares itself to be a "content provider," since at present it produces TV news and programs for many free TV stations, i.e. Channels 3, 5, 7, and MCOT 9, as well as cable TV in the provinces.

THAI TV BROADCASTING POLICY AND REGULATION

Thai television in the first three decades (1950s – 1980s) of Thailand's TV broadcasting industry was completely controlled by state authorities and militaries. In other words, Thai broadcasting media was under state monopoly. Governments and state sectors took "legal control and allocation of frequencies" and distributed exclusive TV licenses to state authorities (Siriyuvasak 1999: 242). Thai governments and politicians considered TV broadcasting frequency as governmental properties, which elites and state officers had absolute rights to use, operate, and regulate. Eventually in the late 1970s military leaders and state authorities began offering concessions to private sectors, in which Siriyuvasak defines this concession as "patron-client relationship" and "privileged concession" (1999: 242). The main regulators and policy makers of Thai TV broadcasting were the governments, the Public Relation Department, Royal Thai Army, and the Department of Post and Telegraph. The principle paradigm of TV broadcasting policy from the establishment until the early of 1980s emphasised on using TV station as governmental tools publicising information and news from the state. State authorities also had privileges to use TV for gaining financial benefits. Many TV stations took incomes from commercials and concession fees directly to their organizations, for example Royal Thai Army TV obtained profits from Channel 5 and Channel 7.

From 1980s until May 2008, Thailand's broadcasting media policy and regulation have been in dramatic transition as caused by a number of circumstances, i.e. (i) the students' and people's demonstrations in October 1973 and 1976, respectively, (ii) the launch of the first "THAICOM"[3] satellite, the coup d'état in 1991 and the Black May in 1992 and the request for national communication reform (Siriyuvasak 1999: 179), (iii) the economic boom during the late 1980s and early 1990s, (iv) the economic crisis or "Tom Yum Kong" crisis in 1997, (v) the overwhelming globalisation trend, capitalism, transnational investments, and free trade, higher demands of broadcasting media operation for commercial, public, and community services, as well as requests for privatising telecommunication and revolutionising the domestic electronic media, (vi) broadcasting reform according to Section 40 of the constitution BE 2540 (1997), (vii) Thaksin Shinnawatttra's regime (1998-2006) or Thaksinisation (see more details in McCargo & Pattamanan 2005, *"The Thaksinization of Thailand"*), and (viii) the political conflicts and the coup d'état in September 2006.

I summarise key significant circumstances in Thailand broadcasting history into Table 11, which presents development of TV broadcasting policy and regulation (1950 - May 2008).

[3] "THAICOM" stands for Thai Communications Satellite. From 1991 until June 2008, Thailand has owned 5 communication satellites: Thaicom1, Thaicom2, Thaicom3, Thaicom4 (IPSTAR), and Thaicom5. See more information about Thaicom at http://www.thaicom.net/eng/about.aspx

Table 11: Development of TV Broadcasting Policy and Regulation (1950 - May 2008).

Year	Regulator/ Policy Maker/ Key Actor	TV Broadcasting Policy	Consequences
1950	- Prime Minister Marshal Plak Pibulsongkram - Director of Kosanakarn Department (PRD)	A letter from the Prime Minister to the Director of Kosanakarn Department (PRD).	Initiative idea for establishing TV station in Thailand
1955	- Kosanakarn Department (PRD) and Thai Television Company	- Authorized and funded by Prime Minister Marshal Plak Pibulsongkram's government.	Establishment of the first TV station in Thailand "Channel 4"
1955	- Kosanakarn Department (PRD) - Department of Post and Telegraph	- Radio and Television Broadcasting Act 1955 - Radio and Telecommunication Frequency Act 1955 - The beginning of state-monopoly in Thai broadcasting system	The launch of 2 Communication Acts
1958	- Prime Minister Marshal Sarit Thanarat - Royal Thai Army (RTA)	- Aim for military benefit and public service	Establishment of the Royal Thai Army TV station "HSATV Channel 7"
1960-1970	- PRD and RTA	- Expanding of TV services to regions	Establishment and installation of TV networks and infrastructures
1967	- RTA	- Technological transition from Black and White to Colour TV - Increasing demand of TV consumption	The first launch of colour TV in Thailand
1967	- Prime Minister Marshal Thanom Kitikajorn and Marshal Praphas Jarusathien, and RTA	- Thai TV broadcasting policy shifted into concessional scheme.	RTA offered privileged-concession of Channel 7 to the Bangkok Broadcast Television Company (BBTV)
1970	- Government and PRD	- Technological transition from Black and White to Colour TV - Increasing demand of TV consumption	The emerge of two new colour TV stations: Channel 3 and Channel 9
1970	- PRD	- Thai TV broadcasting policy shifted into concessional scheme.	Thai Television Company (under regulation of PRD) offered privileged-concession of Channel 3 to Bangkok Entertainment Company (BEC)
1973 and 1976	- Public movements	- Public appeal for freedom of press and broadcasting.	The demonstrates of students and public (Bloody October 1973, and 1976).
1977	- Prime Minister Thanin Kraivichein - Office of Prime Minister - MCOT	- Administrate and own Channel 9 and 62 state-owned radio stations in Thailand	The emergence of a new communication authority Mass Communication Organization of Thailand (MCOT) under the regulation of Office of Prime Minister.
1978	- RTA	- Expanding TV coverage - Adoption of new communication technology	Channel 7 transmit TV signal via Satellite "INTELSAT"
1980 - 1990	- Private sectors and media entrepreneurs	- Expansion of media business - TV and media business started shifting into a commercial scheme	Economic boom

1985	- Office of Prime Minister, and PRD	- Distribute news and information and government policy and campaigns to the public	Establishment of Channel 11 (government station/ operated by PRD)
1991-1992	- Coup leaders - The public	- Broadcasting media were under the control of dictators - The request for national broadcasting reform was raised by the publics as a national agenda	The coup in 1991 and the Black May 1992
1993	- Government and THAICOM (Shin Satellite)	- Expanding TV coverage - Initiative launch of integrated communication services in Thailand	The launch of “THAICOM” satellite
1996	- The Office of Prime Minister/ PRD/ Siam TV Group	- Alternative information resource/TV station according to public request after Black May 1992	Establishment of ITV (a concessional TV station)
1997	- All TV stations and media businesses	- The sharp decline of advertising budget	The economic crisis/ “Tom Yum Kong” crisis
1997	- NTC and NBC	- The declaration of the Constitution BE 2540 (Section 40)	The beginning of national broadcasting reform reallocating radio frequencies and rearranging broadcasting business into 3 sectors: state-owned operator 40%, commercial-owned operator 40%, and public-owned operator 20%. Mandating of establishing new national communication regulators: National Telecommunication Committee (NTC) and National Broadcasting Commiteee (NBC)
1997-present	- Interim regulators: Prime Minister and Government, PRD, and MCOT	- Unborn NBC	National broadcasting policy and regulation in a vacuum atmosphere
1998	- MCOT (Licenser) - True Visions (Operator)	Media and Telecommunication business convergence started. The new stations called United Broadcasting Corporation (UBC) and later changed to True Visions, which owned by the Jierawanon, Telecommunication Tycoon’s family.	The merge of giant subscription TV firms International Broadcasting Corporation (IBC) and United Television (UTV)
1999	- Parliament and Government	- Broadcasting Regulator Acts 1999	Emergence of communication regulation Acts
1998-2006	Prime Minister Thaksin Shinnawattra, Shinnawattra’s family business, and Thai-Rak-Thai Party’s Government	- Media Intervention - Taking over of ITV - Expanding of Shinnawatra’s media and Telecommunication services	Thaksin Shinnawattra’s regime
2002-present	State-owned media business and private sectors	Serving TV niche market and specific campaign	Expansion of Satellite TV stations
2006	Coup leaders and interim government	Declaration of temporary constitution	Coup in September 2006
2007	Parliament and Prime Minister Surayuth Julanon’s interim government.	The Constitution BE 2550	Declaration of new constitution. Main principle of broadcasting reform still remains in the Act. However, there will be a merge of NTC and NBC.
2007	Prime Minister Surayuth Julanon’s interim government.	Government ceased the TV station and changed to temporary station called TITV	Termination of ITV as a contract violation

2008	Parliament and Prime Minister Surayuth Julanon's interim government.	Broadcasting Acts 2008	Declaration of new broadcasting Act
2008	Independent Administration Committee	Thai Public Service Acts	Establishment of Thai Public Broadcasting Service (Thai PBS)

In summary, the modern Thai TV industry and broadcasting policy are in transition. They are influenced by the following contexts:

(i) Global trend of technological transition – digital technology and new media. Thai TV broadcasting has been changing into a digital environment. In addition, 3G and broadband internet technology are coming to Thailand and these will provide a dramatic change in Thai media and communication industry.

(ii) The integration of communication technology generates new and contemporary business models, therefore the traditional TV operators will be challenged by the newcomers. Media market in Thailand will be more competitive.

(iii) Political aspects: TV broadcasting media in Thailand will be affected and will shift to a new scheme as the new TV Broadcasting Act was recently proclaimed on March 4, 2008. In addition, according to the current constitution B.E.2550 (in 2007) two of the national communication regulators (NTC and NBC) will be merged. There will be a shift of dominant powers in Thai broadcasting from government control to this new independent broadcasting regulator. The newly founded committee will play a significant role in directing the national communication system.

IMPEDIMENTS TO THAILAND'S DIGITAL BROADCASTING TRANSITION

It is apparent from the fact that the path to national broadcasting reform in Thailand has been largely untravelled. Thailand needs to find a solution for long-term political sanction, conflicts of interest, and corruption, as well as an effective strategy for privatising its industry. Ubonrat Siriyuvasak, a prominent Thai Mass Communication scholar, argues:

> The military which owned the largest share of the frequencies showed their resentment against the reform. Other state agencies in charge of the broadcast media, i.e. the Public Relations Department and the Mass Communication Organisation of Thailand (MCOT), are also reluctant to reform their services. In addition, the government itself is demonstrating its

> resistance towards the democratization of the broadcast media. It is in favor of deregulating radio and television for the private sector on economic terms but it is unwilling to deregulate its political control over the state broadcast media (2001: 219).

State domination has manipulated the whole industry since its establishment in the 1950s.

In this part, I present a discussion on the potential impediments to launching DTV policy in Thailand. I summarized that there are two prime obstacles of Thailand's digital broadcasting transition, i.e. Thai broadcasting under state monopoly and the failure of communication reform.

<u>(1) Thai Broadcasting Industry under State Monopoly: Accusation of Corruption, Privileged Concessions</u>

Considering on the overall structure of the broadcasting media industry in Thailand, Thai communication scholars apparently demonstrate that TV and radio stations have been operated under state ownership for decades. In addition, privileged concessions in broadcasting media have been provided by the elites and state authorities to favourable business groups and family enterprises (see Siriyuvasak: 1999, Sittirak: 2000, Metheekul: 2002, Tangkitvanich: 2003, and Sothanasathien & Ploysirichon: 2007).

Focusing on current TV station business operations, the main commercial TV stations in Thailand are as follows.

(1) Channel 3 (Concessional Free TV Station), Business Operation by Maleenon's Family, BEC Group

(2) Channel 5 (Free TV Station), Business Operation by RTA Company (Owned by the Royal Thai Army)

(3) Channel 7 (Concessional Free TV Station), Business Operation by BBTV Company

(4) MCOT 9 (Free TV Station), Business Operation by MCOT Public Company

(5) True Visions (Subscription/ Pay TV), Business Operation by Jieravanon's Family (Media and Telecommunication Tycoon Family)

Regarding radio businesses, eleven state authorities completely occupy all 524 radio channels and broadcasting frequencies (Hvangdeesirisakul 2003: 107). The information below presents the prime owners of radio broadcasting frequencies in Thailand.

(1) The Ministry of Defense and Militaries	211	stations
(2) The Office of Prime Minister and PRD	149	stations
(3) MCOT	62	stations
(4) The Ministry of Interior	44	stations
(5) Parliament	16	stations
(6) Other Thai Government Organisations	142	stations

Resource: Hvangdeesirisakul (2003: 116)

State Authorities such as PRD, MCOT, the Office of Prime Minister, and Thai armies usually give privileged concessions as well as extend long-term contracts (15-25 years) to media business enterprises. The state authorities have absolute authority in licensing and providing privileged concessions to favorable companies. Revenues from concession fees of TV and radio stations and media business operations have become lucrative incomes for organizations as well as special welfares for administrators and staff of state agencies, Thai armies, in particular. According to Hvangdeesirisakul (2003: 147-150), the monthly fees for leasing a radio broadcasting frequency in Bangkok (during 1997-1999), which the private sectors paid to government sectors, ranged between 500,000 and 4,000,000 Thai Baht (AUD $16,000-130,000). The yearly leasing fees for airtime leases on the popular TV stations were 59,792,500 Thai Baht (Channel 3), and 160,000,000 Thai Baht (Channel 7).

As can be seen from the example above, the Thai broadcasting media industry has become a resource of lucrative profits for state authorities and officers. Tangkitvanich, a senior researcher from TDRI, comments that broadcasting frequency allocations and concessions in Thailand were not very transparent and fair. The Thai broadcasting system has been monopolized by state authorities, militaries, as well as groups of media enterprises (2003: 192-193). Under the current circumstance of monopolized broadcasting systems, the future of launching DTV in Thailand is still ambiguous. As digital broadcasting technology opens a great opportunity for the new comers or TV station operators (see Chapter 2) the market share of audience as well as incomes from advertisement will be fragmented. The current operators (especially, free-to-air TV station business operators) are very reluctant about further opening of media markets since they may lose revenue to the new competitors. Therefore, the launching campaign of DTV has not been publicly pushed by the current TV business operators. In addition, the state authorities are highly concerned about the increasing number of TV and radio stations, which are facilitated by digital communication signal compression technology (see Chapter 2). The state authorities may not be able to completely control the broadcasting media in the future.

(2) The Failure of Communication Reform and the Vacuum Atmosphere of National Communication Policy and Communication Regulator (NBC-National Broadcasting Committee)

As aforementioned, requests for a broadcasting media reform have been voiced since the 1980s. There were a number of attempts from scholars and civil movements to free broadcasting media frequencies from state manipulation. These included the establishment of ITV in late 1990s, the widespread operation of community radio stations throughout the country, and especially the proposition of media reform in the article 40 of the constitution B.E. 2540, as well as in article 47 of the constitution B.E. 2550. However, the road of Thai media broadcasting reform remains ambiguous. Firstly, broadcasting is still under the state monopoly system. Secondly, the national broadcasting regulator “National Broadcasting Committee (NBC)” has not been established since 1997. The reason for failure in founding the NBC was that the nominated committee members were accused of having conflict of interests in concessional media businesses. In addition, there have been conflicts among groups of interest in media broadcasting businesses, state authorities, and civil movement representatives in naming their nominees for committee selection procedures (Siriyuvasak 2002: 193-203).

According to the determination of the constitution of Thailand B.E. 2540 (1997) and B.E. 2550 (2007), the new independent broadcasting regulator is expected to administer the national broadcasting system, allocate the radio spectrum, issue plans on radio broadcasting frequency usage, as well as issue a national communication policy for country development. In the digital communication era, new communication technology expands the landscape of media the sphere; the NBC is publicly anticipated to be the state authority to manage the usage of digital broadcasting technology effectively. The lack of the NBC becomes the key impediment to moving Thailand forward into the digital environment.

Summary on Conceptual Framework of Communication Policy and Development of Thai Television

Key conceptual frameworks presented in this Chapter are communication policy and background of Thai television industry and development of Thai TV broadcasting policy.

Globally, there are three periods of communication policy, i.e. (i) the foundation or preliminary of communication policy, (ii) the public service media policy (1945 – 1980/90), and (iii) new communication policy paradigm (19980s/90s – present) (Van Cuilenburg and McQuail 2003). These three periodic stages visualise the big picture of world TV broadcasting policy development.

Since the late 1990s, many nation states around the world have reformed their TV broadcasting industries as a result of: (i) global trends of deregulation, privatisation, and communication reform, (ii) influence of international regimes (Raboy 2002), and (iii) introduction of advanced communication technology (Katz 2005). Consequently, communication regulators around the world have reformed broadcasting regulation philosophy and practices (Goldsmith et al. 2004).

Thailand’s TV broadcasters also adjusted their TV broadcasting policy in order to manage industry effectively. Thus, I have analysed Thai TV broadcasting industry based on history and development of TV broadcasting policy and found that there are three significant issues as follows:

(1) TV broadcasting industry in Thailand is highly related to state authorities since establishment. Broadcasting policies and regulations are mandated by state authorities, e.g. Prime Ministers, governments, parliaments, cabinets, Public Relations Department, etc. This means that Thailand's TV broadcasting policy has been in a vertical paradigm (Colebatch 2002) or the elite model (Dye 1992). In other words, the nature of issuing policy and implementing national plans are conservatively and traditionally administered by the elites, state authorities, and governments. Public and business sectors have less influence on pushing national communication policy. Even though, throughout history, there were some policies and projects pushed by the public, such as a request for launching new TV stations since late 1970s (ITV and Thai PBS), these still required approvals and supports from the states authorities. In addition, the policies and projects pushing by the public took years and/or even decades to accomplish.

(2) According to the Constitution B.E. 2540 in 1997, the NBC will be the new state authorities to issue national broadcasting policy and plan, and regulate national TV broadcasting industry. However, since 1997, the NBC has not been established (see Table 11). This means that Thailand's broadcasting policy is in vain.

(3) There have been increasing demands from public and private sectors requesting to obtain TV licences and establishing new TV channels. However, state authorities remain reluctant to give permission to private sectors. The governments and regulators claimed there was a limitation of analogue broadcasting frequency. Digital TV technology and new media platform, therefore, become alternative platform providing a chance for the newcomers (see Chapter 2). In addition, there have been a great number of TV business operators running TV channels on digital new media platforms (digital satellite TVs, cables, and IPTV) in recent years.

Based on the literature review and the above issues, I generate three statements regarding DTV policy in Thailand as follows:

(1) Traditionally, since Thailand is accustomed to the vertical scheme and elite model (top-down authority), Thailand's broadcasting regulator, the NBC, would be expected to be the key actor directing the TV industry into technological transition.

(2) The absence of regulators would be the main obstacle of launching DTV in Thailand.

(3) An increasing domestic demand of TV station business operation would be an internal drive of moving Thailand's TV broadcasting industry into technological transition as DTV technology can be a gateway for new operators.

In this Chapter, I present conceptual frameworks of policy and development of TV broadcasting industry in Thailand. In the next Chapter, research design and methodology of the study will be discussed.

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CHAPTER 4

RESEARCH DESIGN

This chapter begins with key research questions, and premises of the thesis. In addition, I present and explain research design and methods employed in this research. I illustrate the reasons for choosing these methods and the technique used for gathering data. In addition, this chapter presents details of two ethnographic research methodologies employed in this study, i.e. in-depth interviews and observations, including procedures, data resources, criteria and qualification of thesis participants, research sites, data collection, and data presentation. My field research was conducted between October 2006 and October 2007[1] in Bangkok, Thailand.

KEY RESEARCH QUESTIONS

<u>My key research questions are as follows:</u>

(1) What are the major pushing factors influencing Thai TV broadcasting industry to go into technological transition, shifting from analogue to digital between 2006 and 2007?

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[1] In this period, while I was conducting field research, Thailand was in a very ambiguous political atmosphere. There was a coup in Thailand on September 19, 2006 and this event pushed Thailand into a dramatically political transition. The TV broadcasting industry was unavoidably influenced by this change. In addition, there were a number of significant circumstances in Thai broadcasting, i.e. a change of TV executive and administration boards in MCOT 9, and a crisis of TITV (ITV). These circumstances had a strong impact on my protocol for conducting field research, such as delays in data collection and difficulties in contacting and approaching the participants. In addition, many participants refused to comment on some issues that might be related to conflicts and political agenda.

(2) What are the supporting factors and obstacles of launching DTV in Thailand between 2006 and 2007?

(3) What are the prospective key benefits and disadvantages of adopting and launching DTV technology in the Thai TV broadcasting industry in relation to TV consumers and TV station business operators during these two years?

(4) What are the recommendations of thesis participants (TV station administrators and Mass Communication scholars) vis-à-vis establishing a national DTV policy?

(5) To what extent do major TV stations in Thailand use DTV technologies in 2007 for their operation (production and broadcasting protocols), and what preparations are TV stations making for DTV transition?

PREMISES OF THE THESIS

<u>The focused premises of the thesis are as follows:</u>

PREMISE 1: “Two major *pushing factors* driving Thai TV stations into DTV transition are:

(1.1) *a global push* or *an external drive* in relation to the global trend of technological transition influenced by global TV manufacturers; and

(1.2) *a local push* or *an internal drive* from TV station business operators, along with Thailand’s demand to increase radio frequency and broadcasting spectrum usages.”

PRIMISE 2: “Supporting factors for implementing DTV in Thailand are likely to principally depend on state authorities being driven by the National Broadcasting Committee (NBC) to issue a national policy and action plan for DTV transition. However, thesis participants will see the absence of an NBC, and thus a lack of proper national broadcasting policy and regulation to deal with DTV transition as an impediment to implementing DTV in Thailand.”

PREMISE 3: “Despite the fact that Thailand has not had an official national DTV policy for switching over to digital, Thai TV stations, including state-owned TV stations, concession TV stations, and private operators, have employed DTV technologies in their operation for years.”

RESEARCH APPROACH AND METHODOLOGIES UTILISED

Put simply, the central concern of this research is to understand the utilisation and the impact of digital technology on television industries in Thailand, and to examine how television stations implement practical plans to employ digital technology in production, broadcasting, and program distribution.

I decided to conduct the research using multiple research methodologies or the triangulation method. I did this to gain more capacity of quality control and to ensure the internal validity - the trustworthiness and credibility of the research findings. As Buddenbaum and Novak (2001: 254) maintain that “Triangulation can effectively compare the evidence collected in one way with the evidence collected in other ways in order to ensure concurrent validity.”

I chose a specific research methodology for this study, i.e. in-depth interview and observation research methodology that would afford clear explanations and comparisons, and elicit the various perspectives of interviewees vis-à-vis the significance of digital technology on the television industry. These ethnographic research methodologies provide a powerful research tool for exploring ‘real-life data’ (NOP World 2005). It is a form of research methodology that facilitates an invaluable insight, both practically and theoretically, into issues that the thesis participants (television administrators, staff, and academics) perceive and are concerned with in the area of digital television technology. Ethnographic practice offers more than simply lists of findings or unrelated insights: it provides useful representations of how experience is organised.

The multiple ethno-methodologies employed in this study include (1) in-depth interviews, and (2) observations, in accordance with Newcomb's (1991) suggestion about the two primary methods of television station operation and production research. By applying both of these methods to research television operations, cross-checking and amplification of the study is achieved (Newcomb 1991: 100-102). In addition, collecting qualitative data using these types of research methods enables the researcher to gain a clear insight into a specific area of knowledge, which in this case is the impact of digital technology on TV industries in Thailand.

In the next section I outline the research methodologies and tools employed, details of the research approaches, and the procedures that follows in this study.

(1) IN-DEPTH INTERVIEW

The in-depth interview methodology is an effective tool for attaining in-depth information from interviewees regarding their views on certain issues. In addition, the in-depth interview method provides the background to the reasons why certain participants give certain answers. It is through using this method that elaborate data concerning participants' opinions, values, motivations, recollections, experiences, and feelings are obtained (Wimmer and Dominick 2000: 122). This methodology was selected for this study in order to gather the views of TV station administrators and Mass Communication scholars on the following issues:

(1) Major forces of technological transition in Thai TV industry.
(2) Benefits and disadvantages of employing DTV technology.
(3) DTV technology and public interests.
(4) National DTV policy and regulation.
(5) The future trends of DTV industry in Thailand.

CHARACTERISTICS OF THESIS PARTICIPANTS

For this research I gathered the views of and information from 26 participants drawn from two major professions, who fill crucial roles in the television industry. They had to meet certain criteria to ensure that they possessed the appropriate qualifications. These criteria are set out below:

Group 1: TV Station Administrators (15 persons)

Group 1 participants met the following criteria:

(1) currently work in TV stations and/or TV broadcasting agencies in administration and/or management roles

(2) have worked in the TV industry for no less than 10 years, and

(3) presently hold a position that fits any of the following specific categories:

- TV station director/administrator/manager,
- Assistant to TV station administrator,
- Manager/Head of TV Production Department,
- Manager/Head of TV Broadcasting/Transmission/Engineering Department,
- TV station administrator's advisor/consultant, and
- Senior staff who are assigned as the administrator's representative.

In the recruiting phase of the study, I sent information, consent forms and questionnaires to the directors of 9 elite TV stations in Thailand (Channels 3, 5, 7, MCOT 9, 11, TITV (ITV), True Visions, ASTV, and Nation Channel), and to the director of the Government Broadcasting Regulation Authority (Public Relations Department). All stations and authority agreed to participate in the project. These organisations nominated executive staff who would provide information to me as representatives of the TV station or organisation.

I interviewed and obtained information from 15 executive staff and administrators between October 2006 and August 2007. Even though all participants agreed to disclose their names and positions in the thesis, some of them, especially those who worked in state TV stations/organisations, did not wish to have their statements specifically identified as their own views. The participants gave two reasons for this: (i) the statements on certain issues were their personal views not necessarily the views of the organisation and misunderstanding might occur if the readers assumed that these comments were from their organizations; and (ii) as many of them worked for state-owned TV stations, they were reluctant to present their comments on some issues that might contradict the views of other state authorities. Therefore, in order to comply with their requests and protect the rights of the participants, I decided to not indicate names on the statements. Instead, I coded each participant's response using the letters "TSA" ("TSA" represents "TV station administrator") followed by a number. These responses are reported in Chapter 5 and 6.

The names and positions of the participants, as well as a date of conducting interview sessions are provided below. I present the details of the participants in chronological order of date of interview. The order of participants presented below is; therefore, not related to the ordering number or the code of each statement reported in the Results chapters.

Sura Gaintanasilp, Vice President, MCOT 9, (interviewed on October 27, 2006)

Prachuab Pramuan, Manager (Production & On-Air Technical Department), Channel 7, (interviewed on October 30, 2006)

Kantachai Srisukhon, Transmission Manager, TITV (ITV), (interviewed on November 8, 2006)

Waruth Sukont, Engineering Specialist, TITV (ITV), (interviewed on November 8, 2006)

Yothin Trikomut, Executive Director, Engineering Support and Development Bureau, Government Public Relations Department, (interviewed on November 9, 2006)

Chumporn Krua-Khwan, Director of Engineering Division, Government Public Relations Department, (interviewed on November 9, 2006)

Dr Suthiti Khattiya, Assistant Director (Policy and Planning), Channel 11, (interviewed on November 16, 2006)

Boonchu Maikaew, Assistant Director (Broadcasting), Channel 11, (interviewed on November 16, 2006)

Amorn Yothasmuth, Head of Electronics and Engineering Department, Channel 5, (interviewed on November 20, 2006)

Saran Virutamavongsa, Senior Manager, Channel 7, (interviewed on November 21, 2006)

Piroj Pinkaew, Executive Advisor, Channel 3, (interviewed on November 29, 2006)

Dr Niphon Naksompop, Executive Advisor, ASTV, (interviewed on May 17, 2007)

Vichai Sernvongsat, Director of Broadcasting and Engineering, True Visions, (interviewed on May 29, 2007)

Adisak Limprugkij, Managing Director, Nation Broadcasting Cooperation (Nation Channel), (interviewed on August 8, 2007)

Chatchai Phongmala, Assistant TV Project Director, ASTV, (interviewed on August 9, 2007)

Group 2: Mass Communication Scholar (11 persons)

Group 2 participants met one of the following criteria:

(1) currently lecture and with at least 10 years' experience, in one of the following faculties/departments in Universities: Mass Communication, Journalism and Mass Communication, Communication Arts, TV Broadcasting, New Media, Telecommunication, and Information Technology;

(2) senior researcher with academic publications and at least 10 years' research experience in one of the following area: Mass Communication, TV Broadcasting, New Media, Telecommunication, and IT.

I sent information and consent forms to academics and researchers at the faculty/department of Mass Communication in 10 Universities and 1 research institution. Eleven Mass Communication scholars from 6 universities and 1 institution agreed to take part in this study. I conducted the interviews between April and May 2007. All participants agreed to allow me to disclose their names and positions in the thesis. However, some of them did not wish to have their statements specifically identified as theirs. Therefore, in order to comply with their requests and protect the rights of the participants. I chose to not indicate names on the statements. Instead, I coded the participants' responses using the letters "MCS" ("MCS" represents "Mass Communication Scholar") followed by a number.

The names and positions of the participants, as well as a date of conducting interview sessions are provided below. I present details of the participants in chronological order by date of interview. The order of participants presented below is; therefore, not related to the ordering number or the code of each statement reported in the Results chapters.

Associate Professor Joompol Rodcumdee, Director of Chulalongkorn University Radio, Faculty of Communication Arts, Chulalongkorn University, (interviewed on April 25, 2007)

Associate Professor Dr Surat Metheekul, Senior Lecturer, Faculty of Journalism and Mass Communication, Thammasat University, (interviewed on May 1, 2007)

Associate Professor Oranuj Lertchanyarak, Senior Lecturer, Faculty of Journalism and Mass Communication, Thammasat University, (interviewed on May 4, 2007)

Anusorn Srikaew, Dean, Faculty of Communication Arts, Rungsit University, (interviewed on May 4, 2007)

Prapas Nualnetr, Lecturer, Department of Broadcasting, School of Communication Arts, University of Thai Chamber of Commerce, (interviewed on May 9, 2007)

Thitinan Boonpap, Head of Radio and Television Department, Durakij Pundit University, (interviewed on May 15, 2007)

Kulachet Lekprayura, Chairperson, Broadcasting Department, School of Communication Arts, Bangkok University, (interviewed on May 16, 2007)

Dr Somkiat Tangkitvanich, Research Director (Information Economy), Science and Technology Development Program, TDRI - Thailand Development Research Institute Foundation, (interviewed on May 21, 2007)

Assistant Professor Dr Asawin Nedpogaew, Director, Doctoral Program in Communication Arts, Durakij Pundit University, (interviewed on May 22, 2007)

Associate Professor Dr Ubonrat Siriyuvasak, Senior Lecturer, Faculty of Communication Arts, Chulalongkorn University, (interviewed on May 24, 2007)

Assistant Professor Olarn Wongbandue, Head of Mass Communication Department, Faculty of Communication Arts, Chulalongkorn University, (interviewed on May 25, 2007)

RESEARCH INSTRUMENT

The research instrument selected for this research method took the form of a questionnaire. The questionnaire was used as a key data collecting method and instrument for conducting interview sessions. The questionnaires have 8 questions and are divided into five sections:

Section 1: One question regarding major drives of technological transition.

Section 2: Two questions regarding benefits and disadvantages of DTV technology.

Section 3: One question regarding DTV and public interests.

Section 4: Two questions regarding national policy and regulation.

Section 5: One question regarding future trends of DTV in Thailand.

All interviews were audiotape-recorded and lasted approximately 45 - 60 minutes, depending on the information provided by the interviewees or according to the time limitation set by the interviewees.

I sent an information and consent form (an invitation letter) and a set of questionnaires to the research participants in advance. This allowed them to prepare so that they could express their views openly and give their full opinions without constraint. Reproductions of the information and consent form and questionnaire are provided in Appendices No.2and No.3.

DATA PRESENTATION

All tape-recordings were transcribed and translated by the researcher from Thai into English. Then I proceeded with a data analysis of each participant's responses according to the list of questions and issues pertaining to the study. The results of the questionnaires and the in-depth interviews are reported in Chapters 5 and 6. Chapter 5 presents the responses from the TV station Administrators and Mass Communication Scholars regarding the questions in sections 1-3 of the questionnaire, and Chapter 6 presents the responses regarding the questions in sections 4-5.

(2) OBSERVATION

Bertrand and Hughes (2005: 82) maintain that 'observation can be a research method in its own right (for instance in fieldwork), or it can be a supplement to other methods (particularly surveys and interviews). Observation in the context of research is more than just looking: it is purposeful looking, and recording the results'. Furthermore, they observe that in institutional media research and studies of media production, the most general and appropriate type of surveillance is 'observation', wherein the researcher is involved in the social practices of the organisation being studied (ibid.: 146). This method enables the researcher to closely observe the television staff as they go about their everyday duties.

Despite the fact that this method is complex and time-consuming, it offers a great number of advantages. According to Bertrand and Hughes (ibid), the strength of this method are that:

(1) social interaction is best observed in the social setting in which the behaviour would normally occur, rather than in the controlled environment of an experiment or survey,

(2) rich and varied data can be obtained, making possible ‘thick description’,

and (3) it is possible to gain access to participants’ own understandings of the situation, in their own words.

Put simply, this method allows the researcher to gain a comprehensive understanding of the nature of television station operation. In addition, observation enables the researcher to observe actual work routines as they are performed in selected stations. Garson (2005) supports the use of this method, noting that: “Ostensibly, observation is a straightforward technique: by immersing him or herself in the subject being studied, the researcher is presumed to gain understanding, perhaps more deeply than could be obtained, for example, by questionnaire items.”

Regarding the degree of success of observation, Newcomb (1991: 101) suggests that “the more knowledgeable researcher has advantages. If the researcher knows little or nothing of the technical processes [and TV station operation] involved, observations will be limited, narrowly directed, or simply incorrect… there is little time for learning *on the job*.” To this end, before entering his/her research sites, the researcher should study and gain insight into the structure of station operation, digital technology in broadcasting, and technical aspects of the modern television station by drawing upon various resources (such as reviewing literature, and attending courses in media production and television station operation). These activities serve as an orientation program prior to conducting the field research.

RESEARCHER’S PREPARATION PRIOR TO OBSERVATION

Before entering the research sites, I gained knowledge about digital TV technology, TV station operation, and TV program production by visiting a number of TV stations, attending conferences, taking short courses and exchange programs, studying the structure of TV stations in Thailand. These activities were shortcuts for me to gain insight on complicated operation protocols and technology at the contemporary TV stations. My preparation activities are stated below:

(i) I attended a broadcasting technology exhibition and conference "MEDIACAST" in London, United Kingdom (June 2005)

(ii) I participated in an exchange study program "Electronic Journalism" (TV News Program Production) at Butler University, Indianapolis, USA (July 2006)

(iii) I visited TV stations in Chicago, USA: Fox, NBC, WYHR 13, and WFYI. (July 2006)

(iv) I took a short course on "Producing Multi-platform TV" at Australian Film, Television & Radio School (AFTRS) in Sydney, Australia (2006).

(v) I attended a broadcasting exhibition and conference "Australian Broadcasting Summit 2006" in Sydney, Australia.

(vi) I attended a conference "Australian Communication and Media Authority 2006" in Canberra, Australia.

(vii) I spent three months (January– March 2007) studying the history and development of the targeted TV stations of my observation, including annual reports, journals, and research results.

These activities were very helpful. I gained concrete and practical knowledge about TV production and business operation from experts and professionals. Moreover, these gave me a chance to obtain up-to-date information regarding DTV technology. All the activities were useful preparation before entering the research sites and conducting observation protocols.

In conclusion, I opted to use the observational method for this study because it enables the researcher to investigate the current situation in a TV station operation; that is, to observe operations in their natural setting. This method also provides the researcher with an opportunity to contrast and compare selected stations' modes of organisational operations and current broadcasting technology employment as they feature in the transformation and impact of digital broadcasting technology.

RESEARCH SITES

Courtesy protocols and the confidential nature of certain business operations can make accessing the sites of academic studies (in this case, television stations) extremely difficult. In order to gain access to the site, I asked the Director of the Department of International Communication at Macquarie University and my research supervisor to provide me with an official letter (see Appendix No.4) requesting both the permission and collaboration of selected TV stations.

This letter helped me gain access to the stations for the purposes of visiting, observing, and interviewing as an observer. I submitted the request letter and supporting documents to each station administration approximately 2-4 weeks prior to the targeted date for conducting observation. After submitting the request letters to TV station administrators, I obtained permission from nine major TV stations in Thailand. The administrators approved me to observe in their stations in limited conditions and times. All stations allowed me to observe their stations for one day. Each station provided me with TV staff and specialists to facilitate and answer questions regarding technological employment in TV production, station operation, and TV broadcasting protocol at the TV station. I emphasised to the station administrators and TV crews that these observations were used only for thesis writing and research purposes. In addition, in the case of photography, filming, and audio recording, I sought the permission of the station management before taking photos and conducting interviews in these stations.

My observation sessions at 9 TV stations in Thailand were conducted between June and October 2007 as listed below.

(1) True Visions (June 6, 2007)
(2) Channel 3 (June 12, 2007)
(3) Channel 7 (June 18, 2007)
(4) MCOT 9 (July 6, 2007)
(5) Channel 5 (July 17, 2007)
(6) ASTV (August 7, 2007)
(7) Nation Channel (August 8, 2007)
(8) Channel 11 (August 22, 2007)
(9) TITV (October 3, 2007)

FIELD STUDIES AND DATA COLLECTION

The observation methodology requires the researcher to gather data through observation, talking, interviewing, and drawing upon documentary resources. Data obtained from observation ‘provides a solid source of evidence and findings which can be triangulated’ (Hansen, et al.1998: 44). Therefore, I decided to gather information from the research sites by

(1) interviewing a number of TV staff on site,
(2) taking photos and undertaking audio tape recording, and
(3) asking TV crew to fill in a designated form (see Appendix No.4).

The designated form was designed to (1) ask TV staff at the TV stations about the proportion of digital system and analogue system used in TV station operations; and (2) identify major hardware and software employed in TV production and broadcasting. In order to obtain reliable data, I asked 1-3 representatives at each TV station to fill the form (see a reproduction of the form in Appendix No.5). The representatives were experienced producers, editors, technicians, and head of TV production and broadcasting department, and/or persons who were assigned from the TV station administrators to fill in the form. Seven stations returned forms but two stations preferred not to provide any details.

DATA PRESENTATION

The observational research results and additional information are presented in Chapters 7 and 8. I report research findings[2] on my visits to each TV station by giving an explanation of what I noticed about TV station operation there. I present key information obtained from discussions with TV crews regarding working protocol, technological employment at the TV production and broadcasting unit, and opinions on DTV technology. In addition, I present photos taken at the sites, information regarding the proportion of technological systems (analogue versus digital), and details of main equipment used at major stages of TV station operation, i.e. Pre-production, Production, Post-production, and Broadcasting at each TV station. The discussion and summary of the study are presented in Chapter 9.

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[2] The amounts of data obtained from the TV stations, which are reported in Chapters 7 and 8, are different for two main reasons. (i) The restriction of business information: as the TV business operation is highly competitive, there are a number of restriction protocols at the research sites that I was not allowed to enter. In addition, there is some business information that the informants want to be reserved and are unauthorized to reveal. (ii) Time limit of the visit: naturally, working at a TV station is a very busy operation; therefore, there is a time limit for discussions with the staff while they are on duty.

CHAPTER 5

DTV: THAILAND AT THE CROSSROADS

The results presented in this chapter are based on the responses and views of research participants in Group 1: TSA - TV Station Administrator, and Group 2: MCS - Mass Communication Scholar to questions in 3 parts of the questionnaire:

Part 1: Major Drives of Transition

Part 2: Benefits and Disadvantages of DTV

Part 3: DTV and Public Interest

PART 1: "MAJOR DRIVES OF TRANSITION"

1) What are the main factors that drive the Thai TV broadcasting industry into the technological transformation from analogue to digital technology?

In response to this question, the majority of thesis participants from both groups, similarly believed that the major drives are as follows:

(i) external drive (global push): a force of globalisation, and global TV manufacturers' dominance

(ii) internal drive (local push): an increasing domestic demand on broadcasting and telecommunication spectrum utilisation, and the public's increasing need for a variety of communication channels

Many participants asserted that technological drive (technology determinism) or technological advancement is a major cause of transition. In addition, several participants maintained that affordability of digital TV appliances and “technology-craziness” of Thais are a part of the driving factors. The participants’ responses to this question are summarised below organised according to the three main areas as identified above.

“Globalisational Force”

(External Drive/ Global Push)

Group1 - TSA: Eleven out of fifteen TV station administrators[1] claimed that globalisation forces are the major drive of the transition, as the Thailand broadcasting industry is a member of international broadcasting and it cannot resist the “gigantic wave of technological transition” (TSA3, TSA6, TSA14). This change is “irresistible” (TSA 5, TSA11). They claimed:

“The cancellation of analogue and the turn to digital technology will certainly occur soon in every country no matter how we dislike it” (TSA13).

“The factor that drives toward the change of broadcasting technology from analogue to digital is the pressure of situation. It does not matter whether we like it or want to use it. It is the globalisational force. We have to walk on into fully digitalised systems sooner or later” (TSA5).

“Digital TV is the system we cannot avoid. We cannot escape from innovations. We have to join the system because we are a part of the world, and the world’s situation drives us to do that” (TSA1).

“Since nearly all countries in the world have changed their system to digital, it would be difficult for us to remain with the analogue. That means we have to turn to digital system inevitably” (TSA3).

[1] TSA1, TSA3, TSA4, TSA6, TSA7, TSA9, TSA11, TSA12, TSA13, TSA14, TSA15

“The transition is a globalised change. TV is an important business in the capitalist society. Digital technology is now the driving force of TV program production. It is the new global standard of picture and sound broadcasting in the modern world. Thai TV industries cannot avoid the change” (TSA7).

In addition, TSA 12 observed that “Thai law allows free enterprises in trade, telecommunication investments, and in nearly every business. As a result, foreign corporations will certainly enter and dominate the local market. If we do not use digital system, it will be difficult to communicate with others.”

Group 2 - MCS: Nine out of eleven Mass Communication scholars [2] agreed that globalisation is a prime drive of the transition. They stated:

“It is inevitable for Thailand to step into the digital world and be forced in to this technological change” (MCS1).

“Thai TV broadcasting is forced by the global transition; Thai TV industry cannot avoid the transformation from analogue to digital system” (MCS11).

“We cannot resist the globalising change of technology. Our technological transformation does not originate from our preference or the demand of internal industry. Because Thailand is not the owner or manufacturer of technology, we cannot determine our technological future. For Thailand, I think there are only a few driving forces from consumers and grass roots. The main force is the external one; the global trend” (MCS3).

“It is the change of the world. Being a part of the globalizing world, Thailand has to adopt technologies and innovations from abroad. With media industry in the whole world using digital technology as their new standard, we have to use it accordingly” (MCS4).

[2] MCS1, MCS3, MCS4, MCS5, MCS6, MCS7, MCS10, MCS11

"Thailand is an adopter of foreign technology. When countries in the world change their technology to the digital one, we have to follow them inevitably as we tie ourselves to foreign technology which we cannot manufacture. Our adopting of technology does not come from our approval, but from the necessity we cannot deny" (MCS8).

"TV technology is a kind of universal technology which should be used with the same standard throughout the whole world. Since Thailand is a member of International Telecommunication Union and Asia Broadcasting Union, we have to change our technology to the universal standard one sooner or later" (MCS6).

"We need to use new communication technology to increase our capacity in the international business competition. As countries in the whole world, even Myanmar, Cambodia and many of our neighbour countries in SE Asia have already changed or are changing their technology to the digital one. Thailand has to follow them, or else we will be left behind" (MCS5).

"The digital technology has been streaming from the countries of its inventors and owners toward the countries that adopt it. Since most countries in the world have already adopted digital technology, Thailand has to follow them, or else we cannot effectively communicate with them" (MCS7).

"Thai TV stations have contacts with foreign content providers where they buy news and entertainment programs. More and more of these providers have turned to use digital technology in their program recording and signal transmitting, instead of the old procedure of sending recorded tapes. Consequently, Thai TV industry has to use digital technology accordingly, in order to be able to communicate with other countries" (MCS10).

"The driving forces for the technological transformation come from the flood of new technological equipments and media streamed in from abroad. TV and communication industries in the whole world are going towards an important turning point, from analogue to digital system. Influenced by world trend, technology adopting countries such as Thailand cannot resist the overwhelming driving force. Though we have never been politically colonized, we have been an indirect technological colony of western countries for a long time" (MCS1).

"Global TV Manufactures' Dominance"

(External Drive/ Global Push)

Group1 - TSA: Ten out of fifteen TV administrators [3] insisted that global TV manufacturers are prime drive of the change, due to the degeneration of analogue hardware and software. They asserted:

"World TV equipment industries are the ones who determine the technology. We are the buyer and the receiver of technologies from Europe, America, and Japan. Therefore, we have to adapt ourselves to the world's trend of technologies" (TSA14).

"The main factor forcing Thailand to change its broadcasting technology from analogue to digital is the pressure from the manufacturers of equipment in TV signal production and broadcasting. This is inevitable because the manufacturers are the ones who determine the direction of the technology. They have great influence on technology consumers, both the program production and its viewers" (TSA1).

"Even though Thailand may not like to change its broadcasting system to digital, big TV manufacturers of the world, such as Sony, have already planned and prepared for the system. Manufacturers are the real pushing hands. Broadcasters are the ones who have been pushed. We have nowhere to buy analogue equipment, nowhere to find analogue switches, nowhere to acquire analogue spare parts" (TSA11).

"TV stations' equipment will degenerate according to their lifetimes. Actually, we do not want to change much. We have to change our equipment because they are old and outmoded, and we have to buy new ones to replace them" (TSA4).

[3] TSA1, TSA3, TSA4, TSA5, TSA7, TSA8, TSA10, TSA11, TSA13, TSA14

“Analogue equipment is nowhere to be found these days. There isn’t any analogue equipment in the market. I expect the main equipment for analogue TV will run out within 5-7 years” (TSA10).

“Moreover, nowadays, analogue equipment and maintenance costs are very expensive” (TSA13).

“If the manufacturers do not make equipment or spare parts in analogue, TV operators can do nothing. These are the main factors that tell us when to cancel the analogue. Normally, manufacturers retain the spare parts for about 10 years for each model. Consequently, at the eleventh year there will be no spare part, and then we can do nothing but change the system” (TSA7).

“In the past 10 years all has turned to digital. As TV manufacturers produce only digital equipments, the program production and broadcasting systems have to be digital accordingly” (TSA5).

Group 2 - MCS: There were three Mass Communication scholars[4] maintained that this transition is influenced by global TV manufacturers. The scholar stated:

“The main factor for technological transformation is the marketing drive force from TV manufacturers whose products in the last 5-10 years are all in the digital system. Consequently, TV station operators are compelled to change their technology since there is no analogue equipment for sale and no more maintenance services” (MCS2).

“Global TV manufacturers are the masterminds of technological change” (MCS5).

“Global TV Manufacturers take control the global broadcasting industry. They are influencers of transition. Thailand’s broadcasting industry cannot design our own direction as we are a technology dependency nation” (MCS10).

“An Increasing Domestic Demand of Broadcasting and

[4] MCS2, MCS5, MCS9

Telecommunication Spectrum Utilisation”

&

“Public’s Increasing Need for Communication Channels”

(Internal Drive/ Local Push)

Group 1 - TSA: Seven out of fifteen TV station administrators[5] argued that there has been an increasing demand for media and communication business operation in recent years. One of the limitations of analogue technology is that it is impossible to use the analogue system to respond to the increasing need. Digital broadcasting technology can serve this requirement due to its compressing facility and suitability for multi-media features. The participants maintained:

“The rising demands for frequencies in the country’s telecommunication and media business all have effects on the changes in Thai TV broadcasting technology. As there is a limitation on the amount of analogue technology, there are too many producers for analogue TV to be able to broadcast their programs. This limitation builds pressure which drives us to turn to digital systems. You can see that in the past 3-4 years, there were more and more TV stations or content providers in Thailand, alternative TV as they are called, which use digital channels to broadcast their programs, e.g. the satellite IPTV” (TSA15).

“We have limited frequencies for radio and TV broadcasting while more and more producers, including bureaus, want their shares. The 3, 5, 7, 9, 11 and TITV free TV channels are all taken hold of by government and commercial firms, leaving no space for new producers. Therefore, digital technology is the answer to this problem” (TSA2).

“The TV system in Thailand has stayed still for a long time because of the limitation of analogue technology. We have only 6 free channels, but in the past 2-3 years, increasing numbers of satellite TV and local cable TV, both legally and illegally, are coming up. The growing numbers of TV channels show that the Thai people’s need to consume news and entertainment has increased enormously” (TSA13).

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[5] TSA2, TSA4, TSA7, TSA8, TSA10, TSA13, TSA15

"The 6 channels of free TV cannot satisfy the needs of the various kinds of people. The society becomes more complex, and there are more exclusive groups of people. Thai cable TVs have expanded their network remarkably with lots of channels and members. However, as the system and the technology are monopolized, the resulting pressure brings about satellite TVs and local cable TVs in nearly every town in big provinces" (TSA4).

"Consequently, the real driving force for digital technology lays in the demands of new program producers and people's increasing need for information, rather than the drive of technology itself. Technology is more of the tool or way to solve the problems" (TSA7).

"We need for more media channels, more TV stations. Communication business proprietors want opportunities to do their business and channels to present their works. Public services and the private sector want the means to distribute information. Only digital technology can be a solution for the limitation of signal channels. As channels in the analogue broadcasting system were all full, it was a great hindrance to expanding the communication media" (TSA10).

"The main factor is the limitation of the national communication system, where people can view only 6 channels of free TV. People's demands for variety and alternative information programs are the driving force toward the change. You can see that in the past few years, people were getting bored of the old channels and tried to avoid them by turning to satellite TV. Right now, there are 20-30 new digital satellite TV services. The business is fast growing with hundreds of thousand members in recent years" (TSA8).

"I think that people's increasing demands for news broadcasting together with the demands for opportunities in communication business, both rising from the frustration in using analogue system, are the driving force toward the change" (TSA2).

Group 2 - MCS: Eight out of eleven Mass Communication scholars[6] agreed that the transition is driven by the public's increasing demand for communication channels. They stated:

[6] MCS1, MCS 2, MCS4, MCS5, MCS7, MCS8, MCS 9, MCS10

“The main factor for technological transformation would be the public’s increasing need for communication channels to support the development of the country and to increase people’s rights in communication” (MCS8).

“At present, all frequencies for radio and TV in Thailand are in a state monopoly with concessions, considered as a mean to big fortune, given to only few governmental authorities and private firms. With its signal compression capacity, digital technology can increase radio frequency bandwidth, ending the limitation of frequency for radio and TV” (MCS1).

“New TV producers and operators need more channels to present their programs; big entertainment firms need them to promote their numerous singing stars; and the public need them to present their local news or special information for their communities. All of them are confronted with the same problem that the present TV stations have no place for them to present their content” (MCS7).

“There are investors waiting to invest in new TV stations, and organisations in government and the public sector waiting to build their own stations, but they are obstructed by the limitation of frequency in analogue system. These internal needs of frequencies force us to change to a digital system capable of supporting TV station growth” (MCS10).

“Internal communication business is presently at a high growth rate. More investors are interested in putting their capital in the TV industry, as seen in the increase in new local TV stations and cable TV services. These new TV services use digital technology in their program production and broadcasting. It can be considered a real doorway to opportunities for new TV station operators” (MCS2).

“The technological transformation is driven by the internal need for more opportunities for investment in communication business. The analogue system deters new investment, with many disadvantages such as the restrictions of broadcasting time and the domination of certain business groups. Consequently, businessmen hoping to be new TV station operators make demands for digital technology to accommodate their investments" (MCS4).

"Technological Advancement/ Determinism"

(Technological Drive)

Group 1 - TSA: Seven out of fifteen TV station administrators[7] asserted that the advancement, evolution, and greater benefit and advantage of DTV technology were a drive of the transition. They stated:

"The first is the fast advance of modern communication technology. There are always better innovations or systems to replace old ones" (TSA3).

"Digital can serve the viewers' demand the best: best pictures, best sound, and best in every aspect. Digital TV gives precise and clear pictures with multi-colours. Both the pictures and sound from this system are much better than those of the old one" (TSA15).

"Digital technology brings better TV programs to satisfy the viewers' need for the best. Program producers have to compete with each other, each firm, or each group, as well as to do the best for their consumers" (TSA5).

"The advance and development of technologies induce both TV operators and TV viewers to use the innovations. Digital technology can create some attractive qualities. It changes the TV media from one-way communication to two-way and multi-way. It promotes more interaction between program producers and viewers. Viewers want to view better quality TV programs" (TSA11).

"The rise of new media causes TV stations to create new systems to provide content via these new digital media, such as sending news to mobile phones and broadcasting TV in the form of mobile TV, all of which are based on digital technology" (TSA8).

[7] TSA1, TSA3, TSA5, TSA8, TSA10, TSA11, TSA15

"Technically, the old analogue technology uses lots of space and time to transfer data which make them inefficient. On the other hand, data in digital systems are arranged in a binary system which is more efficient, uses less space, squeezes and stores data better, can transfer signals through air or other channels more easily and more accurately" (TSA1).

"One of the best examples is the sending of TV signals through 'THAICOM' Digital Satellite nowadays, which increases the capacity of the channel: one channel in the analogue system can be used for 6-10 signal channels in the digital system. Consequently, digital technology is the solution for the overloaded demands of signal channels for radio, TV, and other telecommunication business increasing in domestic and international communication" (TSA10).

Group 2 - MCS: Four out of eleven Mass Communication scholars[8] considered the advancement of technology is a prime drive of transition. They argued:

"Besides the globalisational drive, I look at the driving force for technology transformation from the technology determinism stand. The technology itself is the core and the most important driving force for the advancement of present world economics and societies. In the TV industry, the technology is the heart of its operation, as it is used in supporting program production and broadcasting. Digital technology enables these processes to run more easily and effectively than the analogue, which is one full of limitations" (MCS11).

"The transition is the nature of the technological cycle and evolution. TV stations use technology as a basis for their program production. Since the technology has been changed from the decades-old analogue to the better digital one, TV stations have to change theirs accordingly for more effective production" (MCS5).

[8] MCS2, MCS5, MCS9, MCS11

"The driving force for technological change comes from the inability to further develop analogue technology. It has been long used since the invention of TV, and cannot satisfy the increasing requirements of the present TV industry anymore. Analogue system has many disadvantages, for example, the limitation of its channel usage and the imprecision of its vision and sound signals. Since digital technology can solve all of these problems, it comes to replace the out-dated analogue" (MCS9).

"Apart from allowing more stations to come up, it also allows more earnings for TV stations from the availability of various new information services and interactive services. The driving force from the technology is more powerful than the internal forces from consumers, the public, and the politics" (MCS2).

"Availability and Affordability of Current DTV Receptions and Overwhelming Flow of Digital Appliances from China"

Group 2 - MCS: Two out of eleven Mass Communication scholars[9] proposed that the availability and affordability of current DTV receptions and the overwhelming flow of digital appliances from China. They maintained:

"Since Thailand has Free Trade Agreement with China, cheap digital TVs and set-top boxes made in China will pour into Thailand from the borders. The high availability of cheap digital TV and its equipment will be another important driving force" (MCS 10).

"The year 2008 will be the year the Asian TV industry pays special attention to digital technology since, in hosting the Olympic Games, the Republic of China has to use the technology for TV signal transmission. The TV manufacturing industry in Asia will grow accordingly, especially in China where its capacity is very high" (MCS6).

"The prices of digital, computer, and information technology equipment are getting lower, making them affordable for everyone. The prices of digital HDTV and LCD right

[9] MCS6, MCS10

now are low enough for middle class consumers to acquire. Naturally, consumers want the better things, which in this case are the better quality picture and sound" (MCS10).

"Technology–craziness of Thais"

Group 1 - TSA: One TV station administrator claimed:

"Another factor is the benefits of communication business and the technology-craziness of Thai people, especially TV mechanics. I think this kind of craziness is the result of Western influences that have come to dominate oriental societies for hundreds of years. Thai people are Western-crazy. They are crazy for every innovation and technology from the West. No matter who has new technology, no matter which country has new innovations, Thailand should have the same" (TSA 12).

PART 2:
"BENEFITS AND DISADVANTAGES OF DTV"

2) What are the apparent benefits of DTV technology?

According to the key informants from both groups, the benefits of DTV technology can be categorised into three aspects.

(i) Benefit for TV audience/ consumers

(ii) Benefit for TV station operator/ broadcaster

(iii) Benefit for public services

Benefit for TV Audience/ Consumers

"Extra Channels and Services - More Freedom of Choice and Variety of Content"

Group 1 - TSA: Nine out of fifteen TV station administrators[10] claimed that DTV provides viewers with more chance and greater freedom to choose what they are really interested in seeing and obtain a greater variety of programs. They asserted:

"The apparent technological advantages are that TV stations have more paths to present their programs, and viewers get a variety of programs on more channels, instead of being forced to watch programs they are reluctant to see as in the present situation" (TSA7).

"TV stations have more paths to present their programs, and viewers get a variety of programs on more channels, instead of being forced to watch the programs" (TSA14).

"We will have channels of sport, movie, health, religion, etc, depending on what viewers want" (TSA1).

"Viewers will have the right to choose from the variety of programs on the increasing channels of free or cable TV. It is certainly better than the limited channels at present" (TSA5).

"They can view what they want with more channels and no limitation of frequencies. They need not view what producers try to force them to" (TSA2).

"The more the choices, the more the benefits they get. As for the society, I think digital technology will help in its development. To have only 6 TV channels is a very limited recognition of people's freedom to choose" (TSA10).

"Viewers will get more varied programs in cheap prices, since all they have to pay to view free digital TV is the cost of signal receivers, without any member fee. TV is a popular medium with open access to everyone, high or low, rich or poor. If the free TV

[10] TSA1, TSA2, TSA4, TSA5, TSA7, TSA8, TSA10, TSA11, TSA14

channels are digital, and if the government gives support by adding educational channels, digital TV can easily help supply Thai society with wisdom” (TSA11).

“If TV broadcasting systems are digital, there will be no more limitation for informative and entertaining programs. The productions can be more specific for certain groups or areas. TV programs in northern or southern provinces can be broadcast in local dialects, which increase viewers’ understandings” (TSA8) .

“Local producers can produce content more relevant to local lifestyles. These are the social and cultural benefits. Unlike the present programs intended for Bangkokians, in the future there will be more programs for the interest of provincial people, such as educational programs which, broadcasting via TV channels, are the easiest accessible media for general public. These are the educational benefits for people” (TSA4).

Group 2 - MCS: Seven out of eleven Mass Communication scholars[11] claimed that DTV technology will provide alternative choices and a wide range of content and program to the viewers. They asserted:

“As for consumers, their benefit is the greater choice of information and entertainment programs from the increasing TV stations” (MCS5).

“The viewers will get the most benefits from the more and varied programs including additional and on-demand services from TV” (MCS8).

“Digital technology will break the limitations and allow people to view whatever programs they would like to. They can choose to fill their heart and souls with certain content they prefer with no more limitations” (MCS4).

“The viewers will have more varieties of program. There will be viewers who choose to watch programs with better pictures, especially in live programs and reality shows” (MCS11).

[11] MCS1, MCS4, MCS5, MCS6, MCS8, MCS9, MCS11

"Digital technology allows more choices for different preferences according to socio-economic status. Those well-educated and well-to-do with good command of English can choose informative programs concerning business, share markets, and foreign affairs more available in new emerging channels than in free TV channels full of soap operas. Those with common needs can also choose a variety of entertainment programs to their full satisfaction" (MCS9).

"Image and Sound Quality Improvement, and Additional Features"

Group 1 - TSA: Five out of fifteen TV station administrators[12] suggested that DTV provides images and sound quality improvement on the TV receptions, as well as additional information, and extra services. They asserted:

"As for consumers, digital technology increases the precision of pictures on TV, unlike analogue technology where pictures can be clear at the stations, but blurred on receivers. Moreover, digital technology provides supplementary systems such as audio systems range 5.1 or 7.1" (TSA3).

"Pictures and sounds on TV sets will be a lot better with a variety of features to use and enjoy" (TSA15).

"Viewers will receive more constant sound and precise pictures no matter where they live, unlike the analogue system in which pictures received are often blurred in some areas" (TSA13).

"In the future, viewers will get more and varied kinds of additional information services via new features and applications" (TSA11).

[12] TSA3, TSA4, TSA11, TSA13, TSA15

"It allows the addition of various applications, such as data, news, weather forecasts, traffic reports, entertainment, information about education and tourism. These are the additional benefits you cannot find in the analogue system" (TSA4).

"A Greater Chance for Participation, Involvement, and Interaction"

Group 1 - TSA: One out of fifteen TV station administrators suggested that DTV provides greater opportunities for the viewer to participate, be involved, and interact with TV stations. They asserted:

"Viewers will be able to conveniently express their opinions or participate in the TV programs' activities. Therefore, TV will be a two-way communication medium. By increasing the broadcasting capacity, digital technology can solve the problem of the shortage of channels for public service or non-profit programs such as educational ones" (TSA6).

Group 2 - MCS: One out of eleven Mass Communication scholars asserted that DTV technology provides viewers a great chance of having instant interaction and participation with the operators.

"As for viewers, they will have the chance to immediately interact with the TV station. Digital technology completes the communication circuit, bringing two-way communication to the Thai TV system, with which program producers/content providers and viewers/content receivers can communicate conveniently and rapidly" (MCS3).

Benefit for TV Station Operator/ Broadcaster

"Increase Ease of TV Station Operation and Enhance Production Quality"

Group 1 - TSA: One out of fifteen TV station administrators[13] maintained that DTV technology can increase the ease of TV station operation and enhance TV program production.

"The digital technology facilitates program production and station management. Its video server system and digital archives are very useful for producers" (TSA13).

Group 2 - MCS: Seven out of eleven Mass Communication scholars[14] maintained that DTV technology will assist TV station operators and TV producers to produce much more attractive program. They asserted:

"For TV program producers and station operators, they will get the most benefits from digital technology in facilitating their production, supporting special effects for artistic attraction, and enabling interactive features for immediate communication between stations and viewers" (MCS4).

"Digital technology also allows new additional services, extra features, and the integration of TV with other telecommunication technologies, which will make TV more attractive" (MCS8).

"Digital video server technology will benefit Thai TV stations in their program production, especially news reporting" (MCS2).

"Digital technology gives more interesting and enticing characteristics to TV, with greater variety of news and entertainment programs" (MCS6).

"Digital facilitates and improves processes of program production and broadcasting. It enables them to produce better quality programs. It lessens the old

[13] TSA13
[14] MCS1, MCS2, MCS4, MCS6, MCS8, MCS10, MCS11

limitations barring producers' creative imagination and increases the efficiency of data management both in their storage and their editing" (MCS11).

"DTV technology provides greater precision in TV signal broadcasting, better quality vision and sound signals, reduction of disturbances, more rapid processes of program production, and more convenience of data storage and searching" (MCS10).

"The digital technology allows more flexibility for communication. It gives convenience in program production and enables any unconventional creative ideas. No matter what producers think, digital technology can make it possible and even better with rapidity" (MCS1).

"Operational Cost Reduction"

Group 1 - TSA: Four out of fifteen TV station administrators[15] maintained that employing DTV technology facilitates operational cost reduction. They asserted:

"The technology lessens the use of frequencies, considered national resources of communication, and sub-divides the channels for more utilization. Therefore, the most apparent benefit for TV stations is the decrease in signal broadcasting costs" (TSA12).

"As for producers, we can save the electricity used in sending picture and audio signals. Therefore, the production costs are less. When we use the digital system, we can easily work together with radios and on-line news services, and make use of our contents in mobile content service and mobile TV, new kinds of media included in the extensive plans of most TV stations" (TSA4).

"Moreover, program producers gain benefits from lower prices of digital equipment compared to analogue, as well as more convenience in production and better quality programs" (TSA9).

[15] TSA4, TSA6, TSA9, TSA12

"Digital technology lessens the station operational costs, which means a better investment. One satellite transponder leased for 100 million baht can be used only for broadcasting 2 channels in the analogue system at most, while the signals can be compressed to be broadcasted for about 14 channels in the digital system. Comparing their broadcasting capacities, 100 million baht for one analogue channel and not more than 10 million baht for one digital channel, you can see the enormous difference they make the profits" (TSA6).

Group 2 - MCS: One out of eleven Mass Communication scholars maintained that DTV technology can reduce the cost for renting a satellite transponder:

"DTV technology reduces broadcasting costs in the long run, especially the rent of satellite transponders where, with the signal compression capacity of digital technology, each transponder can be divided into many channels" (MCS10).

"Better Quality of TV Program Production and TV Signal Transmission"

Group 1 - TSA: Four out of fifteen TV station administrators[16] maintained that employing DTV technology can provide better quality in terms of TV production and broadcasting. They asserted:

"The benefit is the capacity to manage signal channels more conveniently and more efficiently" (TSA5).

"Digital technology will support program producers to produce better quality and more interesting programs, giving direct benefits of more accurate, more varied, and more numerous programs. When the whole production system is digital, the digital video server and digital archives will be very useful resources for news production, as certain pictures can be pulled out promptly to be used with news" (TSA7).

[16] TSA2, TSA5, TSA7, TSA11

“The benefit gained from digital technology is high technical quality program productions. In saying technical quality, I mean better quality of pictures and sounds, additional modes, and better communication with viewers” (TSA11).

“The system changing to digital technology will give immediate benefits for program editing. In every production house or TV station, the first system to be changed to digital is the editing system. The technology brings great advantages in program editing procedures, with greater efficiency and increasing additional modes” (TSA2).

“A Greater Chance for Newcomers into a Monopolised Broadcasting System”

Group 1 - TSA: Two out of fifteen TV station administrators[17] maintained that DTV technology provides a chance for the newcomers who want to operate TV station businesses, as analogue technology and a monopolised broadcasting system are restricted. They asserted:

“As for the production houses, if we have more channels than the present 6 channels of free TV, content providers and production houses will have more ways to present their products. You can see that TV stations’ program layouts have caused a lot of problems every year. There are protests, weeping, wailing, and bribes, with outside producers not allowed in some stations” (TSA8).

“The significant benefit of digital technology is the open opportunities of work. There will be many new TV stations both in central and provincial areas. Independent and minor producers will come about and get their shares. All of these mean there will be a high competition in program production” (TSA1).

[17] TSA1, TSA8

Group 2 - MCS: Two out of eleven Mass Communication scholars[18] believe that DTV technology will open a gateway of chance for new TV station entrepreneurs and private sectors entering into TV industry. They stated:

"The benefit of DTV is the availability of more channels for broadcasting, eliminating the limitation of airtimes. This means that there will be plenty of space and time for everyone interested in TV broadcasting" (MCS5).

"The benefits of digital will go to program producers and new TV station operators from all sectors, private, public, and governmental. Digital technology will allow these business groups into the TV industry. The negotiating power will shift from being with station operators, in the analogue system, to content providers, in the digital system, since the many more stations that come up will need more content accordingly" (MCS9).

"Generate New Channel of Extra Revenue"

Group 1 - TSA: One out of fifteen TV station administrators[19] asserted that employing DTV technology can generate a new channel of revenue and additional income for the TV stations.

"As for TV service providers, digital technology gives opportunities for producing more information, entertainment, and business services. Besides the advertising revenue, TV stations will get more income from various additional applications. The technological advantages are that we get clearer pictures and sounds from the same band width, and we can divide a channel into sub-channels capable of carrying more programs" (TSA14).

Group 2 - MCS: Two out of eleven Mass Communication scholars[20] asserted that DTV technology provides a chance for TV station operators to increase income. They stated:

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[18] MCS5, MCS9
[19] TSA14
[20] MCS3, MCS7

"Digital technology is capable of signal compression in broadcasting. All of these benefits enable TV stations to launch additional services for more income" (MCS3).

"Digital technology facilitates TV information services via various digital media such as internet, on-line services, webcasting, or ipods. TV stations can make more earnings from these new content distribution services and from new extra features and applications" (MCS7).

Benefit for Public Services

"Public Service DTV Channels/ Programs"

Group 1 - TSA: Besides the potential benefits for viewers and operators, two out of fifteen TV station administrators[21] maintained that DTV technology can be beneficial for public service and development of communication campaigns. They stated:

"Digital technology can be of great help in public services. If the government is going to give an operation permit to NBC, it should be done with the condition that the station shall include public service programs in their broadcastings. The current educational TV, such as Kanchanapisek educational TV programs, is intended only for specific groups" (TSA 15).

"Public service programs can be more widespread if broadcast through digital TV, and will enable people in remote areas, the poor, and the disabled to learn. Using the technology to its full benefits, we can solve some problems in our society, especially the educational problems" (TSA1).

[21] TSA1, TSA15

“An Instrument for TV Broadcasting Reform”

Group 2 - MCS: One out of eleven Mass Communication scholars firmly believes that DTV technology will be one of the instruments for reforming and privatising the broadcasting system in Thailand, as the technology eliminates the limitations of the radio spectrum.

“The original analogue technology in Thailand is under a policy of centralization. The government has used the capital and principal cities as centres for news and information distribution to the whole country in a one-way communication mode, blaming the technology’s limited capacity for allowing no chance for the public to voice their opinions. Digital technology will be a tool for the reformation of national TV and radio systems. It will dissolve the limitation of communication channels, giving more chance to the public and local communities to use TV media to express their opinions and to be able to participate in TV programs” (MCS7).

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3) Have you identified any disadvantages/weak points regarding the introduction and use of DTV technology into the Thai TV Broadcasting Industry?

In response to this question, the thesis participants from both groups identified a number of concerns for Thai society regarding implementing and employing DTV technology.

TV station administrators raised some key potential negative issues. These are:

(i) difficulty of regulation and control,

(ii) difficulty of finding supporting funds in a highly competitive market,

(iii) high cost of the national switch to digital, and

(iv) the rapid advancement of digital technology and computer errors.

On the other hand, Mass Communication scholars illustrated a number of potential negative impacts of technology which strongly emphasised its impact on society. These concerns can be categorised into the following topics.

(i) Gateway for negative content/ harm to Thai society and culture and threat to national security

(ii) Technological dependency and economic loss

(iii) Greater chance of content error

(iv) Negative impact on family relationships and other social changes

(iv) Digital divide and technological gap

There were four TV station administrators were very positive to DTV technology as they claimed that they could not find any disadvantages of the technology.

"Difficulty of Regulation and Control"

Group 1 - TSA: Three out of fifteen TV station administrators[22] were highly concerned about whether Thailand would have an effective national regulation and control system for coping with the possible adverse impact of digital technology, since it is uncontrollable media technology. The statements of their concerns regarding the negative aspects of technology are presented below.

"The disadvantage of utilising digital technology is that with many more channels and many more producers, it would be difficult to control content providers whose messages can guide people's ideas. The more choices in information consumption, the more difficult it is to control, especially with Thailand's present situation in which the communication management system cannot keep up with the technology" (TSA5).

"Regulators may not be able to administrate and control digital technology effectively. The obvious disadvantage of digital media is the danger of the freedom to present information in the various ways of digital media. It is possible that the information presented is dangerous to the government's security. Without government security, no

[22] TSA1, TSA5, TSA8

function can proceed. Greater freedom in information presentation is more risky to the government" (TSA1).

"The most challenging issue is the efficiency of media regulators. Usually, Thai regulations are not strict, and the law cannot keep up with wrong doings, all of which can give rise to pirate stations or illegal ones. The important thing is that whatever technology we use, the regulations must come first, or else as good as the digital system can be, it may ruin the country" (TSA8).

"Difficulty of Finding Supporting Funds in a Highly Competitive Market"

Group 1 - TSA: As digital opens a gateway for newcomers, the Thai TV broadcasting business would become highly competitive. Three out of fifteen TV station administrators[23] were greatly worried about finding sufficient funds and being able to survive in the market. Their concerns are demonstrated below.

"The disadvantage of digital for TV broadcasters is the difficulty of finding sponsors as there will be many more competitors. The ensuing problem is where and how to find the income. We have to find new business opportunities since the income from advertising would not be enough" (TSA2).

"Among TV broadcasters, we used to compare analogue free TV to a piece of cake which everyone fights for. Though there are more pieces of cake in digital TV, there also come more business competitors. It may be a great benefit to viewers, but for operators, it means increasing work and competition as well as efforts to increase income" (TSA7).

"The disadvantage of digital technology falls on the former program producers who have stayed for decades in the analogue world, especially those with terrestrial free TV. They would find difficulty in doing business as there would be more competitors. More

[23] TSA2, TSA3, TSA7

market shares and revenues would be snatched away from them. The same old piece of cake has to be divided into even smaller pieces" (TSA3).

"High Expenditure and Investment for Digital Switch Over"

Group 1 - TSA: As the digital switch over requires huge investment, three out of fifteen TV station administrators[24] expressed their concerns as follows.

"The first disadvantage of digital technology is the effect on the national economy, as we have to import the technology. According to the national statistics institute, each of the 12-14 million households in Thailand has 2-3 TV sets. To change the system to digital means that each household has to buy at least one new set top box at a price of around two thousand baht. Certainly, you can see how a lot of money has to be paid for the technology" (TSA4).

"In the broadcast and production sectors their systems would have to be changed, new staff have to be employed, and varied programs have to be produced. This is what the country has to invest economically, and needs to be considered first" (TSA13).

"All systems concerned have to be changed, and that is a high cost. At present, my TV station is going to upgrade its systems to high definition digital, and this equipment is even more expensive at 30 per cent higher than the regular one" (TSA10).

"The Rapid Advancement of Digital Technology and Computer Errors"

Group 1 - TSA: Two out of fifteen TV station administrators[25] asserted that (i) the rapid advancement of digital technology, and (ii) potential computer errors have become obstacles for the operation to some extent. They stated:

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[24] TSA4, TSA10, TSA13
[25] TSA6, TSA9

"The present development of digital technology for TV is not complete yet. Accordingly, we often find technical difficulties, called hanged systems, and we cannot work out where the errors occurred. TV stations need stability in their operations. The frequent failures in digital technology are its weak point, which every station is facing now in their production and broadcasting" (TSA9).

"The disadvantage of digital technology for program producers is the fast changes in technology, which make it difficult to manage" (TSA6).

"Gateway for Negative Content/ Harm to Thai Society and Culture, as well as Threat to National Security"

Group 2 - MCS: Eight out of eleven media scholars[26] expressed their concerns regarding the potentially adverse impact of digital technology as a gateway for negative content, which may be harmful for Thai society and state security. They maintained:

"On the negative side, media using digital technology are difficult to control. The measures set up may not be able to thoroughly screen information and matters dangerous to morality and national security. Digital technology makes it impossible to block any information regarding the public's rights to information access. This is an important point to be considered in national communication management" (MCS5).

"With digital technology, to put up a TV station is not difficult since it requires only a wide room equipped with cameras, webcasting technology, fiber optics and internet. As a result, station operators with avarice or bad intentions can easily use the technology to make consumers victims to their ill purposes. Numbers of illegal TV stations or pirate stations will come up, broadcasting contents with violence, sex, swindling plots, malicious doctrines such as suicide cults or terrorism, and matters dangerous to national security, but regulators are unable to catch them all" (MCS1).

[26] MCS1, MCS2, MCS4, MCS5, MCS6, MCS7, MCS9, MCS11

“The digital technology may be easily used by some irresponsible and avaricious producers to present programs containing sex, violence, and immoral matters where controls of the government and regulator cannot cover effectively” (MCS6).

“The disturbing disadvantage of digital technology is its advancement. DTV is a kind of information technological (IT) media, and its services may include internet protocol TV (IPTV). Since laws and regulations often lag behind the technology, the government cannot control the IT media effectively. So a lot of disturbing images and sound may come out and be presented on pirate DTV shows” (MCS4).

“With plenty of DTV stations emerging into the industry, there may be some that broadcast pornographic scenes, immoral matters, or matters risky to the unity of the nation. In my opinion, the uncontrollable IPTV is dangerous, since everyone, young and old, male and female, can view its programs with no way to block them. Accordingly, more problems in society will follow” (MCS11).

“DTV, similar to the internet, is impossible to thoroughly regulate, or else it may violate the public’s rights to information access. Accordingly, there is high possibility of immoral contents, especially those about pornography which seriously affect consumers and the society altogether. No certainty is assured that the regulator will have appropriate and effective measures in controlling modern communication technology, since the original laws cannot keep up with its advancement, resulting in the producers of such immoral content going unpunished” (MCS9).

“Digital technology brings the danger of immoral content provided with virtual reality from special effect features of the technology. We cannot be completely certain that no one would improperly use the technology to add hidden matters to the programs. In the future, there will be presentations of false vision and sound editing and touching up with digital technology to destroy someone’s reputation or political credit, resulting in the society’s disorder. This effect needs cooperation from every sector in the society in its prevention and solution” (MCS2).

“National security will be challenged, since TV programs in digital system can be produced with equipment that is easy to use and to acquire. If anyone or any group produces and broadcasts programs dangerous to national security in the digital platforms, does the government have the power and capability to bar these programs? In my understanding, the government and the regulator have no ability to do that" (MCS7).

"Technological Dependency and Economic Loss"

Group 2 - MCS: Three out of eleven Mass Communication academics[27] asserted that as the flow of technological transition flooded in to Thailand, they were highly concerned that Thailand, as a technology dependent nation, will lose national funds for importing the DTV technology and products in order to switch to digital. They stated:

"The disadvantages concerning the national economy are the loss of an enormous amount of money, tens of thousand million baht per year, and the endless dependence of Thailand on foreign technologies" (MCS7).

"The change of TV technology means the higher costs for both station operators and consumers. It is a national project where large an amount of money is spent outside the country" (MCS11).

"The country will need a lot of money. The problem is who will be responsible for this amount of money: the consumers, TV operators, or the government? If the responsibility is considered to be on consumers, they would have to pay for all costs in the change of new TV sets and new signal receivers. However, if the responsibility is left on the government, there would be accusations that it spends taxpayers' money inappropriately. These are the costs we have to pay in exchange for new technology" (MCS2).

[27] MCS2, MCS7, MCS11

“A Greater Chance of Content Error”

Group 2 - MCS: Two out of eleven media scholars[28] asserted that as digital technology can facilitate instant content production and distribution, it is possible that the operators may present unchecked information and/ or content. They maintained:

“On the program producers’ side, the high competition in broadcasting and the capacity of digital technology to enable producers to create an instant and live report distributed through a wide range of digital platforms can lead to mistakes in information reports since there will be less checking. The competition to attract more viewers may cause TV stations to exploit every marketing technique for their benefit without any consideration of the social effects. In short, the digital world may contain more situations challenging to the ethics of the journalist” (MCS8).

“The greater convenience and speed of program production provided by digital technology may lead to less carefulness from producers and reporters. The negative effects from mistaken information being broadcast will be spread widely and rapidly, especially information concerning one’s reputation. News reports in the digital system can be produced ready to broadcast in only a few minutes, which allows no time for thoroughly checking the information” (MCS3).

“Negative Impact on Family Relationships and Social Change”

Group 2 - MCS: From the academics’ point of view, two Mass Communication scholars[29] maintained that as digital media influence people to be more individualised, this may affect the relationships between members of Thai families and society. They explained:

“The disadvantage for society is the change in family relationships caused by the increasing channels of DTV. Since the digital technology allows the sub-division of TV channels easily to provide programs according to viewers’ ages or interests, family

[28] MCS3, MCS8
[29] MCS4, MCS6

members tend to separately watch their own preferred programs in their own rooms or from individual mobile TVs rather than the whole family watching TV together as in former times. As a result, the characteristic of Thai society will be changed from gathering together to living individually with less relationship" (MCS6).

"The information broadcast in DTV will not be all-inclusive. As a result, important news and topics needed for public interest or discussions cannot be provided, decreasing public awareness" (MCS4).

"Digital Divide and Technological Gap"

Group 2 - MCS: One out of eleven media scholars asserted that due to implementing nationwide DTV technology, there would be a digital divide and technological gaps occurring in society. This is because of the wide range of generations, groups, and economic classes in society: rich-middle class-poor, technology savvy-laggard, urban-rural, etc.

"The weak point of the digital technology is the digital divide, which is the gap of technology acknowledgement between the well-to-do with high education and the needy with inferior opportunity for information access. With better access to digital technology, those well-to-do, especially city people, can use it to top up their knowledge and wealth, while the needy cannot afford even digital TV and, accordingly, lack the opportunity to use the technology to improve their lives, which results in further widening of the gap. The problem that needs a solution here is how to decrease the gap between those two groups of people" (MCS10).

PART 3: "DTV AND PUBLIC INTEREST"

4) DTV requires a huge investment in transforming the system from analogue to digital, and in installing and purchasing new software and hardware. In your opinion, does this investment serve the national benefit and public interest?

In general, the response of this question can be categorised into three groups, as follows:

(i) Worthwhile investment to serve the nation benefit and public interest.

(ii) Worthwhile investment with conditions.

(iii) Unworthwhile and uncertain investment.

The majority of TV station administrators (12 out of 15 persons) strongly agreed that the cost of the transition is worthy considering the potential benefits. However, the answers from media scholars varied. The responses to the issue are outlined below.

"Worthwhile"

Group 1 - TSA: Twelve out of fifteen TV administrators[30] considered that even though switching the national TV broadcasting system to a fully digital environment may require huge investments, the outcomes make it worthwhile. The following statements show their reasons.

"The investment in the digital TV system is very cheap. It may cost thousands of million baht per station, which is very high in the opinions of some, but compared to the advantages the public gains, I think it is worth the expense. In the system conversion, we can use the old transmission pylons and the old broadcasting devices, gradually adding the digital supplementary equipment to replace the old worn out parts" (TSA10).

[30] TSA2, TSA3, TSA4, TSA5, TSA6, TSA7, TSA8, TSA9, TSA10, TSA11, TSA14, TSA15

“It is worth the investment considering its better quality outputs, its smaller spaces for information storage and arrangement, and its automatic operation system. Most of the TV stations in Thailand have changed to digital. In short, Thai TV stations are ready for the conversion. Concerning the investment, it is a benefit for the country and can be considered very cheap, since the digital system lessens electricity consumption, and brings the advantages of varied programs with lower costs for the public” (TSA2).

“It is absolutely worthwhile. Concerning electricity, the digital broadcasting devices have so few mechanic parts that they consume little electricity and reduce the cost. Concerning management, it is a worthwhile system, since all of it is software controlled, enabling TV stations to reduce staff in certain unnecessary positions” (TSA6).

“It is worthwhile to invest in digital technology because we will have up-to-date equipment, viewers will get more precise pictures and sounds with more channels, producers will have more ways to present their programs. There are also advantages for non-profitable programs such as educational, public, and local community services. People in the provinces will get a lot of benefits from digital TV” (TSA14).

“Though the capital invested in the technology is immense, the benefits gained by the public are relatively huge. Nothing is obtained for free. Since each digital signal channel can be divided into many sub-channels, it enables the contents broadcast to be divided according to their target groups, channels for regular programs, channels intended for specific activities or groups such as morality encouragement, government policy publication, and also public opinion submissions” (TSA11).

“It is worthwhile. The increasing sub-channels of digital TV open opportunities for government authorities, private enterprises, NGOs, public services, and organisations to present their activities concerning various aspects of public welfare. Consumers gain more information via DTV sub-channels while the frequency resources used are of the same quantity as in the analogue system. This is the public benefit gained from DTV” (TSA15).

“It is certainly worth the expense. For example, in the digital system, reporters or station operators can use much smaller cameras with a lot of capabilities for picture and sound recording. All digital equipment is small, quick and convenient for production. The news can be broadcast in close or exact time to the real events. On the contrary, in the analogue system, the equipment is big and heavy. Using it for production and broadcasting is so complicated that it takes at least 3 hours before news can be broadcast. The speed and convenience of DTV production is beneficial and worthwhile for viewers" (TSA3).

"Though transferring the technology from analogue to digital requires huge investment, the main high expenses are on the broadcasting sector where the operators are all ready for it. As for viewers, they can continue using their old TV sets, adding only set-top boxes for digital signal reception. I think the benefits we gain from changing the technology are worth the money invested. Moreover, set-top boxes are not very expensive, and can be made in Thailand these days" (TSA4).

"Regarding the worthiness of changing the system from analogue to digital, which requires a lot of money, I think the main expenses fall on TV stations, and it is for the development of their business anyway. So expenditure is not a big deal. As for viewers, if their TV sets are the old models, they need only to buy set-top boxes for digital signal reception, but if their sets are the modern ones, the signal receivers are already installed in them. However, in case viewers cannot buy set-top boxes or change their TV sets to new ones, they can continue watching programs in the old system for at least 5-10 years" (TSA7).

"As for TV program consumers, I think the changing of the system is worthwhile for them, though the total investment is enormous. There are 14 million households in our country, each with 2 TV sets on average. Considering that we would have to buy 28 million set-top boxes with the average price of 1,000 baht each, it means the total expenses are 28,000 million baht. Nevertheless, there will be more channels, including educational ones. Viewers will get more variety of news and entertainment with better quality pictures and sounds. Public service programs will find their routes via increasing channels. I think all of these make it worthwhile" (TSA 5).

"In DTV investment, for TV stations, the whole amount of money is not put in at once, but gradually by replacing the old expired analogue equipment, just like the fade-in and fade-out effect. As for viewers, the new model TV sets are all digitalised, while the analogue ones would gradually be gone from the market. Therefore, viewers' investment in

DTV is also little by little with new system fade-in and old system fade-out. Comparing the money invested with the benefits gained, I think it is worthwhile” (TSA9).

“I think that the use of digital technology in the Thai TV sector will be a driving force for great revolution in the communication industry. Its benefits for public interests are worthwhile. One good example of DTV utilization is the King’s Klai Kangwon educational TV programs, satellite or actually DTV programs, originated from His Majesty’s idea to solve the problem of the teacher shortage in provincial and remote area schools. It is a very useful technology application: TV sets are distributed to those schools, signal receivers installed, and students can watch the programs, dubbed by teachers, at scheduled times. I certainly believe there will be more of these useful projects once we are completely equipped for the digital system. We have to pay only a few more thousand baht each for digital signal receivers in exchange for the great advantages to people’s education and development” (TSA8).

Group2 - MCS: Three out of eleven media scholars[31] were confident that the huge cost of technological conversion is worthwhile for the public. They maintained:

“Though the cost of investment in digital technology is very high, it is impossible for Thailand to avoid it. Concerning its worthiness, I think it is worthwhile for the business sector. We have to step into the digital world. Many governmental and private corporations want to set up their TV stations to provide their useful news and information to the public. If they are allowed to do so, their good content will add more advantages to DTV. I think that in giving knowledge to people, the investment in DTV gains more than its cost. The investment is not very expensive considering that TV is a cheap medium to bring knowledge into households” (MCS6).

“Thailand may need to change its system to the digital, since the analogue one is at the end of its age. Though we are not going to collapse if we choose to remain with the analogue system for another twenty years, we may lose some worthwhile benefits. In the long run, and on the condition that we use the technology effectively, it will be worthwhile.

[31] MCs4, MCS6, MCS8

DTV is worth the investment in the long run since we can use it as an inexpensive medium to spread wisdom to every class of people. In our society, there are a lot of people lacking access to news and information, especially the minorities at the borders. DTV will serve public interests as it is a kind of public service to improve people's quality of life as well as to give them entertainment. With DTV all people can have access to up-to-date information with more choices than the 6 original channels of free analogue TV" (MCS8).

"Something better is always worth the investment. I believe the investment in DTV will bring advantages to the country and the people even though it costs a lot of money. This technological transformation is based on the appropriate reasons of the growth in the communication industry and the limitations of the analogue system. I think that the new technology can give information and entertaining content useful for the improvement of people's quality of life" (MCS4).

"Worthwhile with Conditions"

Group 1 - TSA: Two out of fifteen TV administrators[32] considered that investments for switching the national TV broadcasting system to a fully digital environment may be worthwhile with some conditions and expected outcomes. The following statements present their claims.

"In changing to DTV, we have to invest enormous money. Considering that our country has to import the technology, it is difficult to say whether it is worthwhile economically. However, considering the public interests, DTV is worthwhile with its increased capacity for providing information. The benefits of digital technology can be very helpful in the country's development. If we choose to remain with the analogue system, contrary to the rest of the world, we will be confronted with the problem of finding equipment and spare parts to replace the expired ones as well as high maintenance costs for the degenerating equipment. Since we have to spend a lot of money either way, we should choose the one with more benefits, the digital system" (TSA1).

[32] TSA1, TSA13

“If we consider the technological conversion, the economic stand is not the only consideration. We have to look at many factors. As we are a developing country, the government or independent organizations should put up a basic communication technology plan to determine the right time to change the technology when the most advantages for the country can be achieved. Being driven by the technology and its manufacturers, we have to change the system unavoidably. We cannot resist the globalising change, like it or not. If our government can implement an effective action and plan for switching to digital, I think that it is worthwhile to go digital” (TSA 13).

Group2 - MCS: Two out of eleven Mass Communication scholars[33] partially agreed that the investment may be worthwhile if considering some aspects or depending on conditions.

“I think the worthiness of the investment depends on 2 factors: the process of technological transformation and the use of the technology. Regarding the process of technological transformation, the government must find a way where consumers pay the least. If the government, NBC, and the industrial sector join in to reduce the price of digital TV sets, the overall cost of investment will decrease relatively. Let’s say the set-top box is 2,000 baht each. For 14,000,000 households in our country, the cost for them is 28,000,000 baht. However, if we can reduce the set-top box price to 1,000 baht each, we can save 14,000,000 baht. Regarding the usage of the technology, we have to effectively use it as a tool to support communication industry investments and to improve people’s quality of life by providing them with information and knowledge. If these two factors are successful, the investment in the technology can serve the public interests and national benefits” (MCS2).

“The answer of whether it serves the national benefits and public interests will depend on three points to be considered. The first one is the source of the assets for the investment whether the government gets them from taxpayers’ money or whether they are the responsibility of TV operators and consumers. The second one is to whom and how NBC and the government will give most support: TV operators or consumers? The third one is what the target of NBC and the government is in the investment and how the technology will be used for the country’s development. I think that if these three points are

[33] MCS2, MCS10

taken into careful analysis with their results seriously observed, the investment in DTV can serve national and public interests" (MCS10).

"Unworthwhile and Uncertain"

Group 1 - TSA: One out of fifteen TV administrators[34] considered that switching the national TV broadcasting system to a fully digital environment is unworthwhile. He argued:

"In changing the technology, the original TV operators have to invest in the upgrading of equipment and the public also has to pay for new digital signal receivers. The idea of technological change originates from modern technicians and engineers who always demand the best and newest technology. Thai people are crazy for Western things and shun those made in Thailand. Whatever is new or in trend in the West, especially things concerning technology, they would dump the old ones and buy the new ones, just to stay equal with other countries" (TSA12).

Group2 - MCS: Four out of eleven media scholars[35] did not believe that the investment in the technological transition is worthwhile for the public. Their reasons are:

"I think DTV is not worth the investment in the present situation. Its benefits for the society are too ideal to be true. There is no guarantee that with DTV, the program quality will be better, more beneficial to morality, more supportive to democracy, and more profitable to the education of the people. Those benefits are all theoretical, but in reality they cannot be completely possible unless we have laws to enforce the use of digital technology with specified dimensions and procedures for the development of the country" (MCS3).

[34] TSA12
[35] MCS3, MCS7, MCS9, MCS11

"In my opinion, the present time is not suitable for Thailand to invest in DTV all at once with its entire budget, but rather little by little according to the readiness of TV operators and the situation of the economy. The technological transformation is not an overnight change, but a gradual one as can be seen anywhere else in the world. We have to admit that among the people in our country, there is a lot of inequality in financial status and in the capability to gain access to technology. Those with A+ financial status are able to buy a new DTV set without hesitation, but the grass roots people and those who live from hand to mouth, which are the majority of the population, cannot afford them. DTV cannot serve public interests unless it can provide for all classes of people the benefits of better and more choices of information and entertainment, advantageous for their everyday lives" (MCS7).

"Actually, I think it is not necessary to change the system now. Though TV signals in analogue system may have some interruptions, there are not so many skyscrapers in our country that they can block the signals and be a good reason for DTV investment. It would be better to use this amount of money for something else more useful. I don't think Thailand can be more developed just because the digital system makes TV pictures more precise. Economically, I don't think there are many benefits from the investment, only that we can boast that our Thai TV programs are more modern, adding more pride to Thai people that our capacity is not to be outdone by any country in the world. It is the very same pride as when we are ranked the third in the world in fibre optic networks" (MCS9).

"In converting to high definition digital TV, TV stations have to use a budget of 1,800,000,000 baht each, and the people have to pay 2.4 billion baht in total. If 6 TV stations have to buy new broadcasting devices, don't you think the expenses for them are very large already? Think about this. There are millions of TV sets in our country; each needs a set-top box to be able to receive digital signals, which raise the total expenses here to tens of thousand million baht. You will see that the money invested at this point is a much greater amount. Why do we have to waste such a huge amount of money unnecessarily buying technology from abroad?" (MCS11).

Group2 - MCS: Two out of eleven media academics[36] were not certain on the issue of whether the huge investment for switching over to digital is worthy. They explained:

"It is difficult to say whether the transformation to digital technology serves public interest. It does, in terms of the opportunities for the public to express their opinions in a democratic way, to have pathways to present their culture, and to have more public information services. On the other hand, considering of the enormous amount of money we have to spend on importing the technology, it is a big loss economically. However, as the technological transformation is caused by the globalizing change, we have to invest in it to be able to keep up with world technological advancement" (MCS1).

"I am not sure whether the investment in DTV will serve the public interests. Using digital technology only for the precision of TV vision and sound is not worthwhile since a lot of viewers are satisfied just to be able to view their favourite soap operas, regardless of the precision. Moreover, if the new technology is adopted just for the interests of certain groups with business or political power, the investment will be wasted. On the other hand, DTV will be worth the investment as a medium to attain the ideal targets of serving the public with a variety of information, supporting democracy by having open pathways for public opinions, and supporting the country's development in local culture and education" (MCS 5).

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[36] MCS1, MCS5

CHAPTER 6

NATIONAL DTV POLICY AND TRENDS

The results presented in this chapter are based on the responses and views of thesis participants in Group 1: TSA - TV Station Administrators, and Group 2: MCS - Mass Communication Scholars to questions in two parts:

Part 4: National DTV Policy and Regulation.

Part 5: Trends of DTV in Thailand

PART 4:
"NATIONAL DTV POLICY AND REGULATION"

5) What are the most important factors for the successful and/or *unsuccessful* launching of DTV technology in TV broadcasting industry?

The responses to this question can be divided into two aspects: (i) prime success factors, and (ii) prime impediments for launching DTV in Thailand. These two key issues are discussed below.

"'*Successful Factors*' for Launching of DTV in Thailand"

Concerning successful factors, all TV station administrators and five Mass Communication scholars emphasised that NBC and the government will be the major players for launching DTV in Thailand. In addition, TV station operators will need to demonstrate the greater benefit of DTV. Sufficient information regarding DTV and certain policies and plans are also important. Affordability of DTV receptions would accelerate launching DTV in Thailand.

'National Broadcasting Regulator and Governments'

Group 1 - TSA: All TV station administrators [1] agreed that the NBC (National Broadcasting Committee) and the government authorities are significant players pushing the broadcasting industry into a digital environment. In addition, they claimed that majority of TV stations in Thailand are ready to convert to digital. They maintained:

"The important factor for the success of launching DTV is the NBC and the government. If the regulators and state authorities can confirm clearly which technology Thailand will adopt, and how long the transferring stage will be, TV stations can be prepared. Right now, equipment and production in TV stations are digitalised already. They could be in full DTV just by flicking the switch. NBC along with the government will the only ones who put the switch on."[2]

Group 2 - MCS: Six out of eleven Mass Communication scholars[3] insisted that NBC (National Broadcasting Committee) is at the heart of launching DTV in Thailand. The brief statements are provided below.

"The factor for the success of launching DTV is the need for a national broadcasting regulator capable of effectively managing, laying policy, planning for the

[1] TSA1, TSA2, TSA3, TSA4, TSA5, TSA6, TSA7, TSA8, TSA9, TSA10, TSA11, TSA12, TSA13, TSA14, TSA15
[2] All TV station administrators
[3] MCS1, MCS3, MCS4, MCS5, MCS8, MCS11

technological transformation, and monitoring broadcast content. Without such a regulator, the Thai TV industry will certainly be in chaos and the ethics and morality of the Thai society will be violated" (MCS11).

"The success of launching DTV depends on the main factor of the government and the NBC having a clear policy and plan for the digital system initiation. To let the technology transform itself naturally according to its evolution may take a long time, but with definite government policies as driving forces, the transformation can be effective and successful within 10 years" (MCS1).

"The successful factor concerns the capability of the NBC in managing national DTV and communication business" (MCS5, MCS8).

"The main factors supporting the launching of DTV in Thailand lie in the NBC and the government. They should have political stability, realise the significance of the reformation of national communication business, and have definite policies and directions for DTV operation. NBC and TV industrial sector must cooperate in providing information to the public. With these supportive factors, Thailand can completely turn digitalised in about 5-10 years" (MCS3).

"The important factor for the success or the failure of launching DTV is the government's management, decisions, and establishment of regulations especially those administered via regulator/NBC. The government and NBC are an important mechanism to set up the foundation, support, and give directions to the development of DTV business. If these governmental roles are clear, the DTV project will rapidly advance. However, with political instability and no regulator body at present, the DTV project in Thailand cannot begin. (MCS4)"

‘Campaign by TV Station Operators’

Group 2 - MCS: Three out of eleven Mass Communication scholars[4] suggested that if the TV stations can effectively demonstrate greater benefits of DTV technology, it will increase the chance for a successful launch of DTV. They asserted:

“The factor is the smart way TV stations/program producers use the technology to improve the quality of the programs, making them more creative, fun, interesting, and advantageous than the analogue TV. Seeing the superiority and the distinguished benefits of DTV, the public will rapidly turn to use DTV” (MCS6).

“The factor to speed up or slow down the DTV launch is the distinguished properties of the new technology. Program producers and station operators should be able to introduce to the public new additional features, special properties of the increasing channels, and unconventional programs provided by digital technology. Viewers must recognize the advantages of DTV in order to accept the new technology” (MCS9).

“The factor is the ability of content providers or TV stations to use digital technology to produce interesting programs to attract viewers. With no distinguished superiority over analogue TV, the launching of DTV will fail. In the technological transformation, content providers need to put more effort into creating more interesting programs” (MCS1).

“Promoting Public Information on DTV”

Group 1 - TSA: One out of fifteen TV station administrators[5] claimed that implementing a public information campaign is necessary for providing sufficient knowledge about DTV for viewers and operators.

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[4] MCS6, MCS8, MCS9
[5] TSA2

"Information about DTV must be provided for viewers, and skill development in the technology provided for TV personnel, preparing both sectors for effective usages of digital technology" (TSA2).

Group 2 - MCS: Two out of eleven Mass Communication scholars[6] claimed that the more knowledge on DTV the viewer has, the greater the chance of accomplishing the launch of DTV. The brief statements are provided below.

"The success of launching DTV relies on the process of giving knowledge and understanding to the public concerning the advantages of DTV. Seeing its superiority, the public will buy more digital signal receivers. To support the DTV launching project, especially at the beginning, the TV industrial sector and the government should join in to provide DTV information to the public as much as possible" (MCS10).

"The public should be able to learn and try this innovation" (MCS2).

'National Broadcasting Policy and Plan for Implementing DTV'

Group 1 - TSA: Besides the importance of the NBC, two out of fifteen TV administrators also suggested that the national policy and plan for DTV will be a significant guideline for all activities of DTV implementation. They maintained:

"For switching off of the analogue system and the beginning of the digital one in Thailand, the most important factor is the national laws and policies. If the laws and policies concerning the system switch are definite and the exact date of digital launching can be fixed, I am certain that most of the program producers can be ready to step into the new system" (TSA4).

"At present, TV program productions in nearly all stations have already turned digital. We have digitalised infrastructures that are well - prepared for communication

[6] MCS2, MCS10

industry. We have the Thai Com digital satellite and have been using it for quite a long time. The transfer to DTV in Thailand should not be difficult if only we have a national definite plan, with responsible units and measures for its initiation. I am certain that we can fade - out from the analogue system within 6-8 years if the national policies and regulators are ready" (TSA10).

'Affordability of DTV Reception for Viewers'

Group 1 - TSA: One out of fifteen TV station administrators[7] claimed that the crucial factor for the successful launching of DTV is the affordability of DTV reception. He maintained:

"The important factor to increase the DTV take-up rate is the lessening of the price of digital signal receiver. I did the research about factors for the adoption of DTV among consumers and found out that the price of signal receivers is the prime factor for them. Consequently, if the government, NBC, and the manufacturers of DTV signal receivers can co-operate their efforts to lessen the price, they can help speed up the DTV launch in Thailand" (TSA3).

"Prime '*Impediments*' for Launching of DTV in Thailand"

There are a number of impediments for the launching of DTV in Thailand mentioned by participants. These obstacles are:

(i) the absence of a national broadcasting regulator and undirected policy and plan for implementing the technology;

(ii) conflicts of interest and political sanction; and

(iii) domestic economic recession and TV consumers' financial readiness.

The brief responses to the issue are outlined below.

[7] TSA3

‘Absence of Broadcasting Regulator, and Undirected Policy and Plan for Implementing DTV’

Group 1 - TSA: All TV station administrators claimed that it is very difficult for implementing DTV in Thailand, as there is no national policy and plan for this issue. They asserted:

“The important obstructions for Thai TV industry in changing its system to digital are the vague national policy, the lack of broadcasting regulators, and the lack of a frequency allotment plan.”[8]

Group 2 - MCS: All Mass Communication scholars claimed that the absence of NBC and national broadcasting policy are a major obstacle for launching DTV in Thailand. They maintained:

“The important main obstruction of this matter is that there has been no national broadcasting regulator or policy for a long time. As long as there is no well-organised body of NBC or DTV policy and plan, Thailand cannot go digital. Even the governments have no clear direction for the technological transformation.”[9]

‘Conflicts of Interest and Political Sanction’

Group 1 - TSA: Five out of fifteen TV station administrators[10] all agreed that conflicts of interest and political sanction are the main obstacles of implementing DTV in Thailand. They asserted:

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[8] All TV station administrators
[9] All Mass Communication scholars
[10] TSA 1, TSA2, TSA4, TSA6, TSA15

“The unsuccessful launch of digital technology in TV broadcasting would come from the disagreement in business interests. The TV broadcasting businessmen with political influences would not welcome DTV. However, the driving force for DTV also comes from another group of moguls in the government” (TSA15).

“Every government in the past used mass media as their propaganda tools, not for something useful or necessary for the public. Consequently, the public communication structure remains with the analogue system for fear that DTV would be difficult for them to control. The state authorities will not be happy with DTV. Digital media is uncontrollable. They are losing power and interests” (TSA 1).

“The hindrance to launching DTV in Thailand in my opinion is the conflict of interest among investors with political power. These people do not welcome DTV as new competitors will come about and their share will be further reduced” (TSA4).

“The important obstruction to launching DTV comes from the former operators, owners, concession holders, stakeholders in original TV broadcasting market. They will certainly resist the launch since they will lose their advantages as free riders with full benefits from sub-leasing the broadcasting times without the trouble of program production. With the sub-division of DTV channels for more signal broadcasting, content providers who used to sub-lease broadcasting times can obtain their own channels independently, lessening the interests of those free riders. This may be the main factor for the possibility of DTV launching” (TSA6).

“The problems of the launch concern NBC, its involvement in complicated interests, its impartiality, and its independence from political power. We cannot be sure that the NBC will not be sanctioned or influenced by politicians or interest group. This will make the launch of DTV abortive. (TSA2)”

‘Economic Recession and TV Consumers’ Financial Readiness’

Group 2 - MCS: Two out of eleven Mass Communication scholars asserted that as the country has been in economic recession; therefore, the consumers’ financial readiness is the key element in the consideration of the launch of DTV in Thailand. They maintained:

“Another factor is the financial readiness of the public. Now our nation has been in the midst of an economic recession period. Though our country is developing, there are a lot of poor people unable to buy new TV sets or set-top boxes to receive digital signals, especially in this economic hard time. So the success of uptake depends if our economy is good at the period of launching DTV, and if the public can afford to buy receivers. (MCS3)”

“The increasing applications or interactive features of DTV may attract the interest of the well-to-do and city people that they are willing to pay for new TV sets. However, for those with low income, TV is only a medium for entertainment, providing movies and dramas to enjoy in their free time. They will not pay for new digital TV sets just for their special features, and the 1,000 – 2,000 baht cost of each set-top box means months of living expenses for their families. Consequently, at the beginning of DTV business, it will be difficult to persuade these low-income people to buy any digital signal receiver, and it may be an important obstruction for the technological acceptance of the whole country. (MCS1)”

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6) In your view, what are the main elements that the National Broadcasting Regulatory Authorities should focus on and review in order to establish a successful national DTV broadcasting policy and plan?

The thesis respondents advised a number of ideas for the NBC and state authorities in establishing DTV policy and plan, and the suggestions are listed in the table below.

Table 12: Participants' Recommendations on DTV Policy

Suggestions	Number of Participants
- "Provide Interval for a Parallel Simulcast: Analogue and Digital"	10
- "Reallocate the DTV Spectrum Fairly"	8
- "Emphasise DTV Information and Public Relations Campaign for Generating Public Concern, Comprehension, and Acknowledgement"	8
- "Support Affordability of Set-top Box/ DTV Reception"	6
- "Arrange Sufficient DTV Spectrum for Social Development, Public and Community Service"	5
-"Develop Governmental Facilitation for Nationwide DTV Infrastructure, Government Subsidy or Co-Investment, and Sufficient Support for Broadcasters"	4
- "Support Domestic TV Manufacturers"	4
- "Collaborate with All TV Broadcasting Industry Stakeholders on DTV Planning and Implementing Activities"	4
- "Support Research on DTV Policy, Plan, and Action Campaign"	3
- "Encourage Establishment of DTV Transmission Pools"	3
- "Protect Citizen's Rights"	3
- "Mandate or Specify Quality Assurance Standard for Set-top Box and DTV Reception"	2
- "Establish an Independent Agent/ Working Committee for Campaigning and Promoting the DTV Project"	2
- "Issue a Master Plan and Mandate a Time Frame for Analogue Switch off and Digital Switch Over"	2
- "Choose Adoption of Right and Proper DTV System and Technology"	1
- "Consider the Cost of Transition Economically"	1
- "Manage Region by Region Digital Switch Over Plan"	1

The statements regarding the recommendations are briefly outlined below.

"Provide Interval for a Parallel Simulcast: Analogue and Digital"

Group 1 - TSA: Eight out of fifteen TV station administrators[11] recommended that NBC should provide a sufficient period for broadcasting in a parallel system, analogue and digital, in order to give broadcasters and nationwide TV viewers time for preparation and technical adjustment for analogue switch off and digital switch over. They asserted:

"In transferring technology with the analogue system switching off, NBC should do it gradually and should leave an interval, about 10 years, when the two systems can be broadcast simultaneously so all the country has time to change or adapt their TV sets. In the 10 year interval NBC should implement a plan for systematically re-arranging the frequencies" (TSA3).

"During technology transfer in the public sector, NBC should give an interval during which TV stations broadcast in both analogue and digital systems simultaneously for the whole country to acquire and familiarize with the new TV system. Before completely switching off the analogue one, the system transfer should be made gradually in stages where the first stage, about 3-5 years, is digital system experimental broadcasting with evaluation through its technical and marketing feedback" (TSA1).

"The transfer of technology should be gradual. I think all station operators are prepared to turn to the digital system. To mandate the analogue switch off time is not difficult, but there should be some interval, I think about 10 years, during which analogue TV is still broadcast simultaneously with DTV" (TSA6).

"NBC should set an interval of 10 years between turning on the digital system and completely switching off analogue system. In addition, they should allow broadcasters to conduct a parallel broadcasting system. So the operators and audience will have sufficient time to experiment and prepare for adopting new technology" (TSA4).

[11] TSA 1, TSA3, TSA4, TSA6, TSA8, TSA10, TSA11, TSA12,

“Television has been part of family culture for decades, and the immediate change may have critical effects on people’s ways of life unless they have some time to prepare for it. People in throughout the nation have varied capacities for receiving the technology, from city dwellers who are innovation lovers and have purchasing capacity, to provincial dwellers who have no readiness either technically or financially. Simulcasting analogue and digital at least for 5 years may be helpful for many TV householders preparing for the transition” (TSA12).

“NBC should allow the broadcasting of two systems simultaneously for a period of time, since people have different degrees of technological readiness” (TSA10).

Group 2 - MCS: Two out of eleven media scholars[12] supported the proposal of interval parallel transmission. They stated:

“The technological transformation should be gradual in a span of 5-10 years where TV stations are obliged to broadcast in both analogue and digital systems simultaneously” (MCS11).

“In the technological transformation, there should be a technological migration interval of at least 5-10 years where both the analogue and the digital systems broadcast simultaneously, so that TV stations and the public can be prepared” (MCS8).

“Reallocate the DTV Spectrum Fairly”

Group 1 - TSA: Four out of fifteen TV station administrators[13] considered the fairness of new broadcasting spectrum allocation to be very significant, and so NBC should reorganise the spectrum with justice and equality. They asserted:

“NBC should establish a new frequency allocation plan with impartiality and national benefits, cancelling the first come first serve system of the present” (TSA3).

[12] MCS8, MCS11
[13] TSA3, TSA7, TSA8, TSA12

“NBC should pay much attention to how to allocate DTV frequencies equitably for both old and new producers, how to avoid conflicts of interest, and how to eliminate the corruption and profit interchange since the digital transfer project is related to a huge sum of money” (TSA12).

“The NBC should take over all frequencies, not to monopolize them, but to be able to lay a well-organised and fair basic allocation system for frequencies before gradually letting them be privatised again” (TSA7).

“The NBC should maintain a fair share of DTV frequencies for every producer. It should indicate the exact time of the DTV launch, how many channels there will be, and how they are allocated to old and new producers. All privileges in concession granting should be dismissed” (TSA8).

Group 2 - MCS: Four out of eleven Mass Communication scholars[14] highly emphasised the importance of fairness of reallocation. They suggested that NBC should focus on equality and justice as fundamental principles of reallocation as it is very important for national broadcasting reform. They asserted:

“NBC’s policy in frequency allocation and concession granting should be fair for both governmental and private enterprises” (MCS4).

“NBC should earnestly reform the national communication business and re-allocate the signal frequencies equally, according to the constitutional laws, to 3 sectors: the government; the private; and the public; considering first the national benefits, and devoid of any influence from business or political power. The equal shares of signal frequency will promote and spread digital technology widely” (MCS7).

“The NBC needs clear and definite regulations in granting licenses to operate DTV stations with a fair share of technology utilization, devoid of any bias towards any group,

[14] MCS4, MCS7, MCS9, MCS10

uninfluenced by any political or business power as in the past. Provided that the NBC can create equality in DTV operation, the business should prosper in Thailand" (MCS1, MCS10).

"Concerning the re-allocation of radio and TV frequencies, the NBC should act justly, and be clean of political, governmental, and business powers" (MCS9).

"Emphasise DTV Information and Public Relations Campaign for Generating Public Concern, Comprehension, and Acknowledgement"

Group 1 - TSA: Four out of fifteen TV station administrators[15] advised that the public's comprehension of DTV is the key for establishing DTV in Thailand. NBC, government, and all stake holders should collaborate in conducting a public information campaign for DTV. They asserted:

"What NBC and the government should make clear is how well-prepared Thai viewers are for DTV. We have to admit that the lower class, the aged, and the provincial people do not understand what DTV is or what good it does and why they have to pay more for it. Consequently, DTV campaigns should begin in big cities prior to expanding them to the regions. The campaigns should have careful procedures, especially in the first 3 years when the public relations work is most important" (TSA 13).

"NBC and the authorities concerned should demonstrate the benefits of DTV, showing the public that it is worth the expense" (TSA 15).

"The campaigns of DTV should focus on the middle class and city dwellers as these people are ready with financial and technological capacities. TV consumers should be shown clearly how much better and more useful DTV programs are. I think that if we can use satellite or cable TV as a pilot project for DTV, the possibility of turning Thailand into a digital broadcasting country would not be very far off, since our satellite and ICT networks are in the process of turning to free telecommunication. If DTV campaigns are

[15] TSA9, TSA13, TSA14, TSA15

successful, though they certainly take a long time, the public response would be nation-wide as everyone would prefer to watch a better TV system" (TSA9).

"NBC should focus on providing knowledge concerning the benefits and disadvantages of digital technology to the public for their decisions of receiving or denying the technology. As I have worked in this field for a long time, I think that there are only few people who have a good understanding and acquaintance with DTV. Consequently, the lack of information and understanding is the important obstruction for launching DTV in Thailand" (TSA14).

Group 2 - MCS: Four out of eleven Mass Communication scholars[16] also agreed that NBC, government, broadcasters, and TV manufacturers should support providing the public with sufficient information and knowledge about DTV and the technological transition as information will be a key for launching DTV successfully. They asserted:

"The point that NBC and the government should consider in the launching of the DTV project is public participation. The public should be well-informed of the advantages and disadvantages of the new technology" (MCS10).

"The NBC, the government, and the TV industrial sector should cooperate to give information to the public, making digital technology look easy and useful" (MCS2).

"NBC and the TV industrial sector should cooperate in publicising the prominent advantages of DTV, e.g. its multi-channel division capacity with more pathways for public communication and its new features and applications, distinguishing DTV from the old analogue one. The advantages of more realistic and precise vision and sound alone will not be attractive enough for viewers to make them buy new DTV sets" (MCS9).

"NBC should cooperate with the TV industrial sector in giving information to the whole country about the advantages of digital technology and the suitable digital receivers

[16] MCS2, MCS4, MCS9, MCS10

for different uses of each family. Sufficient information can decrease the technological gap and increase the rate of technology acceptance among the public" (MCS4).

"Support Affordability of Set-top Box/ DTV Reception"

Group 1 - TSA: Three out of fifteen TV station administrators[17] suggested that affordability of DTV set-top box and DTV reception will assist the take up rate of DTV. NBC and government should negotiate with TV manufacturers to launch economical devices for the masses. In addition, they should design some marketing promotions for increasing the number of DTV distribution. They asserted:

"In spreading the technology, it may need some time, but NBC and TV manufacturers can speed it up by using market promotion techniques such as set-top boxes given out at bargain prices, as rewards, as barters, or as premiums, so that the public shall be well supplied with basic equipment for receiving DTV" (TSA9).

"The government, NBC, and TV manufacturers should set up funds or projects supporting the poor in changing the TV system, for example, exchanging old TV sets for new digital ones at cheap prices" (TSA2).

"NBC and the government should establish procedures for supporting the internal manufacturers of digital equipment to be able to produce and distribute low price digital signal receivers for the low-income people, i.e. decrease their taxes, assist in goods promotion, designate their goods as qualified, and support the discount of the new digital TV sets or the exchange of the old ones. (TSA7)"

Group 2 - MCS: Three out of eleven scholars[18] recommended that NBC and the government should influence TV manufacturers to distribute inexpensive DTV devices to

[17] TSA2, TSA7, TSA9
[18] MCs1, MCS6, MCS7

the market. In addition, NBC and the government should provide assistance for the poor, eliminating a national digital divide.

"The government and private sector should cooperate in providing inexpensive and easy-to-use digital signal receivers of standard quality for the public" (MCS1).

"NBC and the private sector should join in to help TV consumers with low income and less opportunity to get access to technology. DTV sets or set-top boxes should be sold at cheap prices or, in some cases, given free of charge to them" (MCS6).

"NBC and the government should support the internal manufacturers to produce inexpensive DTV sets so that low income people can gain access to the technology and decrease the problem of digital divide" (MCS7).

"Arrange Sufficient DTV Spectrum for Social Development, Public and Community Service"

Group 1 - TSA: One out of fifteen TV station administrators[19] suggested that NBC should support public and community services by giving them a chance to produce useful DTV programs. He asserted:

"NBC should support producers whose productions are aimed at public interests, provide open access for communities, and emphasise on the importance of a balance of educational and entertaining programs, including increasing their variation. (TSA5)"

Group 2 - MCS: Four out of eleven Mass Communication scholars[20] maintained that NBC should consider providing chances for public services, community services, civil organisations, local sectors to use DTV as an instrument for developing the country. They asserted:

[19] TSA5
[20] MCS1, MCS2, MCS5, MCS11

“The public service sector and community should have opportunities to participate in producing programs, managing, and operating local/community DTV stations. The participation of the public will help speed up the acceptance of digital technology as people will feel they know and own TV stations and the technology” (MCS11).

“The NBC should always bring into consideration the fact that the target of this technological transformation is the advantages for national development. As a result, the NBC should allocate the use of the technology equally, according to the constitutional laws, to the 3 sectors; the government, the private, and the public. Its policies in the technological allocation should be (1) to support the use of digital technology in the improvement of government TV stations for a public information service with a two-way communication system, (2) to create equality in the licensing for DTV business operators as well as to urge the private sector to produce good quality information and entertainment programs, (3) to promote opportunities where the public, especially the communities, can use the technology to present programs showing off their local wisdom, regional culture, and matters useful to the improvement of their quality of life and their careers” (MCS2).

“NBC should support the establishment of local and community TV stations as they can speed up the awareness of local people, leading to their application for DTV membership and their increased interest in information consumption” (MCS5).

“As there are a lot of commercial TV stations already, the NBC and the government should support the establishment of more DTV stations specifically for public and community services. (MCS1)”

"Develop Governmental Facilitation for Nationwide DTV Infrastructure, Government Subsidy or Co-Investment, and Sufficient Support for Broadcasters"

Group 1 - TSA: Three out of fifteen TV station administrators[21] asserted that if the government and NBC facilitate the nationwide DTV infrastructure and/or provide sufficient support for the operators, these will increase the possibility of success in establishing DTV in Thailand. They asserted:

"The government should invest in digital infrastructures, especially the broadcasting network which can be used profitably for a signal sending service with content from licensed stations. The broadcasting network, if invested in by the government, can reduce private overlapping investments, or else the government can give the network concession to private firms as been done successfully in many countries" (TSA2).

"NBC and government should invest in all digital broadcasting networks, making it national, and concede it to TV operators as been done with various public utilities. Actually, channels 11 and TITV, which are government channels, already have a joint network and transmission station, which can turn digitalised just with the installation of digital broadcasting devices, and then be leased to private content providers" (TSA7).

"The government investment in the network, which can speed up the launch of the DTV project, is worthwhile, effective, and helpful in eliminating the unnecessary individual import of digital equipments" (TSA5).

Group 2 - MCS: One out of eleven Mass Communication scholars[22] also agreed with the above suggestion as investing in a national DTV system will be effectively manageable and protect repetition of economic loss.

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[21] TSA2, TSA5, TSA7
[22] MCS1

"NBC, the government, and TV business operators should cooperate in the investment in infrastructures for DTV broadcasting. The load of investment should not all fall on any one sector alone. Should it fall on the government, a great amount of tax money would be needed, while if it falls on the private sector it will mean the loss of enormous amount of money spent on importing digital equipment for every TV station. The suggestion here is that joint investments and the cooperative usage of DTV broadcasting infrastructures would be able to lessen the overlapping investments and expenses" (MCS1).

"Support Domestic TV Manufacturers"

Group 1 - TSA: Four out of fifteen TV station administrators[23] suggested an idea that the NBC and government should support domestic TV manufacturers in order to decrease non-necessary product imports from aboard. They asserted:

"From my research, the total money the public would have to spend on changing signal receivers is 2.4 billion baht, which is over-budgeted and wasteful. The only way to enable the transfer to DTV in public sector is through government support in the local manufacturing of DTV signal receivers and their parts to reduce their prices to affordable ones, since the television manufacturing industry in Thailand is basically large enough and ready to expand their capacities" (TSA11).

"NBC should realize that since the technology must be imported, we have to be aware of our economic situation, or else we can be financially off-balanced. Governmental authorities should support the manufacturing of domestically produced set-top boxes in order not to depend permanently on technology from abroad" (TSA3).

"To increase the acceptance of DTV, NBC should ask the TV manufacturers for cooperation in making and distributing good quality TVs at lower prices, and also assisting in DTV promotion campaigns" (TSA14).

[23] TSA3, TSA8, TSA11, TSA14

"NBC and the government should emphasise the importance of developing and supporting the digital equipment industry in the country" (TSA8).

"Collaborate with All TV Broadcasting Industry Stakeholders on DTV Planning and Implementing Activities"

Group 1 - TSA: Four out of fifteen TV station administrators[24] suggested that all DTV stakeholders should get a chance from NBC and government to help design national DTV policy and plans. They asserted:

"In the planning for switching off the analogue system and launching the digital one, I think there should be brainstorming from every concerned sector: the government, TV business operators, scholars, and the public. NBC should not stick to the old Thai style of permitting 2-3 technocrats or any particular group to design and plan the transfer procedures. As the plan concerns the technological use of public communication, the country's development, and an enormous amount of interests, they should be opened for public hearing" (TSA15).

"In changing TV technology, NBC and the government should not use forceful methods, but ones with supportive projects, market mechanisms, and promotion campaigns to convince TV operators and viewers to voluntarily accept the new technology" (TSA2).

"NBC should be a coordinator between stake holders of TV enterprises" (TSA12).

"All stake holders should come to participate in the project launch and the promotion campaigns aimed to widely spread news of DTV benefits by word of mouth, which is the best way to gain interest and acceptance from people" (TSA7).

[24] TSA2, TSA7, TSA12, TSA15

“Support Research on DTV Policy, Plan, and Action Campaign”

Group 1 - TSA: One out of fifteen TV station administrators recommended that NBC should support a comparative study on international digital switch over plans, which would be beneficial for planning the DTV implementation strategy.

“NBC should take a good look at technology transfer or switch-over experiences of other countries and apply the information learned to our future analogue switch off plan” (TSA 5).

Group 2 - MCS: Two out of eleven Mass Communication scholars[25] stressed that NBC should support and conduct research about DTV implementation. Information of international experiences in DTV policy and planning is needed for use as case studies. They asserted:

“NBC should realise the significance of, and give support to, studies and research projects on DTV in cooperation with educational institutes, scholars in related fields, and the TV industrial sector. The research should cover every aspect, including the present situation of Thai TV industry: the advantages and disadvantages of DTV; the budget needed for the technological transformation of the country, each TV station, and consumers; technological effects in various aspects; and the study of the plans and experiences of other countries in switching off the analogue system. Results of the research will be the basic data for laying a national DTV system and policies” (MCS5).

“NBC should do research to collect technical data for an effective DTV launch. It should create scenarios of possible situations and solutions, and also study other countries’ plans for technological conversion” (MCS3).

[25] MCS3, MCS5

“Encourage Establishment of DTV Transmission Pools”

Group 1 - TSA: Three out of fifteen TV station administrators[26] put forward the notion of establishing Thailand DTV pools in order to economise the national investment on DTV transmission. They asserted:

“Concerning TV station operators in Thailand, there are two main groups of them: the army group with channels 5 and 7, and the PRD and MCOT group with channels 3, 9, 11, and TITV. It is the NBC’s job to combine the two groups into one broadcasting network so as to reduce the overlapping investments and save national budgets. I think NBC should establish policies supporting effective investment and management of national technology. Stations need not compete in building signal towers and networks, but should compete in their content which is more beneficial for the public and for both the station operators and the country in not wasting so much money unnecessarily” (TSA 1).

“A joint operation DTV pool, in which TV stations share the use of signal broadcasting devices, or use the same main broadcasting station in the region, will save broadcasters huge costs on individually importing broadcasting devices. The benefits for consumers are clear and precise signal reception in every channel broadcast by the DTV pool, with neither difficulty in choosing set-top boxes nor in signal tuning” (TSA 13).

“There is a high possibility of bringing about a DTV pool due to its advantages. At present, four main TV stations - channel 3, 9, 11, and TITV - already use the same broadcasting site, the Baiyok Tower, for Bangkok and its perimeters. Considering the conservation of natural resources and energy, I think that NBC and TV station operators should join in to implement the DTV pool project. Joint broadcasting in rural provinces can help conserve a lot of forest and mountainous areas which would otherwise be ruined in the construction of stations and signal towers. Besides, TV stations need not compete in obtaining expensive technology, but put their efforts more usefully into the content of the productions” (TSA9).

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[26] TSA1, TSA9, TSA13

“Protect Citizens’ Rights”

Group 1 - TSA: One out of fifteen TV station administrators advocated measures for protecting against negative content that may come with DTV technology, especially issues that may violate citizens’ rights. The advice is provided below.

“DTV program monitoring is another important matter. NBC should keep strict regulations and exercise punishment on producers or stations who commit offences such as those concerning morality, national security, or terms of agreement, with penalties according to the degree of offence, for example temporary suspension of their licenses, cancelling the renewal of their contracts. Besides, the public should be encouraged to monitor programs quality, and should have the right to file court cases against TV stations/producers producing programs violating their rights or having a bad impact on them” (TSA15).

Group 2 - MCS: In accordance with the concern mentioned above, two out of eleven Mass Communication scholars also suggest that NBC should have effective regulation to protect the public’s rights. They asserted:

“NBC should have strict measures to bar immoral information. Its duty is to be a watchdog for the public, protecting consumers’ rights to information, and promoting programs with morality and creative ideas for the benefits of the society” (MCS8).

“NBC should establish discipline to protect the rights of consumers and to strictly monitor for content dangerous to morality” (MCS2).

“Mandate or Specify Quality Assurance Standard for Set-top Box and DTV Reception”

Group 1 - TSA: Two out of fifteen TV station administrators[27] suggested that NBC should mandate technical standards for DTV reception and set-top boxes. They asserted:

“NBC should lay standards for set-top box quality in order that viewers can choose various programs presented by different stations. The government should determine whether to use separate set-top box or built-in receiver for DTV, or else the different systems used will cause difficulties for users which can obstruct the DTV promotion campaign and lead to unnecessary public expense” (TSA5).

“NBC should lay technological standards for digital TV set and set-top boxes for manufacturers in order that every station can use the same standards in broadcasting” (TSA9).

“Establish an Independent Agent/ Working Committee for Campaigning and Promoting the DTV Project”

Group 1 - TSA: Two out of fifteen TV station administrators[28] advised that NBC and all stakeholders should establish an independent agent to run a national campaign for DTV. They asserted:

“NBC should put up a special committee to work on the DTV promotion campaign and be a coordinator between the government, regulators, scholars, TV station operators, program producers, DTV equipment manufacturers and distributors, and consumers or the public. The main duty of this committee is to provide and promote knowledge and information about DTV in Thailand” (TSA4).

[27] TSA5, TSA9
[28] TSA1, TSA4

"A special unit of administration with fast and simple actions should be put up to drive the DTV launch" (TSA1).

"Issue a Master Plan and Mandate a Time Frame for Analogue Switch off and Digital Switch Over"

Group 1 - TSA: One out of fifteen TV station administrators suggested that NBC should issue a master plan and timeline for switching off the analogue and starting the digital system.

"In switching to digital system, we need a principal plan with steps and schedules of procedures towards clear targets to guide TV stations and production houses. NBC should indicate the exact year of switching off the analogue system. As a developing country, Thailand has so many poor people that we cannot switch the old system off immediately, but have to broadcast old and new ones simultaneously for some time" (TSA3).

Group 2-MCS: One out of eleven Mass Communication scholars[29] asserted that NBC should decide a timeframe for transition.

"NBC should decide the definite time frame for the transition of the two technologies and the switching off of the analogue system, leaving an interval for the public to be prepared" (MCS4).

"Choose Adoption of Right and Proper DTV System and Technology"

Group 1 - TSA: One out of fifteen TV station administrators[30] was concerned about the DTV system selection. The suggestion to the NBC is stated below.

[29] MCS4
[30] TSA8

"In choosing to adopt DVB, ATSC, ISDB, or any new system for signal broadcasting, NBC should consider whether our original technology can be applied with it, which direction our country's technology will turn to, what system is generally used in member countries of ABU, our neighbour countries, and our trade related countries. Studies on the matter should be made by committees of experts, and the results should be brought into NBC's decision since the chosen system will be a long term obligation of TV industry" (TSA8).

"Consider the Cost of Transition Economically"

Group 1 - TSA: One out of fifteen TV station administrators[31] recommended that the NBC consider the economic impact before making any decision regarding national DTV. The proposed idea is stated below.

"NBC should re-consider the DTV project economically, and think over who will gain and who will lose in the project. In changing to DTV, I think Thailand, as a buyer of the technology, will be a loser, while some European countries, as manufacturers of technology, will be winners. The loss and the gain are of immense because DTV, with the complete system imported, costs us ten thousands billion baht. How many tons of rice would we have to sell so that we can buy DTV cameras, broadcasting devices, editing equipment, and millions of receivers? It is an immense destruction to our economy, but a big fortune for European manufacturers, and we will also be under their control technologically and economically. Therefore, the DTV project can be a loss to the whole country as well as to individuals. However, if we insist upon converting to DTV, we have to find some way to reduce the out-flowed money spent on importing digital equipment as well as try to make the best use of the expensive technology we paid for in developing our country" (TSA5).

[31] TSA5

“Manage Region by Region Digital Switch Over Plan”

Group 2 - MCS: One out of eleven Mass Communication scholars[32] strategically suggested that the NBC should implement a region by region switch over plan in Thailand based on the readiness of each demographic area.

“The switching off of the analogue system should be by zones or by regions according to the readiness of the TV stations and the people in the areas, beginning from the first one to be ready to the last one at the deadline of the switching off” (MCS6).

PART 5: “DTV TRENDS IN THAILAND”

7) Can you predict future trends of DTV in Thailand?

The predictions from the participants from both groups are various. These can be categorised into four trends.

(i) DTV Station Administration and Business Competition

(ii) Technological Development

(iii) DTV Technology and Television Production and Broadcasting

(iv) DTV Technology and Consumption and Marketing

“DTV Station Administration and Business Competition”

Group 1 - TSA: In short, TV station administrators predicted that (i) TV business in Thailand will be highly competitive as digital technology facilitates emerging new TV stations in a wide range of digital media platforms; and (ii) TV will be integrated with other digital media and will become multimedia, providing TV features on various platforms, i.e. TV on mobile, IPTV, digital satellite TV. Therefore, TV business

[32] MCS6

administrators need to look for alternative plans to search for alternative content sources and business revenue. Statements provided below are their forecasts.

"Thai TV station administration in digital system will be more difficult. TV stations will need network or alliances in providing more content and programs for the increasing channels. The competition between stations and with other kinds of media will be very high in the aspects of prompt delivery and varied quality of content and the availability of network or joint services with other IT media and telecommunication. More services of mobile TV and content on mobile phones will be applied in the future" (TSA1).

"As digital technology allows for sub-division of frequencies for more signal channels, there will be a free market for investment in TV stations. As a result, a lot more stations will come up, but some may not be able to endure the high competition and have to dissolve, and they will always be replaced by new ones coming up nearly every month. The advantages of this situation are that more jobs are available for the people, but the disadvantages fall to terrestrial free TV stations where their sponsors will decrease and, accordingly, they will try to obstruct the emergence of these new stations" (TSA15).

"In the near future, there will be a great number of DTV via satellite, both legal and illegal. However, concerning IPTV in Thailand, I think it cannot be successful for at least 5 years since our country does not have the supporting infrastructure for it. The reason for the emergence of a great number of satellite DTV providers in Thailand is that their operations do not cost much. Each channel leased from Thai Com satellite costs around 700,000 baht which is 23, 000 baht per day, or 1,914 baht for the 12 hours when there is a high possibility of viewers. As for production costs, they will be about 50,000 baht per one hour program, adding another 10,000 baht per hour for operation. However, these costs can be covered by the income from sponsors, and the total money needed to invest is not very high" (TSA7).

Group 2 - MCS: Mass Communication scholars agreed with TV station operators that the TV business will run in a difficult situation as there will be a lot of business competitors. They predicted that digital technology will open the door of chance for newcomers into the media business. They suggested that a successful DTV station will be a station that can provide a rapid and live report or program. Reality shows will become very popular for new generation viewers. DTV technology will shift the traditional TV characteristic of being broadcasting media to “Niche TV Station” or “Narrowcasting” in terms of being much more specific on target audiences and providing exclusive and niche content. Technology will provide a chance for TV operators to obtain direct feedback or data from TV viewers. In order to get acceptance from the viewers, a TV station needs to demonstrate the quality, creativity, trustworthiness, and responsibility of their distributed programs. TV stations need to seek alternative revenue channels, such as subscription fees or extra services. The statements provided below are their forecasts.

“DTV station administrators need to work harder to provide content with freshness, rapidity, unconventionality, and satisfaction, all of which is the key to successful TV business operation where there are a great number of competitors. Live shows and reality shows will be very popular, while programs where viewers can participate in voting, playing games, or sending in their opinions will be the mainstream presentation. TV commercials will be more creative to attract viewers” (MCS3).

“After the Thai TV industry has turned digitalised, investments in communication business will be encouraged for establishment of new TV stations or to increase capital for the development of the original stations. The new emerging TV stations will be concept stations and niche stations with specific philosophies in their broadcasting and specific target groups such as teenagers’ station, sport station, housewives’ station, educational station” (MCS6).

“DTV technology will change the philosophy and the image of TV, from broadcasting to narrowcasting or niche media presenting programs specified for certain interest groups or certain areas. However, the channels 3, 5, 7, 9, 11, the traditional stations, will remain in operation, but with some adaptations and more specific programs for their target viewers” (MCS11).

“In the future, TV stations will be categorized with many sub-channels in each category. There will be more stations with programs specified for certain groups, according to the interests of consumers or their careers, not with general programs as in the present” (MCS8).

"The administration of digital TV stations is different from that of the analogue ones, especially concerning the consumers' feedback management. The administrators should understand the nature of DTV, where consumers' opinions need serious consideration. We may not need research companies to do surveys for TV program ratings anymore since digital technology will allow stations to collect data direct from viewers" (MCS10).

"After the utilisation of digital technology, there will be high competition in the Thai TV industry. Digital technology will be used in program production and to provide interactive features. TV stations in the digital world will be segmented ones and will identify themselves clearly as to the kinds of content they will broadcast and for what target groups" (MCS2).

"In the future, there will be a lot more TV stations with higher competition in the business. Each station needs to apply new strategies to attract consumers who will be more selective. Stations with more interesting or unconventional content will get the most popularity" (MCS7).

"The future competition in communication business will certainly be intense. Mainstream TV stations will remain in operation, while more stations for specific content will be coming up. The advancement and viewers' acceptance of DTV stations depend on the quality and creativity of their programs and the good responsibility in their broadcasting" (MCS4).

"Any station trying to attract viewers with sensational content distorted using technology can rapidly lose trust and popularity just overnight since there are many more TV stations for viewers to choose from in the digital world" (MCS1).

"The main revenue for TV stations will come from commercials, as in the present, but there will be higher competition as well as more competitors. Consequently, DTV stations will need to find new sources of income such as fees for membership or fees from additional services" (MCS9).

“Technological Development”

Group 1 - TSA: Overall, TV station administrators predicted that DTV will progressively develop into a multi-media feature integrated with IT and telecommunication. DTV will include extra features commanded by a remote control, a key board, or a touch screen. TV station operators and audiences can have direct communication via a wide range of interactive and instant communications. Viewers can easily search and download information and content related to the station and program. The statements provided below are their predictions.

“Concerning the trend of TV signal technological development, in the future, TV will be a multi-media device in which consumers can select to operate its functions from lists of menus on the screen” (TSA12).

“The definition of future TV will be changed and the attributes of TV will also be changed to be smaller and portable. There will be more uses of special effects and virtual realities” (TSA2).

“DTV will integrate its system with other kinds of media, especially those concerning IT and computers. Their features will be shown on TV screens to let viewers input their orders using keyboards or remote controls. Viewers will be able to instantly send their content to TV stations in the form of still and motion pictures, video clips, and graphic works, as well as make immediate responses to the stations” (TSA14).

“Future TV will integrate with mobile phones and computers to be a multi-function device operated in a mobile system. TV programs both live and studio-generated will be produced according to public needs. Most of the live programs will be sports as they need high precision pictures” (TSA9).

“DTV will be media for more specific information and will acquire its mobile character since more consumers will choose to receive content on their mobile phones as it can be provided anywhere and anytime they want” (TSA13).

“In the future, TV will become personal television or PTV with more characteristics for individuals. It will change from a family medium to a personal one. TV technology may advance until DTV can be a kind of website where you can view almost anything in the world, just like Google” (TSA8).

“The definition of TV will be changed. DTV will integrate with other digital mobile services and become a multi-media, multi-functional, and interactive device. In the future, TV may be able to function as a computer, with the capacity to download content from various sources into its box or hard disc. Accordingly, viewers will be able to watch any program at their convenient time. They can also lay their own program schedules, with an immense amount of content from around the world to choose from” (TSA11).

Group 2 - MCS: Mass Communication scholars also agreed with TV station administrators regarding the merging of TV and other digital media. In addition, they predicted that the advancement of DTV will go far beyond today’s expectations. It may be technologically merged with other branches of scientific technologies. In addition, there will be interactive features provided on screens or via additional control devices. DTV will feature as windows of knowledge, as people can obtain information and entertainment by getting access to the TV. The scholars estimated that analogue displays will disappear in 5-8 years from now. Their predictions are briefly outlined below.

“The physical features of TV sets will be changed to be more modern, with new applications shown on screens and remote controls. TV will be a multimedia of information and entertainment, where, apart from watching TV programs, one can also listen to radio and music, use it in video conferences, access the internet, and record programs and data in digital files with the convenience of data recall and editing. In short, TV will be more like a computer with all-in-one characteristics” (MCS4).

“TV will be integrated with other IT media such as computers, turning it from just being a device to present pictures and sounds to a personal communication device” (MCS5).

"Integrated functions will be shown on the screen, such as text information, internet service, shopping service, etc" (MCS8).

"Digital technology will be a basis for an important leap in the advancement of TV, allowing it to integrate with technologies in other fields such as engineering technology, biotechnology, nanotechnology, computer technology, etc. In the future, it may be possible that TV program production can directly link to individuals' ideas and imaginations by scanning their brains and copying their content to be used in dramas or paintings. The development of technologies will have great effects on the nature of story telling via media" (MCS1).

"TV stations will provide interactive applications such as video conference system, where viewers' images will be shown on multi-layer screen while talking or participating in a program's activities" (MCS3).

"In the future, the exchange of ideas from viewers can be made immediately via the TV screen with pictures and sounds of viewers displayed with the help of DTV technology" (MCS11).

"In the digital world, TV can be defined as a wishing crystal which we can ask for nearly anything: internet to connect to the world, a department store where we can use a remote control to order goods and services, and a physician to provide knowledge of diseases and their cures via a public health channel, and we can even talk to the physicians themselves via interactive applications. It may sound impossible in the present, but in the future when we have been digitalised, many limitations can be overcome" (MCS7).

"TV is a window-of-the-world medium. The analogue TV is a single opening window, while digital TV with its applications and features is a window inset with many smaller windows from where we can choose to watch" (MCS9).

"Concerning the technological development, in another 5-8 years, analogue TV will disappear from the market with no more manufacturing and no more buyers. In the present, we can see that the format 4:3 TV sets are gradually being replaced by the format 6:9 ones. All TV sets will be digital soon" (MCS2).

"DTV Technology and Television Production and Broadcasting"

Group 1 - TSA: In summary, TV station administrators predicted that DTV technology will play a significant role in all TV production procedures and broadcasting protocols. The technology will make greater quality TV productions and transmitted visuals and sounds. As video cameras, editing software, and video accessories and equipment become available and affordable, the viewers will send video clips, video reports, and their own productions to stations. Home-based or PC-based production will become the new trend of media production. Also the roles of TV personnel will be reformed. As TV production technology is integrated, TV personnel need to be able to handle this change effectively. In addition, the various roles of conventional TV production protocols will tend to be merged in one. The research participants' claims are presented below.

"Technology will play a more significant role in program production, for example, production in the high definition system, where producers need more subtle and careful works giving viewers the benefits of programs with fine pictures" (TSA3).

"Concerning program production and signal broadcasting, the production houses will make better use of digital technology. Their equipment will be smaller, their costs lower, their staff lower in number, but their productions better in quality and more in quantity" (TSA14).

"Production processes and signal broadcasting in digital will be faster, more convenient, and lower in cost, with open opportunities for outsiders to present their program productions" (TSA9).

"In program production, self-produced programs or video clips from viewers will be more welcome, since DTV channels will certainly require more content. The digital production equipment will be cheap enough for any amateur to buy and make his own program production for TV stations” (TSA5).

“Concerning program production, a great numbers of producers will come up. Their programs will be self-produced with private content that can be called home production. There will be a revolution in the TV business” (TSA7).

“Viewers will become content providers, with live coverage and diverse content produced with commonly used digital video cameras and simple computer software, and sent into TV stations via broad band internet. Big name production houses will find it difficult to remain in the business, while a lot of minor ones will come up” (TSA4).

“The future trends for DTV are that audiences will have more participation in program production. There will be more open opportunities for viewers to report their local news in citizen journalist programs or present their productions in programs with user-generated content. The easily acquired digital equipment will promote production by the consumers” (TSA10).

“With the facilitating technology, anybody can produce a TV program or be a citizen journalist. Consequently, the idea of user-generated content will be adopted as a main concept in program presentation” (TSA6).

“There is a high possibility that DTV stations will extend pathways to facilitate contributions viewer-generated programs; for example, digital file programs can be sent to TV stations via internet or through their fibre-optic network” (TSA1).

“The working system in TV business will be reformed. New generation professional producers need to be multi-media journalists/ producers with various skills. They must be able to generate content all by themselves, from recording, editing, and sending pictures via the Internet, to writing scripts and news. TV stations will gain the benefit of more productions produced by the same number of staff” (TSA15).

Group 2 - MCS: Mass Communication scholars also predicted that DTV will provide greater convenience for TV program production, in particular outdoor filming, live programs, and news reports. They predicted that TV production in Thailand will completely switch to digital very soon.

"In the future, more news reporting on DTV will be live broadcasting from the scene of occurrence, where reporters will use the digital technology in connecting signal to stations via various digital platforms. Program production equipment will be easier to use and will be able to be operated with laptop computers, lessening the number of personnel while increasing the facility and the efficiency of news production" (MCS2).

"In the next 5-7 years, TV program production in Thailand will turn completely digitalised" (MCS11).

In addition, Mass Communication scholars predicted that the notion of *"audience/user-generated content"* or *"citizen journalist"* will emerge as the digital technology provides a great chance for laypersons and amateurs to generate their own media productions and to participate with TV stations or distribute on a wide range of new media platforms. The following is a summary of their responses:

"At present, the price of video cameras has decreased and editing has been made easy with general computers. As a result, viewers will not only watch, but will become producers as well. We can see that right now, viewers in Thailand are beginning to produce their video clips and send them to be broadcast via TV stations" (MCS4).

"From now on, even those who have never learned mass communication arts can produce their own user-generated content and send them to TV stations to be broadcast via digital media or internet. At present, teenagers skilful in using editing software can produce their own programs to be shared in their own groups by uploading their video files onto groups' websites or private blogs" (MCS3).

"In the future, these user-generated programs will be normal content in DTV since the stations need more content to add to their variety and attraction. Owing to the greater number of channels and times in broadcasting provided by digital technology, TV stations have to compete in the rapidity of their reporting and the selectiveness of their content. As a result, viewers will be TV stations' important key information resource and local reporters" (MCS6).

"Civil journalist and user-generated content will be new practices in the DTV world. Viewers will have more participation in the production and presentation of content via DTV. There will be independent producers submitting their own generated news and programs to be broadcast by TV stations" (MCS1).

"DTV Technology and Consumption and Marketing"

Group 1 - TSA: Regarding trends of DTV consumption and marketing, the TV station administrators predicted that viewers will be fragmented. The concept of "Mass Audience" will become obsolete and will be replaced by the contemporary concept of "Niche Audience". The audience will opt to get access to information according to their own preferences and interests. TV viewing patterns will be much more personalised, and digital technology will provide a greater chance for modern viewers to interact and participate with TV stations, in various ways. TV consumers will thus become "Active User/ Audience", enjoying getting involved with TV stations and programs. The research participants' statements are provided below.

"Viewers will be separated into many small groups according to their interests. Digital technology will allow viewers to choose TV channels that suit their interests and tastes. DTV stations will have to provide more specific content" (TSA14).

"Consumers of DTV will be more independent and divided into definite groups according to their interests. There will be more private channels, especially on digital platforms and in various kinds of new media" (TSA2).

“Viewers will choose more specific programs according to their interests. Regional stations can also produce better news with the support of digital technology, and they will gain more attention from local people” (TSA4).

“DTV will be widely spread like computers and mobile phones nowadays. TV will be a kind of individual medium, where one can receive its programs on computers and mobile phones to watch anywhere, anytime. The personalized way of TV will lead to a conceptual change and will be the point that marketing professionals have to bring into consideration when dealing with DTV promotion activities” (TSA13).

“In the past, TV was a kind of family medium, one TV set for the whole family to watch together. On the contrary, in the future, each household will have many TV sets so that each family member can watch his/her own preferred programs. With the signal channel limitation broken by digital technology, viewers will have more programs to choose from the greater number of channels, and educational channels or programs should be provided to promote people’s learning” (TSA9).

“On the consumers’ side, digital technology will allow them to be interactive with TV stations” (TSA8).

“Consumers will have more and easier chances to participate in the programs. At present, consumers use SMS or telephone to participate in the programs. In the future, consumers can send their pictures, video clips, or live coverage via the 3G mobile phone network. Digital technology enables signal senders and receivers to see each other, promoting more participation from viewers” (TSA5).

Group 2 - MCS: Mass Communication scholars predicted that TV viewers will hold absolute negotiation power in terms of individual determination in selection, access and control. Technology will enable viewers to escape from the TV stations’ mandated schedule and they will be able to freely retrieve TV programs at anytime they want to see them. Middle class and upper class people in the capital and big cities will be major adopters, accepting DTV technology in first 5 years. Then the innovation will spread to others. Thailand will be able to switch off the analogue system in 10-15 years. The audience will be highly involved with their preferred programs and interactive TV stations. In addition, the traditional way of viewing TV will shift from a “Family-togetherness View” to an “Individualistic View”. New generation viewers will enjoy getting access to information and entertainment via multimedia mobile devices; therefore, TV needs to provide service via mobiles in order to respond to the contemporary lifestyles of youngsters. The scholars’ predictions are outlined below.

“New generation consumers prefer interactive media where they can download songs, video clips, and specific contents according to their individual preferences. As a result, contents are determined by the needs of media users, indicating the change in information consumption of people in the modern world” (MCS1).

“In the future, viewers will hold more power in selecting programs according to their preferences. TV stations cannot force them to view whatever stations put into broadcasting anymore” (MCS8).

“Viewers’ consuming periods will be according to their convenience rather than according to broadcasters’ timetables. They can record their favourite programs to be viewed anytime with the help of set-top boxes, personal video recorders, or modern TV sets, by recording programs to their internal hard disks” (MCS11).

“Viewers will have the power to determine what program they want to see. Program times will lose their importance since viewers must be able to watch programs at their convenience, not according to stations’ schedules. They do not have to watch programs at their broadcast times, but anytime they feel free to, since the DTV system will allow TV services with all 24 hours’ programs kept in their servers for consumers to recall the ones they have missed” (MCS4).

“In the primary stage, the first 1-5 years of digital technology utilisation, the first group of people to accept this innovation will be the middle and upper classes in Bangkok and other big cities, or about 20% of all viewers. Its greater acceptance will extend to viewers from grassroots and from rural areas in the following years. The complete digitalisation in Thailand will need about 10-15 years” (MCS5).

"In the last 2-4 years, consumers' behaviour has changed evidently to be more eager to participate in TV stations' activities as active audiences, since the technology allows them to do so. In the future, when DTV and its interactive applications are fully utilised, I expect that there will be more sending of opinions and responses to TV stations, MCs, and producers" (MCS3).

"Consumers will be more interested to participate in TV programs with responses, conversation, and SMS, and will have more preference towards reality shows. DTV technology will add more attractions to TV programs of the future. Thai consumers will welcome the new features of DTV, especially the interactive applications, since most of them are already acquainted with mobile phones, SMS sending, computers, and internet" (MCS9).

"Consumers will like to be part of and participate in their favourite programs as we can see, despite their own expenses, from the increasing SMS and video clips sent in to various TV programs, and the increasing voluntary joint reporting of traffic and occurrences on the radio programs Joh Soh 100 and Ruam Duay Chuay Kan" (MCS2).

"Unlike the analogue media world of mass society where large groups of people share their activities, the digital world is individualized. In the last 30-40 years of Thai society, TV in the analogue system is a medium where the whole family comes together to watch and discuss at a time considered important for everyone. On the contrary, TV in the digital system is an individual medium where individuals watch their favourite programs privately in their own rooms. Consequently, digital technology will diminish the get-together characteristic of the society, while at the same time increasing individualism" (MCS6).

"New generation consumers of information will be more selective, choosing only programs and information agreeable to their interests. Mobile multimedia devices will be used more widely. Since the lifestyles of people in the modern age have changed, with more of their time spent out of the house, mobile devices will be important tools to get information, and DTV will be one application among these media created to satisfy the information needs of consumers anytime, anywhere. Viewers will watch more TV programs from various multimedia and new media devices such as mobile TVs and internet protocol TVs” (MCS7).

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CHAPTER 7

THAI TV STATIONS IN TECHNOLOGICAL TRANSITION (PART 1)

This chapter provides research results from my observation protocols at four TV stations (of nine TV stations investigated) in Thailand between June 6, 2007 and July 6, 2007. I present the results according to the chronological order of my visits. These TV stations are as follows:

True Visions	June 6, 2007
Channel 3	June 12, 2007
Channel 7	June 18, 2007
MCOT 9	July 6, 2007

In this chapter, I give an overview of the current situation of technological employment in the Thai TV broadcasting industry in 2007. It reveals part of the operational circumstances of TV stations in Thailand during a technological transition at the point of switching systems from analogue to digital, and also presents TV professionals' views on DTV technology. I present the results based on information gathered from my observations including, discussions with TV crews (audio-tape recorded), photographs, and a designated form filled in by TV station representatives. I divide the report of each station into two sections:

Section 1: A report on a visit to the TV station.

Section 2: The use of DTV technology at the TV station.

TRUE VISIONS

SECTION 1: A REPORT ON A VISIT TO 'TRUE VISIONS'

I had a chance to observe a TV station operation protocol at True Visions on June 6, 2007. At the beginning of my observation, I had a discussion with a senior manager, who was a facilitator of my visit, regarding an overview of TV business operation at True Visions. He stated:

> "As True Visions is a subscription TV operator, the nature and characteristics of True Visions are completely different from all other Free TV operators in Thailand, in terms of diversity of content distribution. True Visions is truly a multichannel. True Visions offers subscribers 82 channels [referring to the Platinum Package of 2007]. Each sub channel has its own main concept such as a sport channel, music channel, etc. We buy the content or copyrights from abroad, and like some channels, our TV production team produces and manages the programs. So if we consider the main attributes of digital TV, which is multi channeling, we can claim that major characteristics of True Visions fit the contemporary concept of digital media. In addition, we can say that we have been an innovator of digital TV service providers, as we have employed digital satellite technology for TV signal transmission and distribution since 1995."

Picture 2: True Visions Station and Satellite Unit at Rama VI Rd.

The senior manager also said:

> "True Visions provides a multi-system signal transmission service: analogue and digital. The conditions of TV reception are varied according to (i) preference of customers, (ii) technical limitations, (iii) area of service, (iv) models of reception device (Satellite Disc or Set-top Box) etc. At present, the majority of our clients receive digital TV signal. We have been fading out the analogue system. In addition, True Visions has a policy to completely convert our services and reception equipment into a totally digital system in the next several years. The digital will not only profit the station, but the audience will also obtain great benefits from the technological advancement. They will get extra channels and services, greater quality of images and sounds, and more interactive features, for instance."

He claimed that digital transmission technology provided better copyright protection.

> "Our analogue signal transmission system has been sneakily watched by illegal and unauthorised viewers. Analogue transmission can be very easily violated. An encryption system by using a digital encoder/decoder will alleviate the problem."

True Visions digitally distributes the signal via two major platforms: (i) fiber optic, and (ii) satellite. For the fiber optic platform, the TV broadcasting signal from True Visions tower at Rama VI Road is delivered via fiber optics to the transmitting hub of True Corporation (Telco Company) at True Tower, which then delivers the signals to the subscribers. For the satellite platform, the TV broadcasting signal from True Visions is transmitted via fiber optic to THAICOM satellite station at Laad Hlum Keaw a signal link up to THAICOM 5 satellite. Despite transmitting the signal through the different methods, the contents or programs delivered to the subscribers are identical.

After the discussion, the senior manager took me to visit the TV production and presentation units including (i) sound studios, (ii) digital video server unit, (iii) computer graphic department, (iv) video editing rooms, (v) MCR-master control room, and (vi) TV studios.

AT THE AUDIO PRODUCTION UNIT/ SOUND STUDIOS

At sound studios, I observed that True Visions used a mixed system - analogue and digital. There were a number of sound studios, where I found that they used a combination of analogue and digital equipment, such as the analogue 16 or 32 track audio mixers in use along with digital audio editing stations. Some sound studios were fully digital: major devices in the studio were computer-based technology.

Picture 3: A Sound Studio at True Visions: Integrated Environment of Technological System Employment (Analogue and Digital)

A sound engineer at a sound studio explained:

> "We use both systems, and our working protocols need to comply with multiple-format video tapes submitted by the external content providers. As a subscription TV operator, True Visions imports and buys a wide range of programs from many international content providers and channels. So there are many different kinds of original tapes and materials imported to True Visions. Some are in analogue format such as BETA SP. Some are in a form of digital file format imported from satellites, and/or fiber optics, and then captured into a video server. Some are on DVDs, for instance. Therefore, we need both types of equipment in this sound studio. "

Picture 4: A Staff Member Generating a TV Commercial Spot at a Sound Studio

I asked a staff member to give an example that could illustrate a difference and/or impact of using digital technology in audio production. A member of staff responded that digital audio recording technology can minimise the cost and simplify the audio production procedure. He explained:

> "In the case of producing a Thai narration and subtitle for the program, in the traditional (analogue) way, we need to wait for a master tape and original script, which are regularly delivered by airmail from our contractors, such as from the office of Discovery Channel in Singapore. Then, after the material arrives, we make a translation, record the Thai narration, and send it back to Singapore by the express courier service. This traditional route takes time and costs a lot of money, including taxes and extra fees. However, since we have employed digital technology in an audio recording protocol, the cost of this matter has been sharply reduced. Now we obtain TV programs from our contractors via fiber optic or the internet or satellites, and they come in digital formats. So it is very easy and less time-consuming to do a voiceover, narration, and subtitling. Subsequently, when we finish generating the tasks, we can send the digital audio file, MP3 format enclosed with the generated time code, back to Singapore via the internet. So by doing it this alternative way, it is very convenient and can save a lot of money. It provides a shortcut for audio production."

AT THE DIGITAL VIDEO SERVER UNIT

I asked a staff member at the unit about the significance of the 'Digital Video Server' at True Visions. He explained:

> "The digital video server in this room is the heart of True Visions TV station operation. We have used them since 2003. This room used to be a video tape library containing thousands of rolls of video tapes. But now it is converted to a digital video server, which can store TV programs and video content of approximately 60,000 hours in length. The main operation system of the video server here is completely 100% digital."

Picture 5: Digital Video Server, Digital Video Archive, and Automation System

True Visions obtains digital signals of TV programs and content from a wide range of global content providers and international TV channels (for example CNN, BBC, NHK, TF, ESPN, HBO, Star Movies, Discovery Channel, National Geographic, etc.) by down-linking the signals from the satellites and/ or passing them through the fiber optics. All of these programs are stored in digital video archives at the video server unit. The staff use the computer software to manage and categorise the programs according to the specific channels and put them into video lists or broadcasting program schedules. In case the program needs to be re-edited and/ or narrated, the authorised personnel (producers or editors) will retrieve the program from the servers to an assigned non-linear editing station or to a sound studio. After the program is edited, it will be returned to the server ready to be broadcast. The staff member at the video server unit explained:

> "The video server unit has main three roles, i.e. (i) store the imported and captured programs from external and internal content providers/ producers in the main video servers; (ii) arranging and scheduling the programs; (iii) gathering broadcast programs, video footage, transferred and converted video into a digital video archive. The storage capacity of the hard disks employed at the protocol now is approximately 20 Terabytes (20 TBs = 20 Gigabytes x 1,000,000)."

True Visions has employed an automation software program that can arrange all assigned programs in the video servers to be automatically broadcast. In addition, True Visions has used a robotic system or mechanic arms inserting a selected video tape into a video tape player at the program presentation units. A staff member disclosed:

> "True Visions provides more than 100 channels to the subscribers. The manual operation cannot cope with the overload of tasks. In other words, without the automation system, True Visions needs to hire double the number of staff plus more equipment to manage this job."

For the backup system of video server, the staff member explained:

> "We have a reliable backup system including backup hard disks and spare hardware. Operating a TV business, we cannot put ourselves at risk, we are highly concerned about an unpredictable error that may possibly occur in the system. As a computer system is uncertain, we routinely do maintenance and back up the content. This is an extremely significant discipline for our business. In addition, we select trustworthy and reliable software equipment with a maintenance service and a lifetime warranty."

In addition, the staff at the video server unit believed that "it is possible that True Visions can become a tapeless TV station operator soon."

AT THE TV STUDIO OPERATION UNIT

I visited a number of TV studios at True Visions. Most of them were small-scale studios. Due to the limitation of space at True Visions, the sets in the studio were simple and designated for multiple purposes (mostly they use a blue screen technique for generating a computerized visual set). I noticed that there was both analogue and digital equipment employed in the studio, i.e. TV studio cameras were analogue, video switchers in studio control rooms and visual effect generators were digital.

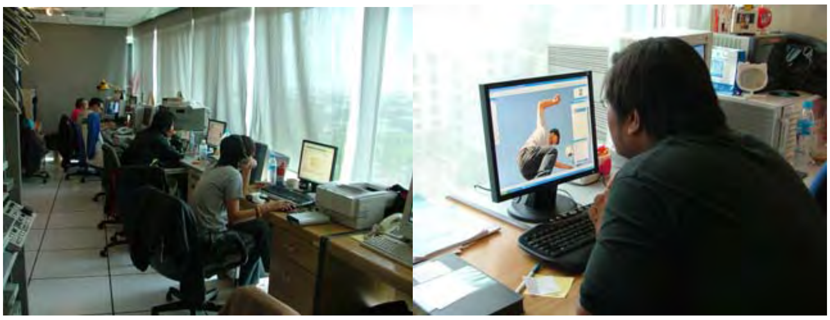
Picture 6: At TV studios and Control Rooms

AT THE COMPUTER GRAPHIC DEPARTMENT

When I visited the Computer Graphic Department, a senior staff member at the computer graphic department explained:

> "At present, we employ over 90 percent digital technology for generating titles, animations, and graphics. We use a wide range of software computer programs such as 3D Max Studio, MAYA, Inscriber CG, and DVE for generating animations and graphics. For retouching and editing images, we use Adobe Photo Shop, Adobe Illustrator, etc. In general we digitally capture and import video and audio into our hard disks. These resources are imported to our department via various channels. Mainly they are delivered through the video server. Some AV resources are sent to our department in the form of tape (analogue or digital). Some images and sound might be stored on CDs or DVDs. So that is why we have to use a wide range of computer software in order to make them applicable to different incoming data sources."

Picture 7: At the Computer Graphic Department



The staff member further explained:

> "After importing images and sound into a hard disk, all graphic and animation production protocols are in totally computerized operations. Completed graphics are incorporated into the programs or saved as digital file formats, then sent to the video server. Producers and other divisions can retrieve these files combined with editing programs. All completed resources are digitally stored in hard disks or digital recording equipment. These materials will usually remain in storage hard disks for 2-3 years."

AT THE CONVERTING ROOM

True Visions set up an operation unit for converting the materials into preferred formats. A staff member at this unit said:

> "My job is converting and transferring the assigned materials into required formats including A/D (analogue to digital) and/or D/A (digital to analogue). In terms of equipment, this room is a mixture. As you can see, we have both analogue and digital systems."

Picture 8: At the Converting Room

The staff obtain internal order forms and master materials (analogue recording materials, such as Beta SP tapes, or digital recording materials) from producers, and/or video editors, and/or staff from other departments. Then they transfer the assigned video/audio material into a specific format. A wide range of resources and materials come to the unit, including VHS tape, BETA SP tape, CD, VCD, DVD, digital files, and incoming A/V signal from video servers.

AT THE VIDEO EDITING UNIT

True Visions employs a combination video editing operation system: linear video editing stations and non-linear video editing stations. A staff member at the unit commented on the use of the two systems:

> "It depends on the job requirement, and the distributing channel or platform. For the non-linear video editing system, editors retrieve video files from the server, from which video and

images are captured and transferred into digital formats, such as AVI, MPEG, JPEG, and TIFF. At True Visions, editors employ a wide range of software including AVID, DPS, Media 100, Dayang, and Adobe Premiere. Majority of completed and edited programs are delivered into "Leitch", a digital video server system, in the MPEG 2 format."

Picture 9: A Combination Working Protocol: Non-linear Video Editing Stations and Linear Video Editing Stations at True Visions

Picture 10: Non-linear Video Editing Stations, Video Editing Software "Dayang" and Digital Video Server System "Leitch"

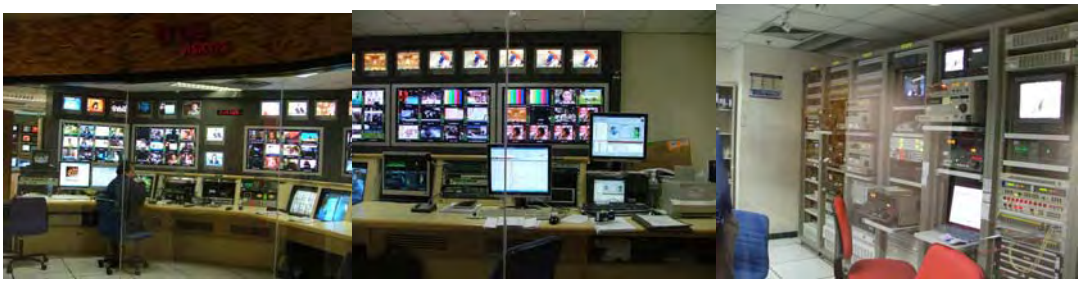
AT THE BROADCASTING AND PRESENTATION UNIT

True Visions broadcasts programs in a dual system: automatic system and manual system. The automatic broadcasting system is used for the sub-channels that digitally import the programs into the digital video servers. The manual broadcasting system is used for sub-channels that primarily use analogue materials such as Beta SP tape. There are staff on duty 24 hours a day in order to regulate the system. Before processing the broadcast, all targeted programs need to be checked (quality control), time coded, and put into a playlist or a daily program schedule.

A staff member at the unit explained:

> "The analogue system has been fading out. Currently, digital technology provides many more channels for distributing the programs. Practically, since we have used digital technology we can use this room more effectively. In a digital broadcasting operation system, we can use up to 4 channels. In comparison, for the analogue system we use one room for broadcasting just one channel. As we are a multi-channeling station, it means that digital technology can save us on operation costs. In addition, the automatic broadcasting systems lessen complications in program scheduling since we can digitally input all targeted programs or promotion spots into a computerized playlist. It is pretty convenient and time saving."

Picture 11: At the Broadcasting and Presentation Operation Unit

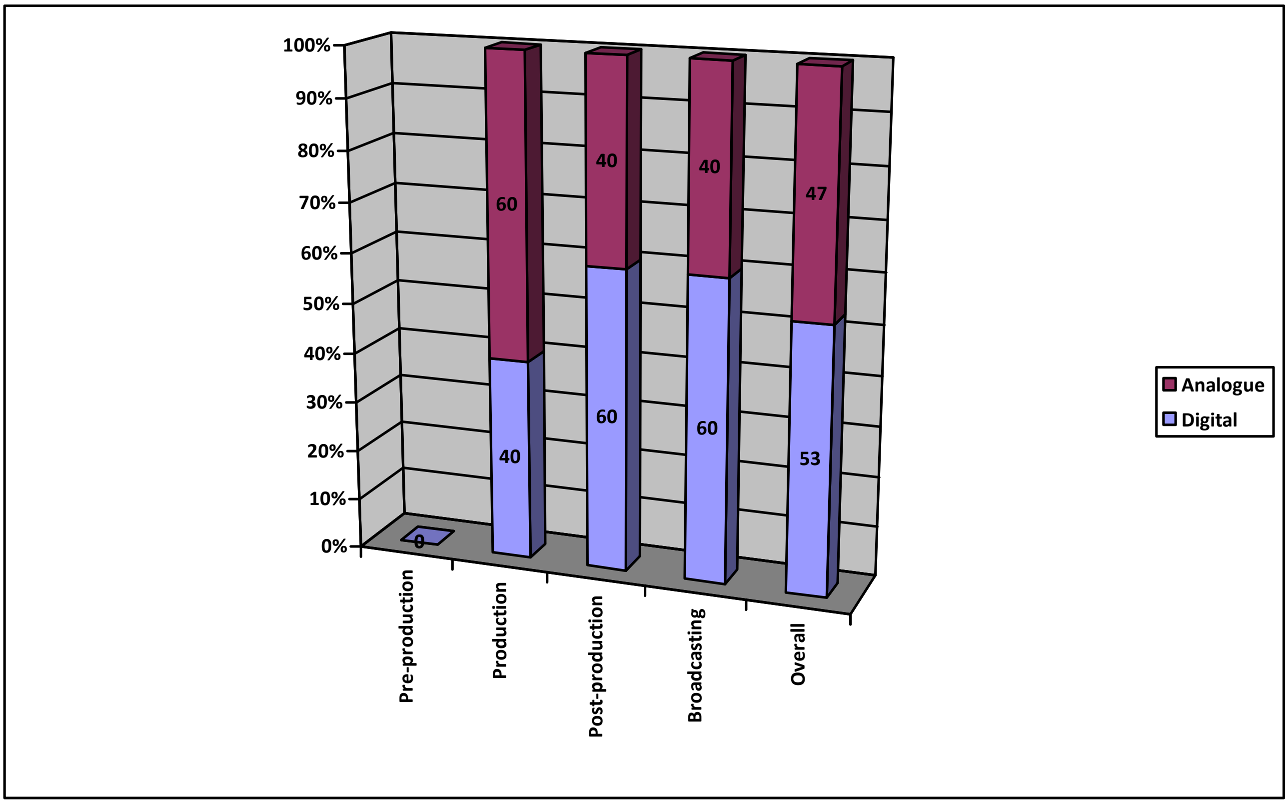


SECTION 2: THE USE OF DTV TECHNOLOGY AT TRUE VISIONS

PROPORTION OF TECHNOLOGICAL EMPLOYMENT (JUNE 2007)

The figure below presents the proportion of technological employment (analogue versus digital) at each stage of True Visions TV station operation, i.e. pre-production, production, post-production, and broadcasting. The proportion was estimated by True Visions representatives in June 2007.

Figure 5: Proportion of Technological Employment in TV Station Operation at True Visions (June 2007)



MAIN DIGITAL HARDWARE AND SOFTWARE (JUNE 2007)

The tables below list the main digital hardware and software used at each stage of True Visions TV station operation, i.e. pre-production, production, post-production, and broadcasting. The information was given by True Visions representatives in June 2007.

Table 13: Main Digital Hardware and Software Used in Pre-production Protocol at True Visions (June 2007)

Tasks	**Details of Main Digital Hardware and Software**
1) Planning and Preparation for Production	- Internet and Email (for searching information and communication) Software: Microsoft Office (for documenting letters, plans, program outline)
2) Writing and Preparing Scripts	- E-mail, Internet, Intranet (for searching information and communication) Software: Microsoft Office (for writing scripts), - BMS (for checking all stock shots, footage, and video sources from video tape that might be used in TV production), - Media Pro (for checking videos and program time codes)
3) Creating a Story Board	- E-mail, Internet, Intranet (for searching information and communication) Software: Video Server System "Leitch" (for generating previews and pre-selecting shots before progressing to editing process)
4) Preparing for Video and Audio Recording	Software: Sugas and AAlib (for arranging and booking TV production equipment)
5) Designing Set, Props and Other Artwork for Production	Software: Adobe Photoshop, Adobe Illustrator, and Microsoft Power Point

Table 14: Main Digital Hardware and Software Used in Production Protocol at True Visions (June 2007)

Tasks	Details of Main Digital Hardware and Software
1) Shooting and Recording Video in TV Studio	- Digital Video Camera, Digital Video Switcher, Digital Graphic Station - Video Server Systems “Leitch” and “Dayang”
2) Shooting and Recording Video on Location/Outdoors	- Digital Video Camera, Video Disk Recorder, Digital Graphic Station
3) Audio Recording	- The staff did not provide any details.

Table 15: Main Digital Hardware and Software Used in Post-production Protocol at True Visions (June 2007)

Tasks	Details of Main Digital Hardware and Software
1) Inputting, transferring, capturing, and processing digital video format and/or video files and/or digital images into editing station.	- Video and images are captured and transferred into digital formats, such as AVI, MPEG, JPEG, TIFF, etc. before editing and delivery to “Leitch” digital video server. Software: Sugas and BMS
2) Inputting, transferring, capturing, and processing digital audio format and/or audio files into editing station.	- Audio sources are captured and transferred into digital formats before editing and delivery to “Leitch” digital video server. Software: Sugas and BMS
3) Non-linear Video/Audio Editing	- Non Linear Video Editing Stations Software: AVID, DPS, Media 100, Dayang, Adobe Premiere
4) Generating Graphics, Animations, and Special Effects	- Computer Graphic Stations Software: 3D Max Studio, Adobe Illustrator, Adobe Photoshop, Inscriber CG, DVE, Maya, etc.
5) Outputting the Completed TV Program into Digital Formats	- All completed and edited programs are delivered into “Leitch” digital video server in MPEG 2 format. Some programs are converted into AVI format and/or DVD.

Table 16: Main Digital Hardware and Software Used in Broadcasting Protocol at True Visions (June 2007)

Tasks	**Details of Main Digital Hardware and Software**
1) Program Scheduling/Automation	- BMS - Automated Broadcasting System
2) Archiving and Storing Digital Videos and Data	- BMS - Automated Broadcasting System - “Leitch” digital video server
3) Monitoring and Quality Control of TV Program Broadcasting	- Automated Broadcasting System - Digital Switcher - Digital Broadcasting Measurement (Video & Audio)
4) Broadcasting	- Digital Video Compression System - Digital Modulator

CHANNEL 3

SECTION 1: REPORT ON A VISIT TO CHANNEL 3

I visited Channel 3 on June 12, 2007. I started my visit at Channel 3 by talking with a senior TV program manager. He stated:

> "When we talk about the overview of employing digital technology for TV program production at Channel 3, it is very clear that digital technology currently plays a significant role in all TV production procedures including pre-production, production, and post-production. For the first stage, Pre-production, let's say that we start planning for a TV program production, making contact with people, and writing a script by using computer-based technology. Many script writers and TV producers at Channel 3 use a laptop computer for writing a script, outlining their TV program production, designing sets and costumes, planning outdoor filming, reviewing video footage, communicating with colleagues, and so on. At Channel 3, the computer becomes the essence of contemporary TV production."

He commented on outdoor or filed work production:

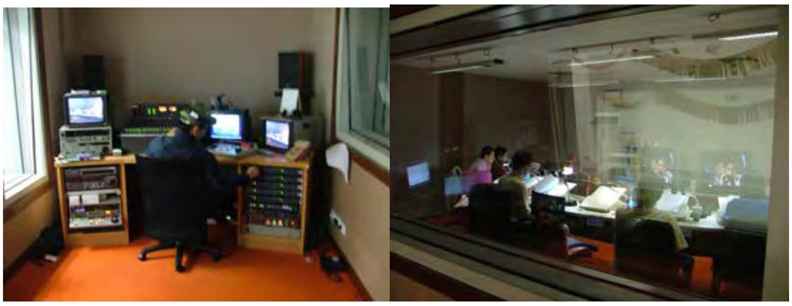
> "I have 25 years of experience in TV production at Channel 3. I have a clear vision of the development of TV production. Talking about technological development, it reminds me of TV production protocol many years ago in the age of analogue. I remember that we carried a titanic video camera plus a heavy portable video recorder and very heavy accessories when we did an outdoor shooting…. Now computer and digital technology minimise all these things and they have become handy and easily controllable… At present, our Channel 3 TV reporters can produce outdoor news reports solo or with a few colleagues by carrying a handheld digital video camera and employing a portable video editing laptop computer, making a news clip and sending back to the station via the Internet."

After the discussion, the senior TV program manager took me to visit the TV production and broadcasting units including (i) sound studio, (ii) TV program censorship unit, (iii) TV studios and control room, (iv) master control and presentation room, and (v) computer graphic room.

AT THE SOUND STUDIO

I entered a sound studio while a sound engineer and narrators were producing a Thai narration for an imported TV drama. Some analogue equipment, such as an analogue audio mixer and an analogue video recorder (BETA SP), remained in use. Some digital devices, for example digital video players and recorders, were used for recording the narration in a digital format. The recorded narration tapes and materials were passed on to the editing units for completing the programs.

Picture 12: A Sound Studio at Channel 3



AT THE TV PROGRAM CENSORSHIP UNIT

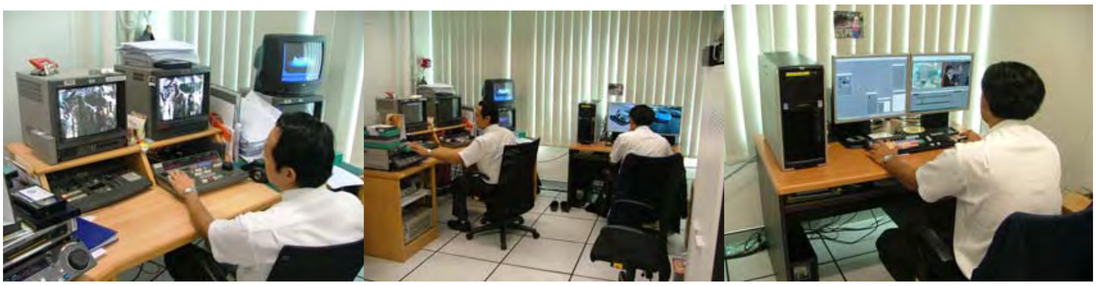
There are a wide range of imported TV programs delivered to the station. In order to comply with the Thai broadcasting regulator's requirements, the station is responsible for screening all programs and censoring all prohibited images and sounds that might violate laws and disturb viewers.

There are two sets of video editing stations at the unit: an analogue video editing station, and a non-linear video editing station. A staff member at the unit explained:

> "The main function of this unit is to do a mask covering improper images and scenes such as images that show nudity, violence, and prohibited images. We use both systems to do a visual effect covering these images depending on the type of imported material and/or the

requirements of the exported video material. As we obtain video tapes from external production houses or foreign companies, there are mixture of tape formats delivered to our station. And we need to be prepared to do the censoring job whether these tapes are analogue or digital."

Picture 13: A Censor Room at Channel 3



AT THE TV STUDIO AND CONTROL ROOM

I entered the TV studio while they were filming a live program entitled 'Season Entertainment'. The studio is designated as a multiple function studio comprising several sets for filming various programs. I noticed that the video cameras employed in the studio were digital. In a studio control room, there was approximately over 60 percent digital equipment employed in operation, including a digital video switcher, a digital audio mixer, a graphic computer station. A number of analogue systems remain in use, such as video tape players and recorders (BETA SP), and a manual studio lighting controller.

Picture 14: A Multi-purpose TV Studio and A TV Studio Control Room at Channel 3

Picture 15: At a Video Editing Unit

AT THE MASTER CONTROL AND PRESENTATION ROOM

A staff member at the unit commented on the state of technology at the unit:

> "We have just changed our major equipment to the digital system. As you can see, the video switcher and control board are computer-based technology. Modern equipment tends to have integrated functions. In the analogue era a master control room was full of many huge devices distinct from each other according to each one's specific function. But now... digital technology minimises and merges all functions into one with a computer control feature."

Picture 16: A Master Control and Presentation Room

AT THE COMPUTER GRAPHIC ROOM

A senior staff member of the department explained the range of technology used in the computer graphic room:

> "We use PC 'DELL' as our computer graphic stations and employ a wide range of computer graphic software including Adobe Video Collection, Maya Unlimited, and 2Brush version 2.5 for generating graphics, titles, spots, and animations…. All input video footage and sources are digitally imported into the hard disk. Analogue video sources are converted into digital file formats before further processing. We also retrieve AV sources and files from the video servers and/ or they are delivered via LAN system from related departments and/ or they are recorded in digital formats such as CDs, DVDs, and digital video tapes and sent to our department. We can say that our protocol is operated almost 90 percent digitally."

Picture 17: A Computer Graphic Room

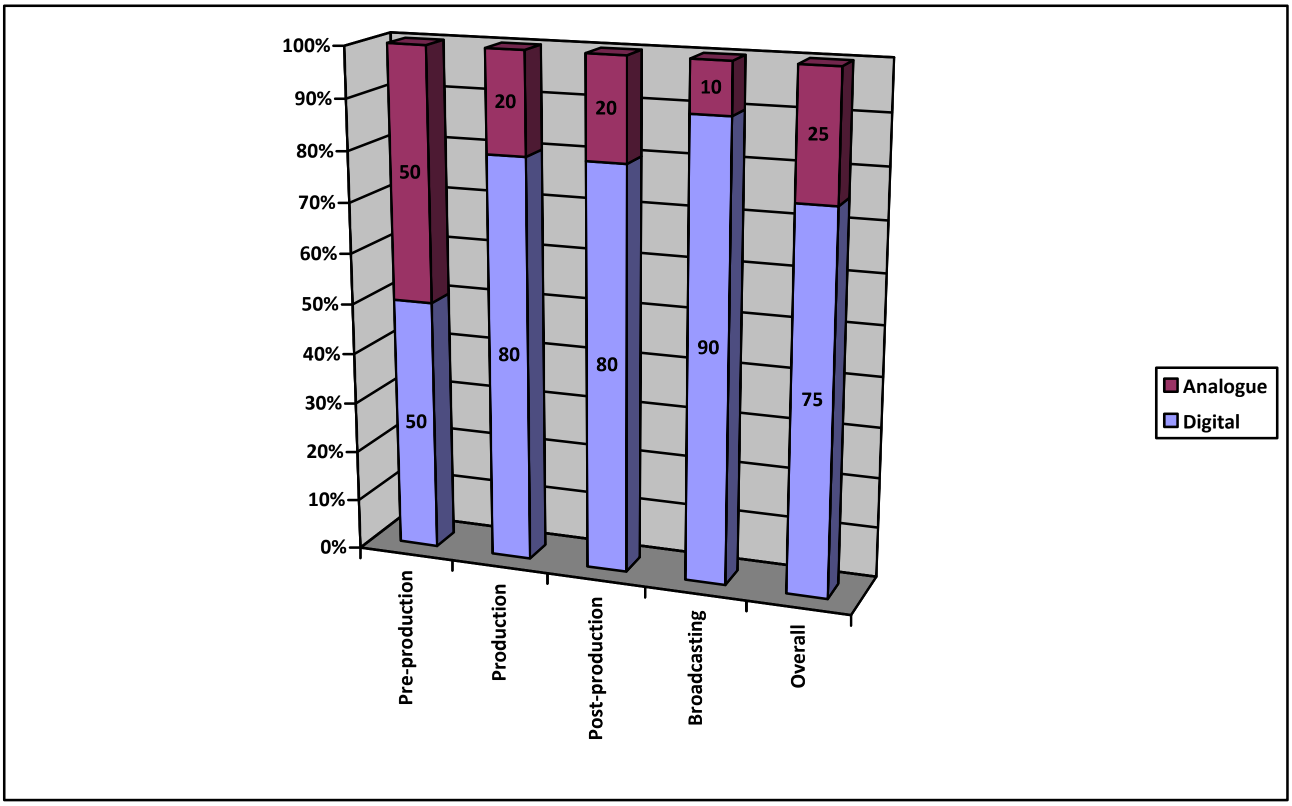
Picture 18: A Broadcasting Operation Unit and Video Servers at Channel 3

SECTION 2: THE USE OF DTV TECHNOLOGY AT CHANNEL 3

PROPORTION OF TECHNOLOGICAL EMPLOYMENT (JUNE 2007)

The figure below presents the proportion of technological employment (analogue versus digital) at each stage of Channel 3's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The proportion was estimated by Channel 3's representatives in June 2007.

Figure 6: Proportion of Technological Employment in TV Station Operation at Channel 3 (June 2007)



MAIN DIGITAL HARDWARE AND SOFTWARE (JUNE 2007)

The tables below list the main digital hardware and software used at each stage of Channel 3's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The information was given by Channel 3's representatives in June 2007.

Table 17: Main Digital Hardware and Software Used in Pre-production Protocol at Channel 3 (June 2007)

Tasks	**Details of Main Digital Hardware and Software**
1) Planning and Preparation for Production	- The staff did not provide any details.
2) Writing and Preparing Scripts	- The staff did not provide any details.
3) Creating a Story Board	- The staff did not provide any details.
4) Preparing for Video and Audio Recording	- The staff did not provide any details.
5) Designing Set, Props and Other Artwork for Production	- The staff did not provide any details.

Table 18: Main Digital Hardware and Software Used in Production Protocol at Channel 3 (June 2007)

Tasks	**Details of Main Digital Hardware and Software**
1) Shooting and Recording Video in TV Studio	- Digital Video Camera, Digital Video Switcher
2) Shooting and Recording Video on Location/Outdoors	- Digital Video Camera, Digital Video Disk Recorder
3) Audio Recording	- The staff did not provide any details.

Table 19: Main Digital Hardware and Software Used in Post-production Protocol at Channel 3 (June 2007)

Tasks	Details of Main Digital Hardware and Software
1) Inputting, transferring, capturing, and processing digital video format and/or video files and/or digital images into editing station.	- Video and images are captured and transferred into digital formats, such as AVI, MPEG, JPEG, TIFF, etc, before editing. Software: DPS
2) Inputting, transferring, capturing, and processing digital audio format and/or audio files into editing station.	- Audio sources are captured and converted into digital formats before editing and delivery to Digital Video Server.
3) Non-linear Video/Audio Editing	- Non Linear Video Editing Stations
4) Generating Graphics, Animations, and Special Effects	- Computer Graphic Stations: PC (DELL) Software: Adobe Video Collection, Maya Unlimited, 2Brush 2.5
5) Outputting the Completed TV Program into Digital Formats	- Matrox Digisuit - Several programs are output into digital format.

Table 20: Main Digital Hardware and Software Used in Broadcasting Protocol at Channel 3 (June 2007)

Tasks	Details of Main Digital Hardware and Software
1) Program Scheduling/Automation	- Automated Broadcasting System (IBM)
2) Archiving and Storing Digital Videos and Data	- Digital Video Archive (there were only TV commercials available in the archive.)
3) Monitoring and Quality Control of TV Program Broadcasting	- The staff did not provide any details.
4) Broadcasting	- Digital Broadcasting System (in a trial stage)

CHANNEL 7

SECTION 1: REPORT ON A VISIT TO CHANNEL 7

I studied a working protocol at Channel 7 on June 18, 2007. I had a discussion with a senior TV technician, who was assigned as Channel 7's representative and facilitator of my visit, regarding an overview of TV operation at Channel 7. He explained:

> "Overall, we can say that approximately up to 80 percent of our internal TV station protocols are digitally operated. Excluding broadcasting protocol, our terrestrial broadcasting transmission is still transmitted in an analogue system. Our station has a plan to shift into a fully digital TV station in the near future…. The technological transition started around ten years ago. I remember that in 1997 our station first purchased a digital tape player. Since then there has been an increasing amount of digital hardware and software imported into our station, for example, digital visual effects generators, non-linear video editing stations, etc."

After the discussion, the senior TV technician took me to visit the TV production and broadcasting units including (i) studio control room, (ii) TV program production department and post-production unit, (iii) computer graphic department, (iv) digital video archive, and (v) outside broadcasting unit.

AT THE STUDIO CONTROL ROOM

A staff member at the TV studio control room explained the use of the digital system in the studio control room:

> "Video signals from different resources passing to the video switcher in this room are mainly in digital formats. The video signals coming from studio cameras are digital. The video signals from video players are digital or converted into digital format. The imported video signals from international news agencies, which are down linked from digital satellites, are also digital. Moreover, the video signals that we deliver to our broadcasting building are digital. So in terms of the internal video signal networking at Channel 7, we can claim that it would be around 80-90 percent digital."

At the TV studio control room, I noticed that a wide range of digital devices were employed for TV program production. A senior staff member at the TV studio control room explained:

> "Majority of equipment in this room is digital, including digital video tape recorders, digital TV studio cameras, and digital video switchers. However, as you can see, there is some analogue equipment, such as video tape players and recorders. We still need them because the Thailand broadcasting industry has not been converted into 100 percent digital. Many external TV production agencies continue submitting analogue BETA video tapes to our station. In addition, we still need to use our analogue-based stock shots, footage, and video from analogue video tape archive (which are mostly stored in an analogue format) for inserting into editing the program."

<u>Picture 19</u>: At a Studio Control Room and a TV Studio

TV crews in the studio hold very positive attitudes to digital technology. They said:

> "Digital makes things [TV production procedures] much easier. We can go far beyond the limitations of days before in terms of creating fantastic images and sounds. Since digital equipment becomes multifunctional and computer controllable, it integrates many once-complicated functions in the analogue world into an easier single controllable function. For example, this digital video switcher [in the studio] integrates all significant features. In the analogue world, we have to use two or three people more than today to manage the different machines."

Moreover, I asked them, as they are technicians and producers who daily use the technology, if they and the TV stations in Thailand are ready to go digital. They were confident that:

> "In terms of technological aspects, it is very easy for us to handle these devices. We can say that switching over to digital is not a big deal for us. As we are technical operators, we are

> ready to use fully digital equipment. But the main point is that we should ask the national regulators if they are ready to implement an effective digital switch-over plan. Moreover, it depends on whether the TV stations will have sufficient funds and be able to manage a financial plan effectively in the technological transition. This requires a huge budget for a full technological conversion. For example, each TV station might have around one hundred video-tape players. This means that we may have to spend approximately three-hundred million baht (approximately 10 million Australian Dollars) for a full conversion of just this equipment. There are many more items… so this is a big deal."

Picture 20: Studio Video Cameras in TV Studios at Channel 7

At a TV studio, I observed a routine work protocol while the TV crews were producing a live sport news program. All TV studio cameras and lighting control systems (lighting mixer, dimmer, and controller) at the main studio had digital and computerised control systems. The systems were synchronised with a visual effects generator at the studio control room. A lighting engineer commented:

> "The synchronized system of visual effects generator and lighting system is very helpful for contemporary program production for which we heavily use the blue screen visual technique. In the past, it was such a time-consuming job to manage lighting functions. The controllable systems provide varieties of lighting effects. The systems are very convenient and accurate."

Picture 21: A Lighting System in a TV Studio at Channel 7

AT THE TV PROGRAM PRODUCTION DEPARTMENT

AND POST-PRODUCTION UNIT

At the Post-production Unit, I noticed that there were more than ten non-linear video editing stations in use. A TV editor overviewed the protocol:

> "We have a video networking system, which can be called a data bank. Editors and TV producers can recall and retrieve digital video files (MPEG 2) for editing TV programs. This internal video networking system enables each producer and editor to work on any work station at the post-production unit. In addition, each video file can be shared by others who may need to use it at the same time. But in the analogue world, if a video tape is needed by more than one producer, producer B has to wait for the tape until producer A finishes the editing job, or we have to make a tape duplication. This affects video generation loss, while the digital can be duplicated without a poorer image effect."

Picture 22: Non-linear Editing Stations at Channel 7

Picture 23: One of the Earliest Non-linear Video Editing Stations "DME-7000" at Channel 7 (introduced in 1997)

I visited editing rooms and noticed that even though there were many non-linear video editing stations at the Post-production unit, the analogue linear video editing stations remain in operation. The staff explained:

> "We still need these analogue video editing stations for editing some programs or for checking and re-editing analogue video tapes from external TV program agencies. We still need an analogue BETA tape editing system because majority of external production houses submit analogue tape to our stations."

Picture 24: Digital Video Tape Recorders and Multi-format Players at Channel 7

I met the Chief of the TV Program Production Department. I asked him several questions regarding contemporary TV program production at Channel 7. He said:

> "Nowadays, producing TV productions is much easier. Integrated, user-friendly, and compact features of digital devices enable us to do almost a one man show TV production. For instance, in particular, a single news reporter now can go to the field with a compact digital video camera, and edit video clips by using a laptop computer. Then this reporter can send digital files back to the station. As you can see, the digital field production procedure is totally different from the past. The integration of digital technology shifts the concept of TV production work."

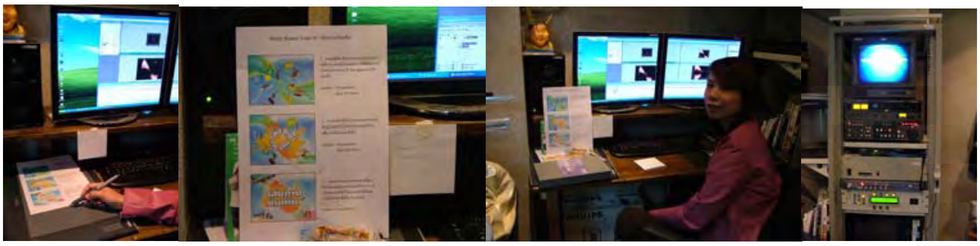
AT THE COMPUTER GRAPHICS UNIT

I observed a Computer Graphics staff member while she was doing graphics for a TV program. She explained:

> "Currently I employ a wide range of computer graphics software to generate TV graphics and animations. I use almost 100 percent digital technology for creating graphics and visual

effects. I use 3D Max Studio, Adobe Illustrator, Adobe Photoshop, Maya, Adobe After Effect, Adobe Premiere, and many others."

Picture 25: At Computer Graphics and Animation Unit



AT THE DIGITAL VIDEO ARCHIVE

I visited Channel 7's digital video archive, which had two sets of digital video servers planned to be used as video data banks. However, at the time of my visit, they were not used to their full capacity, only in a trial operation phase. Channel 7's news department was using one of them for storing news clips, while the other one was being developed to be Channel 7's main video archive. A staff member stated:

> "We bought digital video servers two years ago. They are used for storing TV commercials, video footage, and news clips. When the systems are fully set up and stable, it is possible that Channel 7 may use these digital video servers for the automated broadcasting system."

AT THE OUTSIDE BROADCASTING UNIT

The head of the outside broadcasting (OB) unit explained the operation of the unit:

> "Channel 7 has seven OB vans: five are analogue, and two are digital. The main digital OB van can be operated with seven digital cameras and can be expanded to twelve cameras or more. Video switchers and the main equipment in the digital OB vans are full digital systems. These fully digital operation vans were imported from aboard. We may have another digital OB van next year. The analogue ones have been gradually out of order and they are not in good condition. We still use them on some occasions."

In addition, Channel 7 has three Digital Satellite Signal Uplink vans (KU Band).

Picture 26: At Satellite Signal Uplink Unit

Picture 27: At Outside Broadcasting Unit

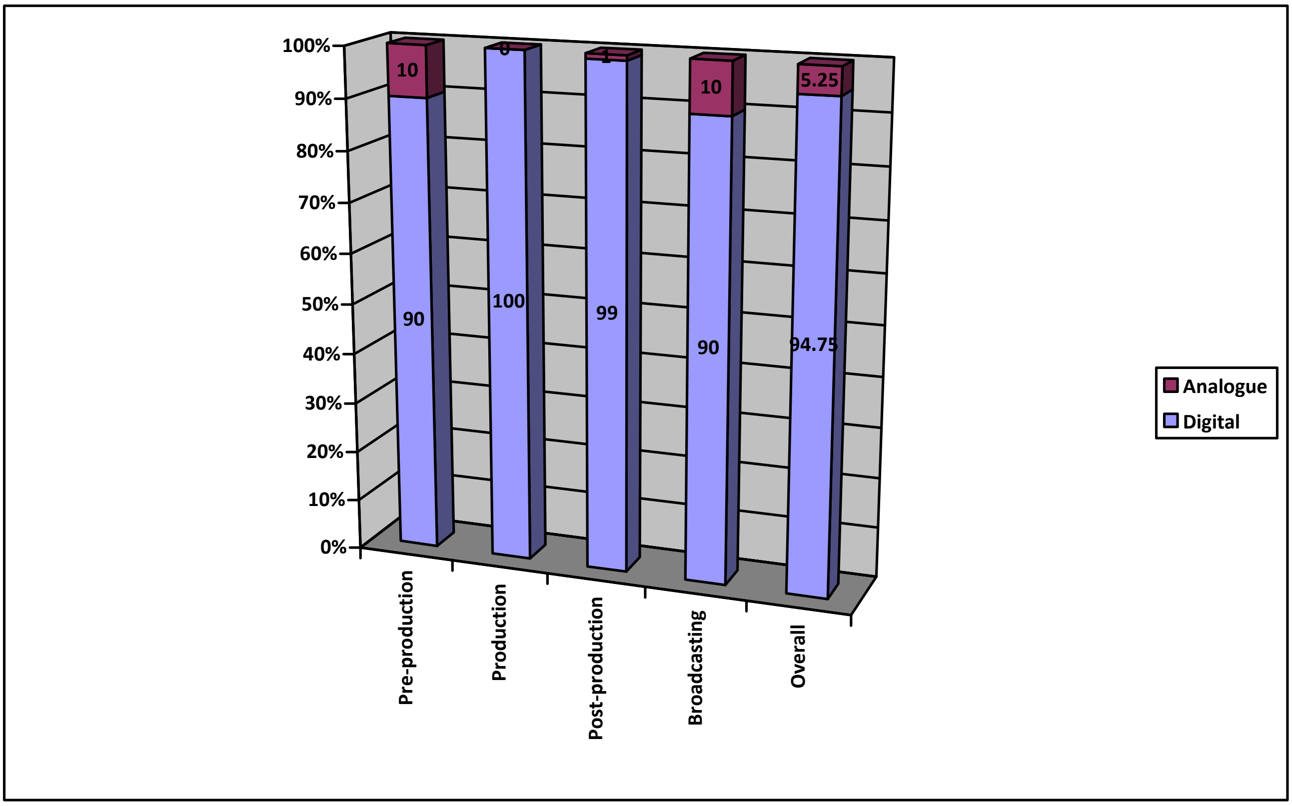
Picture 28: Transmission Tower and Satellite Dish at Channel 7

SECTION 2: THE USE OF DTV TECHNOLOGY AT CHANNEL 7

PROPORTION OF TECHNOLOGICAL EMPLOYMENT (JUNE 2007)

The figure below presents the proportion of technological employment (analogue versus digital) at each stage of Channel 7's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The proportion was estimated by Channel 7's representatives in June 2007.

Figure 7: Proportion of Technological Employment in TV Station Operation at Channel 7 (June 2007)



MAIN DIGITAL HARDWARE AND SOFTWARE (JUNE 2007)

The tables below list the main digital hardware and software at each stage of Channel 7's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The information was given by Channel 7's representatives in June 2007.

Table 21: Main Digital Hardware and Software Used in Pre-production Protocol at Channel 7 (June 2007)

Tasks	**Details of Main Digital Hardware and Software**
1) Planning and Preparation for Production	- Internet and Email (for searching information and communication) - DVD Player Software: Microsoft Office (for documenting letters, plans, program outline)
2) Writing and Preparing Scripts	- Internet and Email (for searching information and communication) - DVD Player Software: Microsoft Office (for writing scripts)
3) Creating a Story Board	- Internet and Email (for searching information and communication) Software: Adobe Photoshop, Adobe Illustrator, Auto Cad, Microsoft Office
4) Preparing for Video and Audio Recording	- Digital Video Server
5) Designing Set, Props and Other Artwork for Production	- Software: 3D Max, Maya, Auto Cad, Adobe Photoshop, and Adobe Illustrator

Table 22: Main Digital Hardware and Software Used in Production Protocol at Channel 7 (June 2007)

Tasks	Details of Main Digital Hardware and Software
1) Shooting and Recording Video in TV Studio	- Digital Video Camera - Digital Video Switcher - Digital Lighting Controlling System - Digital Graphic Station - Digital Video Tape Recorder - DVD Recorder/Player
2) Shooting and Recording Video on Location/Outdoors	- Digital Video Camera (High Definition Video Camera)
3) Audio Recording	- Digital Audio Mixer

Table 23: Main Digital Hardware and Software Used in Post-production Protocol at Channel 7 (June 2007)

Tasks	Details of Main Digital Hardware and Software
1) Inputting, transferring, capturing, and processing digital video format and/or video files and/or digital images into editing station.	- Video and images are captured and transferred into digital formats, such as AVI, MPEG, JPEG, TIFF, before editing.
2) Inputting, transferring, capturing, and processing digital audio format and/or audio files into editing station.	- Audio sources are captured and transferred into digital formats before editing.
3) Non-linear Video/Audio Editing	- Non Linear Video Editing Stations Software: Adobe After Effect Adobe Premiere
4) Generating Graphics, Animations, and Special Effects	- Computer Graphics Stations Software: 3D Max Studio, Adobe Illustrator, Adobe Photoshop, Maya, etc.
5) Outputting the Completed TV Program into Digital Formats	- Some completed and edited programs are delivered into the digital video server in MPEG 2 format. - Some programs are output into digital video file format.

Table 24: Main Digital Hardware and Software Used in Broadcasting Protocol at Channel 7 (June 2007)

Tasks	**Details of Main Digital Hardware and Software**
1) Program Scheduling/Automation	- Desktop Computer (Manual and Semi-automatic Program Scheduling)
2) Archiving and Storing Digital Videos and Data	- Some programs stored on DVD and digital video tapes.
3) Monitoring and Quality Control of TV Program Broadcasting	- DVD Recorder - Digital Video Server - Digital Wave Form Monitor
4) Broadcasting	- Digital Switcher - Digital Video Compression System - Digital Modulator

MCOT 9

SECTION 1: REPORT ON A VISIT TO MCOT 9

I observed a working protocol at MCOT 9 on July 6, 2007. A senior TV engineer was assigned by the TV station administrator to be my facilitator. He firstly took me to observe the main TV station operations at MCOT 9 main building and explained MCOT 9's use of digital technology:

> "MCOT 9 adopted DTV technology at our station approximately twelve years ago. We have converted our TV studio No. 1 into a fully digital system since 1995. We imported a fully digital OB van, which is an OB DSC (Digital Serial Component) van from Germany, to use for producing live reports for the SEA Games (South East Asia Games) in Chiengmai in 1995. In recent years, we have invested a huge budget to modernise the business and update technology. We just moved into a new building a few years ago. This building has become the main working location for production and operations at MCOT 9. All newly installed hardware and software employed in this building are digital. There are still a few analogue devices in use because we need to link with analogue signals from the old building. Moving to the new building could be a symbol of transforming and reforming our business operation from the analogue world into the digital era. Our administrators are aware of the fact that Thailand TV broadcasting industry is moving to digital."

In the lobby of MCOT 9's new building, I had seen an exhibition presenting the development of MCOT 9 from a black and white TV station (this first TV station in Thailand), Thai TV Channel 4 at Bang Kunphrom, as an analogue TV station, to MCOT 9 a contemporary TV station in a digital world.

<u>Picture 29</u>: An Exhibition and Display in the Lobby on the History of MCOT 9

AT THE MASTER CONTROL ROOM (MCR)

I visited a MCR for the first leg of the visit, where a staff member described the MCR operations:

> "We monitor all incoming and transiting of video, audio, and data from various resources: satellites, news agencies, live programs, etc. We do the internal quality control of video and audio signals, and data connections. The main hardware and software in this room is 95 percent digital."

<u>Picture 30</u>: At Presentation & MCR

I asked him whether MCOT 9 used an automated program system. He replied:

> "We have not used it for the main station (MCOT 9). But we use it for our sub channels, MCOT 1, 2, 3, because they are digitally operated protocols. For the main channel, we may need time to get used to it.... Or it might not fit Thai TV production. We [Thai TV producers] are not strict on formatting video tape and video tape time coding so we might find an error while using an automatic broadcasting system. That is why we run the programs manually. However, if we (Thailand TV industry) are in a fully digital system, automated systems will be much more practical because we can systematically arrange and play digital files from the playlist."

I asked him if using digital technology had impact on his work. He responded:

> "Of course, it has an impact on TV personnel's working culture. Digital technology generates a new working atmosphere. We need to be more systematic. For example, if we use automation for program scheduling, we need to input all programs a day or days before the target date. In addition, we need to be more careful in backing up the system regularly if we lose data, they will be gone forever. Principally, digital is either all or nothing. As we are professionals, we need to ensure that our station and broadcasting signals are running smoothly."

I asked the staff member in the MCR, who was an experienced TV professional, about his opinion of the transition to DTV and the apparent feature changes between analogue and digital. He replied:

> "In my opinion, the technological transition is a matter of time. Since we established our TV station five decades ago, we have adopted TV technology mainly from developed countries: USA, Europe, and Japan. Now it is a transition period from analogue to digital. I do agree with switching our TV broadcasting over to digital. We cannot avoid this change… Technically, what I have noticed is that digital provides greater convenience, flexibility, intelligence, and stability. In addition, digital is good for information networking in the way that we can share and distribute content, video, images, and sound, into multimedia and multichannel platforms. MCOT 9 has started providing digital content in the new media for several years: MCOT 1, 2, 3 via cable, and the internet. We are moving to mobile TV in the next few months [October 2007] by using DVB-H technology."

AT MCOT 9'S TV NEWS PROGRAM PRODUCTION UNIT

I entered a TV news studio while TV crews were producing a live TV news program. They used the blue screen technique to generate a virtual background.

Picture 31: Entertainment News Program Production in a Studio

A senior staff at the unit explained:

> "We set up our production units to be digital many years ago. Our main equipment, such as High Definition TV studio cameras, are digital. Digital can respond to the requirement of contemporary TV programs and news production, which crucially need to be quick and fresh. Digital fully meets the requirements. We now emphasise producing live news programs, in particular on-location news reports such as a live report from parliament. We can produce a live program from the field by using our digital OB van and delivering the signal back to the station via either digital satellites or microwaves."

Picture 32: HD Studio Cameras at MCOT 9's TV Studios

The staff member further explained:

> "We employ fully digital equipment in this TV studio control room and our studio news production. We have two sets of equipment ready and on stand-by just in case there is a system error. All data are backed up in specific hard disks. MCOT 9's news bureau obtains a wide range of international news resources. At present, the news clips and data obtained from satellites and microwave are in digital formats. We store these in our department's video servers."

Picture 33: At a Studio Control Room

At the video editing unit of MCOT 9's news bureau, the senior technician explained:

> "At the news bureau, we are in 24 hour operation. We use a LAN system that can link information from the main news video server to each station. We use AVID and Final Cut Pro software for editing the news programs."

Picture 34: At MCOT 9's TV News Bureau

At the news bureau, I saw TV news producers using non-linear video editing stations. They retrieved video clips and footages from video servers and hard disks. However, I noticed that the analogue editing stations remained in use. A senior staff member explained:

> "We still use a linear editing station because there are a lot of analogue footage video tapes that we have not transferred into digital formats. In addition, there are some TV news producers who are accustomed to producing the news report in a traditional style."

AT MCOT 1, 2, 3

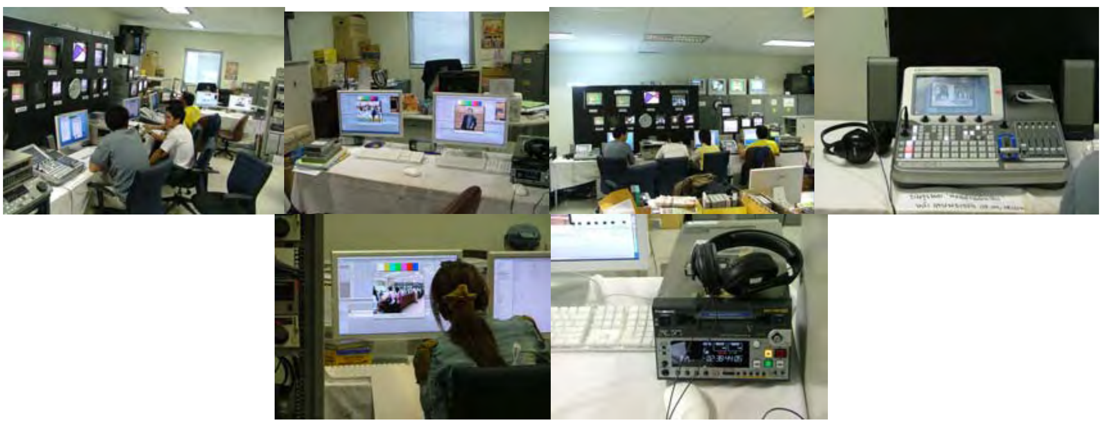
I visited MCOT 1, 2, 3, where I went into a small room which was a workspace of approximately 6 meters x 6 meters. This room was occupied with three computer work stations. A staff member in this unit described operations:

> "This room is the hub of our three new sub TV channels. These extra channels are distributed to our licensee's subscription TV channels [True Visions, and other cable TVs in provinces] and via our IPTV. We expanded our channels to digital new media platforms. We have prepared for the future, and we expect that digital technology will extensively enhance the landscape of the media industry in Thailand. There will be a great number of multi-channeling TV stations. So MCOT 1-3 will be our trial platforms. As "MCOT" has such a lot of content and programs, the traditional way of distributing them, i.e. terrestrial TV, cannot provide enough time and space for delivering the programs. In addition, contemporary consumer behaviors have been changing. So we need to shift our concept to be more specific and responsive to the audiences. As you can see, new generations gradually decline in accessing the traditional media. They prefer to obtain data from new media. So we offer MCOT 1-3 to the contemporary audiences. We expect that these new channels might be alternative information sources for them."

MCOT 1-3 were established in order to distribute overloaded content that cannot be presented in the conventional channel, MCOT 9. The staff member explained:

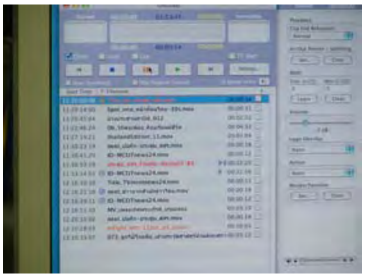
> "We provide specific content, for example with MCOT 3 we conceptualise it to be promoting constitutional information and political issues to anyone who is interested in this matter. These channels are now available on cable TV and IPTV but in the near future they will be delivered to mobile TV[1]."

Picture 35: Fully Digital Working Environment at MCOT 1-3, Contemporary Channels; Desktop Computer-based TV Channel Operation



[1] MCOT 1-3 have now been available on the mobile TV platform since October 2007.

Picture 36: An Automation System: A Program Playlist of MCOT 1-3



Picture 37: At a Network Room

OBSERVATION OF LIVE TV PROGRAM PRODUCTION "PHAI RAI WAN"

I observed the overall procedure of producing a live program, "Phai Rai Wan," at a TV studio. I went into a studio control room while TV crews were in their positions. Main equipment were over 80 percent digital; TV studio cameras, video switchers, computer graphic generators, and etc.

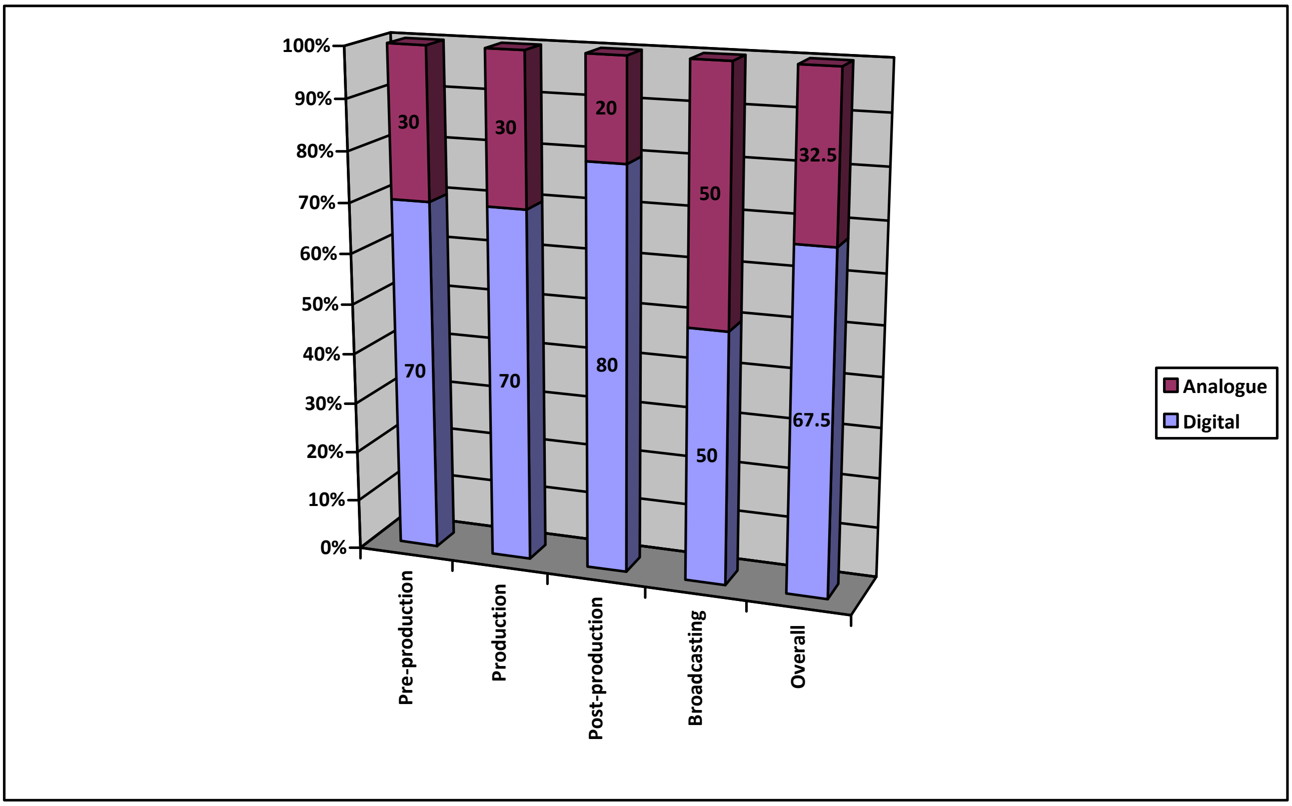
Picture 38: A Live TV Program Production "Phai Rai Wan"

SECTION 2: THE USE OF DTV TECHNOLOGY AT MCOT 9

PROPORTION OF TECHNOLOGICAL EMPLOYMENT (JULY 2007)

The figure below presents the proportions of technological employment (analogue versus digital) at each stage of MCOT 9's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The proportion was estimated by MCOT 9's representatives in July 2007.

Figure 8: Proportion of Technological Employment in TV Station Operation at MCOT 9 (July 2007)



MAIN DIGITAL HARDWARE AND SOFTWARE (JULY 2007)

The tables below are list the main digital hardware and software at each stage of MCOT 9's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The information was given by MCOT 9's representatives in July 2007.

Table 25: Main Digital Hardware and Software Used in Pre-production Protocol at MCOT 9 (July 2007)

Tasks	**Details of Main Digital Hardware and Software**
1) Planning and Preparation for Production	- Internet and Email (for searching information and communication) - Electronic News obtained from Digital Satellites - Computers used in designing timeline and outline of production, and budgeting. Software: Microsoft Office (for documenting letters, plans, program outline)
2) Writing and Preparing Scripts	Software: Microsoft Office (for writing scripts)
3) Creating Story Boards	Software: Corel Draw, Adobe Photoshop, Microsoft Power point
4) Preparing for Video and Audio Recording	Software: SSL
5) Designing Set, Props and Other Artwork for Production	Software: Adobe Photoshop, Adobe Illustrator, Corel Draw

Table 26: Main Digital Hardware and Software Used in Production Protocol at MCOT 9 (July 2007)

Tasks	**Details of Main Digital Hardware and Software**
1) Shooting and Recording Video in TV Studio	- Digital Video Camera (Sony, Canon, etc.) - Digital Video Switcher
2) Shooting and Recording Video on Location/Outdoors	- Digital Video Camera (Digital Beta SX, DV Camcorder)
3) Audio Recording	- DAT (Digital Audio Tape) - Wireless Microphone
4) Any Other Tasks in Production	- Digital OB Van

Table 27: Main Digital Hardware and Software Used in Post-production Protocol at MCOT 9 (July 2007)

Tasks	**Details of Main Digital Hardware and Software**
1) Inputting, transferring, capturing, and processing digital video format and/or video files and/or digital images into editing station.	- Video and images are captured and transferred into digital formats, such as AVI, MPEG, JPEG, TIFF before editing.
2) Inputting, transferring, capturing, and processing digital audio format and/or audio files into editing station.	- Audio sources are captured and transferred into digital formats before editing. - Digital Audio Mixer
3) Non-linear Video/Audio Editing	- Non Linear Editing Stations Software: AVID, Final Cut Pro, etc.
4) Generating Graphics, Animations, and Special Effects	- Computer Graphics Stations Software: Adobe Photoshop, etc.
5) Outputting the Completed TV Program into Digital Formats	- Completed and edited programs are output into Digital Beta Tape.

Table 28: Main Digital Hardware and Software Used in Broadcasting Protocol at MCOT 9 (July 2007)

Tasks	**Details of Main Digital Hardware and Software**
1) Program Scheduling/Automation	- Digital Video Server
2) Archiving and Storing Digital Videos and Data	- The staff did not provide any details.
3) Monitoring and Quality Control of TV Program Broadcasting	- AM 700 (Trial) - MPEG IMX
4) Broadcasting	- Digital Ni-cam Audio (Dual Language)
5) Any Other Tasks in "Broadcasting"	- MCOT 1 & MCOT 2: Digital Video Switcher and Digital Video Server

CHAPTER 8

THAI TV STATIONS IN TECHNOLOGICAL TRANSITION (PART 2)

This chapter presents research results from my observation of protocols at five TV stations[1] (of nine investigated TV stations) in Thailand between July 17, 2007 and October 3, 2007. I present the results in chronological order of my visits. These TV stations are as follows:

Channel 5	July 17, 2007
ASTV	August 7, 2007
Nation Channel	August 8, 2007
Channel 11	August 22, 2007
TITV	October 3, 2007

In this chapter, I give an overview of the current situation of technological employment in the Thai TV broadcasting industry in 2007. It reveals part of the operational circumstances of TV stations in Thailand during a technological transition at the point of

[1] ASTV and TITV did not consent to disclose the details of technological employment at the stations. These stations did not return the data collecting forms to the researcher.

switching from analogue to digital system, and also presents TV professionals' views on DTV technology. I present the results based on information gathered from my observations including, discussions with TV crews (audio-tape recorded), photographs, and a designated form filled by TV station representatives. I divide the report of each station into two sections:

Section 1: A report on a visit to the TV stations.

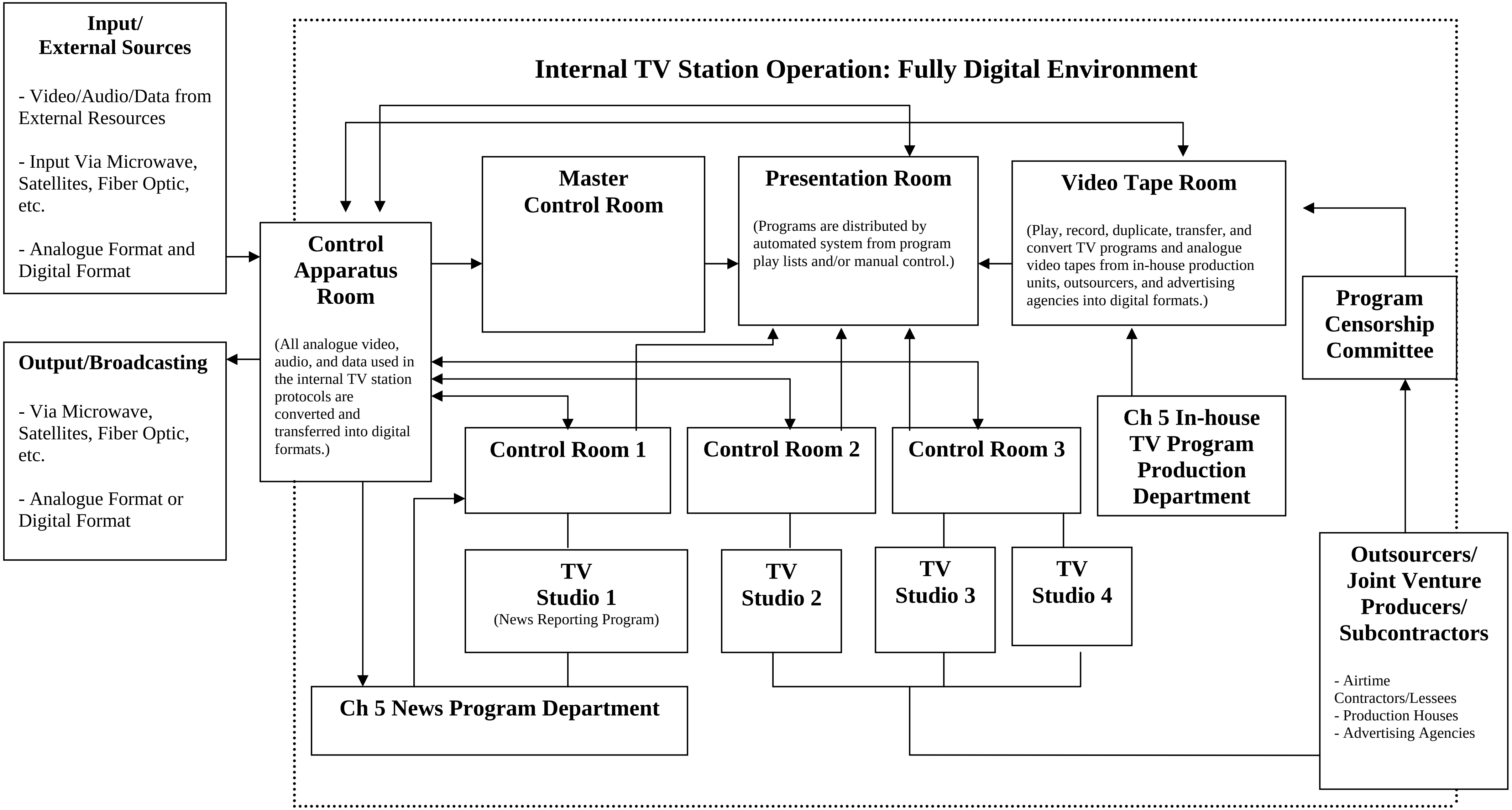
Section 2: The use of DTV technology at the TV station.

CHANNEL 5

SECTION 1: REPORT ON A VISIT TO CHANNEL 5

I observed a working protocol at Channel 5 on July 17, 2007. I had a discussion with a TV broadcasting engineer and a senior TV producer, who were my facilitators, guiding me on a one-day visit observing TV station operation at Channel 5. They explained the overview and working protocols at Channel 5. According to their explanation, I constructed a diagram presenting an overview of Channel 5's operation protocol.

Diagram 1: Television Station Operation Protocols of Channel 5 (Royal Thai Army Radio & Television Station: Observed on 17th July 2007)



As it can be seen from the diagram, Channel 5's internal operations are fully digital. Both senior staffs said:

> "Our administrators have had a very clear policy to shift Channel 5 into a fully digital TV station. The internal TV station operation protocol of Channel 5 has operated in a digital environment for years. This idea was been implemented a decade ago, in 1997; we started converting the main equipment then. All major internal protocols, i.e. TV studios, control rooms, CAR [Control Apparatus Room], master control room, in-house production department, and Channel 5's news bureau, now employ almost 100 percent digital equipment. We have been accustomed to this contemporary atmosphere for 10 years. We can claim that we are at the forefront of TV stations in Thailand in terms of being an innovation leader."

I asked if Channel 5 was ready for switching over to digital broadcasting transmission. The staffs replied:

> "Currently, the main hardware and software employed in the broadcasting unit and transmitters are capable of transmitting signals in a digital format. However, for the big picture, Thailand has not had a national plan to switch over to a digital TV broadcasting system. In addition, majority of households' TV receptions are not digital. At present, our station needs to convert an internally digital signal into an analogue signal before distributing it to the audiences. Another factor is that the external TV production agencies mainly submit analogue video master tapes to the station… Or we can say that the input and output protocols are not in a fully digital system. These above factors might be reasons why we could not go to a fully digital TV broadcasting system. For Channel 5, we firmly believe that we are ready to go digital."

At the time of my visit, Channel 5 transmitted TV signals in two formats: analogue and digital. An analogue transmission was broadcast for domestic terrestrial TV receptions. The digital format was for international satellite TVs, 'TV 5 Thailand Global Networks', and IPTV. The senior technician disclosed.

> "Our Channel 5 satellite uplink signals will be delivered to 'THAICOM 5' (a new Thai digital communication satellite) in the next several years, so at that moment all uplinked signals from Channel 5 will be fully digital"

A senior TV producer overviewed the TV program production procedure at Channel 5:

> "At the pre-production stage, substantially we do pre-production jobs principally by using computers, for example, doing a production research, writing a script, creating a story board, and so on. At the production stage, all TV studio and outdoor cameras are digital. We ceased using analogue Betacam video cameras years ago. We currently use a number of digital video cameras, such as Digital Betacams, HD [High Definition] video cameras, and DV cameras. For the Post-production stage, we employ non-linear editing stations and computer graphic stations. At the broadcasting phase, our unit is now capable of delivering digital signals through a wide range of digital platforms."

Therefore, in order to verify their technology and procedures' claims, I asked them to take me to visit all of Channel 5's major protocols as presented in the diagram.

AT THE CAR (CONTROL APPARATUS ROOM), PRESESENTATION ROOM, VIEDO TAPE ROOM, AND MCR (MASTER CONTROL ROOM)

A senior technician firstly took me to the CAR and Presentation Room. I observed that at the CAR there were more than ten huge mainframe computers. All the main equipment was in computerized-control system. I estimated that approximately 95 percent of devices in this room were digital, e.g. the video switcher, control boards, and mixers were digital.

A staff member at the CAR explained:

> "This room can be compared to the main entrance/exit for all external signals to the station. Channel 5 obtains a wide range of video, audio, multimedia, and data from external information resources, such as international news agencies, and global TV stations. These external information resources are transmitted via microwaves, satellites, and fiber optics. Then they are liked into the CAR. These signals are multiple: analogue and digital. CAR is in charge of arranging information traffic. We import the signals, manage information flow, and convert the incoming signals into the preferred formats. If the incoming signal is analogue, our duty is to convert it into digital (as it is a requirement of our internal protocols). The main authorised units at Channel 5 can retrieve digital video, audio, and data from the CAR. Our internal units at Channel 5 are digitally interconnected. Regarding the output protocols, CAR obtains signals and data from each unit, i.e. from the presentation room, videotape room, and control rooms, and then CAR delivers these signals to the broadcasting department. Channel 5 can transmit signals through microwaves, satellites, and fiber optics in both systems: analogue and digital format. In short, CAR is responsible for importing, arranging, converting, transferring and distributing all internal and external video/audio resources."

Picture 39: At CAR (Control Apparatus Room)

At the Presentation Room and Video Tape Room, a senior technician described the protocols at this unit:

> "All master tapes, completed TV programs, and TV commercials are sent to the Video Tape Room. If these materials are analogue, we convert them into a digital format. We have all types of video tape players and recorders (both analogue and digital). All TV programs are usually input and transferred into a daily program playlist. We have used an automated broadcasting system since 1998. We have a mechanical/ robotic arm, which can grasp and insert a tape into a video tape player for playing automatically."

At the time of my visit, however, the automation system was out of order. The staff claimed that:

> "We have used a 'Louth' automation system for almost ten years. So the system has become so old and has been in poor condition. We are repairing it and considering having a replacement. As a result, Channel 5 is temporally using a manual program presentation system for a while."

I asked a staff member at the Presentation unit if he had any problems using the automation system. He disclosed that:

> "Firstly, as the external production houses do not properly format the video tape time code to comply with the technical requirements of the TV station standards, it makes trouble for us because the automation system cannot run the listed programs smoothly. Secondly, in the case of emergency news and unexpected circumstances, it is quite complicated to insert urgent tapes and rearrange the broadcasting schedule on the automation playlists. So we normally employ two methods for presenting the TV programs: automatically and manually. Automation is punctual and quite helpful for arranging TV advertisements during commercial breaks and inserting TV graphics and animations, while the manual system provides us flexibility."

The senior technician explained the technology and procedure for data storage and retrieval:

> "Channel 5 uses a "Pinnacle" Media Stream Server for retrieving TV commercials and video clips into hard disks. We have increasingly used a video server as a central data bank and video archives for TV production and post-production protocols. We believe that the digital video server and archive will be very significant for DTV station operation in the future because every unit can share data between sub departments. In addition, the video server will be a benefit to distributing content via various types of digital multimedia platforms."

Picture 40: At the Presentation Room and the Video Tape Room at Channel 5

Picture 41: A Mechanical/ Robotic Arm for Inserting Video Tape into the Video Player

At the MCR (Master Control Room), a staff at the unit explained:

> "Our function is making a selection of video sources that we want to broadcast. Moreover, we have a duty of quality control. We have digital and computer checking systems, and also manually monitor protocol. All the main hardware and software are in a digital format."

Picture 42: At MCR and Control Rooms

AT THE TV STUDIOS

The senior technician explained:

> “There are four TV studios at Channel 5. Studio 1 is used for producing news reporting programs. Studios No. 2, 3, and 4 are used for filming other type of programs, especially by our in-house TV program production department, and joint venture TV production agencies. All TV studio cameras are digital and we use either digital Beta tape recorders or DV recorders, or capture and record the footage and programs in digital file formats. However, some programs which are produced by our joint ventures, might be recorded in an analogue Beta tape format.”

Picture 43: At a TV Studio

AT CHANNEL 5’S IN-HOUSE TV PROGRAM PRODUCTION DEPARTMENT AND OB (OUTSIDE BROADCASTING) UNIT

A senior TV producer at the TV program department summarised the current technology used for production at Channel 5.

> “For the production protocol at Channel 5, we can claim that we employ digital technology over 95 percent. In terms of gathering information, generating scripts, and pre-production, we use computer-based technologies. For the filming and recording, we use DV cameras, Sony Digital Beta cameras, and a number of HD cameras. We employ digital audio recorders and DAT (Digital Audio Tape) for sound recording. At the post-production stage, we employ digital non-linear editing stations “Velocity Q”, which can give us a very professional outcome. For the graphics and animations, we use a wide range of computer graphics hardware and software such as 3D Max Studio, Adobe Illustrator, Adobe Photoshop, and Adobe After Effect.”

At the OB unit, a senior staff member at the unit explained:

> "Now we have 3 OB vans: one is a fully digital operation system, another one is analogue, and another one is a shared analogue and digital system. And in the next months [August-September 2007], we will have a High Definition OB van including HD cameras and recorders."

Finally, the senior TV producer and the senior TV technician explained the nature of the station:

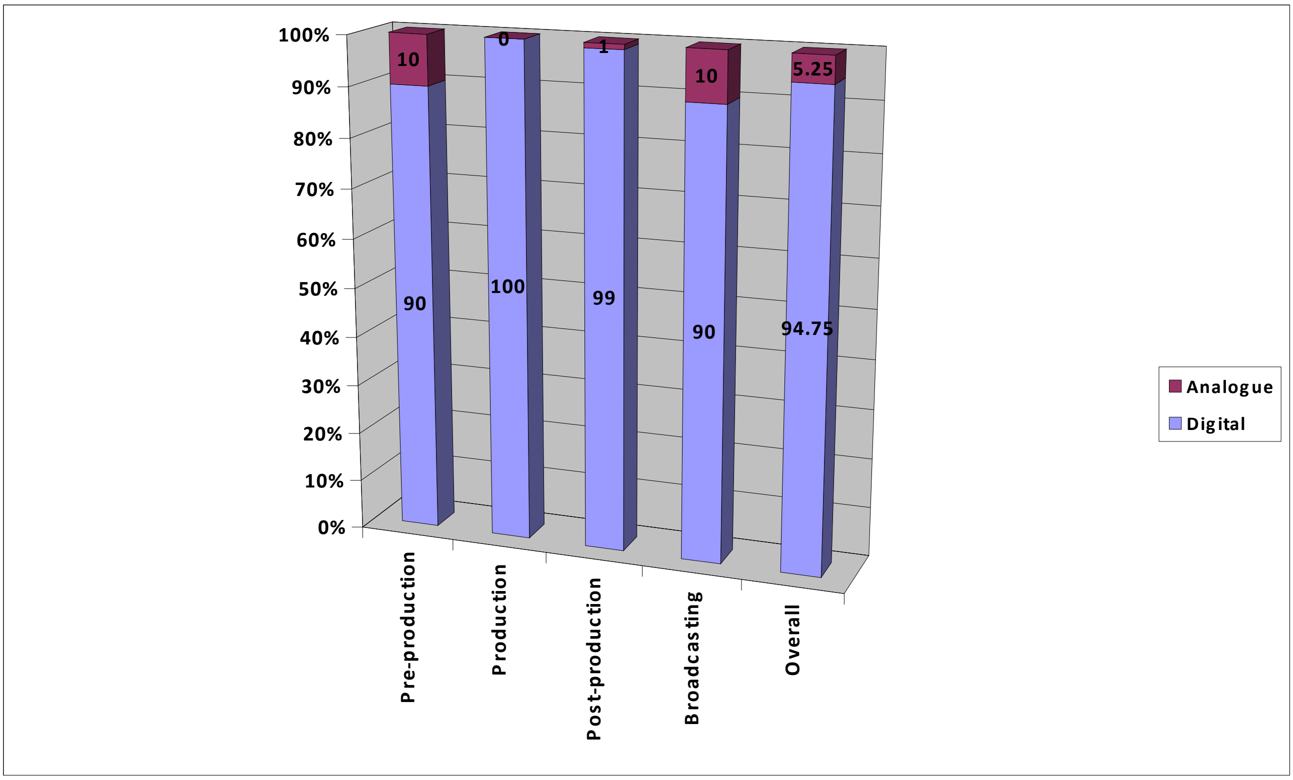
> "As we are an army-owned TV station, our board of directors holds full authority in directing the technological direction of our TV stations. So this might be a factor explaining why we can convert to digital quite progressively if we compare with other stations and our competitors."

SECTION 2: THE USE OF DTV TECHNOLOGY AT CHANNEL 5

PROPORTION OF TECHNOLOGICAL EMPLOYMENT (JULY 2007)

The figure below presents the proportions of technological employment (analogue versus digital) at each stage of Channel 5's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The proportion was estimated by Channel 5's representatives in July 2007.

Figure 9: Proportion of Technological Employment in TV Station Operation at Channel 5 (July 2007)



MAIN DIGITAL HARDWARE AND SOFTWARE (JULY 2007)

The tables below list the main digital hardware and software at each stage of Channel 5's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The information was given by Channel 5's representatives in July 2007.

Table 29: Details of Main Digital Hardware and Software Used in Pre-production Protocol at Channel 5 (July 2007)

Tasks	Details of Main Digital Hardware and Software
1) Planning and Preparing Production	- Internet and Email (for searching information and communication) Software: Microsoft Office (for documenting letters, plans, program outline)
2) Writing and Preparing Scripts	- E-mail, Internet (for searching information and communication) Software: Microsoft Office (for writing scripts)
3) Creating a Story Board	The staff did not provide any details.
4) Preparing for Video and Audio Recording	The staff did not provide any details.
5) Designing Sets, Props, and Artwork	The staff did not provide any details.

Table 30: Details of Main Digital Hardware and Software Used in Production Protocol at Channel 5 (July 2007)

Tasks	Details of Main Digital Hardware and Software
1) Shooting and Recording Video in TV Studio	- Digital Video Camera (Sony Digital Betacam, digital studio camera) - Digital Video Switcher - Digital Audio Mixer - Digital Beta Video Tape (Sony)
2) Shooting and Recording Video on Location/Outdoor	- Digital Video Camera (Digital Betacam, DV Camera)
3) Audio Recording	- DAT (Digital audio Tape) - Wireless Microphone
4) Any Other Tasks in Production.	- Digital OB (High Definition)

Table 31: Details of Main Digital Hardware and Software Used in Post-production Protocol at Channel 5 (July 2007)

Tasks	Details of Main Digital Hardware and Software
1) Inputting, transferring, capturing, and processing digital video format and/or video files and/or digital images into editing station.	- Video and images are digitized, captured, and transferred into digital formats, such as AVI, MPEG, JPEG, TIFF before editing. Software: Velocity Q
2) Inputting, transferring, capturing, and processing digital audio format and/or audio files into editing station.	- Audio sources are digitized, captured, and transferred into digital formats before editing. Software: Velocity Q
3) Non-linear Video/Audio Editing	- Non Linear Editing Stations Software: Velocity Q, Adobe Premiere, etc.
4) generating Graphics, Animations, and Special Effects	- Computer Graphics Stations Software: 3D Max Studio 9, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, etc.
5) Outputting the Completed TV Program into Digital Formats	- All completed and edited programs are output into digital video format.

Table 32: Details of Main Digital Hardware and Software Used in Broadcasting Protocol at Channel 5 (July 2007)

Tasks	Details of Main Digital Hardware and Software
1) Program Scheduling/Automation	- "Louth" Automated Broadcasting System - "Pinnacle" Media Stream Server (for retrieving and running TV commercials and station promotion spots)
2) Archiving and storing Digital Videos and Files	- "Pinnacle" Media Stream Server (for retrieving TV commercials and station promotion spots)
3) Monitoring and Quality Control of TV Program Broadcasting	- "Louth" Automated Broadcasting System - Digital Switcher - Digital Wave Form Monitor (video & audio)
4) Broadcasting	- Digital Video Broadcasting System (available) - Digital Modulator (available)

ASTV

SECTION 1: REPORT ON A VISIT TO ASTV

I observed a working protocol at ASTV on August 7, 2007. The TV station administrator assigned a TV technician to facilitate my visit. The technician introduced the TV station and its technology:

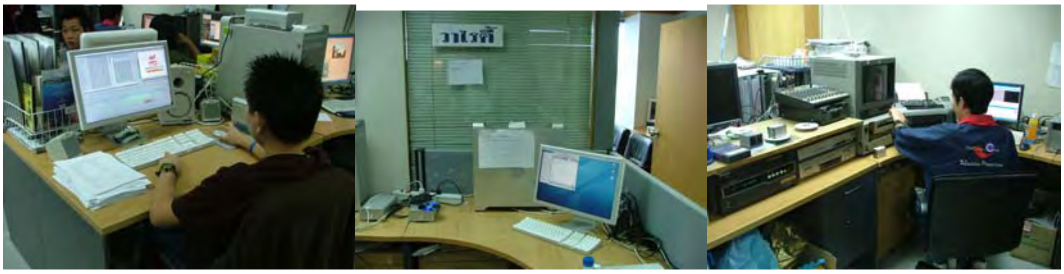
> "ASTV was started in 2005. We can say that ASTV is one of the newly established TV stations in Thailand in recent years. The recently purchased equipment for TV station operation and TV program production are majorly computer-based technology or involved with digital technology. In other words, over 80 percent of hardware and software at our station is digital."

AT THE POST-PRODUCTION AND COMPUTER GRAPHICS UNIT

The technician took me to see the post-production and computer graphics desks. The technician explained:

> "ASTV employs a non-linear video editing system for producing TV programs and spots. Most of the editing stations and computer graphic operations are run on McIntosh computers. The main editing and computer graphics software are 'Final Cut Pro' and the Adobe software suite. Majority of recording video materials are digital. However, there are some in analogue format, especially videotape from external program production houses and advertising agencies. We transfer these analogue tapes into a digital file in a 'MOV' format, capturing them on hard disk, in video server or digital video library. Editors can retrieve these video files for editing by using the 'Final Cut Pro' software."

Picture 44: Non-linear Editing and Computer Graphics Stations at ASTV



AT THE NEWS BUREAU AND TV STUDIOS

A staff member described the technology used for recording and editing:

> "We use 'Canon' mini DV camcorders for filming the outdoor news. We have more than 20 camcorders. As these cameras are very tiny, they are suitable for field work. For the editing operations, we use non-linear video editing stations running on McIntosh computers. We use 'Final Cut Pro' software for editing the video news clips."

Picture 45: At the TV Studios

At the TV studio, a staff member described the process at the studio:

> "There are 4 studios at ASTV. These are mainly used for producing TV news programs and discussion programs. We either capture the filmed video signals from studios into hard disks/servers in the form of a 'MOV' digital file by using the 'Final Cut Pro' software, or record it onto a DV tape. As the digital file is transferred from the studio control room to the server, we can instantly deliver TV signals from our station in Bangkok to the satellite uplink station in Hong Kong. So our satellite viewers from many countries around the world can see a live program directly from the studio at almost the same time of filming a live program in the studio. The main equipment employed in the studio and control room is computer-based, such as a video switcher; however, several analogue TV studio cameras are still in use."

Picture 46: At the News Bureau and TV News Production Unit

AT THE MCR (MASTER CONTROL ROOM) AND VIDEO SERVER ROOM

A staff member explained the use of technology in the MCR:

> "Majority of completed and edited programs are either stored in digital file formats or exported into digital video tapes. These formats make presenting and distributing the programs easy. Most of the completed files are stored in a server, then they are inserted into a computerized program playlist. Subsequently, these completed program files are transmitted to the uplink station via the internet. ASTV does not have a license to broadcast the programs on a terrestrial TV platform. Therefore, our station delivers TV signals to the uplink satellite base in Hong Kong. The viewers can watch ASTV from a satellite reception dish."

Picture 47: At the MCR

At the video server unit, a staff member explained:

> "All incoming resources such as news clips from news agencies, selected video data from the internet, captured video footage, recorded and selected video files from studios and from other departments are stored in a video server and categorized into specific folders. These files and footage are encoded. The server system is very useful for editors and producers. They can call all related files to their video editing stations for producing the programs. Then the completed programs are sent back to the server. I think that this system makes the production and TV station operation a lot easier."

Picture 48: At Video Networking Room and Video Server

SECTION 2: THE USE OF DTV TECHNOLOGY AT 'ASTV'

A PROPORTION OF TECHNOLOGICAL EMPLOYMENT (AUGUST 2007)

MAIN DIGITAL HARDWARE AND SOFTWARE (AUGUST 2007)

***Remark:** ASTV did not consent to disclose the details of technological employment at the station. The station did not return the data collection form to the researcher.

NATION CHANNEL

SECTION 1: REPORT ON A VISIT TO NATION CHANNEL

I visited Nation Channel to observe a TV station protocol on August 8, 2007. A senior staff member who was in charge of guiding me on my visiting at Nation Channel explained the situation:

> "If we compare Nation Channel with other traditional TV stations, we can see that Nation Channel is totally different to those because I think that we'd better define ourselves as a content provider rather than as a TV station operator. Nation Channel stresses producing content and distributing program through various genres of media. TV is one of our main platforms. Moreover, physically Nation Channel has only several floors for operating the TV production protocols, while other TV stations have huge studios and enormous work spaces. Nation Channel can claim that we are an alternative station because firstly, our station emphasises the concept of being a 24 hour news channel. The main programs on our station are news. Secondly, our target audiences are those who are highly interested in informative programs. We do not have so many entertainment programs as the free TV stations do. Or we can say that we are a niche TV channel."

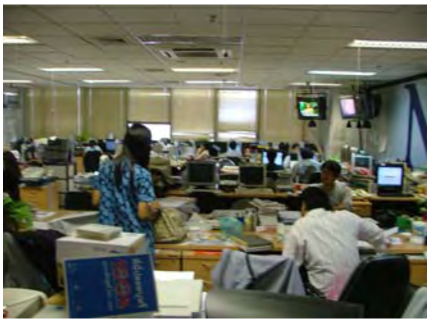
AT NATION CHANNEL'S NEWS BUREAU, TV NEWS STUDIO, AND TV STUDIO CONTROL ROOM

I began my visit by observing Nation Channel's news bureau. A staff member at the news bureau explained the overview of working protocol at Nation Channel:

> "We divide our bureau into sub news desks, such as a politics desk, a current affairs desk, an economics desk, a sport desk, an entertainment desk, etc. In regards to the technological employment, we employ a mixture of technological systems [analogue and digital] supporting our works. For example, regularly our routine starts with using the internet [as

a digital communication tool], searching and updating news from international news agencies or retrieving news from satellites [as a digital communication channel], then recording these news reports into a Betacam video tape [an analogue video tape format], or a Beta SX/ DVC Pro video tape [a digital video tape format]. After that these tapes are sent to each news desk. The news writers use our designated scriptwriting computer software [digital software] for writing TV news scripts. Subsequently we use either a linear [analogue] or a non-linear [digital] video editing station, a computer graphics generator, and a digital audio mixer to produce TV news reports. Then we export this to either analogue or digital tape."

Picture 49: At Nation Channel's News Bureau



At the TV news studios and control rooms, the senior staff member explained:

"There are two main TV studios and one mini studio at Nation Channel. Studios No. 1 and 2 are used for producing live programs. At studio No. 1, all 3 TV studio cameras are analogue format but we record the filming and output video signals into DVC Pro video tapes [digital format]. We have a plan to change all filming, recording, and editing systems into digital format around next year in 2008. We plan to record all filming material in the digital file format MPEG2."

Picture 50: At TV News Studio and Studio Control Rooms

At the studio control room No. 1, a staff member said:

> "The main equipment in this room is digital, including the 'CVG Model 2200 and 1200' video switchers and controllers, 'Sound Scape' digital audio mixers, and 'Inscriber CG' computer graphic generators. However, the overall technological system of our production procedure at this unit can be described as a combination environment. To put it simply, the incoming signal from the TV studio cameras into the digital switcher is analogue so the signal must be converted from A [analogue] to D [digital]. Then all processing signals/programs need to be either (i) sent to the 'VSR 2000' video server in a digital format or (ii) passed to the master control room and converted from 'D [digital]' into 'A [analogue]' for recording onto an analogue tape."

AT THE PRODUCTION DEPARTMENT

For the overall TV program production (pre-production, production, and post-production), the senior staff member estimated that:

> "the overall proportion of analogue equipment versus digital equipment would be 50:50. Nation Channel still employs analogue video cameras for outdoor productions despite the fact that we have recently purchased a number of digital video cameras for our TV program production."

I noticed that there were both formats of video editing stations at the Nation Channel. The analogue Betacam video editing stations remained in use, especially at the news bureau, while there were also a number of digital non-linear editing stations at the channel.

A video editor explained:

> "For the video editing software at Nation Channel, we employ a wide range of programs, but the main software includes 'Avid', 'Final Cut Pro', and 'Adobe Premiere'. I think that when the video server arrives next year [2008], this will move Nation Channel into a digital atmosphere."

Picture 51: Linear Video Editing Station versus Digital Video Editing Station at Nation Channel

At the audio studios, there were also many analogue audio studios, especially mini audio studios for producing news programs. There were several digital audio studios. I visited one digital audio studio and had a short discussion with a staff. He explained:

> "The audio mixer and main hardware at this studio are digital. This studio is used for producing TV commercial spots, and recording narrations for the imported programs, while other small studios are used for simple voiceovers on news video clips or less complicated jobs. Although using a digital audio system provides more convenience than the analogue does, we cannot trash the analogue studios because these are still useful for producing news programs."

Picture 52: At an Audio Studio

At the computer graphics unit, a staff member described their use of technology:

> "We use over 80 percent digital and computer-based technology for generating the graphics and animations. We use most of the Adobe software series such as Adobe Illustrator, Adobe Photoshop, Adobe Premiere, Adobe After Effect, 3D Max Studio, and others."

Picture 53: At the Computer Graphics Department

AT THE MCR-MASTER CONTROL ROOM

A staff member at the MCR unit explained:

> "We control, arrange, and monitor incoming video and audio signals from the studio control rooms and other sources including signal from satellites, microwaves, and fiber optics. Our main equipment combines analogue and digital, due to the fact that we obtain both signal formats. For example, the external production agencies and advertising agencies send us master tapes in various formats: some send analogue Beta SP, some send digital Beta SX, some send DVC Pro, and some send DVDs to us. So we have to have various types of players, recorders, and converters for making these formats fit our Channel's standard."

A senior staff member revealed:

> "Nation Channel is preparing to install a new video server system. We plan to integrate it as a part of the MCR operation. This new server will be installed next year [2008]."

Picture 54: At the MCR

AT THE PRESENTATION ROOM

At the presentation unit, a staff member explained that:

> "Nation Channel is a content provider so we do not have our own transmission networks. We distribute the programs by sending all packaged programs to (1) TTV [Thai TV] via a fiber optic, and (2) a satellite transmission service provider who sends our programs via satellites to other customers who are subscription/cable TV operators in the provinces. Therefore, from the perspective of program distribution technology if we consider these two distributing methods, we can say that we use digital technology as a foundation for presenting the programs. However, considering the hardware and software that are currently used, there are some analogue devices supporting the operation."

AT NATION'S NEW MEDIA UNIT

Besides distributing programs via the two aforementioned platforms, Nation Channel also offers content via other digital platforms: the Internet (streaming videos and IPTV), and in the form of a blog 'Nation Blog'. A webmaster of Nation Blog stated:

> "We use these platforms for distributing the content from Nation Channel and our newspapers ('Nation', 'Bangkok Biznews', 'Komchadluek'), and also we produce specific content uploaded to the internet. Moreover, we have recently opened a new platform 'Nation Blog', which provides an opportunity for Nation's crew and general users/audience to create their own content (video, audio, photos, articles, etc) and present it on the website. I notice that there were many people joining and applying to become members of our Blog. Each day there are a number of video and news reports produced by the members. In addition, we have launched a content service for new generations who use 'iPod'. Our mission aims to be a multimedia service provider."

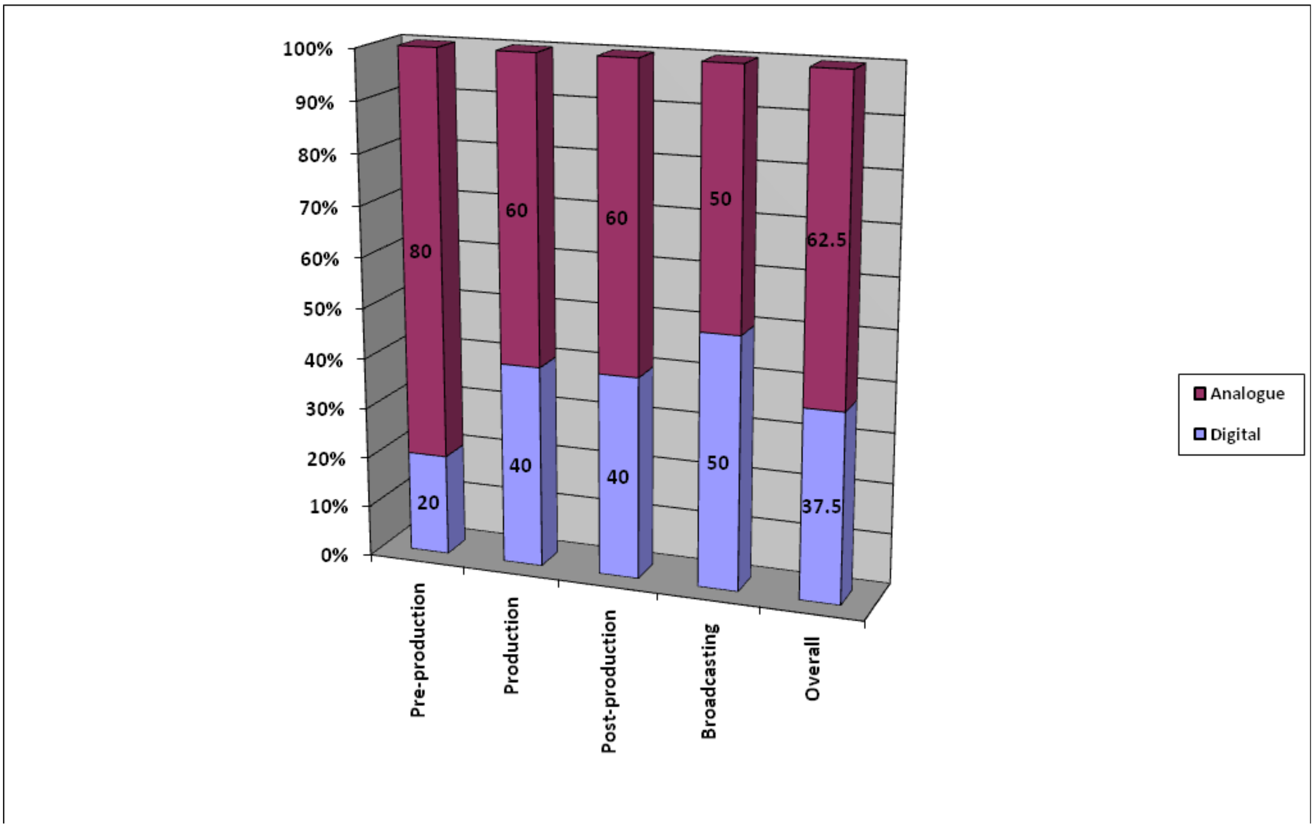
Picture 55: At Nation Channel's New Media Operation

SECTION 2: THE USE OF DTV TECHNOLOGY AT NATION CHANNEL

PROPORTIONS OF TECHNOLOGICAL EMPLOYMENT (AUGUST 2007)

The figure below presents the proportions of technological employment (analogue versus digital) at each stage of Nation Channel's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The proportion was estimated by Nation Channel's representatives in August 2007.

Figure 10: Proportion of Technological Employment in TV Station Operation at Nation Channel (August 2007)



MAIN DIGITAL HARDWARE AND SOFTWARE (AUGUST 2007)

The tables below list the main digital hardware and software at each stage of Nation Channel's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The information was given by Nation Channel's representatives in August 2007.

Table 33: Details of Main Digital Hardware and Software Used in Pre-production Protocol at Nation Channel (August 2007)

Tasks	Details of Main Digital Hardware and Software
1) Planning and Preparing Production	- Internet and Email (for searching information and communication) Software: Microsoft Office (for documenting letters, plans, program outline)
2) Writing and Preparing Scripts	- E-mail and Internet (for searching information and communication) Software: Microsoft Office (for writing a script)
3) Creating a Story Board	- computer graphic stations Software: 3D Studio Max, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, Inscriber CG.
4) Preparing for Video and Audio Recording	- The staff did not provide any details.
5) Designing Sets, Props and Artwork	- computer graphic stations Software: 3D Studio Max, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, Inscriber CG.

Table 34: Details of Main Digital Hardware and Software Used in Production Protocol at Nation Channel (August 2007)

Tasks	Details of Main Digital Hardware and Software
1) Shooting and Recording Video in TV Studio	- digital video switcher: "CVG Model 2200, 1200"
2) Shooting and Recording Video on Location/Outdoor	- digital video switcher: "Sony"
3) Audio Recording	- The staff did not provide any details.

Table 35: Details of Main Digital Hardware and Software Used in Post-production Protocol at Nation Channel (August 2007)

Tasks	Details of Main Digital Hardware and Software
1) Inputting, transferring, capturing, and processing digital video format and/or video files and/or digital images into editing station.	- The staff did not provide any details.
2) Inputting, transferring, capturing, and processing digital audio format and/or audio files into editing station.	- digital audio mixer: "Sound Scape"
3) Non-linear Video/Audio Editing	- non linear editing stations Software: AVID, Final Cut Pro, Adobe Premiere, Inscriber CG
4) Generating Graphics, Animations, and Special Effects	- computer graphic stations Software: 3D Max Studio, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, Inscriber CG.
5) Outputting the Completed TV Program into Digital Formats	- The staff did not provide any details.

Table 36: Details of Main Digital Hardware and Software Used in Broadcasting Protocol at Nation Channel (August 2007)

Tasks	Details of Main Digital Hardware and Software
1) Program Scheduling/Automation	- The staff did not provide any details.
2) Archiving and Storing Digital Video Files	- The staff did not provide any details.
3) Monitoring and Quality Control of TV Program Broadcasting	- Digital Master Control Switcher - Digital Broadcasting Measurement (Video & Audio)
4) Broadcasting	- Digital Video Server: "VSR 2000"
5) Any Other Tasks in Broadcasting	- Broadband and Internet Protocol TV

CHANNEL 11

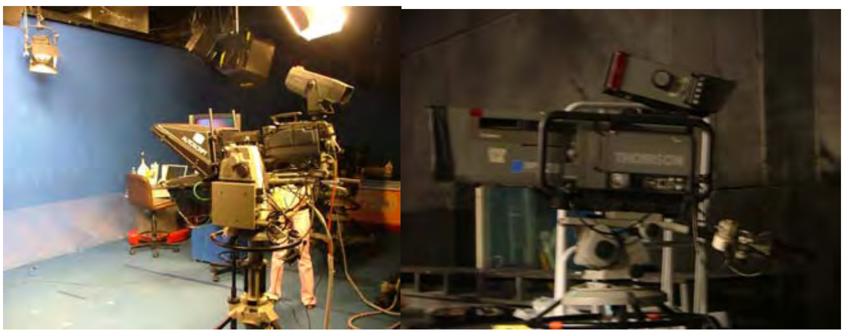
SECTION 1: REPORT ON A VISIT TO CHANNEL 11

I conducted an observation at Channel 11 on August 22, 2007. In the morning, a representative of Channel 11 took me to the TV studios, master control room (MCR), and control apparatus room (CAR). Then, in the afternoon, I had a chance to observe and discuss with staff at the TV program production department, the news program production department, and the outdoor broadcasting (OB) unit.

AT THE STUDIOS AND STUDIO CONTROL ROOMS

I spent approximately an hour observing at this site while the staff were working in the studio and control room. I noticed that majority of the main equipment in the studio was digital. There are three TV studios at Channel 11: (i) a small studio used for producing TV news programs; (ii) a medium studio used for filming talk show and discussion programs; and (iii) a large studio used for producing special TV programs, for example, significant events, live programs, plays and concerts.

<u>Picture 56</u>: TV Studio Cameras at Channel 11



I asked a member of staff to give an overview of TV studio program production at Channel 11. He explained:

> “TV production in the studios at Channel 11 employs SD [Standard Definition] technology for filming and recording video. This means all videos and images produced in the studios are digital SD [Standard Definition]. However, for the audio recording, Channel 11 still uses analogue technology.”

He claimed that the reason analogue equipment still remains in use is that:

> “There is a lot of analogue audio equipment, for instance microphones, audio mixers, that is still in good condition and can provide a good quality for TV production. In addition, in order to save the budget, staff and station agree to use analogue equipment for recording sound in the studios. However, these audio sources are converted into a digital audio format and integrated with the video before the program is edited and distributed.”

Picture 57: A TV Studio Control Room at Channel 11

A staff member at the control room explained the main functions at the unit:

> “For the programs produced in the TV studios, all video and audio from each studio are delivered to the master control room in order to make a selection for signal distribution. Then the selected programs are sent to the CAR. Eventually, the selected programs from the CAR are transmitted via fiber optic to Channel 11’s presentation and broadcasting department at New Phetchaburi Rd, which is Channel 11’s satellite station [used for TV signal uplink and downlink operation in order to obtain and/ or deliver signal from/ to the overseas and Channel 11’s network TV stations throughout the country]. We uplink the signals to the satellite in the MPEG 2digital format and then our networks also receive and downlink the signal in the digital format. The above protocols can be claimed as a fully digital procedure. However, at the final stage, terrestrial TV transmission, all signals must be converted to analogue before transmitting this to household analogue TV receptions. The Thai broadcasting system has not yet been converted into a digital system. Channel 11 has had some trials of transmitting program in a digital format; these trials have remained in a pilot project in the capital areas [Bangkok] and a few major provinces.”

I entered a Digital Virtual Studio. A staff member introduced the purpose of the studio:

> "This digital virtual studio at Channel 11 has become essential for producing TV programs at Channel 11, especially for producing talk shows and discussion programs. The background of the set is painted in blue. By using digital visual effects, the computer graphics designer can generate three dimension or 3D virtual sets, which is very helpful for generating a spectacular set, convenient, and less-time consuming for program production preparation. Since the Digital Virtual Studio was first employed in 1997, this innovation has made video shooting in the studio simple. In the past, we used a simple blue screen technique and we could only insert simple motion pictures or still images for generating backgrounds or sets. This technique was too plain and it provided dimensionless, non-realistic, and flat images. The digital virtual studio eliminates the limitations of the analogue blue screen technique. We can generate backgrounds and sets that look more real and flexible. Another apparent benefit of the digital virtual studio is that the station can economize on the cost of set building and travelling for outdoor production. However, there remain some criticisms such as lack of atmosphere of the backgrounds and the working environment."

Picture 58: Digital Virtual Studio and Virtual Generator at Channel 11

Before filming programs in the digital virtual studio, producers and the production team need to design the input backgrounds/sets, which could be still images and/or moving images and/or inserted video footage. Then the graphic designer composes all these materials together using the virtual studio software.

AT THE MCR (MASTER CONTROL ROOM) AND PRESENTATION ROOM

The MCR (Master Control Room) was combined with the Presentation Room. Staff in this room had a double function, which was (i) making selections and controlling all video, audio, and data sources from the three TV studios and from the CAR (Control

Apparatus Room) and (ii) presenting programs on air as a function of the Presentation Unit. These sources were digitally linked to the MCR (Master Control Room).

Channel 11 uses BETA SX, which is a kind of digital video tape format, for recording, producing in-house programs, and playing programs/broadcasting. However, the outsource producers send tapes to the station in both formats: analogue and digital.

Picture 59: MCR-Master Control Room & Presentation Room

A staff member stated:

> "Many outsource production houses still send analogue master video tapes to the channel. Technically, we have to have a wide range of video players and recorders so we can make these analogue tapes compatible with our broadcasting standard. All completed programs/tapes are sent to the MCR/Presentation Room. Tapes are converted into a standard format before being put into the video player."

Channel 11 has an automated program playlist system, which can automatically play inputted video tapes and/or TV programs from the list. However, Channel 11 does not use the automated system to its full capability. The automation is only used for running TV commercial spots.

A staff member explained the reason for not using automated system in full:

> "The automated system is not certain. It is not convenient to use this [they are accustomed to manual play that has been used for many years]. Playing program in a manual style, if there is any technical error, we can solve the problem easier than if something goes wrong in the automation. For example, when the tape is stuck in the player, we can take the tape

> off or we can replace the tape instantly. If the automation goes wrong, we cannot fix the problem right away."

AT THE DIGITAL VIDEO SERVER UNIT

There are digital video servers employed in Channel 11. One set in the MCR was used for storing all broadcast programs in a digital format. This video server was set up to record all broadcast programs automatically. The stored programs can be recalled and rechecked, especially in case of any unexpected mistakes. The video server is used as a storage unit and a monitoring system. A staff member explained:

> "We use the video server for monitoring and recording functions: one channel for recording the real-time broadcast programs, another channel for monitoring the technical quality of the programs."

There are also digital video servers in some departments, such as the stand-alone video servers of Channel 11's news bureau (containing imported video and audio files) linked to the post-production and program editing units.

AT THE CAR (CONTROL APPARATUS ROOM)

At the CAR (Control Apparatus Room), this room is an I/O or input and output control unit of the station. All incoming outsources of video, audio, and data delivered via satellites, fiber optics, microwaves, and the internet into Channel 11 firstly imported into CAR. A senior technician described the situation:

> "The main hardware and software in CAR is operated under a computerised control. We can say that the signals that pass through CAR [in/out] are now more than 95 percent digital. CAR is in charge of distributing video and audio to the digital video servers or to the main production and broadcasting units, i.e. TV studios, news bureau, MCR and Presentation Room, etc."

The staff member explained the outputting signal protocol:

> "The major signal distribution gates of Channel 11 can be divided into two routes. For terrestrial transmission, we send the TV signals directly to the transmitter at Bai Yok Building by using a microwave. The coverage area of this transmission covers Bangkok and surrounding provinces in the central region of Thailand. For satellite transmission, we transmit the digital signal from Channel 11's mother station at Vibhavadee Rangsit Rd via fiber optics to our satellite uplink unit at New Phetchaburee Rd Then the signals from the satellite are down-linked by our regional network stations throughout the country."

I asked the staff member in CAR about his view regarding DTV technology. He stated:

> "One of the apparent benefits of using digital technology for broadcasters and TV audiences is that we can manage satellite bandwidth usage effectively. For instance, Channel 11 leases one 'Thai Com Satellite' transmission transponder (36 MHz). For the analogue system we found difficulties and limitations with uplink and downlink of our TV signals, as the analogue satellite takes up a large bandwidth for transmitting the signals. On the contrary, digital technology can provide more flexibility and add up to ten extra transmitting channels in one transponder. Therefore, Channel 11 can manage multiple channels for our eight sub-regional TV stations.
>
> Practically, we can share and exchange news and programs from our regional stations, and it will be very useful for our live program productions. In other words, each regional network can freely produce their local content that serves the local audiences. The audiences will receive various programs from different cultures and dialects from local producers. Audiences can see what they want to see in their area. They do not have to see what the centre forces them to watch. In the future, when the digital broadcasting technology is fully implemented in Thailand, Channel 11 has a plan to transmit multiple TV channeling: one is Channel 11 from the centre, and others will be from regional stations."

AT CHANNEL 11'S NATIONAL NEWS BUREAU

I talked with staff at this department, who explained:

> "The digital video server system has become essential for Channel 11's news program production. It can be described as a heart of modern news program production, due to the fact that it makes news program production faster and much more convenient compared with an analogue or traditional news gathering style."

Picture 60: A Digital Video Server at Channel 11's National News Bureau

A senior technician at Channel 11's National News Bureau said:

> "Channel 11's National News Bureau has employed the news server since 2000 obtaining news from international news agencies such as Reuters and AP [Associate Press]. These external news sources are sent via satellite and the signals are in digital formats. All data and information obtained is stored in the video servers. Then the news production crews select and retrieve these digital files for translating, making voiceovers, and editing. The original news clips, data, video and audio, text, and edited programs are stored in digital formats which can be easily re-edited, deleted, converted, and retrieved."

The technician explained the details of the outdoor news production process:

> "Channel 11's National News Bureau crews mainly use 'DVC Pro' digital video cameras for producing news reports in the field. However, there are some news production events where news crews use BETA SP analogue video cameras. In the case of using the analogue video camera, the recorded video from the analogue tapes is converted into a digital format before being edited. Eventually, the recorded video and audio from outdoor shooting are imported into the digital video server. The video editors and news producers at Channel 11 retrieve the digital files and edit them by using the non-linear video editing stations. Then all completed news clips are indexed and composed into a news program.
>
> Many outdoor news reporters and production teams at Channel 11 now employ PC or laptop computer editing devices, generating video news clips by using various video editing software: Adobe Premiere, Adobe Final Cut, Ulead Studio. Then the reporters send the video clips (standard format is MPEG 2) to the station via the internet and upload them to the station's servers."

For the production and post-production protocol in the news studio, he explained:

> "This part is highly related with the digital technology, i.e. filming and recording the news reporters or hosts by digital studio video camera, using the digital virtual set. The news clips are retrieved from the digital video server, completed and recorded in a digital format into a digital archive. Texts and graphic on screens are generated by computer software."

The senior staff disclosed that besides distributing content via the traditional platforms,;

> "Channel 11's News Bureau plans to deliver digital content, audio and video news clips to mobile devices and now we are trialing this project. So I think that this project will be launched in the near future."

AT THE TV PROGRAM PRODUCTION DEPARTMENT AND VIDEO EDITING/ POST-PRODUCTION ROOMS

A member staff at the unit stated:

> "There are many types of digital video cameras and recorders that are currently used for video shooting and recording such as Digital BETA SX video recorders [since 1997], XD cameras [since 2006], and Sony Mini HDV cameras [since 2006]. These digital video cameras and recorders have gradually replaced the analogue system, the BETA SP cameras and video recorders that have been used for TV program production for more than ten years [since 1993]. For the Post-production protocol, there are six video editing/post-production rooms, which comprise four digital non-linear editing stations [Post-production rooms No. 1, 4, 5, and 6], two linear-editing stations [Post-production room No. 2 and 3]. Post-production room No.3 is also used for converting video and audio signal from A to D [Analogue to Digital], and from D to A [Digital to Analogue], facilitating TV program producers' editing protocol in case of using footage, stock shots, or audio sources from various formats. The non-linear video editing stations are operated on PCs (Dell and HP) using video editing software: AVID, DPS, News Edit, and Adobe Premiere Pro."

AT THE COMPUTER GRAPHICS ROOMS

There were three computer graphics rooms in the department. These rooms were used for producing all graphics, titles, text, video effects, and TV spots. Each room has one set of computer graphic work stations (Dell or HP computers). A graphic designer described that:

> "We employ a wide range of software for generating graphic and visual effects; these software computer programs are 3D Studio Max, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, Title Deco, Inscriber CG, Illusion, Hollywood Effect, for instance."

AT THE OUTSIDE BROADCASTING (OB) UNIT

There were two Outside Broadcasting vans at Channel 11. The head of the Outside Broadcasting Unit explained:

> "These OB vans were donated to Channel 11 under the support of the Japanese government (JIGA) many years ago. Therefore, the main functions of these operation units are analogue. However, many accessories and equipment are obsolete and they are no longer manufactured. Therefore, a number of pieces of digital equipment have replaced some functions. The OB vans have become hybrid: 80 percent analogue and 20 percent digital. Only the switchers and some hardware in these vans are digital, while the major parts are analogue."

<u>Picture 61</u>: Outside Broadcasting Unit at Channel 11

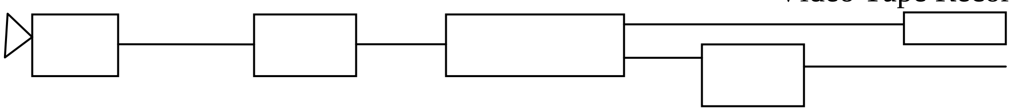
The head of the unit explained:

> "The outdoor cameras of OB units are analogue. The input signals are, therefore, analogue. So the analogue signals are converted [by a video signal converter] into a digital format before being imported into a digital video switcher. After processing through the switcher, the output signal can be transferred or delivered according to two options: (i) delivering directly to the digital video recorder or other digital output platforms, or (ii) reconverting the output signal into analogue format. The type of output signal varies with the objective of signal utility."

From this explanation, I have summarised the process in the diagram below.

<u>Diagram 2</u>: Outside Broadcasting Protocol

Video Tape Recorder



Camera (Analogue) A/D Digital Video Switcher D/A

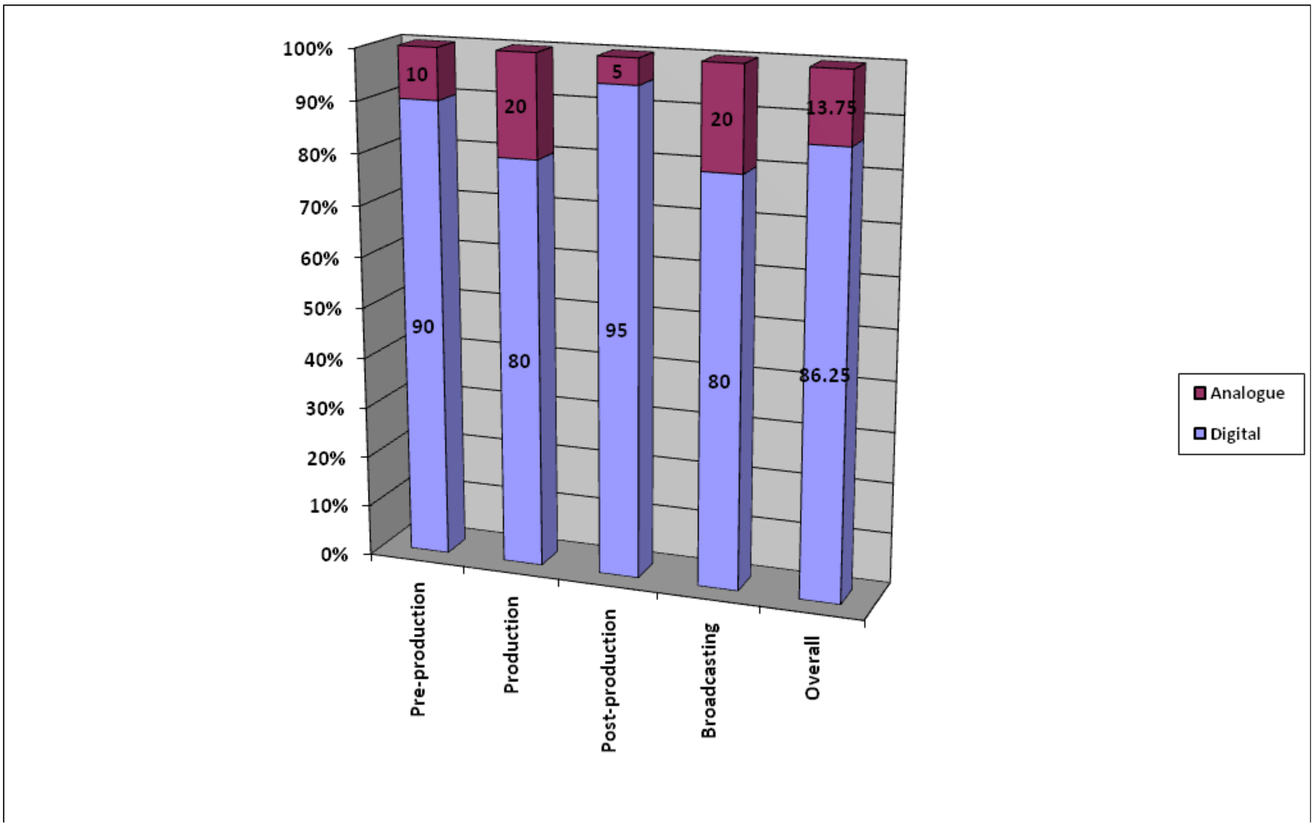
(Converter: Analogue to Digital) (Converter: Digital to Analogue)

SECTION 2: THE USE OF DTV TECHNOLOGY AT CHANNEL 11

PROPORTION OF TECHNOLOGICAL EMPLOYMENT (AUGUST 2007)

The figure below presents the proportions of technological employment (analogue versus digital) at each stage of Channel 11's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The proportion was estimated by Channel 11's representatives in August 2007.

Figure 11: Proportions of Technological Employment in TV Station Operation at Channel 11 (August 2007)



MAIN DIGITAL HARDWARE AND SOFTWARE (AUGUST 2007)

The tables below list the main digital hardware and software at each stage of Channel 11's TV station operation, i.e. pre-production, production, post-production, and broadcasting. The information was given by Channel 11's representatives in August 2007.

Table 37: Details of Main Digital Hardware and Software Used in Pre-production Protocol at Channel 11 (August 2007)

Tasks	Details of Main Digital Hardware and Software
1) Planning and Preparing Production	- Internet and Email (for searching information and communication) Software: Microsoft Office (for documenting letters, plans, program outline)
2) Writing and Preparing Scripts	- Email and Internet (for searching information and communication) Software: Microsoft Office (for writing scripts)
3) Creating a Story Board	- The staff did not provide any details.
4) Preparing for Video and Audio Recording	- The staff did not provide any details.
5) Designing Sets, Props and Artwork	Software: Adobe Photoshop, Adobe Illustrator

Table 38: Details of Main Digital Hardware and Software Used in Production Protocol at Channel 11 (August 2007)

Tasks	Details of Main Digital Hardware and Software
1) Shooting and Recording Video in TV Studio	- Digital Video Camera: Sony E10, Sony XD Camera, Sony Mini HDV Camera - Digital Video Switcher (DVS) - Betacam SX Video Tape - Digital Video Server System; Sony MAV-70
2) Shooting and Recording Video on Location/Outdoor	- Digital Video Camera: Sony XD Camera, Sony Mini HDV Camera, Sony Betacam SX
3) Audio Recording	- Digital Audio Recorder: Sony Mini Disk MDS-E12

Table 39: Details of Main Digital Hardware and Software Used in Post-production Protocol at Channel 11 (August 2007)

Tasks	Details of Main Digital Hardware and Software
1) Inputting, transferring, capturing, and processing digital video format and/or video files and/or digital images into editing station.	- Some video or TV news clips from outsources are captured and transferred into digital formats, such as AVI, MPEG, DVA, etc. before being edited and delivered to "GVG" Digital Video Server. Software: Pinacle, Matrox, and Leitch
2) Inputting, transferring, capturing, and processing digital audio format and/or audio files into editing station.	- Some audio sources are captured and transferred into digital formats before editing process. Software: Sony Sound Force
3) Non-linear Video/Audio Editing	- Non Linear Editing System on PC: Dell and HP Software: AVID, DPS, News Edit, and Adobe Premiere Pro
4) Generating Graphics, Animations, and Special Effects	- Computer Graphics Stations on PC: Dell and HP Software: 3D Studio Max, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, Title Deco, Inscriber CG, Illusion, Hollywood Effect, etc.
5) Outputting the Completed TV Program into Digital Formats	- Most edited TV programs are recorded in Beta SX videotape. - Some programs are output into MPEG 1 and/or MPEG 2, and/or AVI format. - Some edited programs are output into DVD or VCD.

Table 40: Details of Main Digital Hardware and Software Used in Broadcasting Protocol at Channel 11 (August 2007)

Tasks	Details of Main Digital Hardware and Software
1) Program Scheduling/Automation	Software: AVID Airplay
2) Archiving and Storing Digital Video Files	The staff did not provide any details.
3) Monitoring and Quality Control of TV Program Broadcast	- digital master control switcher - digital broadcasting measurement (video & audio) - EVS Server
4) Broadcasting	The staff did not provide any details.

TITV

SECTION 1: REPORT ON A VISIT TO TITV

I conducted an observation protocol at TITV on October 3, 2007. There were three senior officers facilitated my visit. One staff member was the head of the TV program production department, another was a senior technician at the department of broadcasting, and the other was an assistant to the station's Director. I discussed TITV operations with them, and they explained:

> "Since we established our TV station, we have been using DSL [Digital Serial Line], DNG[2] [Digital News Gathering] and DSNG [Digital Satellite News Gathering] at our TV news production department. We can claim that our station has been involved with digital environment since the early days of station establishment."

AT TV STUDIOS, STUDIO CONTROL ROOMS, AND MASTER CONTROL ROOM (MCR)

There are three master TV studios and two mini studios at TITV. The senior staff explained that "master studios No. 1 and 2 are used for TV news, master studio No. 3 and other smaller studios are used for producing entertainment shows and variety programs."

Picture 62: At a TITV Studio during Filming of a Live Program

[2] According to Silbergleid and Pescatore (2000: 296), DNG stands for digital news gathering: Electronic news gathering by using digital equipment and/or transmission.

I entered studio No. 1 while staff were filming a live program, then I visited studio No. 2 while TV crews were preparing for a breaking news program production. I noticed that all TV studio cameras in every studio, and the main equipment in the master control room, were digital. The staff explained:

> "There are 3-5 digital studio cameras in each TV studio. Analogue TV studio cameras have been retired and many of them are in very poor condition. Spare parts and accessories for analogue cameras are scarce. Manufacturers charge expensive fees for repairing. In addition, the analogues are not compatible with newly purchased equipment. That is why the analogue equipment has been faded out."

Picture 63: At a TV News Studio

At studio No. 2, I spoke to a staff member who was preparing the visual effect "Blue Screen". He explained:

> "The visual effect is very helpful for producing news reports and live programs because we can generate a virtual set and insert background images, animations, and graphics conveniently. It is very easy to put designated animations, video footage, and stocked images on screen, which can fulfill some content that cannot be described by narrations or sounds as we have limited time for presenting each news or program."

Picture 64: At a Studio Control Room

The main apparatus in the studio control room, i.e. video switchers, audio mixers, graphics generators, DVC-Pro digital video tape players/recorders, and operating software were digital. However, a staff member in the studio control room stated:

> "We cannot say that our TV studio production and studio control rooms are in fully digital operation because some analogue hardware remains in use. As you can see, there are many analogue devices and materials in these rooms, for example, video monitors, lighting controllers, and especially BETA video players and recorders. We still use BETA video players because most of external content providers and customers (advertisers), say approximately 70 percent, send master video tapes for broadcasting in a BETA analogue tape format. So our TV studios and control rooms at present are a mixture, or we can say that our protocols are in a technological transition that may take a while to move into fully digital operation."

At the MCR, TITV had merged a MCR and a presentation room into one unit. I noticed that over 70 percent of equipment in the unit was digital or on a computerized-control system. I asked if TITV had an Automated Program Broadcasting System. A staff member replied:

> "We have the automation but we have not used it. We run the programs manually. Anyway, we use it for arranging or listing the TV commercials. We think that the automation is not reliable. We have tried to use it but we found that, as our station always has live programs or breaking news reports, adding programs into the automation can negatively affect the consistency of overall broadcasting operation. Moreover, we found that it is too risky to use it because machine errors can happen at any time."

Picture 65: At Master Control Room (MCR)

AT CONTROL APPARATUS ROOM (CAR), INGESTION UNIT,

NEWS BUREAU AND DIGITAL VIDEO SERVER UNIT

The head of staff at the CAR explained:

> "Overall the operation at this department is involved with digital technology more than 90 percent. Our routine work is capturing, converting, storing, and arranging, all external video and audio signals and materials into digital formats, then we deliver them into the news bureau's digital video servers. Everyday, TITV's news bureau obtains data and news from a wide range of resources, which can be divided into two major sources: international and domestic. For the international resources, video signals are majorly obtained from satellites from international news agencies [Reuters and AP] and international content providers. All of the incoming video signals delivered via satellites are in the digital system. For the domestic resources, we obtain video signals from two major channels; satellite and the internet. Our regional TV networks deliver signals to the head station here in Bangkok via satellite. Our field/local news reporters use either satellite or the internet to send news clips and/or edited news reporting programs to the station. We use two digital file format standards, which are MPEG and WMW, for sending video news clips via the internet to the station's video servers."

Picture 66: Control Apparatus Room (CAR)

Both international and domestic signals are ingested into the department's video servers. And other video recording materials that come to this bureau mainly in digital formats such as DVC-Pro, Mini DV, DVD, are also captured on the servers. Some analogue tape formats such as BETA tape are still in use. These analogue video materials are converted into digital then delivered into the servers.

At the unit, a staff member explained:

> "We have eight ingesting machines operating on PCs. Each of them is assigned for ingesting each specific incoming video resource. Then all ingested digital video files are encoded, for example SPO 50001 means video files of imported Sport News video clip No.50001.These specific codes are well known and understood by internal and authorised staff. The coded video files in the servers are retrieved daily and transferred in and out of the video editing rooms for producing the news programs. At present, the capacity of digital video servers at TITV's news bureau can store approximately 300 hours of video. We manage and monitor the system regularly. Unnecessary video files are transferred into video recording materials or erased in order to maintain sufficient space and effectiveness of the operation. We also set up a sophisticated backup system including backup hard disks."

I asked the senior staff member about his opinion on employing digital technology. He was quite positive about the technology, arguing:

> "It is obvious that digital technology is better than analogue. In the aspect of TV news production, the digital video servers play an important role in producing TV news program. DTV technology responds to the nature of TV news production because it makes it easy to retrieve video and data to the editing stations. We can produce programs more quickly than we called using the analogue. That means that digital technology enables us to report very fresh news to the audience. In addition, digital technology really supports producing live news reports. We have used DSNG to send live video news reports via satellite to the station for years. It makes our station become a forefront TV news station. We usually obtain live videos from the field and present them instantly to the audience. Digital video technology is an important element of contemporary TV news production."

At the news bureau, a senior staff member of the bureau described the technology used there:

> "We have 9 video editing rooms consisting of 6 digital non-linear video editing stations, and 3 analogue editing stations. Our unit has digital video servers which enable us to retrieve video clips and footage for producing news programs. In addition, we have 6 DVC-Pro laptop editing stations. Our reporters use these laptops for editing news and urgent reports on location and either deliver the programs to the station's video servers via satellite by DSNG, or carry the edited tapes back to TITV. Using the portable video editing stations is very helpful for the reporters because they can produce a very fresh and live news report on location or at an event. Our outdoor video cameras are mostly DVC-Pro, which is in a digital format. Some analogue video format cameras remain in use as reserve cameras if the digital video cameras are fully occupied."

Picture 67: Portable Video Editing Stations (Laptops)

At the video server unit, a senior staff member explained:

> "All incoming news, video footage, and data from the contracted international news agencies and content providers are stored on the digital video servers in this room. We have 8 importing channels: 4 channels for importing signals from satellites, 3 channels for capturing signals from microwaves, and 1 channel for transferring video and audio from video tapes, which can obtain signals from the various external sources. We can say that all data, video, and audio in the archive are in digital format. The video server has storage space for keeping 300 hours' worth of video."

Picture 68: Network Control Centre and Network Monitoring System

AT THE NETWORK CONTROL CENTRE

The main assignments of the network control centre are to (1) uplink the TV signals from the station to satellite, which then distributes the TV signals from the head station to 10 network stations, (2) downlink the incoming TV signals via satellite, fiber optics, and microwaves from the network stations and external content providers, and (3) distribute the TV signals to TITV’s internal units.

A senior technician stated:

> “In short, this unit can be defined as a gateway and connector of the station. We import signals from the outside, for instance, we obtain the signals from the OB unit or the helicopter news reporting team, then we send them to CAR, MCR, TV studios, production units. Eventually, the selected and assigned broadcasting signals are sent back to us for uplink to the satellite ‘THAICOM 2’. Majority of hardware and software operating in this unit are digital.”

AT THE POST-PRODUCTION AND COMPUTER GRAPHICS DEPARTMENT

I visited the post-production and computer graphics (CG) department while the staff were working on assignments. I noticed that there were 7 editing rooms comprising 7 non-linear video editing stations using ‘Avid’ software.

I had a chance to talk with the head of the CG department regarding the details of the operation at the units. The head of staff stated:

> "The CG department is in charge of generating all key graphics and animations of TV programs, promotion spots, and TV commercials produced at TITV. We are involved at all stages of graphics and animation generation, including design, art direction, and production. We can say that generating the graphics and animations at this department is almost 100 percent digital. We use both PC and Macintosh for generating CG at our unit. A wide range of digital software is employed, for example, 3D Max Studio and MAYA for generating 3D graphics and animation, Adobe After Effect for 2D works, and Adobe Illustrator and Adobe Photoshop for retouching and creating still images, and etc."

Picture 69: Non-linear Video Stations and Computer Graphics Stations at TITV

AT THE OUTSIDE BROADCASTING (OB) UNIT

AND DIGITAL SATELLITE NEWS GATHERING (DSNG) UNIT

There were 3 OB vans and 4 DSNG vans at TITV. I asked a senior staff member at the unit to give an overview of the operation of the OB unit. He explained:

> "TITV has 3 OB vans: OB No. 1 and 2 are digital, OB No. 3 is analogue. OB van No. 1 has 6 digital TV cameras, and OB No. 2 has 4 digital cameras. OB 1 and 2 are regularly used for producing live programs or reporting important news on location. On some occasions, especially for a big event, we combine OB 1 and 2 for increasing capacity of camera angles; therefore, we can have 10 cameras for filming significant programs. At present, the analogue OB van No. 3 is occasionally used as a spare unit in case OB 1 and 2 are not available.
>
> OB vans are used as outdoor studios and control rooms. We can say that over 80 percent of the hardware and software employed in OB 1 and OB 2 are digital, including CCU [Camera Control Units], video switchers, graphic generators, cameras, digital video players and recorders. Analogue can be counted as approximately 20 percent because we still use some analogue tools such as TV monitors, audio mixers, and Beta video recorders but I think that these may be replaced by digital quite soon."

Picture 70: Outside Broadcasting Unit and Digital Satellite News Gathering

For the DSNG unit, a senior staff member disclosed:

> "TITV has 4 DSNG vans used for uplinking the signal to the satellites. DSNGs are usually used as a key supporting operation of TITV news reporting. DSNG plays a significant role in being a gateway for transmitting news and reports back to the station. The signal sent to the station via the satellite is digital. However, the equipment is a mixture of analogue and digital."

SECTION 2: THE USE OF DTV TECHNOLOGY AT TITV

PROPORTION OF TECHNOLOGICAL EMPLOYMENT (OCTOBER 2007)

MAIN DIGITAL HARDWARE AND SOFTWARE (OCTOBER 2007)

***Remark:** TITV did not agree to disclose the details of technological employment at the station. The station did not return the data collecting form to the researcher.

CHAPTER 9

DISCUSSION AND CONCLUSION

This chapter is divided into four parts, providing (1) a revisitation of the research aims, (2) a summary of the results of the in-depth interviews in Chapters 5 and 6 and key findings from the observations in Chapters 7 and 8, (3) a summary of the significance of the premises, and (4) a discussion and conclusion of the thesis and recommendations for future study.

PART 1: A REVISITATION TO THE RESEARCH AIMS

The intention of this thesis entitled “Digital Television in Thailand (2006-2007)” is to (1) explore major drives influencing the Thai TV broadcasting industry into technological transition, shifting from analogue to digital; (2) investigate prospective key advantages and disadvantages of adopting and launching DTV technology in the Thai TV broadcasting industry in relation to TV station business operators and TV audiences; (3) obtain views from thesis participants vis-à-vis whether a national investment in implementing DTV technology in Thailand is worthwhile for public interests; (4) discover prospective supporting factors and obstacles of launching DTV in Thailand; (5) obtain thesis participants’ recommendations for establishing a national DTV policy; (6) explore future trends of DTV in Thailand; and finally (7) scrutinize the current circumstances of Thai TV stations regarding technological employment in TV operation (production and broadcasting protocols), as well as a preparation and readiness of Thai TV stations for migrating to digital.

There were two research methodologies employed in the study: in-depth interviews and observation. The key informants of the interviews were 15 Thai TV station administrators (TSA), and 11 Thai Mass Communication scholars (MCS). The interviews were conducted between October 2006 and August 2007. The observation protocols were conducted at nine TV stations in Thailand: True Visions, Channel 3, Channel 7, MCOT 9, Channel 5, ASTV, Nation Channel, Channel 11, and TITV between June and October 2007.

PART 2: A SUMMARY OF THE RESULTS (CHAPTERS 5-8)

In this part, I provide a summary of key research findings from the two research methodologies (in-depth interviews and observation). I divide this part into two sub-topics: 2.1 a conclusion on key findings from the in-depth interviews, and 2.2 a conclusion on key findings from the observations of nine TV stations in Thailand.

2.1 A CONCLUSION ON KEY FINDINGS FROM THE IN-DEPTH INTERVIEWS (CHAPTERS 5-6)

MAJOR DRIVES OF TRANSITION IN THAI TV BROADCASTING INDUSTRY

Table 41 reveals a comparative overview of the opinions of research participants regarding the major drives of technological transition in the Thai TV broadcasting industry.

Table 41: Responses of Thai TV Station Administrators and Thai Mass Communication Scholars regarding Major Drives of Transition in the Thai TV Broadcasting Industry

Response	**TSA** (15)	**MCS** (11)	**Total** (26)
(1) Global push/ Globalisational force	11	9	19
(2) Increasing domestic demand for broadcasting and telecommunication spectrum utilization & increasing public need for communication channels	7	8	15
(3) Dominance of Global TV manufacturers	10	3	13
(4) Technological advancement/ determinism	7	4	11
(5) Availability and affordability of current DTV receptions and overwhelming influx of digital appliances from China	0	2	2
(6) Technology-craziness of Thais	1	0	1

As shown in Table 41, majority of research respondents (nineteen out of 26) believed that the main drive of transition in the Thai TV broadcasting industry is a global push or an external drive. The technological transition has started and is in progress throughout the globe; therefore Thailand is forced by the global transition, and cannot resist the gigantic wave of technological change.

There were fifteen participants who maintained that the transition of Thai TV industry is caused by an internal drive, as there has been a higher demand for broadcasting and telecommunication use in the country. In addition, public and community services, the private sector, and entrepreneurs need more communication channels for operating new TV broadcasting services and stations). Thirteen participants, especially TV station administrators, asserted that the change has been influenced by the TV hardware and software manufacturers, who can be considered the mastermind behind the transition. Global TV manufacturers have recently launched a wide range of new digital equipment models to the market and ceased manufacturing analogue equipment. The Thai TV industry is a technological adopter, therefore TV stations operators inevitably have to switch to the newly mandated systems.

Eleven participants agreed that the advancement and evolution of the TV technology, as well as the greater benefits of digital technology is a prime drive of transition, while a smaller number of participants regarded the transition as a result of affordability of cheap TV hardware and software flowing from China, as well as the technology-craziness of Thais.

ADVANTAGES AND DISADVANTAGES OF ADOPTING DTV TECHNOLOGY INTO THE THAI TELEVISION BROADCASTING INDUSTRY

Table 42 presents a summary of research participants regarding potential benefits of adopting DTV technology into Thai TV broadcasting industry.

Table 42: Responses of Thai TV Station Administrators and Thai Mass Communication Scholars regarding Potential Benefits of Adopting DTV Technology into the Thai TV Broadcasting Industry

Response	**TSA** (15)	**MCS** (11)	**Total** (26)
(1) Extra TV channels and services more freedom of choice and variety of content (Benefit for TV audience/ consumers)	9	7	16
(2) Improved image and sound quality, and additional features (Benefit for TV audience/ consumers)	5	0	5
(3) Reduction of operational costs (Benefit for TV station operator/ broadcaster)	4	1	5
(4) A greater chance for newcomers into a monopolized broadcasting system (Benefit for TV station operator/ broadcaster)	2	2	4
(5) Increase in public service DTV channels/ programs (Benefit for public service)	2	0	2
(6) An instrument for TV broadcasting reform (Benefit for public service)	0	1	1
(7) Increased ease of TV station operation and enhanced production quality (Benefit for TV station operator/ broadcaster)	1	0	1

As shown in Table 42, majority of participants (16 out of 26) maintained that the main potential benefit of using DTV technology is that the Thai TV audience will gain extra TV channels and more freedom of choice from a variety of content, as DTV technology facilitates a greater number of new operators joining the TV industry. Five participants stated that TV viewers will benefit from image and sound improvement. From the perspective of TV station operation, five participants asserted that DTV technology will assist in reducing operational costs. In terms of TV business, four participants stated that DTV will provide a greater chance for newcomers and entrepreneurs to join the media business industry. A few participants expected that the DTV technology would increase a number of public TV services, provide a chance to reform the Thai broadcasting industry, increase ease of TV station operation, and enhance TV production quality.

Table 43 presents a summary of research participants' responses regarding potential disadvantages of adopting DTV technology into the Thai TV broadcasting industry.

Table 43: Responses of Thai TV Station Administrators and Thai Mass Communication Scholars regarding Potential Disadvantages of Adopting DTV Technology into the Thai TV Broadcasting Industry

Response	**TSA** (15)	**MCS** (11)	**Total** (26)
(1) Gateway for negative content and harm to Thai society and culture as well as threat to national security	0	8	8
(2) No answer/ cannot foresee any negative aspect of DTV technology	4	0	4
(3) High expenditure and investment for digital switch over	3	0	3
(4) Difficulty of regulation and control	3	0	3
(5) Technological dependency and economic loss	0	3	3
(6) Difficulty of finding supporting funds in a highly competitive market	3	0	3
(7) The rapid advancement of digital technology and potential for computer errors	2	0	2
(8) A greater chance of content error	0	2	2
(9) Negative impact on family relationships and social change	0	2	2
(10) Digital divide and technological gap	0	1	1

As shown in Table 43, majority of Mass Communication scholars (8 out of 11) were highly concerned about the negative effects of using digital television technology. They claimed that some TV operators may use DTV technology as a gateway for negative content (immoral/ disturbing/ illegal) that may have adverse effects on Thai society and culture, as well as threaten national security. Three scholars argued that launching DTV technology would require a huge national investment and inflate Thailand's foreign technology dependence. In addition, two media scholars were worried about the greater chance of content error because the combination of increased production speed and increased media competition may lead to content checking procedures being ignored. Two media scholars noticed that niche programs being provided on a wide range of DTV channels would make family members watch programs separately and the socially inclusive society of Thailand would be faded out and become more individualistic.

Four TV station administrators were very positive to the DTV technology as they claimed that they could not foresee any negative aspects of the technology. Three TV administrators mentioned the negative point that converting national and TV station operation systems to digital may cost an enormous budget. Three administrators pointed out that broadcasting regulators and governments would find difficulty in regulation and control as digital media technology is diverse and uncontrollable. Three TV administrators were concerned about the difficulty of finding supporting funds as there would be a greater number of DTV operators in the future.

DTV AND PUBLIC INTEREST

Table 44 presents a summary of research participants' responses regarding the worthiness of investment in DTV transition, and issues of public interest

Table 44: Responses of Thai TV Station Administrators and Thai Mass Communication Scholars regarding DTV and Public Interest

Response	**TSA** (15)	**MCS** (11)	**Total** (26)
(1) Worthwhile investment to bring national benefits and serve the public interest	12	3	15
(2) Worthwhile investment with conditions	2	2	4
(3) Unworthwhile investment	1	4	5
(4) Uncertain	0	2	2

As shown in Table 44, majority of research participants (15 out of 26 participants), particularly TV station administrators, agree that the investment for shifting the Thai TV industry into digital environment is worthwhile for the public interest, as they claim that the DTV technology provides a greater benefit than the analogue does. Four media scholars claimed that the investment cost is too high and may be not worthwhile for Thai society as Thailand may lose a significant amount of money for converting the system. They argued that billions of baht that this would cost should be spent on other national development projects.

NATIONAL DTV POLICY AND REGULATION

The following table presents a summary of research participants' responses regarding factors for the successful launch of DTV in Thailand.

Table 45: Responses of Thai TV Station Administrators and Thai Mass Communication Scholars regarding Factors for the Successful Launch of DTV in Thailand

Response	**TSA** (15)	**MCS** (11)	**Total** (26)
(1) National broadcasting regulator and governments	15	6	21
(2) Campaign by TV station operators	0	3	3
(3) Promoting public information on DTV	1	2	3
(4) National broadcasting policy and plan for implementing DTV	2	0	2
(5) Affordability of DTV reception for viewers	1	0	1

As shown in Table 45, 21 out of 26 participants emphasised the significance of the national broadcasting regulator, state authorities, and government in orchestrating a mission to launch DTV in Thailand. This factor was followed in importance by the campaigning of TV station operators, as well as promoting public information about DTV to increase public awareness and understanding about the technological transition. Two TV administrators mentioned that the authorities should issue a national broadcasting policy and plan for implementing the national DTV project. One TV administrator recommended that the affordability of DTV reception for the consumer would increase the chance of success in launchiing this new innovation in the country.

Table 46 presents a summary of research participants' responses regarding impediments to the launch of DTV in Thailand.

Table 46: Responses of Thai TV Station Administrators and Thai Mass Communication Scholars regarding Prime Impediments to the Launch of DTV in Thailand

Response	**TSA** (15)	**MCS** (11)	**Total** (26)
(1) Absence of broadcasting regulator, and undirected policy and plan for implementing DTV	15	11	26
(2) Conflicts of interest and political sanction	5	0	5
(3) Economic recession and TV consumers' financial readiness	0	2	2

As shown in Table 46, all participants (26 participants) unanimously agreed that the major impediment to launching DTV in Thailand was the absence of an NBC and national broadcasting policy and plan. In addition, five TV station administrators asserted that conflicts of interest in the national TV broadcasting system and political sanction would obstruct the progress of the project. Two media scholars maintained that, as Thailand has been in an economic recession period, this may cause a delay in nationwide DTV penetration.

Table 47 presents a summary of research participants' recommendations for national DTV policy in Thailand.

Table 47: Recommendations of Thai TV Station Administrators and Thai Mass Communication Scholars for National DTV Policy

Response	**TSA** (15)	**MCS** (11)	**Total** (26)
(1) Provide an interval for a parallel simulcast: analogue and digital	8	2	10
(2) Reallocate the DTV spectrum fairly	4	4	8
(3) Emphasise DTV information and public relations campaign for generating public interest, comprehension, and acknowledgement	4	4	8
(4) Support affordability of set-top box/ DTV reception devices	3	3	6
(5) Arrange sufficient DTV spectrum for social development, public and community service	1	4	5
(6) Develop governmental facilitation for nationwide DTV infrastructure, government subsidy or co-investment, and sufficient support for broadcasters	3	1	4
(7) Support domestic TV manufacturers	4	0	4
(8) Collaborate with all TV broadcasting industry stakeholders on DTV planning and implementing activities	4	0	4
(9) Support research on DTV policy, plan, and action campaign	1	2	3
(10) Encourage establishment of DTV transmission pools	3	0	3
(11) Protect citizens' rights	1	2	3
(12) Mandate or specify quality assurance standards for set-top box and DTV reception devices	2	0	2
(13) Establish an independent agent/ working committee for campaigning and promoting the DTV project	2	0	2
(14) Issue a master plan and mandate a time frame for analogue switch off and digital switch over	1	1	2
(15) Adoption a standard DTV system and technology	1	0	1
(16) Consider the economic cost of transition	1	0	1
(17) Manage region by region digital switch over plan	0	1	0

As shown in Table 47, there were a number of guidelines for issuing national DTV policy proposed by the participants. Majority of participants suggested that the NBC and governments should provide an interval (5-15 years) for parallel simulcast of analogue and digital. This would assist the TV station operators and TV audiences in making a smooth and gradual migration to digital. Eight participants stressed the importance of faire reallocation of the DTV spectrum. Eight respondents suggested that the NBC should provide the public sufficient comprehension regarding the new television technology through an information and public relations campaign. Six participants proposed that the NBC and government should support affordability of set-top box and/ or DTV receivers, or implement marketing promotion programs for lower income TV households. Such a campaign would increase the uptake rate of domestic DTV launch.

Six participants suggested that the NBC should provide sufficient DTV spectrum and permission for social development, public and community services because these sectors would be able to use the DTV technology for socio-economic development. Four participants recommended that the NBC and government should support TV station operators with nationwide DTV infrastructure and other necessary supports. Four research respondents advised that the government and NBC should enforce domestic TV manufacturer production standards and support affordable DTV receivers in order to minimize the financial impact of importing hardware and software from foreign companies. In terms of policy making and planning, four research participants suggested that the NBC and government should give the chance for all stakeholders to take part in generating a national DTV strategy.

Three participants emphasised that the NBC should support research on DTV. The idea of establishment of DTV transmission pools also was raised by three TV station administrators. They proposed that the DTV transmission pools would not only assist TV business operators, but that they would also save billions of baht in national investment, as well as ensuring that the DTV signal quality control of the joint venture stations would be efficiently managed. Three participants proposed that the NBC should implement effective measures and discipline to protect audiences from immoral and disturbing content that may violate citizens' rights.

Regarding the technical aspects of DTV implementation, two TV station administrators recommended that NBC should mandate or specify quality assurance standards for set-top boxes and DTV receivers. Two administrators advised that NBC should establish an independent agent or working committee for campaigning and promoting the national DTV project. Two research respondents proposed that the NBC should issue a master plan and mandate a time frame for national analogue switch off and digital switch over. Choosing the adoption of an appropriate DTV system and technology, considering the economic cost of transition, and managing a region by region digital switch over plan were also proposed by the participants.

DTV TRENDS IN THAILAND

The highlights of the predictions from thesis participants regarding trends of DTV in Thailand can be categorised into four trends: DTV station administration and business competition; Technological development; DTV technology and television production and broadcasting; and DTV consumption and marketing.

Regarding DTV station administration and business competition, the participants predicted that the TV broadcasting industry in Thailand would be in a very competitive situation because there will be a lot of newcomers and investors joining the media business. The research participants suggested that TV station administrators need to generate new business plans and strategies to maintain brand loyalty. Digital technology will change the landscape of media business. Electronic media, ICT, and telecommunication will become integrated in terms of information and communication functions, business, and services. Digital television technology will expand the concept of TV into new definitions and distribute content and programs in a wide range of digital platforms. Satellite TV stations will be become very popular as the cost of establishment and operation is not very high. Contemporary TV stations in the digital sphere will become niche stations providing specific content and programs for specific groups/individuals. Live, interactive, and reality shows will become contemporary trends gaining in popularity among the viewers.

Concerning technological development, the participants predicted that DTV would combine a wide range of new features and functions with digital new media, as well as provide interactive features via remote control, key boards, and other accessories. DTV will integrate and be integrated with other communication devices and applications, such as personal computer, mobile phone, and multimedia players in order to serve the modern needs of consumers who will enjoy getting access to TV on demand or content on demand.

In the aspect of TV production and broadcasting, thesis participants asserted that digital technology would play a significant role in all procedures of TV station operation: pre-production, production, post-production, and content distribution. Technology will enhance the quality of image and sound production, computer graphics, animation, and broadcasting. Digital TV production equipment will become handy and portable, and this will be useful for generating outdoor programs and live broadcasting. Thai TV program production will become completely digital in the next 5-7 years. In addition, the notion of "audience/user generated content" or "citizen journalist" will emerge with the increasing affordability of digital media production equipment. Laypersons will be able to share their video clips or programs through a wide range of digital media platforms.

Regarding DTV consumption and marketing, thesis participants predicted that the niche audience would become a new trend of TV consumption and marketing. The audience will hold absolute power in selecting content and program according to their preferences. They will enjoy participating and interacting with their favorite channels. Time shifted viewing will be a future trend of media consumption, as audiences will be able to get access to content or TV programs anytime and anywhere. Thai TV station business operations, therefore, will need to be reformed in order to serve the new trends of media consumption.

2.2 A CONCLUSION ON KEY FINDINGS FROM OBSERVATIONS (CHAPTERS 7-8)

A SUMMARY OF OBSERVATIONS OF NINE TELEVISION STATIONS IN THAILAND

Conducting observations at nine TV stations in Thailand enabled me to accomplish one of the aims of this research project, which was to scrutinise the current circumstances of Thai TV stations in terms of technological employment in TV production and broadcasting protocols. I had the chance to visit nine TV stations in Thailand during June and October 2007, and below I give a summary of significant issues which arose from my observations and discussions with TV staff members.

Introduction of DTV Technology into Thai TV Stations: Thai TV stations have been using DTV technology in operations since the mid 1990s and early 2000s. MCOT 9 purchased a digital OB van and built a digital TV studio in 1995. ITV used Digital Serial Interface System (DSI) in TV news program production in 1996 and broadcast audio through a Digital NICAM Stereo system. Channel 7 imported a digital video tape player into the station in 1997. Channel 5 started a technological transition plan in 1997 and first used an automated broadcasting system in 1998. Channel 11 built a digital virtual studio in 1997. True Visions started uplinking the digital signal to satellites in 1993, and began using a digital video server in 2003.

Trials and Development of DTV Transmission and Broadcasting in Thailand: Despite the fact that not all terrestrial TV stations in Thailand have started officially transmitting terrestrial TV signals to nationwide TV households in a fully digital format, TV station administrators and state authorities (PRD) disclosed that there have been a number of trials of digital terrestrial TV transmissions since 1996. According to Srisukhon (2006: 9), the first digital satellite transmission in Thailand was in 1993 by a subscription TV service provider, IBC (International Broadcasting Corporation), which later became True Visions

Thai TV Stations in Technological Transition: From my observations, the overall estimated proportion of DTV technology employment at majority of Thai TV stations at the time of my visit was more than approximately 70 percent. In particular, the internal TV program production protocols (production units, TV studios, MCRs, video editing units, and computer graphics units) of Thai TV stations are strongly reliant on digital hardware and software. In general, all TV stations in Thailand are in transition. They have been in a transitional stage of using dual systems (analogue and digital). However, the comparative proportion of each station using analogue and digital system is quite varied.

I observed that the state-owned TV stations (Channel 5, MCOT 9, and Channel 11) are very progressive in terms of technological advancement. The proportions of DTV technology in these stations are over 80 percent, as the stations are fully supported and funded by the government and state authorities. MCOT 9 has progressively moved towards integrating TV services with new media, for example, expanding content services to digital new media platforms such as MCOT 1, 2, 3 and mobile content services.

For the privately owned stations, ASTV is an example of a newly established TV station; therefore, all main equipment is in a digital format. Channel 3 has been speeding up to be a fully digital TV operator. The station has recently installed new TV transmitters at its nationwide network TV stations, which are ready to transmit digital DTV signals.

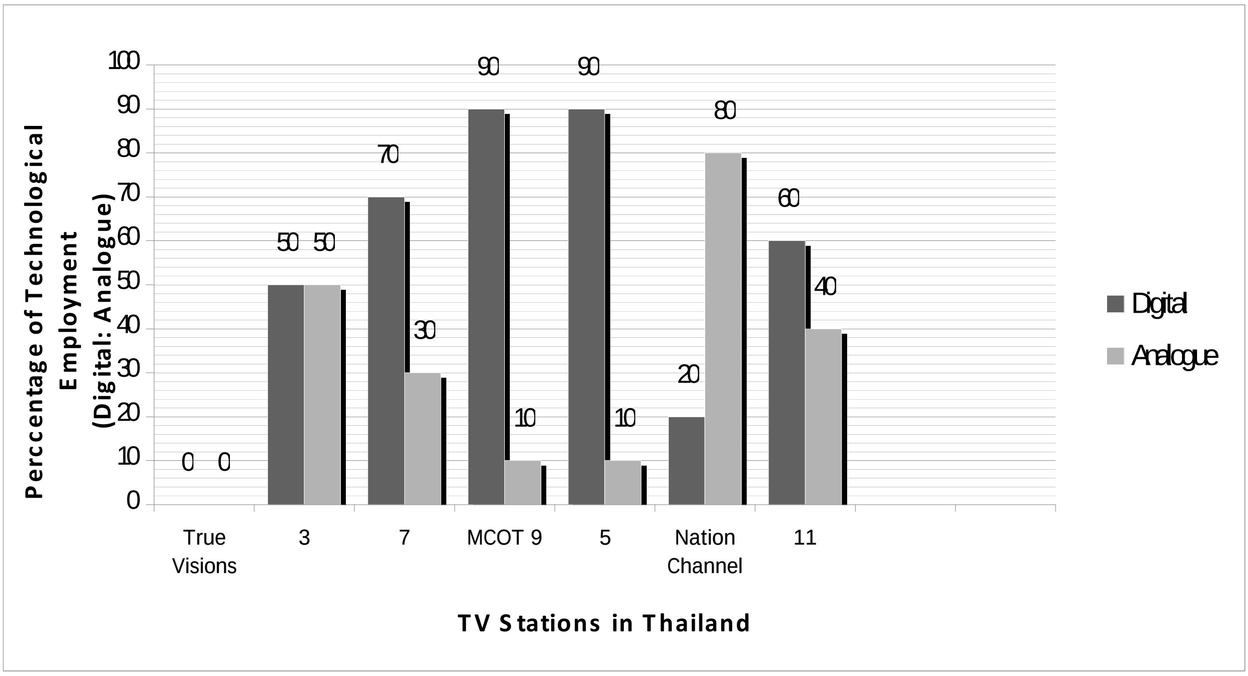
Although, physically, Nation Channel’s TV station operation remains in the analogue system (as the main equipment used is analogue), it distributes content on a wide range of multimedia. It can claim to be one of the pioneer TV channels in integrating its service on the Internet platform, through Nation Blog and NTV webcasting

In general, analogue equipment employed at TV stations has become obsolete and is no longer in a good condition. TV production and broadcasting equipment manufacturers have ceased providing maintenance services. Therefore, new models of imported equipment into TV stations in Thailand are now only in digital format. Digital video cameras and digital non-linear video editing stations have replaced the analogue ones. Majority of TV staff members at all stations were very positive towards digital TV production devices, as the new technology is quicker, smaller, and provides better image and sound quality compared to the analogue equipment. Digital video servers are currently employed in many TV stations. They will become the heart of contemporary TV station operation because digital video files will be archived and inter-linked within internal departments of TV stations.

A SUMMARY ON THE PROPORTIONSD AND DETAILS OF TECHNOLOGICAL EMPLOYMENT AT TV STATIONS IN THAILAND (JUNE-AUGUST 2007)

In this part, I provide a summary of the proportions and details of technological employment at TV stations in Thailand. Seven out of the nine observed TV stations consented to provide me with proportions and details of technological employment. I present the data in the form of charts and tables to make comparisons. The data presentation is divided according to major TV station operation protocols: pre-production, production, post-production, and broadcasting (excluding TV signal transmission). The following Figures (Figures 12-16) and Table (Table 48) present comparative proportions of technological employment, digital versus analogue, in pre-production, post-production, broadcasting, and overall proportions of technological employment in operation protocols of seven Thai TV stations (June-August 2007).

Figure 12: Comparative Proportions of Technological Employment (Digital versus Analogue) in the Pre-production Protocol in Thai TV Stations (June-August 2007)



Note: True Visions did not provide the proportion of technological employment in pre-production protocol.

Figure 13: Comparative Proportions of Technological Employment (Digital versus Analogue) in the Production Protocol in Thai TV Stations (June-August 2007)

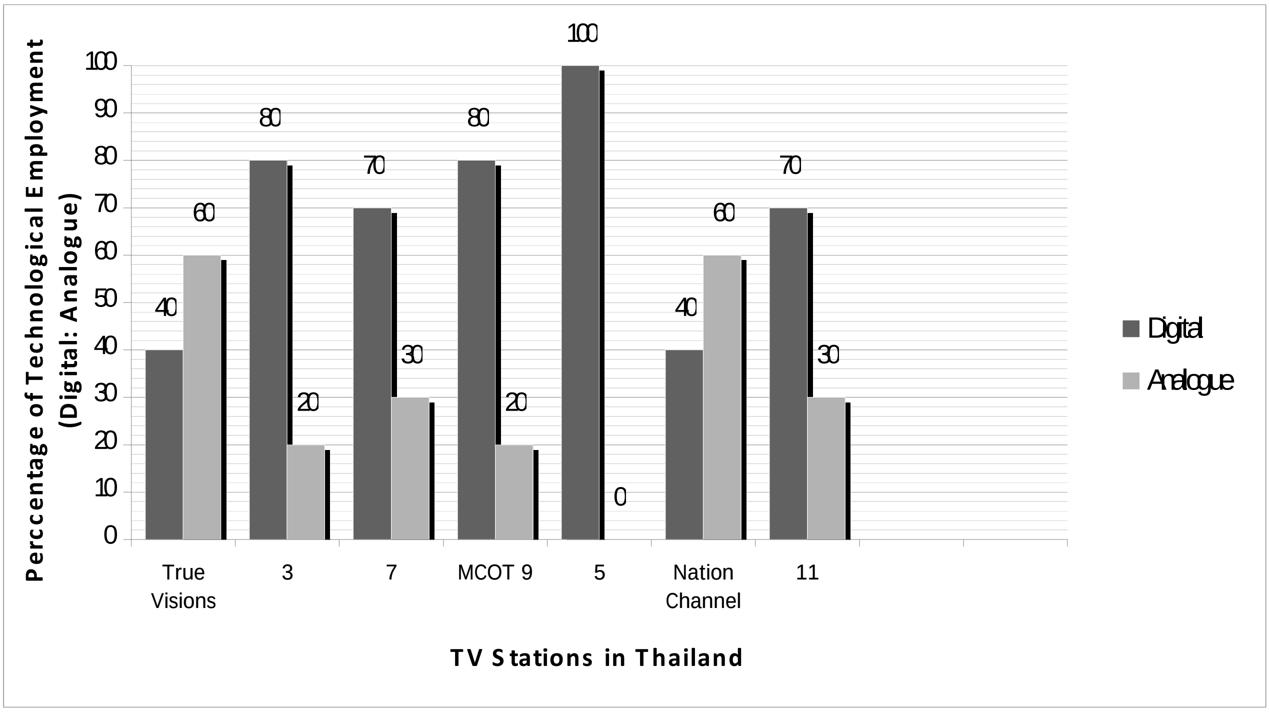


Figure 14: Comparative Proportions of Technological Employment (Digital versus Analogue) in the Post-production Protocol in Thai TV Stations (June-August 2007)

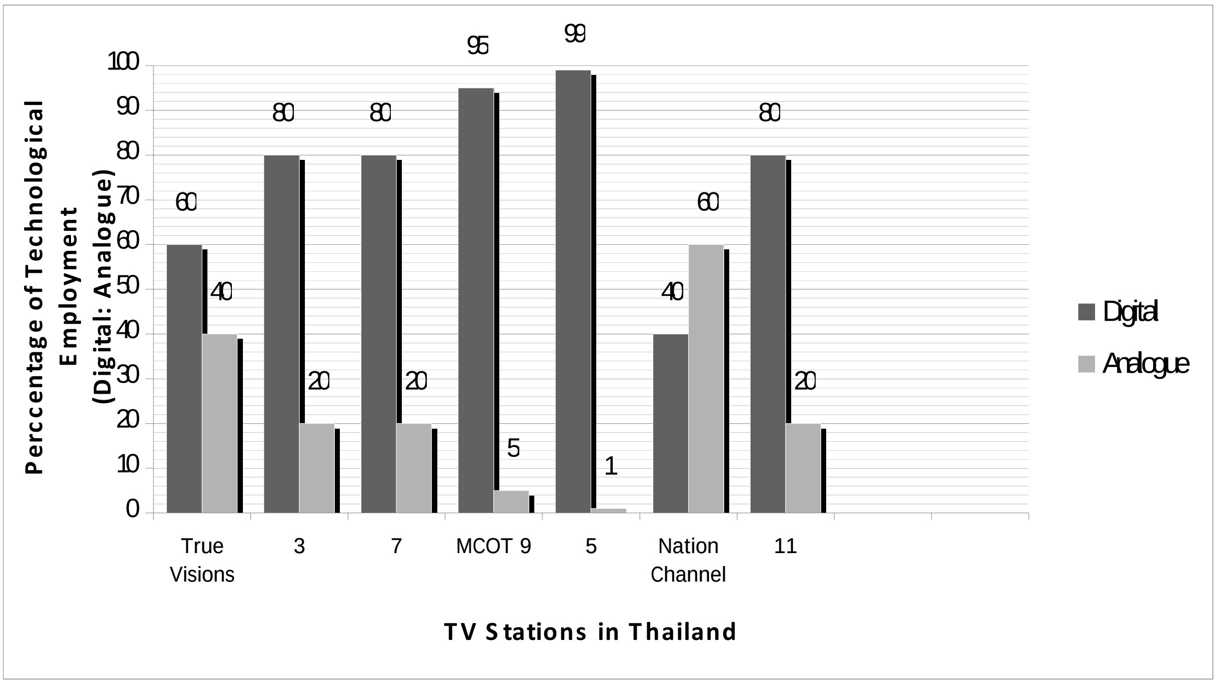


Figure 15: Comparative Proportions of Technological Employment (Digital versus Analogue) in the Broadcasting Protocol in Thai TV Stations (June-August 2007)

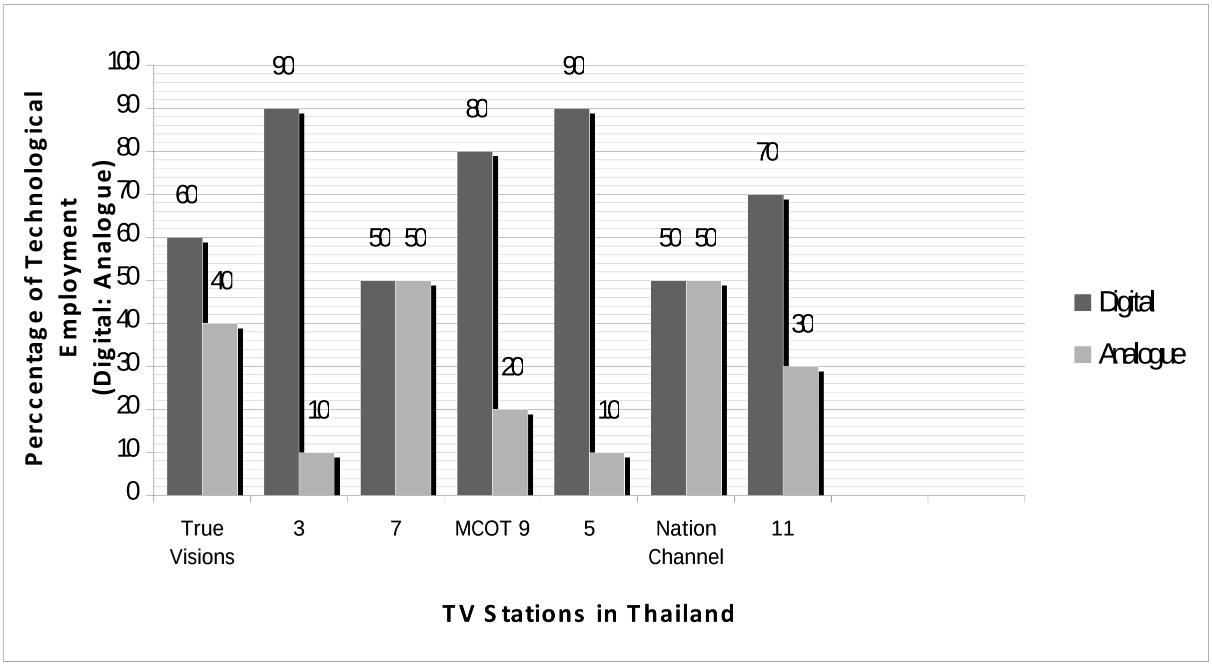


Figure 16: Overall Proportions of Technological Employment (Digital versus Analogue) in Thai TV Station Operations (June-August 2007)

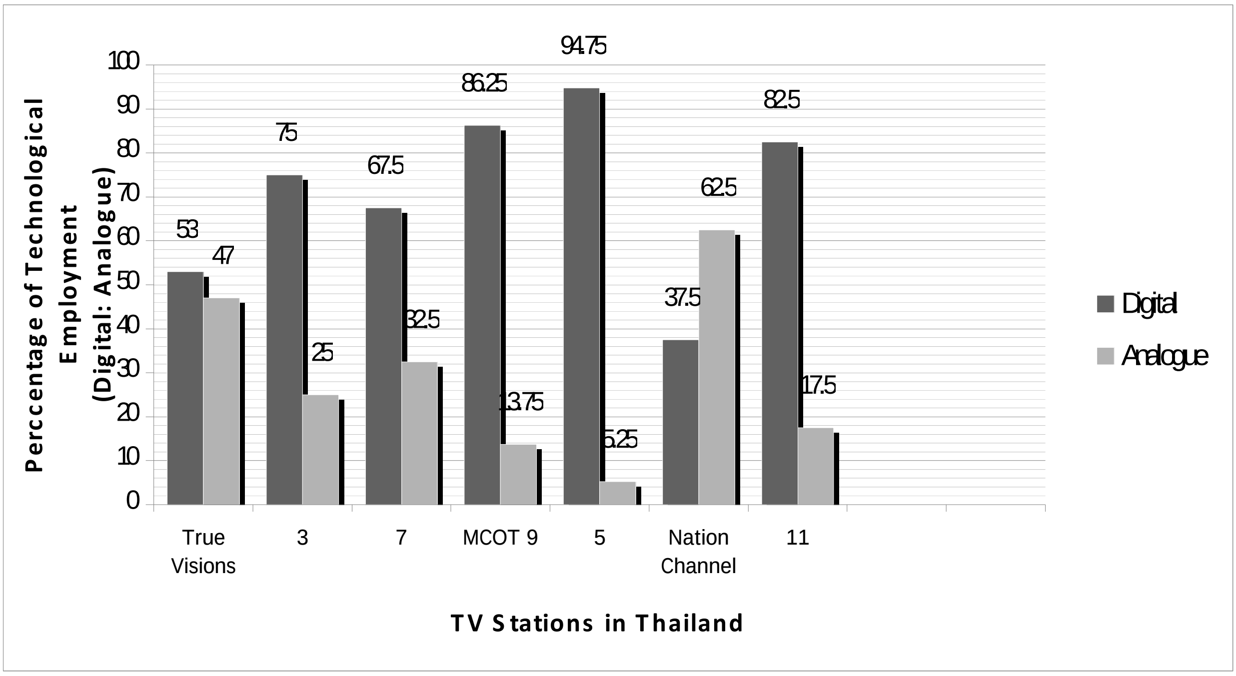


Table 48: Comparative Proportions of Technological Employment (Digital versus Analogue) in Thai TV Station Operations (June-August 2007)

True Visions (June, 2007)		Channel 3 (June, 2007)		Channel 7 (June, 2007)		MCOT 9 (July, 2007)		Channel 5 (July, 2007)		Nation Channel (August, 2007)		Channel 11 (August, 2007)	
Pre-Production		**Pre-production**		**Pre-production**		**Pre-production**		**Pre-production**		**Pre-production**		**Pre-production**	
Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue
N/A	N/A	50%	50%	70%	30%	90%	10%	90%	10%	20%	80%	60%	40%
Production		**Production**		**Production**		**Production**		**Production**		**Production**		**Production**	
Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue
40%	60%	80%	20%	70%	30%	80%	20%	100%	0%	40%	60%	70%	30%
Post-production		**Post-production**		**Post-production**		**Post-production**		**Post-production**		**Post-production**		**Post-production**	
Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue
60%	40%	80%	20%	80%	20%	95%	5%	99%	1%	40%	60%	80%	20%
Broadcasting		**Broadcasting**		**Broadcasting**		**Broadcasting**		**Broadcasting**		**Broadcasting**		**Broadcasting**	
Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue	Digital	Analogue
60%	40%	90%	10%	50%	50%	80%	20%	90%	10%	50%	50%	70%	30%
Total Average		**Total Average**		**Total Average**		**Total Average**		**Total Average**		**Total Average**		**Total Average**	
Digital	**Analogue**	**Digital**	**Analogue**	**Digital**	**Analogue**	**Digital**	**Analogue**	**Digital**	**Analogue**	**Digital**	**Analogue**	**Digital**	**Analogue**
53%	**47%**	**75%**	**25%**	**67.50%**	**32.50%**	**86.25%**	**13.75%**	**94.75%**	**5.25%**	**37.50%**	**62.50%**	**82.50%**	**17.50%**

Note: Information presented in the Figures and Tables is based on an estimate provided by TV station representatives (head/ manager of department and/or senior TV producer/ technician).

Figure 12 shows that four TV stations, Channel 7 (70%), MCOT 9 (90%), Channel 5 (90%), and Channel 11 (60%), currently use greater than 50 per cent of digital technology in pre-production protocol, while Channel 3 and Nation Channel used digital technological only 50 percent and 20 percent respectively (True Visions did not provide the proportion of technological employment in pre-production protocol). Figure 13 discloses the proportions of technological employed in the production protocol TV stations. Representatives from five TV stations claimed that their stations used digital technology in production protocols more than 60 percent: Channel 3 (80%), Channel 7 (70%), MCOT 9 (80%), Channel 5 (100%), and Channel 11 (70%). Only two stations, True Visions (40%) and Nation Channel (40%), used digital technology less than 60% in their production protocols. Figure 14 reveals that six of seven TV stations used digital technology to a significant extent in their post-production protocols: True Visions (60%), Channel 3 (80%), Channel 7 (80%), MCOT 9 (95%), Channel 5 (99%), and Channel 11 (80%). Only Nation Channel (40%) used the digital system less than analogue. As shown in Figure 15, digital technology has been used in broadcasting protocols in a proportion of between 50 and 90 per cent. Channel 3 and Channel 5 used digital technology in a high proportion (90%), MCOT 9 also used it 80 percent, True visions 60 percent, and Channel 7 and Nation Channel employed digital technology for 50 percent of the broadcasting protocol.

Figure 16 reveals the overall proportions of technological employment. Six out of seven TV stations used digital technology greater than 50 percent. Channel 5 claims to have the highest proportion of digital technology use at 94.75 per cent, followed by MCOT 9 at second rank (86.25%), Channel 11 at third rank (82.50%), Channel 3 at fourth rank (75%), Channel 7 at fifth rank (67.50%), and True Visions in sixth rank (53%). Only Nation Channel remains largely analogue TV station, with a dominant proportion of analogue versus digital (62.50% analogue versus 37.50% digital). Table 48 revisits and presents the big picture of comparative proportions of technological employment in the Thai TV broadcasting industry during June and August 2007.

The following Tables (Table 49-52) present the main digital hardware and software employed in pre-production, production, post-production, and broadcasting protocols during June and August 2007.

Table 49: Main Digital Hardware and Software Employed in Pre-production Protocol at TV Stations in Thailand (June-August 2007)

Tasks / Channel	True Visions	3	7	MCOT 9	5	Nation Channel	11
1) Planning and Preparation for Production	- Internet and Email (for searching information and communication) Software: Microsoft Office (for documenting letters, plans, program outline)	- The staff did not provide any details.	- Internet and Email (for searching information and communication) - DVD Player Software: Microsoft Office (for documenting letters, plans, program outline)	- Internet and Email (for searching information and communication) - Electronic News obtained from Digital Satellites - Computers used in designing timeline and outline of production, and budgeting. Software: Microsoft Office (for documenting letters, plans, program outline)	- Internet and Email (for searching information and communication) Software: Microsoft Office (for documenting letters, plans, program outline)	- Internet and Email (for searching information and communication) Software: Microsoft Office (for documenting letters, plans, program outline)	- Internet and Email (for searching information and communication) Software: Microsoft Office (for documenting letters, plans, program outline)
2) Writing and Preparing Scripts	- E-mail, Internet, Intranet (for searching information and communication) Software: Microsoft Office (for writing scripts), - BMS (for checking all stock shots, footage, and video sources from video tape that might be used in TV production), - Media Pro (for checking videos and program time codes)	- The staff did not provide any details.	- Internet and Email (for searching information and communication) - DVD Player Software: Microsoft Office (for writing scripts)	Software: Microsoft Office (for writing scripts)	- E-mail, Internet (for searching information and communication) Software: Microsoft Office (for writing scripts)	- E-mail and Internet (for searching information and communication) Software: Microsoft Office (for writing a script)	- E-mail and Internet (for searching information and communication) Software: Microsoft Office (for writing a script)
3) Creating a Story Board	- E-mail, Internet, Intranet (for searching information and communication) Software: Video Server System "Leitch" (for generating previews and pre-selecting shots before progressing to editing process)	- The staff did not provide any details.	- Internet and Email (for searching information and communication) Software: Adobe Photoshop, Adobe Illustrator, Auto Cad, Microsoft Office	Software: Corel Draw, Adobe Photoshop, Microsoft Power point	- The staff did not provide any details.	- computer graphic stations Software: 3D Studio Max, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, Inscriber CG.	- The staff did not provide any details.
4) Preparing for Video and Audio Recording	Software: Sugas and AAlib (for arranging and booking TV production equipment)	- The staff did not provide any details.	- Digital Video Sever	Software: SSL	- The staff did not provide any details.	- The staff did not provide any details.	- The staff did not provide any details.
5) Designing Set, Props and Other Artwork for Production	Software: Adobe Photoshop, Adobe Illustrator, and Microsoft Power Point	- The staff did not provide any details.	- Software: 3D Max, Maya, Auto Cad, Adobe Photoshop, and Adobe Illustrator	Software: Adobe Photoshop, Adobe Illustrator, Corel Draw	- The staff did not provide any details.	- computer graphic stations Software: 3D Studio Max, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, Inscriber CG.	Software: Adobe Photoshop, Adobe Illustrator, etc.

Table 50: Main Digital Hardware and Software Employed in Production Protocol at TV Stations in Thailand (June-August 2007)

Tasks/Channel	True Visions	3	7	MCOT 9	5	Nation Channel	11
1) Shooting and Recording Video in TV Studio	- Digital Video Camera, Digital Video Switcher, Digital Graphic Station - Video Server Systems "Leitch" and "Dayang"	- Digital Video Camera, Digital Video Switcher	- Digital Video Camera - Digital Video Switcher - Digital Lighting Controlling System - Digital Graphic Station - Digital Video Tape Recorder - DVD Recorder/Player	- Digital Video Camera (Sony, Canon, etc.) - Digital Video Switcher	- Digital Video Camera (Sony Digital Betacam, Digital Studio Camera) - Digital Video Switcher - Digital Audio Mixer - Digital Beta Video Tape (Sony)	- Digital Video Switcher: "CVG Model 2200, 1200"	- Digital Video Camera: "Sony E10", "Sony XD Camera", "Sony Mini HDV Camera" - Digital Video Switcher DVS - Betacam SX Video Tape - Digital Video Server System "Sony MAV-70"
2) Shooting and Recording Video on Location/Outdoors	- Digital Video Camera, Video Disk Recorder, Digital Graphic Station	- Digital Video Camera, Digital Video Disk Recorder	- Digital Video Camera (High Definition Video Camera)	- Digital Video Camera (Digital Beta SX, DV Camcorder)	- Digital Video Camera (Digital Betacam, DV Camera)	- Digital Video Switcher "Sony"	- Digital Video Camera: "Sony XD Camera", "Sony Mini HDV Camera", "Sony Betacam SX"
3) Audio Recording	- The staff did not provide any details.	- The staff did not provide any details.	- Digital Audio Mixer	- DAT (Digital Audio Tape) - Wireless Microphone	- DAT (Digital audio Tape) - Wireless Microphone	- The staff did not provide any details.	- Digital Audio Recorder: Sony Mini Disk MDS-E12
4) Any Other Tasks in Production	- The staff did not provide any details.	- The staff did not provide any details.	- The staff did not provide any details.	- Digital OB Van	- Digital OB (High Definition)	- The staff did not provide any details.	- The staff did not provide any details.

Table 51: Main Digital Hardware and Software Employed in Post-production Protocol at TV Stations in Thailand (June-August 2007)

Tasks/Channel	True Visions	3	7	MCOT 9	5	Nation Channel	11
1) Inputting, transferring, capturing, and processing digital video format and/or video files and/or digital images into editing station.	- Video and images are captured and transferred into digital formats, such as AVI, MPEG, JPEG, TIFF, etc. before editing and delivery to "Leitch" digital video server. Software: Sugas and BMS	- Video and images are captured and transferred into digital formats, such as AVI, MPEG, JPEG, TIFF, etc, before editing. Software: DPS	- Video and images are captured and transferred into digital formats, such as AVI, MPEG, JPEG, TIFF, before editing.	- Video and images are captured and transferred into digital formats, such as AVI, MPEG, JPEG, TIFF, before editing.	- Video and images are digitized, captured, and transferred into digital formats, such as AVI, MPEG, JPEG, TIFF before editing. Software: Velocity Q	- The staff did not provide any details.	- Some video or TV news clips from outsources are captured and transferred into digital formats, such as AVI, MPEG, DVA, etc. before being edited and delivered to "GVG" Digital Video Server. Software: Pinacle, Matrox, and Leitch
2) Inputting, transferring, capturing, and processing digital audio format and/or audio files into editing station.	- Audio sources are captured and transferred into digital formats before editing and delivery to "Leitch" digital video server. Software: Sugas and BMS	- Audio sources are captured and converted into digital formats before editing and delivery to Digital Video Server.	- Audio sources are captured and transferred into digital formats before editing.	- Audio sources are captured and transferred into digital formats before editing process. - Digital Audio Mixer	- Audio sources are digitized, captured, and transferred into digital formats before editing. Software: Velocity Q	- Digital Audio Mixer "Sound Scape"	- Some audio sources are captured and transferred into digital formats before editing process. Software: Sony Sound Force "
3) Non-linear Video/Audio Editing	- Non Linear Video Editing Stations Software: AVID, DPS, Media 100, Dayang, Adobe Premiere	- Non Linear Video Editing Stations	- Non Linear Video Editing Stations Software: Adobe After Effect Adobe Premiere	- Non Linear Video Editing Stations Software: AVID, Final Cut Pro, etc.	- Non Linear Video Editing Stations Software: Velocity Q, Adobe Premiere, etc.	- Non Linear Video Editing Stations Software: AVID, Final Cut Pro, Adobe Premiere, Inscriber CG	- Non Linear Video Editing System on PC: Dell and HP Software: AVID, DPS, News Edit, and Adobe Premiere Pro
4) Generating Graphics, Animations, and Special Effects	- Computer Graphics Stations Software: 3D Max Studio, Adobe Illustrator, Adobe Photoshop, Inscriber CG, DVE, Maya, etc.	- Computer Graphics Stations: PC (DELL) Software: Adobe Video Collection, Maya Unlimited, 2Brush 2.5	- Computer Graphics Stations Software: 3D Max Studio, Adobe Illustrator, Adobe Photoshop, Maya, etc.	- Computer Graphics Stations Software: Adobe Photoshop, etc.	- Computer Graphics Stations Software: 3D Max Studio 9, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, etc.	- Computer Graphics Stations Software: 3D Max Studio, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, Inscriber CG.	- Computer Graphics Stations on PC: "Dell" and "HP" - Software: 3D Studio Max, Adobe Illustrator, Adobe Photoshop, Adobe After Effect, Title Deco, Inscriber CG, Illusion, Hollywood Effect, etc.
5) Outputting the Completed TV Program into Digital Formats	- All completed and edited programs are delivered into "Leitch" digital video server in MPEG 2 format. Some programs are converted into AVI format and/or DVD.	- Matrox Digisuit - Several programs are output into digital format.	- Some completed and edited programs are delivered into the digital video server in MPEG 2 format. - Some programs are output into digital video file format.	- Completed and edited programs are output into Digital Beta tape.	- All completed and edited programs are output into digital video format.	- The staff did not provide any details.	- Most edited TV programs are recorded in Beta SX videotape. - Some programs are output into MPEG 1 and/or MPEG 2, and/or AVI format. - Some edited programs are output into DVD or VCD.

Table 52: Main Digital Hardware and Software Employed in Broadcasting Protocol at TV Stations in Thailand (June-August 2007)

Tasks/Channel	True Visions	3	7	MCOT 9	5	Nation Channel	11
1) Program Scheduling/Automation	- BMS - Automated Broadcasting System	- Automated Broadcasting System (IBM)	- Desktop Computer (Manual and Semi-automatic Program Scheduling)	- Digital Video Server	- "Louth" Automated Broadcasting System - "Pinnacle" Media Stream Server (for retrieving and running TV commercials and station promotion spots)	- The staff did not provide any details.	- Software: AVID Airplay
2) Archive and Storing Digital Videos and Data	- BMS - Automated Broadcasting System - "Leitch" digital video server	- Digital Video Archive (there were only TV commercials available in the archive.)	- Some programs stored on DVD and digital video tapes.	- The staff did not provide any details.	- "Pinnacle" Media Stream Server (for retrieving TV commercials and station promotion spots)	- The staff did not provide any details.	- The staff did not provide any details.
3) Monitoring and Quality Control TV Program Broadcasting	- Automated Broadcasting System - Digital Switcher - Digital Broadcasting Measurement (Video & Audio)	- The staff did not provide any details.	- DVD Recorder - Digital Video Server - Digital Wave Form Monitor	- AM 700 (Trial) - MPEG IMX	- "Louth" Automated Broadcasting System - Digital Switcher - Digital Wave Form Monitor (video & audio)	-Digital Master Control Switcher - Digital Broadcasting Measurement (Video & Audio)	- Digital Master Control Switcher - Digital Broadcasting Measurement (Video & Audio) - EVS Server
4) Broadcasting	- Digital Video Compression System - Digital Modulator	- Digital Broadcasting System (in a trial stage)	- Digital Switcher - Digital Video Compression System - Digital Modulator	- Digital Ni-cam Audio (Dual Language)	- Digital Video Broadcasting System (available) - Digital Modulator (available)	- Digital Video Server "VSR 2000"	- The staff did not provide any details.
5) Any Other Tasks In Broadcasting	- The staff did not provide any details.	- The staff did not provide any details.	- The staff did not provide any details.	- MCOT 1 & MCOT 2: Digital Video Switcher and Digital Video Server	- The staff did not provide any details.	- Broadband and Internet Protocol TV	- The staff did not provide any details.

In summary, research results from observations at nine TV stations in Thailand (during June and October 2007) and information regarding proportions and details of main hardware and software employed at TV stations (during June and August 2007) indicate that Thai TV stations have been preparing for migrating from an analogue to a digital environment since the late 1990s. In terms of technological transition, majority of the main TV stations in Thailand would possibly move to a fully digital TV station operation in the next 5-10 years. In particular, three state-owned TV station operators, i.e. Channel 5, MCOT 9, and Channel 11, are highly advanced in the technological transition.

PART 3:
A SUMMARY OF
THE SIGNIFICANCE OF THE PREMISES

3.1 PREMISE 1 (Proven)

PREMISE 1: “Two major *pushing factors* driving Thai TV stations into DTV transition are:

(1.1) *a global push* or *an external drive* in relation to the global trend of technological transition influenced by global TV manufacturers; and

(1.2) *a local push* or *an internal drive* from TV station business operators, along with Thailand’s demand to increase radio frequency and broadcasting spectrum usages.”

The thesis has demonstrated that the majority of thesis respondents believe that a global push (an external drive) from globalisation, global trends of TV technological transition, and global TV manufacturers, as well as a local push from the increasing domestic demand for broadcasting and telecommunications spectrum utilisation and the public’s increasing need for communication channels, are major pushing factors driving Thai TV stations into DTV transition (see Part 1 in Chapter 5 and Table 41 in this Chapter).

3.2 PREMISE 2 (Proven)

PRIMISE 2: “Supporting factors for implementing DTV in Thailand are likely to principally depend on state authorities being driven by the National Broadcasting Committee (NBC) to issue a national policy and action plan for DTV transition. However, thesis participants will see the absence of an NBC, and thus a lack of proper national broadcasting policy and regulation to deal with DTV transition as an impediment to implementing DTV in Thailand.”

According to the results of the thesis (see Part 4 in Chapter 6 and Table 45 in this Chapter), majority of thesis participants agreed that the NBC and government are significant players pushing the national TV broadcasting industry into a digital environment. In addition, all thesis respondents also agreed that the absence of the NBC, and the lack of a policy and plan for DTV are the major obstacles of introducing DTV in Thailand (see Part 4 in Chapter 6 and Table 46 in this Chapter).

3.3 PREMISE 3 (Proven)

PREMISE 3: "Despite the fact that Thailand has not had an official national DTV policy for switching over to digital, Thai TV stations, including state-owned TV stations, concession TV stations, and private operators, have employed DTV technologies in their operation for years."

The results in Chapters 7 and 8, as well as Figures 12-16 and Tables 48-52 in this Chapter, have affirmed that all nine main TV stations in Thailand have used DTV technologies in their TV station operations, including pre-production, production, post-production, and broadcasting protocols.

PART 4: DISCUSSION AND CONCLUSION

4.1 DISCUSSION ON CORRELATION BETWEEN THEORIES AND RESEARCH RESULTS

In the previous chapters, literature reviews and theories on Globalisation and Network Society, Digital Television, and Communication Policy and Development of Thai Television were reviewed. In this part, I provide a summary and discussion on correlation between aforementioned literatures and my research results.

In this study, theories and literature reviews (presented in Chapters 1-3) are used for (1) constructing a research framework, (2) establishing research premises, (3) generating key research questions, and (4) providing a better understanding regarding development of digital communication and digital television technology, communication policy, and development of the television industry in Thailand.

The first Chapter (Chapter 1: Globalisation and Network Society) emphasizes "Globalisation" trends, which become a global dominance paradigm of the contemporary world society and economy. In conclusion, the key attributes of globalization can be described as (1) the integration of national economies into the international economy through trade, foreign investment, and technology (Chomsky 2006; Bhagwati 2004), (2) the contemporary trend of international economic interdependency, and integration between countries in the world economy (Nayyar 2002; Wallerstein 2004), (3) one world culture (Ritzer 1996, 1998) or a single global culture (Barber 1995; Albrow 1990), and (4) a new global mechanism of interconnection and interdependency (Castells 1996, 1997, 1998; Griffiths and O'Callaghan 2002; Orakzi 2006; Ostry 1990).

In accordance with the Network Society theory, Manuel Castells (2001) defines that the "Network Society" is a society where the key social structures and activities are organized and interconnected around electronically processed information networks. In addition, fast advancement of communication technology (digital communication technology) has influenced all nation states to comply with and follow up the global trends.

The current transition of TV technology from analogue to digital television technology can be defined as a global trend. Concerning aspects of the global communication industry (presented in Chapter 1), the global flow and diffusion of technologies have been dominated by huge global communication technology enterprises (which are owned by developed countries) for decades (Thussu 1998; UNCTAD 2007; Financial Times Global 500 2007). Thailand can be classified as a technological adopter nation, which mainly adopts innovation, in particular media and telecommunication technology and IT (see Chapter 1), from the huge global communication technology manufacturers.

In this regard, considering the literature reviews on globalization provided in Chapter 1, together with research results (see Chapters 5-8), and the summary of the significance of the premises (see Premise 1 in Part 3 of this Chapter), it is evident that one of the major forces pushing the Thai TV industry into the digital environment is the globalisational trend (see more details in the discussion of research results in Part 4.2 of this Chapter). Based on the theoretical framework of globalisation and the answers from the majority of interviewees in the research (see Part 1 in Chapter 5), it can be summarized that Thailand's TV industry cannot resist the global trend of change which is dominated by the global TV industries. In other words, the shifting of Thailand's television broadcasting from analogue to digital is an inevitable result of the global technological transition.

The second chapter (Digital Television) presented theoretical frameworks on digital television, a current circumstance of global digital television, and digitalization of communication technology. The literature reviews of these issues, again, support the argument that the transition of TV technology from analogue to digital has become a global phenomenon (globalization trend). At the international level, since the 1990s many nations around the world have launched plans to convert the TV broadcasting system into digital (see Table 5 in Chapter 2). Drawing on literatures reviewed in Chapter 2, I proposed five research questions of this thesis: (1) advantage and disadvantage of launching DTV in Thailand, (2) worthiness of investment in national TV technology conversion, (3) strategy of technological transition, (4) trends of DTV in Thailand, and (5) readiness of current TV stations in technological transition.

Theories on the benefit of DTV technology by Book, O'Leary, Adam, Anand, Fox, and Griffits (see Chapter 2) are supported by results derived from interviews with Thai thesis participants in this research (see detailed discussion in Part 2 of Chapter 5). These benefits include the benefit for TV audiences (extra TV channels and services – more freedom of choice and variety of content, image and sound quality improvement, additional features, a greater chance for participation, involvement and interaction), and benefit for TV station operators (increased ease of TV station operation and enhanced TV production quality, operational cost reduction, better quality of TV program production and TV signal transmission, provision of a greater chance for newcomers into the domestic TV market, generation of a new channel of extra revenue). More detailed discussion on significant research results is also provided in Part 4.2 of this Chapter.

Chapter 3 presents the theoretical frameworks and development of communication policy and the development of the Thai TV industry (1950-2008). The literature reviews provide fundamental knowledge regarding the development of global communication policy as well as development of the TV industry in Thailand. Based on the literature reviews, it can be concluded that the key players in making communication policy (or Policy Formulators and Policy Implementers) in Thailand are governments and state authorities. In addition, considering the notions of "Vertical Paradigm of Policy Making" (Colebatch 2002) and "Elite Theory" (Dye 1992), these paradigms are suitable to explain the nature and circumstances of Thailand's TV industry. Thailand's TV broadcasting industry has been manipulated by the state authorities since the first day of establishment. The elites and state authorities play a crucial role in regulation and issuing policy, and making decisions (see Table 11: Development of TV Broadcasting Policy and Regulation (1950 – May 2008)).

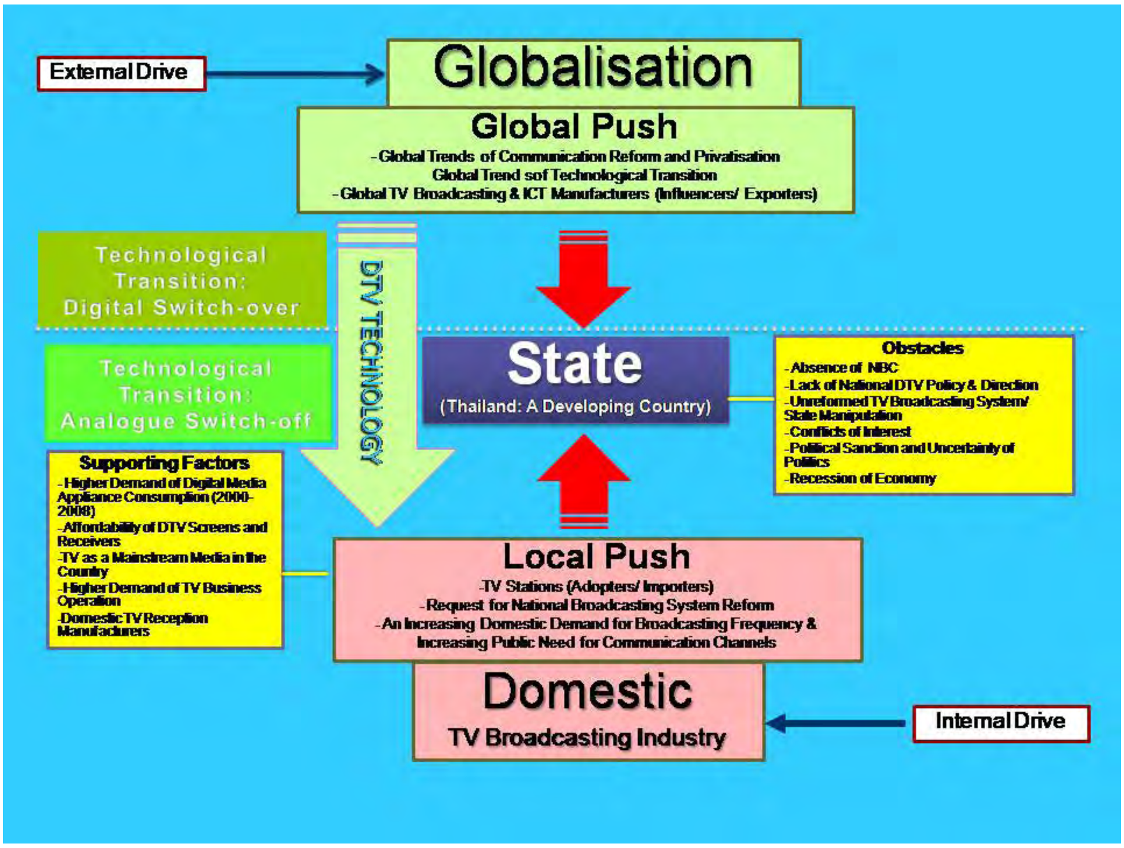
The research results (responses from the majority of Thai thesis participants) presented in Part 4 of Chapter 6 also highlighted the important role of the National Broadcasting Committee (which is a state authority/ a national broadcasting regulator) and governments in launching DTV in Thailand. Despite the fact that Thai TV station operators have employed DTV technology for a decade (see Chapters 7-8), the Thai TV market cannot completely migrate into the digital environment unless the NBC and governments implement national DTV policy.

In addition, the literature reviews on development of communication policy and trends of communication policy in the 21st century (Katz 2005; Goldsmith et al 2002, 2004) suggest that broadcasting regulators need to revise national communication policy and prepare domestic TV broadcasting industries to step forward into the digital age. The regulators need to generate updated and effective policy in order to be able to handle the changing media environments as illustrated in literature review chapters (Chapters 2 and 3). The opinions of the thesis participants regarding the future circumstances of digital television in Thailand (see Part 5 in Chapter 6) were also identical to the notions recommended by scholars and contributors in the theory chapters. Furthermore, I applied a part of notions of communication policy in the 21st century (Katz 2005; Goldsmith et al 2002, 2004) as a fundamental framework constructing a research question on the transition strategy to launch DTV in Thailand. The research results regarding recommendations on establishing a successful national DTV broadcasting policy and plan (see Table 12 in Chapter 6) should be considered as a guideline for launching DTV in Thailand.

4.2 DISCUSSION ON RESEARCH RESULTS

In this part, I revisit the introductory chapter, and the conceptual frameworks of globalisation, digital television, and communication policy in the theory and literature review (Chapters 1 - 3) and use these to discuss the significant issues of the research findings (Chapters 5-8). I synthesise a model of “Thailand’s TV Broadcasting Industry in Technological Transition” based on key responses from the interviews, data from observations, discussions with TV crews, and information about the TV broadcasting industry .

Figure 17: A Model of Thailand’s TV Broadcasting Industry in Technological Transition



Globalisation is a major force of global change and social reform (Rantanen 2005). Modern communication technology, transnational trade, capitalism, and international economy are the key components of globalisation in the contemporary world (Marx 1848; Scheuerman 2006; Bhagwati 2004). All members of the globe become socially and economically interdependent on and interconnected with each other (Thompson 1995; Nayyar 2002). Ratenen (2002) and Appadurai (1998) emphasise that the main compositions of globalisation are media ("mediascape") and technology ("technoscape"); therefore, technological innovator nations who own communication technology completely take control and orchestrate the direction and technological change of the rest. Digital communication technology has become a lucrative product in the global market (see the wealth of the world's leading TNCs in communication technology in Table 3). From the perspective of world system theory (Wallerstein 1987), the flow of global communication technology can be defined as an economic push from "the core states", to "the semi-periphery countries", and to "the peripheral nations". Following Thussu's study on Electronic Empires in 1998, and my repeated study on the TNCs in 2007 (see Table 4 in Chapter 1), I consider that the developed and industrialised nations in America, Europe, and some countries in Eastern Asia can be defined as the core states or the world's influencers who play a very significant role in leading the global communication and electronic equipment industry. Therefore, when the dominant nations of the world have moved into a new media and technological environment, the rest (semi-periphery and periphery nations) have also been pushed forward into the transition.

In a global picture of the world economy, Thailand can be defined as a small country in terms of economic wealth, as its GDP is only US $245.659 billion, which is a long way behind the world's leading nations in communication technology, such as the US (GDP US $13,843.825 billion), and Japan (US $4,383.762 billion) (IMF 2008). This means Thailand has less negotiation power in the world economic arena. In addition, as mentioned in Chapter 1, Thailand spent a lot of its national budget importing electronic equipment (a total of US $19,451 million in 2007, according to the Department of Foreign Trade 2008). The OECD (1989) also defined Thailand as a Second-tier Asian NIE, a country that is technologically dependent on foreign innovation for domestic socio-economic development.

The main responses from the majority of thesis respondents on the prime drives of transition loudly echo that the transition is “irresistible”, “a gigantic wave of global technological transition”, “a globalisational force”, “…because we are a part of the world” (see Part 1 in Chapter 5). These again represent the fact that Thailand is highly reliant on the global system as a foreign technology dependent country. This is a historical factor of the development of Thai TV broadcasting (see Part 2 in Chapter 3), as Thailand has been dependent on American and British TNCs since the establishment of Thailand’s TV industry in the 1950s. American and British software, hardware, and knowledge were used for Thailand’s TV trials and then the installation of its first TV station (Channel 4) in 1955 and other pioneer state-owned TV stations. Decades later, Japanese TV manufacturers have become newly dominant in Thai TV production, as can be seen from the fact that there are a wide range of Japanese TV production equipment brands and products have been employed in Thai TV stations and media production agencies, such as SONY, JVC, and PANASONIC video cameras, video tape players and recorders, and video and audio editing stations. At present, when the dominant nations and world leaders of the TV industry, e.g. US, European nations, and Japan, migrate to DTV, Thailand has also been driven to migrate into this new environment. As shown in Figure 17, the global push (external drive) can directly impact on two layers of key actors in the domestic TV broadcasting industry: the state/government and TV station operators.

At the macro level, in terms of external influences on the state’s decision and policy making, the transition of global communication technology has been influenced by international regimes and TNCs (Raboy 2002; Sarikakis 2002; Chakravartty and Sarikakis 2006), such as ITU, DVB, NAB, ABU (Asia-Pacific Broadcasting Union), and etc. Therefore, the transition has been pushed into the global agenda. Many nations around the world have mandated national policies and plans for the analogue switch off and digital switch over (see Table 5 in Chapter 2). The Thai government and state authorities have been pushed by the external/international forces (a global trend of shifting the media industry from analogue into a digital environment). In addition, the pressures are also coming from the campaigns of the ABU to switch Asian broadcasting industries into digital. Thailand does not want to be left behind from the neighboring countries in ASEAN

(Association of Southeast Asian Nations)[1]. The neighboring countries around Thailand, such as Singapore, Malaysia, Burma, and Cambodia, have been progressive in the transition to digital.

In addition, the global trend of communication reform and privatisation since the late 1980s has changed communication policy and regulation in many countries (see McQuail 2000). McChesney (2001) maintains that the notions of “free market”, “deregulation”, “privatisation” and “communication reform” have become the dominant ideology for modern media, communication, and telecommunication business. The main driving mechanism of modern media business after deregulation and privatisation tend to be market force and capitalism (Chakravartty and Sarikakis 2006; O’ Sullivan et al 1994; Thompson 1994; and Tumber 2000). The 4th protocol to the General Agreement on Trade in Services (GATS), in which Thai government signed a contract with WTO (World Trade Organisation), is an example that the global force has influenced the state, forcing Thailand to privatise the domestic communication and telecommunication businesses.

In the domestic TV industry, Thai TV station business operators have been dominated by global manufacturers to move to digital since the late 1990s. There have been many imported digital hardware and software into Thai TV stations (see Chapters 7-8, and also in Tables 49-52). Many TV administrators (see Part 1 in Chapter 5 and Table 41), and TV crews also admitted that global TV administrators are the masterminds of the transition (see Chapters 7-8).

Another prime drive of the transition has been a local push (see Part 1 in Chapter 5). All terrestrial TV stations in Thailand have been in state a monopoly system for decades (see background of Thai TV industry in Chapter 3). Even though state authorities give privileges to some private sector operators, there still remain a great number of investors and community services who have been enthusiastic to operate TV station businesses. State authorities always claim that the TV and radio frequencies in the analogue system are

[1] ASEAN is a regional multi-state grouping (Raboy 2002).

limited and reserved for public use only, and that there is no space for the newcomers or for the private sector to join the industry. As digital technology enables TV signal compression and provides a broader gateway for media business entrepreneurs (Book 2004; O' Leary 2000; Kawamoto 2003; Griffiths 2003; Negroponte 1995; Flew 2005; Goldsmith et al 2002; and Van Tassel 2001), the requests for using digital technology as a tool for freeing the national broadcasting system are being voiced increasingly loudly.

In regard to the national launch of DTV and policy, according to majority of thesis participants' responses (see Table 45), the NBC and government are expected to be key agents or policy formulators (ILRI 1995) of the campaign. In accordance with Colebatch's (2002) and Dye's (1992) notions about the policy making paradigm, the vertical dimension of policy making and elite model are regarded as a suitable scheme for launching DTV policy in Thailand. The participants considered that the national TV transition project should be raised in the national agenda. The project also needs formal authorization (Hogwood and Gunn 1984) and a state authority, the NBC, to implement policy and regulate the campaign. In addition, in terms of identifying policy problems (Dye 1992), the main impediments to launching DTV in Thailand are the absence of the NBC and lack of a national digital switch over plan. In other words, the central mechanism of transition is bureaucratic and horizontal authorization from the state authorities. As long as Thailand fails to raise the transition to a national agenda and legislation, the official transition to DTV cannot proceed.

The results in Chapters 7-8 demonstrated that, overall, TV stations in Thailand have been progressively developing into semi-digital stations, and many of them have progressed to integrating services with other digital new media. Therefore, I argue that in terms of TV station operations, the majority of TV operators are ready to go to digital because the main basic equipment and production and broadcasting infrastructures are compatible with the digital TV stations scheme.

According to participants' predictions on the trends of the Thai TV broadcasting market, after opening for new technology (see Part 5 in Chapter 6), there will be higher competition. Thai TV operators also need to reorganize the TV broadcasting business. There will be a number of main changes in Thai TV industry as follows:

(1) <u>Contemporary TV Business</u> (Integration and Cooperation). The landscape of DTV will be expanded into a new media scheme. There will be high convergence in forms of media and communication technology and business. TV content will be distributed via various new digital platforms as “images and sounds in digital format can be integrated with other forms of telecommunication resources and then transmitted over various types of telecommunication network” (O’ Leary 2000: 1). Besides terrestrial TV and satellite TV, there will be a wide range of digital TV content services provided in the format of multi media on mobile devices and broadband Internet. Since the NTC recently approved the 3 G and broadband Internet services, many giant telecommunications and mobile phone service firms such as TOT Corporation Public Company Limited, CAT Telecom Public Company Limited, AIS (Advanced Info Service), True Move, and DTAC have made plans to move towards taking part in the media and broadcasting industry. Some of these companies own IPTV, such as Buddy TV serviced on the Internet. True Move provides TV content services on mobile and links with affiliated TV station “True Visions”. Some companies have business agreements with major free TV stations. Digital technology will open up chances for extra business services in Thailand: VOD, TV direct shopping, games on TV, and voting on panels or in polls related to TV programming (Griffiths 2003).

(2) <u>Contemporary DTV Audience</u>. The Thai TV audience will be segmented, accessing TV programs and content according to interests and preferences, and will become more active viewers. The balance of power will be shifted from TV producers’ hands in an analogue world to viewers’ control as the digital technology provides a solution to the limitations of communication channels and a greater possibility for contemporary TV audiences to *choose, control, and actively participate in* their preferred TV channels (McQuail 2000). In other words, contemporary TV consumption will be shifted into a *viewer/audience-oriented media exposure concept* (Griffits 2003). There have been signs in recent years that niche TV programs and reality and live shows with interactive paths (voting via SMS) such as True Academy Fantasia (AF), Big Brother, and

The Star have obtained popularity from Thai viewers. In addition, there have been an increasing number of niche satellite and cable TV stations established since 2004 (these stations mainly use digital technology in TV station operations), such as health stations, news stations, music stations, and religious stations. Besides audiences interacting as receivers, the notion of user generated content/ and citizen journalist will be a new trend of modern TV programs. Some TV channels and operators such as the Nation Multimedia Group have been conducting such projects in trials via their Internet services platform.

(3) Challenges of Launching DTV Technology into the TV Broadcasting Industry in Thailand. Digital technology will provide great benefits to Thailand's broadcasting system; however, there will be a number of challenging issues that the regulators and entrepreneurs may need to consider. The research results in Chapters 5-8 also confirm these challenges and impacts. These issues are:

- Investment cost of transition and digital switch over (Van Tassel 2001). From the perspective of TV station operators, despite the fact that majority of Thai TV stations have been migrating to the digital environment for years, there will be extra costs of upgrading equipment and transmission paths throughout the country, e.g. the digital transmitters and transmission towers in regional network stations. There will also be the big challenge of converting all of the more than 15,233,700 TV households (NSO 2003) into digital. Although majority of the thesis participants agreed that the transition is a worthwhile investment (see Part 3 in Chapter 5, and Table 44), the NBC and government should consider the high cost of transition in both aspects.

- Revision of TV broadcasting policy and regulation (Goldsmith et al. 2004). Digital communication technology will generate a paradigm shift in regulating the TV broadcasting system in Thailand in various aspects. In terms of content regulation and issuing DTV licenses, the regulators, NBC, and state authorities need to generate a new broadcasting frequency and spectrum allocation plan for effectively serving socio-economic development and complying with new Constitution and Broadcasting Acts. Thesis participants also indicated that fairness in reallocating the broadcasting frequency is very significant for moving Thailand's broadcasting industry forward to a digital sphere.

As digital technology promises multi-channelling, datacasting, and multimedia services, it forces the NBC and state authorities to review the national communication policy and strategy to support TV operators in using digital TV technology for public services and national development. In the aspect of media and telecommunication convergence, Thailand's broadcasting regulators also need to update the laws and measures in order to cope with the changing attributes of the contemporary media services. The new regulations should emphasise protection of citizens' rights and high service standards. However, the new regulations should also promote fairer competition in the broadcasting market without presenting an obstacle for running the businesses.

4.3 CONCLUSION AND RECOMMENDATIONS FOR FUTURE STUDY

In summary, Thailand's TV industry has been driven into technological transition by both global and local pushes. In the big picture, Thai TV stations have already started moving into digital operation. The NBC and governments are expected to be prime agents of shifting Thailand to a new technological environment. After adopting DTV technology, the Thai broadcasting industry will be in a very competitive environment.

Theoretically and technically, digital communication technology can be used as an assistance tool for eliminating broadcasting frequency limitations; however, technology cannot provide a solution for the real impediments of the Thai broadcasting system, which are the state monopoly, conflicts of interest, and a vacuum atmosphere of broadcasting regulator and policy. Therefore, in terms of launching DTV into the country successfully, first of all, Thailand needs to reform, reconstruct, and reorganise its industry, and make a serious commitment to generating a national master plan for orchestrating the future of the broadcasting and new media industry.

This thesis can be seen as a preliminary study on DTV in Thailand (during 2006 and 2007). In addition, there were a number of limitations of the study, in particular, the fact that the field study was conducted after the coup in September 2006. I would recommend that future studies may consider TV audience's perspectives and use different research methodologies, for example focus groups, Delphi technique, surveys, and quantitative research methods. The views of TV professionals regarding DTV policy, impact of DTV technology on media production, and trends of digital new media and integration of broadcasting, telecommunication, and IT business services should be investigated. In addition, in a broader area, it will be useful to conduct a comparative study on the effects of the international transition to DTV on national policy, strategy, and practice of TV station operators of other countries from different regions and continents. In addition, future studies may examine on the impact of DTV on economic, political, and socio-cultural aspects.

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APENDIX 1A

MACQUARIE
UNIVERSITY - SYDNEY

3 February 2006

Mr Sikares Sirakan
23/2 Greenknowe Avenue
Potts Point NSW 2011

Reference: HE25NOV2005-D04374

Dear Mr Sirakan

FINAL APPROVAL

Title of project: *Digital TV in Australia and Thailand*

Your responses to the outstanding issues raised by the Committee have satisfactorily been addressed You may now proceed with your research

Please note the following standard requirements of approval:

1 Approval will be for a period of twelve months At the end of this period, if the project has been completed, abandoned, discontinued or not commenced for any reason, you are required to submit a Final Report on the project If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. The Final Report is available at http://www ro.mq edu.au/ethics/human/forms

2 However, at the end of the 12 month period if the project is still current you should instead submit an application for renewal of the approval if the project has run for less than five (5) years This form is available at http://www ro mq edu.au/ethics/human/forms. If the project has run for more than five (5) years you cannot renew approval for the project You will need to complete and submit a Final Report (see Point 1 above) and submit a new application for the project (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

3. Please remember the Committee must be notified of any alteration to the project.

4. You must notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that might affect continued ethical acceptability of the project

5. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University (http://www ro mq.edu au/ethics/human)

If you will be applying for or have applied for internal or external funding for the above project **it is your responsibility** to provide Macquarie University's Research Grants Officer with a copy of this letter as soon as possible. The Research Grants Officer will not inform external funding agencies that you have final approval for your project and funds will not be released until the Research Grants Officer has received a copy of this final approval letter

Yours sincerely

Catriona Mackenzie

Dr Catriona Mackenzie
Chair, Ethics Review Committee (Human Ethics)

cc. Dr Sripan Rattikalchalakorn

CRO File: 05/1740

ETHICS REVIEW COMMITTEE (HUMAN RESEARCH)
MACQUARIE UNIVERSITY (E11A)
SYDNEY, NSW, 2109 AUSTRALIA
Secretary: Ph: (02) 9850 7854 Fax: (02) 9850 8799 E-mail: kdesilva@vc.mq edu.au
http://www.ro.mq edu.au/ethics/human

Portrait (85%)

APENDIX 1B

MACQUARIE
UNIVERSITY ~ SYDNEY

21 September 2006

Mr Sikares Sirakan
23/2 Greenknowe Avenue
Elizabeth Bay NSW 2011

Reference: HE25NOV2005-D04374

Dear Mr Sirakan

APPROVAL OF AMENDMENT TO PROTOCOL

Title of project: ***Digital TV in Australia and Thailand***

Thank you for your recent correspondence dated 17 September 2006. The requested amendments have been reviewed and approved.

This approval applies to the following amendments:
1. *The addition of an observational research methodology to the project*

Please note the following standard requirements of approval:
1. Approval will be for a period of twelve months. At the end of this period, if the project has been completed, abandoned, discontinued or not commenced for any reason, you are required to submit a Final Report on the project. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. The Final Report is available at http://www.ro.mq.edu.au/ethics/human/forms
2. However, at the end of the 12 month period if the project is still current you should instead submit an application for renewal of the approval if the project has run for less than five (5) years. This form is available at http://www.ro.mq.edu.au/ethics/human/forms. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report (see Point 1 above) and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).
3. Please remember the Committee must be notified of any alteration to the project.
4. You must notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that might affect continued ethical acceptability of the project.
5. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University (http://www.ro.mq.edu.au/ethics/human).

Yours sincerely

Dr Margaret Stuart
Director of Research Ethics
Chair, Ethics Review Committee [Human Research]

cc. Dr Sripan Rattikalchalakorn

ETHICS REVIEW COMMITTEE (HUMAN RESEARCH)
MACQUARIE UNIVERSITY (E11A)
SYDNEY, NSW, 2109 AUSTRALIA
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http://www.ro.mq.edu.au/ethics/human

APENDIX 2

INFORMATION AND CONSENT FORM

Name of Project: “Digital TV in Thailand (2006-2007)”

You are invited to participate in a study of the impact of Digital Technology on the Television Broadcasting Industry. The purposes of the study are as follows: 1) To establish a better understanding of DTV station policy and implementation of TV stations in Thailand, 2) To explore the guidelines recommended by thesis participants (TV administrators and Mass Communication scholars) for the national DTV industry regulation, and DTV station administration and management, 3) To discover the use of digital technology (i.e. software programs and digital hardware/equipment) in Thai TV station operation, 4) To provide views of thesis participants (TV administrators and Mass Communication scholars) on the impact of digital technology regarding the following issues; 4.1) the transformation of the TV industry in Thailand, 4.2) domestic TV/media consumption and marketing, 4.3) media and communication theory, and 5) To predict the future trends of digital TV industry in Thailand.

The study is being conducted to meet the requirement for the degree of Doctor of Philosophy in International Communication by Mr. Sikares Sirakan, a PhD candidate at the Department of International Communication, Macquarie University, Sydney, Australia (telephone number +61 (0)4 1654 8456, e-mail: sikares.sirakan@students.mq.edu.au) under the supervision of Dr Sripan Rattikalchalakorn (telephone number +61 (0)2 9850 8014, e-mail: sripan@scmp.mq.edu.au) and Professor Dr Naren Chitty.

If you decide to participate, you will be asked to answer a number of questions in accordance with your understanding and experience of Digital Television. Each interview may take 45-60 minutes. If agreed, these interviews could be recorded by employing an audio-recorder. There will not be any payment for participation. However, each participant will receive a souvenir as a gift of appreciation from the researcher.

Any information or personal details gathered in the course of the study will be confidential. No individual will be identified in any publication of the results unless he/she gives permission. Therefore, if you would like to be identified (by name and position) in this thesis, please mark a tick ✓ in this check box ☐.

Results will be presented in a thesis to be submitted to Macquarie University. A copy of the thesis will be made available on CD-ROM to each participant.

If you decide to participate, you are free to withdraw from further participation in the research at any time without having to give a reason and without consequence.

I, ………………………………………………………. have read and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep.

Participant’s Name: …………………………………………………………..……………… (block letters)

Participant’s Signature: ………………………………………………Date:……….………………………

Investigator’s Name: …………………………………………………......…………………. (block letters)

Investigator’s Signature: …………………………………...………. Date: ………………...…………..…...

The ethical aspects of this study have been approved by the Macquarie University Ethics Review Committee (Human Research). If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Ethics Review Committee through its Secretary (telephone +61 (0)2 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

☐ **Researcher’s Copy** ☐ **Participant’s Copy**

APENDIX 3

QUESTIONNAIRE

Instructions: Please provide your answers and indicate your opinions on the questions/statements below.

Section 1: Major Drives of Technological Transition

(1) What are the main factors that drive the Thai TV broadcasting industry into the technological transformation from analogue to digital technology?

Section 2: Benefit and Disadvantage of DTV

(2) What are the apparent benefits of DTV technology?

(3) Have you identified any disadvantages/weak points regarding the introduction and the use of DTV technology into the Thai TV Broadcasting Industry? Please provide your specific reason or comment ……………………

Section 3: DTV and Public Interest

(4) DTV requires a huge investment in transforming the system from analogue to digital, and in installing and purchasing new software and hardware. In your opinion, does this investment serve the national benefit and public interest?

Section4: National DTV Policy and Regulation

(5) What are the most important prime factors for the *successful* and/or *unsuccessful* launching of DTV technology in TV broadcasting industry?

(6) In your view, what are the main elements that the 'National Broadcasting Regulatory Authorities should focus on and review in order to establish a successful national DTV broadcasting policy and plan?

Section 5: Future Trends of DTV in Thailand

(7) Can you predict future trends DTV in Thailand?

APENDIX 4

A Request for Conducting an Observation Research Protocol in TV Production and Broadcasting Procedures

Dear

I am writing to request permission for conducting observational research in TV production and broadcasting procedures on behalf of Mr Sikares Sirakan. Mr Sirakan, a PhD candidate is currently undertaking a PhD program at the Department of International Communication, Macquarie University, Sydney, Australia. His research project is entitled “Digital TV in Thailand”. This study is being conducted to meet the requirement for the degree of Doctor of Philosophy in International Communication under the supervision of Dr Sripan Rattikalchalakorn and Professor Naren Chitty.

The purposes of the study are as follows:

(1) To explore major drives influencing Thai TV broadcasting industry into technological transition shifting from analogue to digital.

(2) To investigate prospective key benefits and disadvantages of adopting and launching DTV technology in Thai TV broadcasting industry in relation to TV audiences and TV station business operator.

(3) To obtain views from thesis participants vis-à-vis if a national investment on implementing DTV technology in Thailand is praiseworthy and can serve public interests.

(4) To discover prospective supporting factors and obstacles of launching DTV in Thailand.

(5) To obtain thesis participants’ recommendations vis-à-vis establishing a national DTV policy.

(6) To explore future trends of DTV in Thailand.

(7) To scrutinize a current circumstance of Thai TV stations regarding technological employment in TV operation (production and broadcasting protocols), as well as a preparation and promptness of Thai TV stations for migrating to digital.

This project will employ two research methods for gathering data. One selected method is an in-depth interview, through which the researcher will gather views from TV station/production agency administrators and Mass Communication scholars in Thailand, regarding the impact of Digital Technology on the Television Broadcasting Industry. Another research method is an observational research protocol in which the researcher aims to study and obtain information on how the digital technologies, i.e. software and hardware, are currently being used in the modern TV station operation.

As your organization is one of the leading TV stations in Thailand, I firmly believe that it will provide a valuable experience for Mr Sirakan to obtain in-depth knowledge and understanding regarding significance of digital technology in TV production process. I would like to request your kind consideration in providing Mr Sirakan permission to undertake an observation research protocol at your TV station at a time convenient to you.

Please notify name, position, and contact details of the person whom you will appoint as a contact person and/or a person who can provide information about the TV station operation workflow in your organization. In addition, the researcher also would like to ask permission for conducting interviews with a number of your staff regarding the employment of DTV technology. These interviews will be audiotape recorded. Furthermore, the researcher also would like to ask permission for taking photos of the process of TV production and broadcasting. These audiotape records and photos will be used only for academic purposes.

Please notify Dr Rattikalchalakorn, Mr Sirakan or myself about the result of your consideration. After obtaining your permission, Mr Sirakan will be in contact with you to make arrangements and provide you with more details about conducting the observational research project at your TV station. If you have any questions regarding this project or the PhD program, please do not hesitate to contact me.

Yours faithfully

Professor Naren Chitty
Head, Department of International Communication

Dr Sripan Rattikalchalakorn
Lecturer, Department of International Communication
Research Project Supervisor

APPENDIX 5

A list of main equipment used in TV production and broadcasting in TV station

Date: ……………………………………

Name: ………………………………….. Surname: ………………………………..

Position: ……………………………….... TV Channel: ……………………………

Work Experience in TV Station/Broadcasting: ………………………………. Years

(1) What is/are your main role(s) in TV production and/or in TV broadcasting operation?

( ) Pre-production

( ) Production

( ) Post-production

( ) Broadcasting

(2) At present, please provide the estimation on the proportion of TV technological system employment between digital system and analogue system in the TV production and broadcasting procedure at your TV station.

2.1) the proportion of TV technological system employment between digital system and analogue system in *"Pre-production Protocol"* …….. : ……….

2.2) the proportion of TV technological system employment between digital system and analogue system in *"Production Protocol"* …….. : ……….

2.3) the proportion of TV technological system employment between digital system and analogue system in *"Post-production Protocol"* …….. : ……….

2.4) the proportion of TV technological system employment between digital system and analogue system in *"Broadcasting Protocol"* …….. : ……….

(3) Please specify main digital software and hardware used in the TV production and broadcasting protocols.

3.1) Pre-production Protocol

Task	Do you use any digital software and hardware in this task?	If yes, please provide details of software and hardware.
1) Planning and Preparation for Production	( ) Yes ( ) No	
2) Writing and Preparing Scripts	( ) Yes ( ) No	
3) Creating a Story Board	( ) Yes ( ) No	
4) Preparing for Video and Audio Recording	( ) Yes ( ) No	
5) Designing Set, Props and Other Artwork for Production	( ) Yes ( ) No	

3.2) Production Protocol

Task	Do you use any digital software and hardware in this task?	If yes, please provide details of software and hardware.
1) Shooting and Recording Video in TV Studio	( ) Yes ( ) No	
2) Shooting and Recording Video on Location/Outdoor	( ) Yes ( ) No	
3) Audio Recording	( ) Yes ( ) No	

3.3) Post-production Protocol

Task	Do you use any digital software and hardware in this task?	If yes, please provide details of software and hardware.
1) Inputting, transferring, capturing, and processing digital video format and/or video files and/or digital images into editing station.	( ) Yes ( ) No	
2) Inputting, transferring, capturing, and processing digital audio format and/or audio files into editing station.	( ) Yes ( ) No	
3) Non-linear Video/Audio Editing	( ) Yes ( ) No	
4) Generating the Graphics, Animations, and Special Effects	( ) Yes ( ) No	
5) Outputting the Completed TV Program into Digital Formats	( ) Yes ( ) No	

3.4) Broadcasting Protocol

Task	Do you use any digital software and hardware in this task?	If yes, please provide details of software and hardware.
1) Program Scheduling/Automation	( ) Yes ( ) No	
2) Archiving and Storing Digital Videos and Data	( ) Yes ( ) No	
3) Monitoring and Quality Control of TV Program Broadcasting	( ) Yes ( ) No	
4) Broadcasting	( ) Yes ( ) No	