

# Responding to media convergence: Regulating multi-screen television services in Thailand



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## ABSTRACT

This study examines how Thailand's convergence regulator, the National Broadcasting and Telecommunications Commission (NBTC), regulates digital television's transition and new audiovisual services. In addition to document analysis, this study interviewed stakeholders (e.g. NBTC policymakers, broadcaster and cable TV operators). The socio-technical analyses show that the NBTC prioritized digital television transition and imposed substantive government/policy support. Comparatively, Internet Protocol television (IPTV) and mobile TV which are driven by the industry/market subsystem have sluggish regulatory advancements. The interview results show that the NBTC is likely to regulate multi-screen TV services' contents and platforms separately as a result of complexity. Hence, this study recommends a platform-neutral approach to regulate audiovisual media categorized by socio-cultural impact and content production/aggregation model. It suggests that Thailand's TV-like services which can reach a mass market and produce/aggregate contents/services via a gatekeeping mechanism should be subject to strict content regulations and licensing schemes. However, light-touch regulations in content and licensing are suitable for governing emerging TV-like services which utilize a participatory content model with less socio-cultural impact. Finally, net neutrality is recommended in facilitating cross-platform content innovations and distribution.

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## 1. Introduction

Due to rapid technological advancements, television has transformed into various innovative and individualized audiovisual services including Internet Protocol television (IPTV), mobile TV, over-the-top TV, etc. As a result of improved viewing experiences and wireless connectivity, smartphones and tablets have become popular screens for people to watch videos on the move. In 2009, the emergence of three-screen TV developed integrated solutions for video viewing (Krazit, 2009; Noam, 2008). Later, multi-screen TV services which allow users to consume videos on various screens (i.e., smartphones, games consoles, tablets, PCs, and TVs) introduced new ways to distribute, consume, share, and create content in countries with advanced information and communications technology (ICT) (Simon, 2011). On the one hand, cross-platform video consumption leads to continued significance of TV media nowadays. According to

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Ericsson Consumer Lab report (2014), TV remains the most used screen media for video consumption, yet its importance decreases due to prevalent use of portable devices. Avid multi-screen TV users are typically young adults (Pew Research Centre, 2012). On the other hand, multi-screen TV has brought complex convergence issues and regulatory challenges in existing socio-technical systems of traditional TV industries (Lin, 2011). In response to rapid audiovisual media convergence, different countries develop different regulations to foster innovations and economic growth and protect socio-cultural values like cultural diversity and minority.

In Thailand, TV is most important media, accounting for 60% of advertising revenues, based on 2012 Nielsen media research (Yoonaidharma, 2012). However, it is the last ASEAN country to introduce digital TV (DTV). In December 2010, after its Parliament passed the Organization to Assign Radio Frequency and to Regulate Broadcasting and Telecommunication Services Act (henceforth, the NBTC Act), the long-term monopoly over Thailand's telecommunication and broadcasting industries came to an end (Thaveechaiyagarn, 2012). Its first independent convergence regulator, the National Broadcasting and Telecommunications Commission (NBTC), was formed in late 2011, which aims to take concrete actions and make significant changes to ensure the growth of the two industries. The NBTC's DTV master plan (2012–2016) widened business opportunities for broadcasters, content providers, telcos, device manufacturers, and advertising agencies (Leesa-nguansuk, 2012). After completing the spectrum auction of commercial DTV, a 10-year migration plan from analog to digital TV started in January 2015 with a goal of 80% population adoption by 2020 (Tortermvasana, 2012). Triple-play networks have grown steadily to provide IPTV services for Thai audiences despite the low broadband penetration (IPTV News, 2012). The widespread use of mobile phones in Thailand presents business opportunities for mobile TV services. These show that Thailand has great potential for multi-screen TV development.

The multi-directional trajectory of emerging multi-screen TV is shaped by various actors in the socio-technical subsystems. Thailand's TV industry, its most popular form of mass media, has long been controlled by the government for propaganda purposes. After the NBTC Act, how did advancing digital multi-screen technologies and changing media consumption styles reform audiovisual media environment and shape the convergence regulations in Thailand? Taking a socio-technical approach, this study examines the regulatory development of digital audiovisual media after the NBTC Act, and investigates how key stakeholders in the policy/government and industry/market subsystems shape the trajectory of emerging multi-screen television services. This study not only conducted document analysis of abundant second-hand data such as NBTC reports, policies/regulations documents, media market analyses, and news articles, but also interviewed key stakeholders involved in convergence including policymakers and regulators (e.g., NBTC's vice chairman and committee of digital switchover), and broadcasters and cable TV operators (e.g., top management in MCOT and True Corporation Public Company) in June 2012, March 2013, and December 2014. This study used the socio-technical framework to analyze data and applied a platform-neutral multi-screen TV regulatory scheme (Lin, 2013) to make recommendations for Thailand's case. The findings contribute to the latest understanding of Thailand's convergence and regulatory challenges in emerging multi-screen television services and make platform-neutrality recommendations to regulate content and licensing differently on four types of audiovisual media.

## 2. Multi-screen television convergence issues

The rapid adoption of smartphones and tablets as second screens has transformed traditional television viewing (Tribbey, 2014). In recent years, connected TV allows users to access Internet content such as web videos. Although many smart TVs are not comparable to smartphones in terms of usability, new TV devices and services such as Apple TV and Google TV bring Internet content and services to the living room and challenge conventional passive TV services directly. With the availability of new devices, the consumption of audiovisual content across platforms is growing rapidly, which shapes conventional TV businesses drastically and turns consumers' viewing behaviors towards time-shifted and over-the-top services (Nielsen, 2014). Consumers select live and time-shifted audiovisual services and create personalized viewing schedules to fit their flexible digital lifestyle. It is crucial for industry players to address the evolving consumer expectations with multi-screen TV services.

Regardless of platforms, TV is ultimately content-driven. Traditional TV channels, on-demand videos, and a huge amount of user-generated content give consumers a variety of viewing options and personalized experiences. As video delivery modes increase, audiovisual content producers (e.g., broadcasters, cable TV, and IPTV) have diverse ways to redistribute their programming to maximize long-tail revenues with increasing concerns over digital copyright protection. To engage audiences, TV operators harness social media to create a backchannel which facilitates social expression and co-viewing experiences (Shepatin, 2012).

One key technological issue in multi-screen TV industry is providing integration solutions with system interoperability capabilities so that audiences can watch varieties of videos via different screens seamlessly. Also, it is essential to develop platform independent devices for different systems and networks (O'Neill, 2009). The 2012 Future of TV Survey reported that over half of the TV operators regarded cloud computing as a crucial technology in TV innovations (Informa, 2012). Creating ubiquitous audiovisual contents over the cloud which can be distributed and accessed swiftly cross platforms is also the key to successful multi-screen TV services (Davidovitz, 2010).

### 3. Multi-screen television regulatory issues

#### 3.1. Convergence policy

In the past, broadcast and telecommunications were clearly separate markets based on different technologies with distinct governance and regulatory frameworks. Through technological advances, this well-organized and segregated situation transformed into one of convergence, allowing for similar sets of services to be offered over various platforms, and for bundling distinct services onto one platform (triple and quadruple play) (OPTA, 2008). To face the convergence challenges, different countries set up different policies.

Since digitalization blurs media distinctions, causes industry crossovers, and creates cross-platform content distribution, a differentiated regime governing European countries' broadcasting and telecommunication industries is hard to sustain (Storsul and Syvertsen, 2007). In 1997, the EU Green Paper on Convergence (COM/1997/0623 final) was published, claiming that substantial changes in existing regulations were necessary to adapt to convergence (European Commission, 1997). It first emphasized regulatory barriers and interventions must be reduced and closely targeted in order to encourage investments in new media. Secondly, due to increasing horizontal regulation, common regulatory frameworks would replace the existing sector-specific regulations for broadcasting, telecommunications, and information technology. Finally, self-regulation played an important role in issues concerned with the protection of minors and public order.

Some regulatory reform issues were continually addressed in the 2013 EU Green paper (COM/2013/0231 final) which discusses the convergence transformation of audiovisual media in the European market caused by the merger of traditional broadcast services and the Internet (European Commission, 2013). Its goals include turning media convergence into economic growth and business innovations as well as protecting values like media pluralism, cultural diversity, and consumer rights. It examines the existing technology-neutral Audiovisual Media Services Directive (AVMSD) which regulates media service providers with content editorial responsibilities regardless of platforms. The non-linear services are also subject to the E-Commerce Directive and data protection legislation. It also developed several policy strands for media literacy.

Self-regulation plays a visible role in US responses to convergence. Self- and co-regulation become viable alternatives to traditional TV and telecommunication regulations because the fast changes and difficulties in control and enforcement require flexible instruments which are better grounded in the market and more credible and less burdensome to stakeholders (OPTA, 2008). However, it is vulnerable to collusion and corruption which requires government support, constraint, or monitoring. In response to global competition and Internet complexity, the EU Commission also developed a code of good practice for self- and co-regulation exercises in 2012 (European Commission, 2013).

To cope with convergence challenges, China's then Premier Wen Jiabao announced in January 2010 the acceleration of its three-network integration (i.e., telecommunication, broadcasting, and the Internet), which initiated tremendous advancements in Chinese media convergence (Feng and Jiang, 2013). Meanwhile, the State Council set objectives to push for the full popularization of China's triple-play convergence system by 2015 after a two-year experimental phase (2010–2012). The national blueprint of the three-network integration propels the development of multi-screen audiovisual services in China like DTV and mobile broadcasting TV. Although China launched its triple-play convergence much later than its western counterparts, its strong government support facilitated the fast advancement of innovative audiovisual services and thus developed enormous markets (e.g., China has the largest mobile TV in the world) (Lin, 2012).

#### 3.2. Multi-screen TV policy

The key regulatory challenge for multi-screen audiovisual services is to decide whether to apply existing, amended, or new policies to regulate cross-platform TV-like services, which is highly associated with policymakers' perceptions of these innovations (Lin, 2013). Some countries use extended TV regulations such as licensing schemes and content regulations to govern new audiovisual services on other platforms in order to maintain existing interests (Noam, 2008). However, the traditional or amended broadcast model hardly covers complex issues of multi-screen TV that involves multiple platforms and cross-border content.

Because the layer approach which treats audiovisual services on different platforms differently suffers from technocratic complexity, Noam (2008) proposed a two-tier framework to separately regulate content (i.e., message) and conduit (i.e., medium) of three-screen TV services. The current global trend is to move towards a common infrastructure regulation to govern various video delivery networks (e.g., broadcasting, fixed and wireless telecommunications) (Henten et al., n.d.). Lin (2011) suggested videos distributed via different mobile networks (i.e., mobile cellular technologies and mobile broadcasting frequency) should be regulated based on content nature (e.g., broadcasting/mass market and on-demand/niche). Additionally, Flew (2012) and Australian Law Reform Commission (ALRC) (2012) recommended a platform-neutral approach to regulate media convergence, which focuses on regulating content classifications rather than means of delivery. The advantage of platform neutrality is to maintain an adaptive regulatory framework to cope with fast-changing technologies and global competition. Bauer and DeMaagd (2008) also emphasized the significance of net neutrality to foster business and innovation of multi-screen audiovisual media. They argued that without net neutrality, content providers would be forced to negotiate with different platform operators, which would generate higher transaction costs and cause less innovation incentives. Hence, applying net neutrality is useful in developing multi-screen TV businesses as it can reduce complicated

**Table 1**  
Multi-screen TV regulatory scheme.

Socio-cultural impact	Content model	
	Gatekeeping mechanism (video only)	Participatory mechanism (video + interactive services)
Broadcasting & mass market	Type I Broadcasting TV content code & strict individual licensing <ul style="list-style-type: none"> <li>– Broadcasting TV content regulation</li> <li>– Individual licensing (e.g., broadcaster)</li> </ul>	Type III Subscription TV content code & less strict licensing <ul style="list-style-type: none"> <li>– Subscription TV content regulation</li> <li>– Less strict individual licensing (e.g., mobile broadcasting TV)</li> </ul>
VODs & niche market	Type II Subscription TV content code & subscription or VOD licensing <ul style="list-style-type: none"> <li>– VOD and/or subscription TV content regulation</li> <li>– Individual licensing (e.g., cable TV, IPTV, OTT)</li> </ul>	Type IV Self- or co-regulation of content & light-touch licensing <ul style="list-style-type: none"> <li>– Self-regulation of content</li> <li>– Light-touch licensing (e.g., internet TV, cellular mobile TV services)</li> </ul>

content-platform negotiations and facilitate innovations. Moreover, to manage convergence complexity and foster new TV-like services, light-touch licensing and content regulations are recommended to regulate these next-generation media systems and innovative audiovisual services (Noam, 2008; Lin, 2011, 2012, 2013).

To cope with complex convergence of audiovisual media, Lin's (2013) multi-screen TV regulatory scheme which takes a platform-neutral approach to classify complex cross-platform videos recommended not differentiating policy treatments with respect to delivery and viewing modes. It proposes to categorize varieties of audiovisual services into four types based on two criteria: (1) the socio-cultural impact (i.e., 'broadcast and mass media' and 'VOD and niche market'); and (2) the content production/aggregation model (i.e., 'gatekeeping mechanism' and 'participatory mechanism'). Table 1 shows that each type of services is subject to different license and content regulations. To foster nascent audiovisual media and increase their competitive advantages, the principle of this multi-screen TV regulatory scheme is to apply light-touch licensing schemes and content regulations to innovative TV-like services which usually have less socio-cultural impact (i.e., 'VOD and niche market') and less control in content production/aggregation (i.e., 'participatory mechanism'). That is, Type IV providers (e.g., Internet TV and mobile cellular videos) which provide on-demand videos to niche markets and produce/aggregate content through a participatory mechanism should be regulated under self- or co-regulation of content and Internet-like loose licensing schemes. In contrast, Type I operators (e.g., broadcasters) that create or aggregate audiovisual content via strict gatekeeping transmit scheduled broadcasting content to mass markets. They are subject to strict broadcasting TV content codes and individual licensing schemes. Type II operators (e.g., cable TV and wall-gardened IPTV) should be regulated by on-demand TV content code (and/or subscription TV content code) with individual licensing because they provide VODs selected through a gatekeeping mechanism. Finally, Type III operators (e.g., mobile broadcasting TV) broadcast videos with some participatory contents and services. These new TV-like services tend to have less socio-cultural impact than Type I and Type II, due to their smaller viewership. Hence, at their early adopter stage, they are subject to subscription TV content regulations with less strict licensing schemes. As this multi-screen TV regulatory scheme aims to foster the growth of audiovisual media's content creation, aggregation, and distribution (Lin, 2013), it is later applied to analyze Thailand's various cross-platform audiovisual services after the NBTC Act.

## 4. Thailand's TV services and regulators

### 4.1. Conventional TV services

TV, the most powerful mass media form in Thailand, has a high household penetration rate of 99% and a large share of total advertising spending (NBTC, 2013). The popular delivery modes of TV services among Thai households include satellite TVs (45%), free-to-air (FTA) TVs (35%), cable TVs (11%), and other TV services through set-top-boxes (STB) (9%). Prior to the official launch of DTV in May 2014, Thai people could watch six national TV channels: three offered by state operators (Channel 5, Channel 9, and Channel 11), two by private operators under state-owned concessions (Channel 7 and Channel 3), and one by a public organization (Thai Public Broadcasting Service or Thai PBS, formerly ITV). Currently, the total FTA channels comprise 24 commercial TV services and three public TV services. Thai people prefer free-to-air (FTA) TV programs to those on cable TVs and satellite TVs (National Statistic Office, 2013).

Thailand has many pay TV operators at national and local levels. TrueVisions is the only monopolized national cable TV operator for decades, belonging to True Corporation which offers broadband services, mobile telephony, electronic cash and payment services, and digital content. Aiming at the high-end market, TrueVisions is the first to broadcast HDTV in Thailand with smart STB in order to differentiate its services from other broadcasters and add value to its content and branding. Established in 2011, Cable Television Holding (CTH) formed a nationwide network with a partnership of 170 local cable TV operators, which raise funds to import foreign content on a cost-sharing basis (Thongtep, 2011). CTH beat True

Visions, the previous rights holder of English Premier League (EPL) to secure three-season broadcasting rights (2013–2015) (Bangkok Post, 2013). Because of insufficient regulations, local cable TVs bloomed and expanded from 77 stations in 2006 to over 300 operators (Sukonrat, 2010).

Thailand experienced an explosion in satellite TV adoption, rising to 5.8 million households in 2010, which was triggered by cheap satellite dishes, poor FTA reception, and new advertising regulations (CASBAA, 2011). GMM Grammy and RS, the two music, entertainment, and media conglomerates, also stepped into the satellite TV market to provide free and pay-per-view video services. Thailand's color-coated politics (e.g., the "yellow" and the "red shirts") also use satellite TV to spread their beliefs and information to supporters, which increased the popularity of satellite TV (Thai Media Policy Center, 2010). However, the growth of satellite TV is hampered by limited frequency resources and a shortage of satellite transponder capacity in Thailand.

In sum, Thailand's conventional TV services show an industry push model. The loopholes of licensing schemes contribute to strong competitions in pay TV businesses among hundreds of local cable TV and satellite TV services.

#### 4.2. Transformation of TV regulators

Thailand's TV industry has been controlled by the government since 1955. National broadcasters were then employed by military governments to promote policies and spread pro-government and pro-nationalist propaganda (Biggins, 2008). During 1992–1997, political and media reform movements initiated by civic groups who did not support the unaccountable government system and intense media censorship in the 1992 Black May crisis. As a result, the 1997 Constitution or the 'People's Charter' was promulgated for political reform. The provision of Section 40 of the 1997 Constitution first paved the way for citizens' access to broadcasting and telecommunication frequencies for public interests and freedom of expression (Ramasoota, 2013).

To facilitate media reform, the 1997 Constitution urged the setting up of two independent regulators to supervise broadcasting and telecommunication businesses for the purposes of state security, education, culture, and fair competition. The regulators were later formed based on the Act on Organization to Assign Radio Frequency and Regulate the Broadcasting and Telecommunication Services B.E. 2543 (2000) (ITU, 2012). Although the National Telecommunications Commission (NTC) was established in 2004 to allocate radio frequency spectrum and oversee the telecommunication sector, two rounds of selections for the National Broadcast Commission (NBC) in 2001 and 2005 both failed (Ramasoota, 2013). As a result of the NBC's absence, the TV industry was kept under the state's control and it maintained ownership concentration under privileged concession systems. In 2006, the Constitution was abolished due to the military coup.

A decade of regulatory vacuum and disarray finally came to an end with the enforcement of the NBTC Act in December 2010. Under this Act, the long-awaited independent converged regulator, NBTC, was formed to oversee Thailand telecommunication and broadcasting sectors. Before the NBTC in 2012, the NTC served as an interim regulator but it did not deal with sensitive issues such as 3G licensing. The NBTC has an essential mission to regulate the fast-evolving convergent media industry. Eleven NBTC commissioners are responsible for issues like frequency management and allocation, standard setting, licensing and regulating broadcasters and telecommunication businesses, and protecting consumer rights. With a clear regulatory regime and a licensing regime, the NBTC enables development of the broadcasting industry on a more level playing field (CASBAA, 2013). In general, the Thai people perceived the NBTC as a positive force for establishing a competitive framework for the TV industry in future (Credit Suisse, 2011). However, the NBTC first emphasized the deployment of DTVs rather than other multi-screen TV-like services.

After the coup in May 2014, the National Council for Peace and Order (NCPO) partially repealed the 2007 constitution and enacted an interim constitution to establish the National Legislative Assembly (NLA) which aims to fulfill national reforms including media reform. The NBTC remains the independent broadcasting and telecommunication regulator; however, the NLA would amend the NBTC Act to resolve some unclear areas such as conflicts between the online audiovisual content regulations of the NBTC and the Ministry of Information Communication Technology (MICT). For example, some free Internet TV-like services which gain popularity among Thai young audiences are not subject to any licensing scheme under the NBTC but must conform to the computer-related crime law enforced by the MICT. In early 2015, the two agencies defined their roles distinctively and made joint proposals to the NLA with suggested amendments of broadcasting, telecommunication, frequency, and computer-related crime laws (The Nation, 2014b).

## 5. Multi-screen TV development after NBTC

### 5.1. Digital TV

In addition to content creators and device creators, the digital transition in TV industry fragmented the value chain and divided conventional TVs' roles into four players (i.e., content aggregators, multiplex operator, service providers, and content distributors) (Fig. 1). They have different incentives to enter the DTV market. Facility and network providers need huge investment, face less competition, and receive low but long-term revenue on return (ROR). In comparison, service providers and application providers which require lower investment cope with strong competition due to a relatively lucrative market with high but short-term ROR.

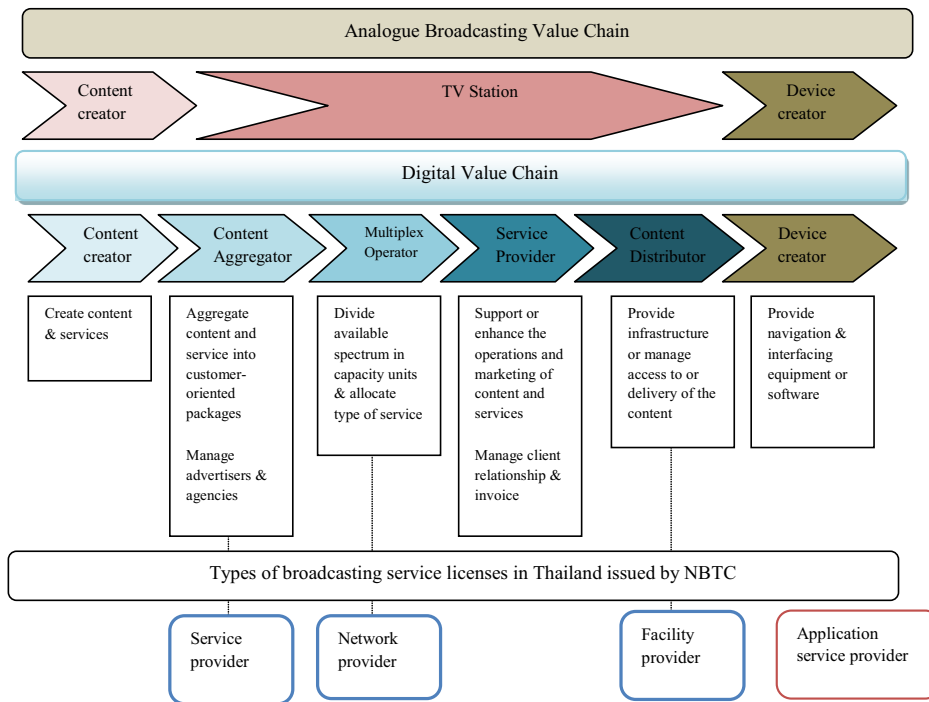


Fig. 1. Analog and digital broadcasting value chain and broadcasting service license types. (Source: adapted from ITU and NBTC reports, 2013).

The NBTC regarded the deployment of DTV as its first priority, announced a five-year “Digital roadmap” master plan, and started national DTV transition in February 2012 (Tortermvasana, 2012). After 3 months, DVB-T2 was chosen as the DTV standard because of its superior transmission efficiency. As the last ASEAN country to launch DTV, Thailand set its analog switch-off deadline in 2025. To smoothen digital migration, the NBTC ought to allocate digital frequencies effectively to service providers and impose universal service obligations to broadcasters. It categorized broadcasting services into four license types (i.e. service provider, facility provider, network provider, and application service provider). The DTV licensing process took place from February 2012 to December 2013. In the first phase, 17 commercial SDTV channels, 7 HDTV commercial channels, 12 public SDTV channels, 12 community SDTV channels (per area) would be broadcast on the air. During the remaining license period, FTA incumbents (i.e., Channel 5, Modernine, and ThaiPBS) ought to simulcast both analog and digital signals.

Under the 2008 Broadcasting Act, DTV service providers include public services, commercial services and community services. After a spectrum auction of 24 commercial DTV channels in December 2013, the auction winners were resourceful large corporations which could take the risks in investing in the new market. They came from three groups: (1) incumbent analog broadcasters (BEC-Multimedia – Channel 3’s operator, MCOT, and BBTV – Channel 7’s operator), (2) cable TV operators (True Corporation), and (3) TV content providers including news agencies (e.g., NationChannel, Spring News, and Voice TV) and music and entertainment companies (e.g. GMM Grammy and RS). After another three incumbent broadcasters were granted DTV public service provider licenses, eight public services provider licenses will be granted in 2015. However, the plan to issue community DTV licenses depends on the sustainability of financial support after NBTC’s analog switch-off (Bangkok Post, 2014a).

Three incumbent broadcasters (ThaiPBS, MCOT, and the Royal Army’s Channel 5) were granted DTV facility provider licenses as they have analog broadcasting infrastructures nationwide. ThaiPBS, MCOT, Royal Army’s Channel 5, and the Public Relation Department (PRD) were granted as DTV network providers due to prior experiences, expertise, and personnel. According to K. Terdpong (personal communication, June 15, 2012), a member of the Subcommittee on Digital Switchover at NBTC, private telco operators may collaborate with incumbent broadcasters and serve as DTV network providers because mobile phone towers are suitable to function as ‘gap fillers’ in solving signal attenuation of main broadcasting towers. In 2013, the NBTC recognized three categories of application service providers, including SMS and electronic voting systems for TV and radio broadcasters, special services via broadcasting networks (e.g., home shopping, VODs, and interactive TV), and media-research and audience-measurement companies (The Nation, 2013).

During the trial period, commercial DTV operators faced difficulties in keeping up plans to go fully into generating revenue (The Nation, 2014c). For example, MCOT and PRD delayed the roll-out of DTV networks; others failed to distribute coupons to households for digital receiver subsidy. Satitsamitpong and Mitomo (2013) found that the awareness of DTV

among Thailand audiences was still low and their adoption decisions were influenced by better video quality, lower STB cost, and more TV channels and data services instead of interactivity. However, media agencies forecasted fierce competition among commercial DTV service providers in 2015 after the improvement of digital audiovisual contents (Bangkok Post, 2014b).

### 5.2. IPTV

Based on Thailand's 2014 ICT statistics, mobile phone users (48.1 million, 77.2% of total population) considerably outnumber Internet users (21.7 million, 34.9% of total population) (National Statistic Office, 2014). Mobile penetration has exceeded Thailand's population in 2013 and thus Thai people connect to the Internet through smartphones (ETDA, 2014). In terms of innovative audiovisual services, both IPTV and mobile cellular TV services have not diffused well in Thailand.

Technological convergence enables Thai broadband operators to become crucial network providers for IPTVs which bring competition to existing pay TV businesses. There are five IPTV service providers including TOT, Vooz by V.R.M. Voizplus, Cubic IPTV by Cubic Associates, 3BB IPTV by Triple T Internet, and Buddy IPTV by Advanced Datanetwork. They provide various scheduled programs in high definition and video-on-demand for premium content. True Corporation ended its IPTV service after 2 years. Meanwhile, CTH planned to provide triple-play services by renting optical fiber to support its pay-TV businesses, including digital cable TV and IPTV (CASBAA, 2013).

Currently, paid IPTV still has a sluggish take-up rate in Thailand as a result of the low penetration of broadband services (7.96%) (NBTC, 2014). However, only 5–7 million out of Thailand's total 22 million households have cable TV or satellite TV services, indicating a huge business potential for new TV-like services like IPTV (Bangkok Post, 2012). The future success of IPTV must rely on the government's push to increase the penetration of the fixed broadband with affordable prices (Bangkok Post, 2012). Nonetheless, IPTV operators must overcome the major barrier of insufficient programming when cable and satellite TV service providers control copyright of high-quality programs (Bangkok Post, 2012).

After regulating DTV, the NBTC started to look into Thailand's new TV services such as IPTV and mobile TV (N. Sukonrat, personal communication, March 9, 2012). In addition to protecting public interests, the NBTC supported the development of innovative TV services which improve industry growth and increase consumers' choices. Later, the NBTC classified two types of broadcasting licenses: (1) broadcasting services using frequency waves and (2) broadcasting services without using frequency waves (e.g., cable TV, satellite TV, and IPTV). IPTV operators must apply for the second type of broadcasting licenses which require licenses of network providers on IPs. Others like TOT and Triple T have already granted the network licenses.

### 5.3. Mobile TV

Smartphone ownership and mobile Internet penetration are keys to diffuse mobile TV services in Thailand. Srinuan et al. (2012) suggest Thailand's regulators make policies to increase competition and infrastructure investment so as to stimulate growth of mobile Internet. According to Sukonrat, the Head of the NBTC Broadcasting committee (personal communication, March 9, 2012), mobile TV fits Thai audiences' preferences in watching and listening to media content. Yet mobile TV services have not been adopted by many in Thailand. Mobile cellular TV services are offered by three leading mobile operators (Advanced Info Service (AIS), Total Access Communication Public Company (DTAC), and TrueMove) via mobile Internet and mobile apps. At present, AIS and DTAC which partner with major content providers such as GMM Grammy, The Nation Group, and Kantana Group provide free TV programs and over 40 cable TV channels through mobile applications. Also, they cooperate with CTH to obtain premium content including subscription-based EPL programs on mobile. Meanwhile, TrueVisions provides repackaged cable TV programs through 'TrueVisions Anywhere' as a bundled, value-added service for mobile customers (CASBAA, 2013). They have convergence plans to provide multi-screen audiovisual services (A. Asawan, personal communication, May 17, 2013). Watching cellular mobile TV services fits Thai viewers' behaviors, especially youths who enjoy viewing on-demand videos than scheduled broadcasting programs (A. Asawan, personal communication, May 17, 2013). So far, the NBTC has not formally considered any licensing scheme of mobile cellular TV services (K. Terdpong, personal communication, December 26, 2014).

Mobile broadcasting TV is nascent in Thailand. i-Mobile Corporation offered DTV channels on mobile which could be viewed on DVB-T2 built-in smartphones or tablets. Recently, the NBTC mandated MCOT and International Engineering Plc. (IEC) which illegally used some frequencies stopped the third mobile broadcasting TV trial on China Multimedia Mobile Broadcasting (CMMB) standard and UHF 58 Bandwidth (The Nation, 2014a). The Head of the NBTC broadcasting committee, N. Sukonrat (personal communication, March 9, 2012) and MCOT's vice president, S. Gaintanasilp (personal communication, March 8, 2012) both agreed that Thailand's mobile broadcasting TV business would begin with a free-to-air, advertising-supported model that fits Thai audiences' media consumption behaviors and then transit to the subscription model with some free content.

Mobile broadcasting TV's facility providers and network providers are likely to be similar to DTV's if their infrastructures and hardware employ the same standards (e.g., DVB-T2 lite). However, if mobile broadcasting TV adopts CMMB, its network operators must invest in new facilities (K. Terdpong, personal communication, June 15, 2012). The final decision on mobile broadcasting TV standard will take NBTC's considerations into account (N. Sukonrat, personal communication, March 9, 2012). As for mobile broadcasting TV, the licensing process will be rescheduled to begin after 95% completion of DTV

coverage in 2017, according to the DTV roll-out plan of NBTC (K. Terdpong, personal communication, December 26, 2014). The NBTC also worked on policies to automatically grant the licenses in providing mobile TV services to DTV licensees (Naewna, 2013).

Despite of the increasing popularity of multi-screen video consumption, the NBTC has not made specific licensing schemes and content regulations for new TV-like services such as mobile TV. In response to rapid technological advancements and strong competition among audiovisual media, it is crucial to apply a holistic regulatory scheme to oversee various cross-platform video services.

## 6. Discussion and conclusion

Due to the long absence of a TV regulator, Thailand has myriad pay TV services in the competitive markets with legal licensing issues because industry players tended to launch TV-like services (e.g., satellite TVs, IPTV) to serve untapped markets without clear regulations. In 2012, the independent regulator NBTC was finally formed to oversee and govern the fast-changing and converging broadcasting and telecommunication services. After the establishment of this convergence regulator, Thailand speeded up the implementation of DTV, reallocated spectrum, and issued different licenses for stakeholders in the value chain (e.g., service providers, network providers, facility providers, and application service providers). Its licensing scheme is based on the roles involved in the DTV industry.

Since 2012, developing DTV has become the first priority of the NBTC in order to catch up to other ASEAN countries. The analysis shows the incumbent commercial and public broadcasters have advantages in being granted the licensing of facility providers and network providers. New players like cable TV operators, satellite TV operators and music/entertaining companies are likely to fight for the licensing of DTV service and application providers. When examining the driving forces of Thailand's DTV industry, it is heavily government/policy driven with some industry support. The DTV case was the first time that the government pushed the development of any TV-like services in Thailand at such rapid speed, in drastic contrast to the still-lagging IPTV and mobile TV services.

To date, Thailand's innovative TV-like services, IPTV and mobile TV, have not reached widespread diffusion yet. The NBTC which prioritized DTV development from 2012 to 2016 did not focus on regulating other innovative audiovisual media even though there is an increasing Thailand audience adopting cross-platform video consumption. Although only a few IPTV and mobile cellular TV services are available in this country, they have created regulatory challenges and cross-over issues between broadcasters and telcos. Currently, IPTV is categorized as the second type of broadcasting without frequency wave license similar to cable TVs and satellite TVs. Its license required network providers on IPs. As for mobile TV, in late 2014 the NBTC has not formally considered any mobile cellular TV licensing or determined the standards of mobile broadcasting TV yet.

In recent years, the Thai government encouraged the diffusion of broadband technology and the deployment of the triple-play network nationwide. This may improve the low penetration of Internet broadband and give IPTV services better chances to increase Thai viewership. As the majority of the IPTV operators are telcos, their services have problems in aggregating compelling content as cable and satellite TV operators control the supply of premium programming. However, the cable TV operator, CTH, under a triple-play business model, has challenged the incumbent IPTV operators in the telecommunication industry. After examining the socio-technical forces, this study finds that IPTV development in Thailand has a much stronger industry/market power than government/policy intervention.

In comparison, mobile TV in Thailand is still in its infancy. Only one mobile cellular TV service is available with a smaller size of subscribers, while mobile broadcasting TV trials have not finalized the standard setting yet. Since mobile penetration in Thailand is much higher than the Internet's, mobile broadcasting TV which has the advantage to reach geographically extensive areas and a big population at relatively economical cost and still has potential to become prevalent in the long run. However, multiple technological standards (technology subsystem) and less decisive policy decision (government/policy subsystem) delay the development of mobile broadcasting TV in Thailand despite industry players' (MCOT) effort in trials to test technological feasibility and market responses.

After the NBTC announced the DTV roadmap and completed 2.1 GHz spectrum auction, the broadcasters were encouraged to push innovative TV services, which is likely to accelerate the development of Thailand's multi-screen TV services. Also, the related authorities, the NBTC and the Ministry of ICT, tried to clarify their regulatory scopes of supervising the new TV-like services on Internet and mobile. After the digital migration, the NBTC will shift its attention to regulating the convergent cross-platform audiovisual media. The vice chairman of the NBTC, Sukonrat (personal communication, March 9, 2012) indicated:

*After digital broadcasting switch on, the NBTC predicts that TV services will go multi-screen including mobile TV, IPTV, and Interactive TV. The NBTC definitely supports these kinds of innovative TV businesses to enhance the consumer choices of TV services and fosters economic growth, while NBTC has to regulate these new services by law to protect public interest. We will separate the regulations between platforms and audiovisual contents and still enforce some basic rules of content regulation such as protection of minors.*



According to the NBTC's vice chairman, the Thai government emphasizes the importance of both industry innovativeness and public interest and will regulate content and conduit separately for various multi-screen TV services. So far, the NBTC has not developed any concrete policy or law for governing complex issues involved in licensing and regulating multi-screen TV content. However, this study recommends a platform-neutral approach to regulate content classifications regardless of video delivery platforms because such an adaptive regulatory framework can oversee complex convergence issues and respond swiftly to technological advancements and strong global competition (ALRC, 2012; Flew, 2012; Lin, 2013). To foster the growth of multi-screen TV in Thailand, this study suggests the NBTC to consider taking a platform neutral approach in regulating various audiovisual services based on two criteria of content classifications: (1) the socio-cultural impact (i.e., "broadcast and mass media" and "VOD and niche market"); and (2) the content production/aggregation model (i.e., "gatekeeping mechanism" and "participatory mechanism"). Under Lin's (2013) multi-screen TV regulatory scheme, this study further recommends classifying Thailand's various cross-platform audiovisual media according to four types which are regulated by different licensing schemes and content regulations (Table 2):

- *Type I: Broadcasting & mass market vs. gatekeeping mechanism* – As analog and digital terrestrial TV service providers (public, commercial and community TVs) transmit scheduled broadcasting content via a gatekeeping mechanism to a mass market, this type of broadcasting service provider have a higher socio-cultural impact and should be subject to strict TV content code including Article 37 of the 2008 Broadcasting Law and the NBTC's rules on TV programming. These operators should require strict individual licensing as they utilize assigned spectrum to serve public interest with a FTA advertising model.
- *Type II: VOD & niche market vs. gatekeeping mechanism* – Subscription-based and/or conditional access TV service providers (i.e. cable TV, satellite TV and IPTV) supply both scheduled and on-demand videos with a gatekeeping mechanism to those who can afford the paid services. Due to less socio-cultural impact, they are subject to subscription TV content code and/or on-demand TV content code. However, they should require individual licensing as their audiovisual contents are produced and selected by media professionals.
- *Type III: Broadcasting & mass market vs. participatory mechanism* – Future mobile broadcasting TV providers and application services providers (i.e., audience rating system, SMS, home-shopping) supply one-to-many videos and interactive services through a participatory mechanism. These services should be regulated by subscription TV content regulation due to their broadcasting nature. However, a less strict licensing scheme will be beneficial for the growth of these innovative audiovisual media.
- *Type IV: VODs & niche market vs. participatory mechanism* – Web TVs, online streaming video services, and mobile cellular TVs provide on-demand videos services to niche markets and produce/aggregate video contents through a participatory mechanism. This type of innovative and nascent audiovisual media should be subject to self- or co-regulation of content and light-touch licensing schemes similar to information services.

Historically, as result of lacking TV regulators, Thailand had an unhealthy pay TV market structure which caused hundreds of small audiovisual service providers to compete fiercely for audiences with illegal licensing and low-quality content or reception. Its evolution of digital audiovisual media, like DTV and mobile TV, is slower than other digital-savvy countries. Nonetheless, it could be a blessing in disguise. To catch up to global advancement, the NBTC can concurrently consider other important audiovisual services' licensing and content regulation during the first stage of DTV implementation. This study suggests Thailand should take advantage of being a late mover to learn from other countries' lessons in convergence, avoid similar mistakes, and thus leapfrog the development of multi-screen TV services. Since policymaking tends to lag behind technological advancements, the NBTC should make flexible convergence policies to regulate emerging multi-screen TV services which is responsive to fast technological changes and increasing global competition. Basing DTV licensing on roles in the value chain in fact complicated and postponed the deployment of the new media. Hence, this study emphasizes a platform-neutral approach to tackle complex convergence audiovisual media issues in licensing and content regulation. Meanwhile, technology neutrality is beneficial for industry players to select the best match of standards to rapidly diffuse innovative TV-like services such as mobile broadcasting TV (Lin, 2011). Net neutrality can reduce audiovisual content

**Table 2**  
Multi-screen TV regulatory scheme in Thailand.

Socio-cultural impact	Content model	
	Gatekeeping mechanism	Participatory mechanism
Broadcasting & mass market	Type I Broadcasting TV content code & strict individual licensing (National or state-level commercial & public free-to-air TV channels)	Type III Subscription TV content code & less strict licensing (Mobile broadcasting TV like i-Mobile Corporation)
VODs & niche market	Type II Subscription TV content code & subscription or VOD licensing  (Cable TV like True Visions, CTH, local cable TVs; Satellite TVs like GMM Grammy and RS; IPTVs like TOT, Vooz, Cubic IPTV)	Type IV Self- or co-regulation of content & light-touch licensing  (Web TV, online streaming video services, mobile cellular TV such as AIS, DTAC, and TrueMove)

providers' negotiation hassles with multiple platform operators so as to foster multi-screen TV innovations and diffusion (Bauer and Demaagd, 2008). Moreover, light-touch licensing schemes and content regulations are advisable for regulating new TV-like services in order to encourage the development of the emerging multi-screen TV industry in Thailand or elsewhere. In sum, this study investigated how Thailand's stakeholders responded to media convergence and regulatory challenges in relation to emerging multi-screen television services and make recommendations to regulate licensing and contents in various audiovisual services. The socio-technical analyses showed how Thailand's new convergence regulator and industry stakeholders shape the development of fast changing, cross-platform audiovisual media businesses. The insights can shed light on other countries' convergent media regulators and industry players in multi-screen TV industry.

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