

以數位民主再造台灣無線電視產業

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REINVENTING TAIWAN TERRESTRIAL TV SERVICE THROUGH A DIGITAL DEMOCRACY

INTRODUCTION

After the lift of Marshall Law in 1987, it was seen Taiwan, as one of the latecomers of democratic countries developed through her exceptional transformation. On media reform, the first and foremost objective was the democratization of TV broadcasting industry. According to the reform missions, building a civil television sector was a consensus realized by releasing broadcast media from the hold of military, political party and government bureaucracy. However, so long as the Nationalist Party resided in government, this tripartite structure of terrestrial TV industry kept intact. On the other hand, a technological revolution driven by digitization, for example, cable TV, satellite receiver, high-definition TV, digital TV, forced the analogue terrestrial TV service to its demise after 1998. Meanwhile, the first public television channel was launched through the pressure of democratic movement. As a result, the over-commercialized television industry is changing. Not until 2000, Nationalist Party was defeat by Democratic Progressive Party (DPP) in a presidential election, a breakdown of television industry structure was not rolling out. A late (re) modernization of broadcasting industry finally launched.

According to the White Paper of Presidential Communication Policy in 2000, currently two state-owned TV stations, TTV and CTS, are planned to transform into the public service broadcasting. Many technocrats criticized this policy by emphasizing the diversity and freedom of speech brought by digital media. However, the continuous lack of investment and effort on digitization of terrestrial TV service proved the digitization wouldn't come down naturally. Comprised of major commercial broadcasting TV service, the Association of Terrestrial Television Network (ATTN) was designated as the prime mover of digital broadcasting service. Faced by decreasing market share and short-term competition for rating, it is not interested in developing digital content and service except replacing the analogue device by digital one.

Failed to lead the digital terrestrial service, the government directed by DPP started to reorganize terrestrial TV structure and digitization strategy together in 2003. According to the several commissioned researches funded by Government Information Office, and the recommendations made by Advisory Group of Broadcasting Law Amendment and Taiwan DTV Committee, a consensus was reach as the following proposal: (1) pouring more public fund into the digital terrestrial broadcasting substituted for advertising revenues; (2) dismantling the vertical integration of terrestrial TV industry in the long run and creating a neutral platform for new service providers; (3) innovating the content and service prior to the hardware for switching over analogy signals.

However, by whom will be commissioned to implement this public action plan, that was a great debate within the Education and Culture Subcommittee of Parliament in the first-half of FY 2003. Negotiated through the MPs, GIO, ATTN, and also gathered the opinions from Campaign for Citizen's TV and Public Television Service (PTS), finally the decision wad made to commission PTS to executive the Plan Phase I on fifth of May. It was also a reasonable policy output after Taiwan adopted DVB-T standard in May 2001. According to European experience, the leading role of digital terrestrial TV was designated to public service broadcasting (PSB) as follows Table 1 shows. It will work toward establishing a third party of multiplex provider (or virtually). Then, a transparency, fair, reasonable and non-discriminatory mechanism of gatekeeper will be easily and trustworthily implemented by PSB. After the infrastructure in place, the EPG, CA, API can be organised accordingly to a uniform end-user interface. This strategy will expedite the process of digitization on the technical issues. On the other track, PSB will invest the R&D of digital content and roll out the multi-channel service simultaneously (Tadayoni, 2001). Combined two sides' endeavour, the digital terrestrial service will match the request of switch off analogy policy. Those steps above are the legitimacy of subsidizing PSB to lead the digital television project.

Table 1. Public Fund for European DVB-T

Country	Period	Fund (Million Euro)	Commission	Outcome
Austria	2003-2006	10 (from license fee)	ORF	12-16 SDTV portability mobility
Belgium	2000	4 (Government Appropriation) ; 2.5 (Belgacom, counterpart fund)	VRT (Flemish PSB)	Digital Home Platform (100 HH)
Denmark	2001-4	Provision have been made for the funding from license fee (DKK Million) 94 (transmission) 45 (DAB)	DR, TV2	ROFL Boogie

		200 (on-line digital service) 180 (program production)		
Finland	2000	Television fees rose at one point to over two million Sales revenue was EUR 141 million	YLE	Digita 5 SDTV
France	2001	150 (Special Fund)	France Television	News, culture, and local channels
Germany	2001-4	94.589 (KEF funding)	ARD, ZDF	20 SDTV portability
Netherlands	2002	19 (FOR Fund)	NOS	New media internet related service
United Kingdom	2000-6	A 7-year, £ 200m rise in license fee income	BBC	SDTV 9 DAB 7 BBCi

(Source : Schnepfleitner, 2002; Directorate General of Human Rights, 2002; Punie and Terzis, 2003)

However, the scenario of Taiwan is rather different than the one of Europe. First, the original broadcast networks are maintained by each station. Before defeat by DPP, the Nationalist government allowed commercial broadcasting service keep its own broadcast facilities resulting in a competition on the multiplex block level. Once the DVB-T has been adopted, the uniform multiplex structure was introduced with much support of reform groups, including Directorate General of Telecommunications. It forced the four commercial broadcasters to accept common solution and prepared for selling out their broadcast network units. PTS is commissioned by this policy in following five years to spin-off a new operating department to take over four broadcast units. Finally, this department is mandated to organize as an independent public corporation in charging terrestrial transmission business.

The second issue is the leading role of public television service in rolling out digital service and boutique. For providing free-to-air (FTA) analogue service, Taiwan PTS is funded by government appropriation at fixed-budget US \$ 30 million annually. In the short term, there is no space of extra fund to pouring into the digital content and channel investment. The dilemmas brought back the issue of publicizing state-owned broadcasting stations. In the mid of 2003, GIO has reach the agreement with Education and Culture Subcommittee on transforming issue. They estimated that at least one state-owned FTA commercial station will transform to PSB. After the amendment of Broadcasting and Television Law was passed for eliminating political influence from broadcast media, GIO will initiate six-month phase of research to plan the transfer. It foresees a group of PSB will

work together on platform building and service package with commercial service ones as counter partners (see following charts).

As the DVB-T model's expectancy, the digitization of Taiwan terrestrial television inaugurates a reform by bringing European experience into the local context, reengineering the vertical structure into the horizontal value-chain, and leading service development by public sector expenditure. Digitization requests to establish an economic scale of public service broadcasting and result in a health order of broadcasting industry by following goals: (1) providing a multi-channel of digital television other than the analogue ones of dominated cable service; (2) converging digital signal into an universal multimedia service (3) digital transmission enhancing terrestrial broadcast up to a mobile reception and offering added-values when passengers moving.

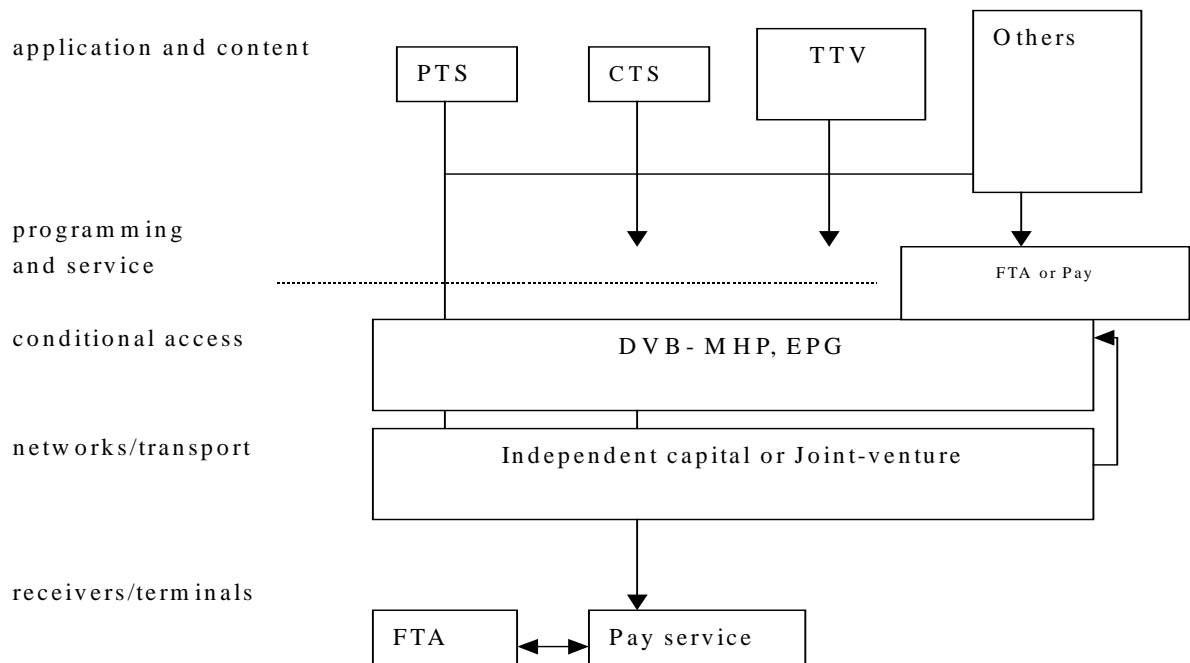
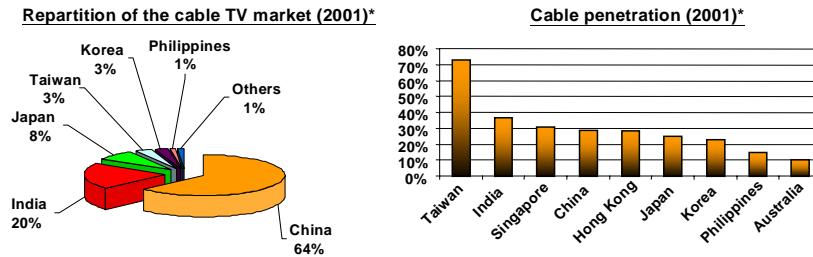


Figure 1. DVB Market Model and Taiwan Application

THE HISTORICAL DELIMMA ON THE WAY TO DIGITIZATION

The importance of DVB-T project above could be illustrated by the historical fact of electronic media in Taiwan. According to the information by French Trade Commission, Singapore (Castaignede, 2002), the credit of Taiwan cable TV penetration was outstanding (see the following figure). Taiwan cable TV industry achieved the highest penetration rates

(around 80%) within Asian community, although its audience market is rather small (6.8 millions TV households, only equal to 3% of Asia Pacific region) .



* Source Morgan Stanley, 2002

Figure 2. Taiwan Cable TV Market Credit in Southeast Asia Region

In the beginning of cable TV industry around 1980, it was an illegal business and run by informal economy sector without the consent of authoritarian regime. For oppressing the dissent voices, The Nationalist Party did not allow any electronic media except terrestrial broadcasting service, which operated by the government, military and Kuomintang itself. Those cable services provided the Japanese drama, sports, pornography, and pirated films, which were not available in terrestrial TV program schedule. This TV culture reflected the underground wants of audiovisual marketplace and also satisfied the unregulated desire without moral screening . The Nationalist Party temporally tolerated those services if they would not broadcast the news program directed by objective and impartial journalism.

After the lift of Marshall Law, the cable TV industry obtained the leeway to expand its service. The Nationalist Party resisted the democratic reform by shelving every media reform proposals. Without any other alternative, the audience gradually switched over to the cable services from terrestrial ones. However, those who subscribed to the cable TV service didn't necessarily mean the satisfaction was reached. The cable TV service provide majority of entertainment, added some Japanese channel, stock market news, piracy foreign film, and pornography. Only Democratic Alliance Cable System provided local independent news channel operated by the supporting group of opposition party. For the most cable TV operators, their program packages narrowly represented many of the same taste compared with terrestrial TV without diversity. The cable system, run by the private interests and contributed to the entertainment purpose only, should not consider as a civilian media sector which followed the principles "of the people, by the people, and for the people".

It was not until the trade dispute broke out between Sino-American relationship on intellectual property right issue, The Nationalist Party would legitimate cable TV service in Taiwan. Under the threat of retaliation by Department of Commerce, U.S., the Nationalist government speeded the process of law making of Cable TV Act. Finalized the Act in 1993, Taiwan cable TV industry suddenly moved into an era of cutthroat competition.

The entire current illegal operator obtained five-year phase I allowance to roll out their attractive package without effective regulation on market behaviour. Under this condition, operator with huge cash flow churned out a promotional package by paying a basic tier price exchanged for the whole service, including the erotic and adult channels without scramble. Most of the entertainment outsourced to the foreign program with royalty to save the cost and obey the law. Without the piracy, the informal sector of investors could not sustain their service and sold out their system to the media conglomerate or consortium. As a result, in the end of 20th century, Taiwan achieved an outstanding cable penetration rate by oligopoly market structure consisted of four multiple-system operators.

To keep their advantages of political support by sufficient market share, the four systems didn't change the promotional package even when the audience market saturated. Moreover, the operation they organized is the vertical integration of channel and system. As a result, it was impossible to implement the tier price structure of service to differentiate subscriber because the negotiation among system operators for price tier is directly against the interests of their parent companies as channel providers. This local model of cable TV industry created an unexpected problem between service providers and subscribers as follows.

The worldwide cable industry operated their business according to the tier price structure. This structure is not only allowed them to increase revenues but also managed subscriber access to adult materials. However, the case of Taiwan told a different story. After the cable industry reach its peak around 1996 (see following table), it meant the majority of TV household in Taiwan would receive the entertainment, news, film, and with many unscramble adult channels (talk show, horror movie, X-rate film, pornography) altogether. So long as Government Information Office would not intervene, each family must be fully responsible for what they receive, specially the program unsuitable to children and adolescence. That condition created a terrible media disorder in the living room.

Table 2. The Growth of Cable Penetration Rate (1994-2001)

Year %	1994	1995	1996	1997	1998	1999	2000	2001
National Total	43.37	54.15	59.57	65.97	68.09	67.87	71.96	72.34
Taipei	50.57	60.30	69.00	73.52	81.30	78.68	83.73	82.82
Kaohsiung	63.86	72.98	80.51	88.68	91.05	92.45	92.19	90.78

Taiwan Province	40.07	51.23	55.89	62.51	63.63	63.69	68.05	68.85
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(Source: The ROC Survey of Family Income and Expenditure)

Although the problem was so pervaded, the Nationalist government insisted staying away from the broadcasting issue except give fine due to the deregulation and liberalization media policy. The national cable operators also put a hold on that issue in order to extend the advantage of market share by not implementing cable subscriber ladder system in exchange of high subscribe rate and strong political support (see following chart).

			Impulse PPV non- available (VOD)	Non- available
			Pay-per-view HBO	Belong to Basic Tier for Taiwan subscribers
		Multipay Discovery, National Geographic, Animal Planet, BBC, CNN		
	Pay Cable	TVBS, STAR, ET, SET		
	Basic Cable	terrestrial TV, public access		
Home Passed				

(Source: Sherman, 1995; Taiwan case added by author)

Figure 3. The Comparison of U.S. Cable Subscriber Ladder and Taiwan Application

On the surface, audience welfare is enhanced. However, the subsidy from cable TV industry to them by not enforcing pay channel services must be paid back from somewhere. So in the long term, audience welfare actually is decreased after cutting cost of channel provider or putting many advertising channels within the package. Again, it created many of same genre of program (low quality entertainment, profit-oriented scheduling) then downgraded the level of diversity. Compared with the original capacity of cable TV service (100 channels), the Taiwan case didn't keep abreast of advanced communication technology due to utilizing it as the limited old terrestrial TV service (such as over-the-air signal is constrained by its physical reception condition and economy scale). According to the macroeconomics, this phenomenon is called "Market Failure".

"Market Failure", on the surface, caused Taiwan broadcast media disorder by providing too much sensational program and tabloid TV news in the cable channels. But the critical reason contributed to this was the profile of TV marketplace. Comparing the rest of Asian industrialized countries, Taiwan cable operator was a dramatically superior actor in quantity of service and economical of charge.

Table 3. The Comparison of TV Market Profile among East Asian Countries

Country By number	Taiwan	Hong Kong	Singapore	South Korea	Japan
Cable penetrated	82.68%	28.6%	35%	30%	31.2%
Cable channels	Over 100	62	38	82	48
Monthly sub	US\$17.40	US\$13-26	US\$11	US\$13-24	US\$29-58
Public welfare on TV per capita or HH	NT\$57	NT\$386	NT\$468	NT\$825	NT\$1,355
Public TV Channel	1	3	4	5	3
Terrestrial TV	5	4	7	5	6
Cable Operator or MSO	4	1	1	79	528

(Source: TelevisionAsia, Satellite & Cable Annual Guide, 2003/4)

However, if we analyzed further about this picture, we will find Taiwan cable service is too cheap and generous to harm industry itself. Generally speaking, cable and terrestrial services divide the national penetration market. The finance of TV industry is divided by public fund and advertising. A health industry must base on a reasonable balance between its revenues and its shares. If we demonstrated the above countries in this regards, we will find a distorted picture in which only Taiwan broadcast media market situated (see following table).

Table 4. The Estimation of Asian Countries TV Finance

Number	Taiwan		Hong Kong		Singapore		South Korea		Japan	
	Cable	Terrestrial	Cable	Terrestrial	Cable	Terrestrial	Cable	Terrestrial	Cable	Terrestrial
Market Share %*	80%	15%	28%	70%	35%	60%	30%	65%	31%	59%
Channel	Over 100	5	62	4	38	7	82	5	48	6
Public fund	1	1	3	3	4	4	5	4	3	2
Ad fund	Over 100	4	Over 50	2	34	3	Over 70	1	Over 40	4

*Usually, after divided by cable and terrestrial TV service, the rest percentage of penetration

(market share) left to satellite TV or other broadband access.

Except Taiwan, the rest of countries' terrestrial TV service still enjoyed a good share of audience market, and with support evenly from public fund and advertising expenditure. Under this condition, TV stations could develop their brands and make quality program without too much worry about rating game or short-term survival. So the sensational, violence, erotic and tabloid TV genre are not so attractive to both TV producers and audience. And a democratic governance of broadcasting authority also stands behind the news profession and quality control.

However, the Taiwan case told a different scenario. Terrestrial commercial TV service competed each other for such small market share (15%) due to their past protection and inefficiency by Nationalist party. And the public fund is rather insignificant compared with other East Asia countries (see Table 3.). It generated much weakness of their finance by mostly depend on advertising, let alone said put them into the four of one-hundred cable channels package. Although cable TV market share was gained so successfully, lack of government supply control, the one-hundred more channels is getting less and less everyday from shrinking advertising expenses caused by other broadband service competition. The majority of Taiwan audience can receive over 100 hundred channels everyday. It means they will stay at one channel less than five minutes in a period of broadcast time by zapping the remote control. As a result, each cable TV channel must provide only the attractive if not meaningful materials (i.e. sensational message) to keep the eyeball stick on it.

On the contrary, the rest of cable service in other countries with significant penetration (not counted by its quantity) could utilize the value-added service or elite profit-oriented model. By providing better quality or personalized channels, these cable systems could harvest the big pocket of innovative users on new communication technology. As a result, they can create a new business model separated with the current saturated audiovisual marketplace without infringe the program code and standard.

As Steve Johnson (2004), a Chicago Tribune television critic referred to Jamie Kellner (co-founder of Fox channel) said, " As you fragment the audience down to too small a piece, you actually damage the business, its ability to do what pays for it". For letting majority of audience receive 100 channels by a basic price, the industry lost what it should gain from the added-value service then turned to cut cost and deteriorate quality. As the channel only can compete for very fragment piece of audience then it must turn to broadcast indecency, violence, and rumours and manage the short-term profits.

Conclusively, this distorted profile of Taiwan broadcast media market deterred digitization. On the one hand, terrestrial commercial TV is on the brink of generating deficit. Too small advertising revenue prevents them from developing digital multi-channel market (McGarrity, 2002). Without new content, the egg-chicken inquiry is endless dispute about who should blame for that delay. On the other hand, keep the analogue cable service intact, digital cable package doesn't match the market need by only added pornography, international news, and more shopping channels. Both situations created the difficulties to

promote digital broadcasting service in Taiwan. As a result, it is a right time to pour more public fund to ignite digitization project by expanding the public service broadcasting with adopting DVB-T model. PSB is responsible to the accountable, transparent, impartial service providers no matter on the benchmarking, cultural or universal functioning (CMRTV, 2001). Based on these missions, digitization led by PSB must benchmark digital contents production, setting the common solution for device, and building the uniform multiplex block. In Taiwan, this vision will contribute to promote digitization as well as strengthen civil media sector by easing the over-commercial competition within broadcast media. Opposed to sensational content, vertical integration, and discriminatory pricing, the new digital terrestrial PSB if it is not unrealistic, could bring the democracy by allowing people own, participate and manage the broadcasting culture. Those promises are the implications of digital democracy in Taiwan context.

THE PROJECT DEVELOPED

Paralleling the DVB-T project began in 2003, the Executive Yuan (Central Government) started to reengineer the slow and regressive process of digital television limited by current home appliance manufacturers and commercial broadcasters. Under the recommendation by Directorate General of Telecommunications, a European DVB based-Digital Broadcasting Integration Plan was accepted. National Information and Communication Initiative, Executive Yuan established an Integrated Digital Video Development Working Group in April 2003 to initiate the new process. The structure of working process is shows as following chart (IDVDWG, 2003).

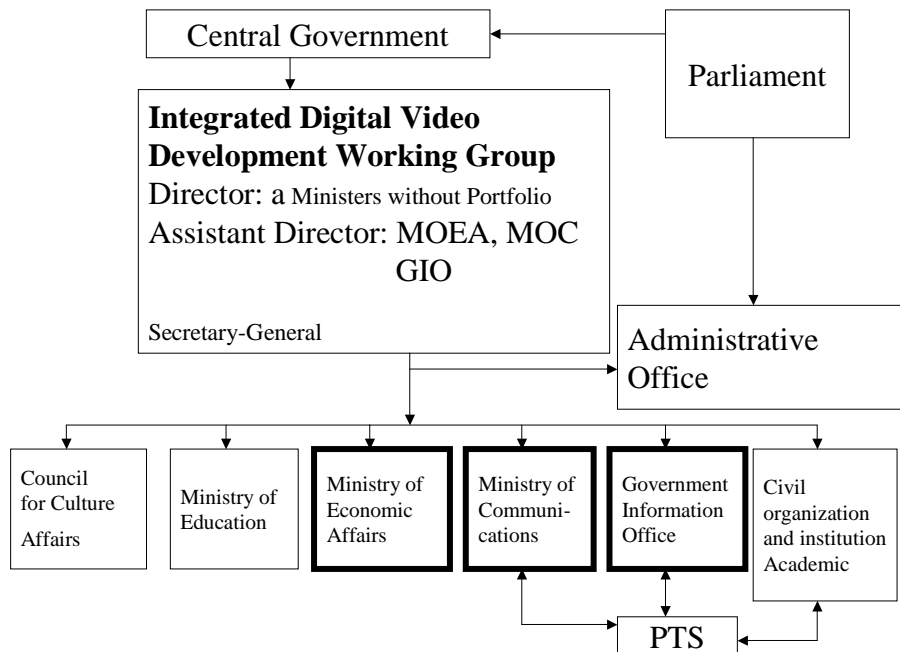


Figure 4. The Structure of the Integrated Digital Video Development Working Group

Kicked off by this working process, PTS commissioned by GIO under the approval of the Legislative Yuan (Parliament) at US\$ 10 million. This fund is separated by three sub-projects at US\$8.3 million on common platform (including network, mast and site engineering), US\$0.6 million on MHP trial plan, and US\$ 1.1 million on program cost of mobile and interactive digital services (also see Television Asia's Executive News, 2003).

At the network and mast building, PTS negotiated through ATTN reaching an agreeable solution. For realize the uniform multiplex block run by an independent corporation, PTS chose the plant site in southern Taiwan metropolitan area--Kaohsiung and Tainan as a trial basis. To invest in the South is a conflict-free action compared to the current intricate interests within four commercial stations in Taipei metropolitan area. Moreover, it is a mission to universalize digital service in the disadvantage area for bridging the digital divide between north and south.

After negotiation, a twin-tower solution was set. It mitigate the requests for the capacity of current infrastructure and the state of art site design. Public Television Service insisted the site design must comply with the uniform multiplex block structure

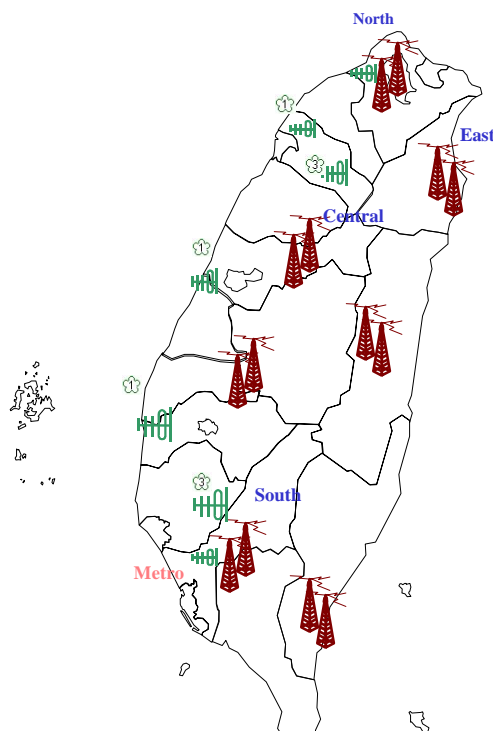


Figure 5. The Twin-tower Making of Multiplex Block in Taiwan

(Source: Taiwan DTV Committee, 2003)

Under this presumption, the four commercial broadcasters could reach an agreement with PTS in equally sharing the cost and expenditure of the southern multiplex network as Table 5. As a result, there is no incurred expense after the arrangement was settled for maintaining the new multiplex structure.

Table 5. The Exchange of Site Planning within PTS and ATTN

Planned Site Broadcasters	Kaohsiung	Tainan	* Taipei (twin-tower setting temporarily undecided)
PTS	Tower 1	Moved to Tower 1	Moved to Tower 1
C(hina) T(V) System	Moved to Tower 1	Moved to Tower 1	Tower 1
F(ormosa) TV	Moved to Tower 1	Tower 1	Moved to Tower 1
T(aiwan) TV	Moved to Tower 2	Tower 2	Tower 2
C(hina) TV	Tower 2	Moved to Tower 2	Tower 3

* For scenery of Yangming Mountain National Park, the Taipei site searching is launching by Executive Yuan in 2003. So the transmitter stations of ATTN is currently kept intact until the new plan is chosen. Under this situation, PTS and FTV could be allowed to install new digital transmitters in CTS' site temporarily on Yangming Mt. as equivalent benefits from denoting places to CTS in Southern Taiwan. And CTV and TTV also can keep their own facilities without move.

This project directed ATTN to abandon its vertical integration model operated in the past forty years. Reorganized the resource and facilities, the common platform in Southern Taiwan is supposed to be an example to implement in other places island wide. Finally, the five multiplex operators will be managed by a public corporation. As a response, the ATTN established a working group for one digital terrestrial transmission network in October 2003. Initially, the first step of DVB-T reform is undergoing. The public will expect there is only one uniform multiplex structure, like Teracom in Sweden, Digita in Finland, MTT in Singapore, Retevision in Spain, charged the digital service rollout technically.

The second project initiated by PTS is offering an experimental platform of mobile reception and its business model. Gained the knowledge of TV Mobile in Singapore, PTS decided to promote the outdoor TV reception on the move after attended BroadcastAsia 2002 international conference and exhibition. Afterward, the first choice of reception site is designated to vehicles of mass transportation. For moving beyond the egg and chicken question, the mobile reception carried by public transportation, for example, bus, coach, ferry, taxi etc., is a solution to allow general audience free access to digital TV without purchasing digital STB. It is a kind of action to profess the digital media literacy.

The editorial policy of mobile TV channel is catered to the commuters' behaviour and demand. The research of commuters profile in Kaohsiung city was conducted by local branch of Gallup Market Research Corporation. Based on the objective and experienced data, the schedule of program was tailor made for local commuters. According to the following findings, this channel is programmed into a young, dynamic, and knowledgeable TV.

Table 6. The Profile of Kaohsiung Commuters

Behaviour By means of	The percentage of total usage	Purpose of commute	Minutes per trip	The TV genre preference when moving
Scooter (49.76% will switch to bus or other system if condition is improved)	66.3%	For work 58.03%	Less than 30 min	Breaking news 86.37% Infotainment 78.56% Natural 76.41% Tourism 74.88%
Mass Transportation	Bus 6.1% Coach 2.2% Train 0.07% Ferry 0.01%	For business and Medicare 48.48% For class 34.03%	Between 30-59 min	Breaking news 80.65% Infotainment 78.68% Popular Music 76.92% Tourism 73.65%
Vehicle	15.7%			
Others	9.00%			

(Source: Gallup Marketing Research Corporation, 2004)

The research shows the bus is mainly serving the students. The rest of service takes care of the various needs. This experiment aims to target at a regular group on a certain platform. As a result, to enhance the value of watching digital video material during commuting, the pilot program of mobile reception is scheduling to a 5-10 minutes slot and art, science and humanities oriented type, which all started from a 10-minute current news reporting in the beginning of each one-hour program cycle (see Table 7). The program schedule is broadcast every weekday from the morning 6:00-9:00, at noon and 16:00-18:00 evening to serve the students and other commuters.

Table 7. Hourly Schedule of Mobile TV in Kaohsiung City

Genre	Length (min)	Content
News	10	Breaking News
Arts Science Humanities	40	Short film 4 min Medium 8 min Long 12 min
Advertising and Underwritten	10	Sponsorship, Promo of public service, and experimental Commercials

With local government contribution, each bus will be installing the platform (set-top-box and LCD 19-inch) for receiving mobile TV by a two-year investment plan. This project is co-funded by Department of Communications between Central and Kaohsiung government. In exchange for collaboration, PTS will release few portion of electromagnetic wave to broadcast the traffic information (a guide to bus transfer) on the screen during 9:00-12:00, 14:00-16:00 and nighttime. The different information guides are delivered to the dedicated routes powered on the screen by GPS. This structure of DVB-T, ATIS (Advanced Transportation Information System), GPS integrated service system is illustrated as following figure.

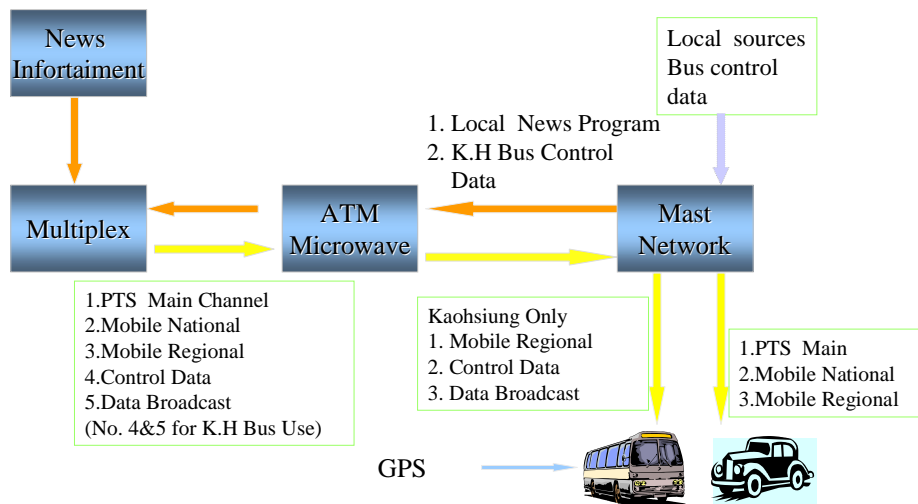


Figure 6. The Data Flow of Digital Mobile Reception in Kaohsiung

The perspective of mobile reception in Kaohsiung City is hardly forecast. However, that is the necessity of pouring public fund into a risky venture through public service broadcasting. Due to this pioneer investment in Kaohsiung City, PTS will also establish a window of public service programming to the southern general audience on the move. The industry will anticipate the take up rate of vehicle-made digital STB after mobile reception launching. Moreover, the coverage of signal is improving further when 1st filler is installed on the top of 85-floor Tuntex Tower Building inside Kaohsiung city in the mid of 2004.

The third project is a long-term planning. To introduce a common platform for DVB, Central Government intended to expedite the research and development of MHP by public fund. As the only PSB in Taiwan, PTS is designated to be the coordinator of the whole

project. Based on the principle of negotiable standard rather than law-binding one, PTS divided the fund with ATTN to let the four commercial broadcasters to join the pilot MHP application production. Each station chose one of promising applications in the future interactive video business. These productions included weather, traffic, interactive game and advertisement. PTS also started the MHP program production. For education purpose, PTS created three interacting instructional edutainment : 'Let's Talk in English on PTS' for general public ; 'e4Kids' for English course in elementary school; 'Follow Me', an extra-curricular guide for Grade 12. For providing the related information, game, practice, MHP format is implementing to realize the functions.

Based on those above developing materials, the second step of project is establishing a test bed and functioning like a MHP Lab for future application. PTS will purchase the MHP facilities manufactured by different providers (including authoring tool, server, Re-Mux, modulator & up-converter, stream analyzer). Testing by the program and application made by PTS and ATTN, a compatibility of vertical connection (from production, multiplex, and reception) through different equipment could be evaluated. This project aims to prevent the leading multiplex operator from adopting the proprietary part of currently MHP manufacturing (De Cockborne, Bernard and Brown, 1999). PTS also commissioned the comparative authoring tool research to the Institute of Industrial Technology in Hsinchu. This third DVB-T project is also bridging the efforts between different civilian sectors of R&D on DTV, which worked separately in the past few years lacking national coordination.

In the long run, MHP implementation is supposedly to replace the proprietary system utilized by dominance of vertically integrated players (e.g., cable MSO system). It could create the alternative of digital video and interactive service that let the consumers is out of the hands of the political economy complex within cable or broadband industry since the open architecture and horizontal interoperability was introduced by PTS, non-for-profit and public funded organization in this project.

CONCLUSION: A DEMOCRATIC DIGITAL PROMISE

Digitization brings with the new structure of audiovisual service to reshuffle the traditional broadcasting market. For the past ten years, the local market was overwhelmingly dominated by cable TV service. Along with new technology, this DVB-T system can breakup the dominance of vertical integrated players by its improved reception and contribute to public service broadcasting in digital era. The potential of paradigm shift is so significant in Taiwan context.

For keeping abreast of advanced technology so desperately, Taiwan government could not stand for over-profit oriented broadcasting industry without R&D investment to rollout the digital television service. It created a conflict interest between government and private interest of broadcasting industry, although both cooperated so closely during Nationalist regime in the past ten years. Then DPP-led government and parliament provided the public fund and political support to initiate the DVB-T project. Referring to the European broadcasting policy on DTV, government finally decided to disburse the first ever five-consecutive-year project fund to public service broadcasting sector. On the surface, the digital terrestrial TV service is making its route. More importantly, it will expand the scale of PSB in Taiwan broadcasting market if the project is continuously commissioned.

Given the project's priority to "assign the whole multiplex block to one player", the first common platform of multiplex operator in Southern Taiwan announced the demise of vertical integrated broadcaster implemented by U.S. business model in here 40 years ago. Planning through the revision of Broadcasting and Television Act in 2003, a single multiplex provider will be licensed to operate franchise nationally. According to Scandinavian countries' endeavour, one multiplex operator will utilize the resource of spectrum more efficiently (Tadayoni, 2001). It will release more channel capacities to new applicants if there gathering enough digital content providers. Except the current scale of four commercial broadcasters, the new platform will allow more public service or public access channels launching to balance the over-commercial broadcasting within cable industry. Once the multi-channel digital terrestrial TV being the counterpart of cable TV, simultaneously without increasing the numbers of commercial terrestrial actors, the advertising revenues will increasingly contributed to them competing with media product market rather than advertising market (Picard, 1989: 17-18). It prevents the liberalization of free-to-air market from degrading itself into "Market Failure".

About mobile reception and MHP-oriented horizontal platform, these two projects led by public broadcasting service in the near future will greatly enhance the competence of Taiwan broadcasting industry. Based on a mandate by current Broadcasting and Television Law to expand the scale of PSB should not later than December 2005, it seems that a gradually mature open-architecture of digital TV market will come along with a strengthening PSB. An expanding PSB will reorganize the workforce, resource, spectrum, and finance into a state of the art. The expecting synergy and accountability will adopt new service and implement the truly open and interoperable performance within the interactive digital video devices if the oversee mechanism is still in place by representative democracy.

The mobile reception project will add value to commuters in regards to outdoors video demand. If the business model is survival, the sectors of broadcasting and telecommunication are converging. It will also assist government to revise a reasonable spectrum allocation. The MHP test and pilot production project will bring the open standard come true. Under this reliable assessment, the new actors for digital content or academy on art and science of television will be flourish and foster a clear link with industry and develop together to serve the next generation of DVB service.

Having started the uniform multiplex structure of DTT development plan, Taiwan now can take an opportunity to make a prospect of new broadcasting culture. Digitization, one the one hand, modernized the broadcast technology and business to target the niche and interactive service. Moreover, DTT created a competitive platform in line with dominant cable industry nationally. It will enhance the choice, diversity, and innovation compared to current screen program. That is a democratic action to reform the broadcasting industry. Based on the expansion of public service broadcasting, DTT is giving Taiwan an opportunity to tell the different route of media reform by its particular interlocking interests between modernization and democratization.

REFERENCES

Castagnede, O., (2002). Overview of the DTV market in AsiaPac. Paper presented at BroadcastAsia 2002 International Conference, 17-21 June, Singapore.

CMRTV, Conseil mondial de la Radiotelevision (2001). Public Broadcasting, Why? How? Montreal.

De Cockborne, Jean-Eric, Bernard Clements and Adam Watson Brown., (1999). EU policy on multimedia regulation. Paper Presented at The Montreux Symposium, June 14.

Directorate General of Human Rights (2002). Group of Specialists on the Democratic and Social Implications of Digital Broadcasting. Strasbourg: Council of Europe.

Gallup Market Research Corporation (2004). The Research of Commuter Profile and Digital Mobile TV in Kaohsiung Metropolitan Area. (in Chinese)

IDVDWG, Integrated Digital Video Development Working Group (2003). Action Plan of Digital Video Development. Taipei: NICI, Executive Yuan. (in Chinese)

Johnson, S., (2004). Why more choices may mean fewer. Chicago Tribune, February 1.

McGarrity, I., (2002). Digital television in Asia. Paper presented at BroadcastAsia 2002 International Conference, 17-21 June, Singapore.

Picard, R.G. (1989). Media Economics, Concepts and issues. Newbury Park, CA: Sage.

Punie, Y. and G. Terzis. (2003). Media Innovation in Europe. Heerlen: International Institute of Infonomics.

The ROC Survey of Family Income and Expenditure. Taipei: Directorate-General of Budget, Accounting & Statistics, Executive Yuan.

Schnepfleitner, R. (2002). The Use of Funds Collected for "Public Service Broadcasting". Wein: Rundfunk & Telekom Regulierungs-GmbH.

Sherman, B.L. (2nd, 1995). Telecommunications Management: Broadcasting/cable and the new technologies. New York: McGraw-Hill, Inc.

Television Asia's Executive News, (2003). Taiwan sets digital agenda. May 19.

TelevisionAsia Satellite & Cable Annual Guide 2003/2004.

Tadayoni, R., (2001). Digital terrestrial broadcasting: Innovation and development or a tragedy for incumbents? Communications & Strategies, 42(2). pp 89-129.

Taiwan DTV Committee. (2003). Introduction to Digital Terrestrial Television Broadcasting. (in Chinese)

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