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Second Consultation on: Development of Mobile Television Service

Submission by
Nokia Corporation
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1 Executive Summary

Making TV mobile is the natural next step in the evolution of digital world. We have witnessed the era when voice has been made mobile and some key leanings are worth to remember and take along when taking this next step.

Nokia recommendations for Mobile TV deployment in Hong Kong are very much in line with the previous submission. We are based on our experiences from our deep involvement in mobile voice revolution and based on recent experiences on mobile TV trials and commercial deployments across the world.

The success of the mobile telephone and recently success of mobile TV have been building on following tree aspects:

- Efficient usage and allocation of spectrum
- Creation of customer demand for mobile TV: Offering of new valued services to consumers
- Enabling of sustainable business ecosystem creation by competitive supply products and services on open market approach

Spectrum usage & allocation: UHF is clearly the most suitable and efficient technology to be used for mobile TV. Alternatives such as VHF or L/S-band have fundamental problems. VHF will require cumbersome antenna solutions in handhelds and L/S band will require substantial high CAPEX and OPEX to build mobile TV coverage.

Nokia has closed observed both beauty contest and action based spectrum allocation processes. Both methods have their benefits, but beauty contest based spectrum allocation method leads to faster business ramp-up and better managed business environment, leading to benefits to society. Government is benefiting financially with increased tax income and spectrum license fees. Consumer get faster new services and service levels can be protected via license obligations. Broadcast operators can better manage their respective business.

Creation of consumer demand: Business environment should encourage offering rich channel supply, high quality services with good network coverage. Rich channel supply means that consumer are expecting to get about the same number of channels transmitted to their mobiles as there are receiving to home TV sets. The service level for Mobile TV has to be guaranteed. Consumers expects from the mobile TV service the same reliability and availability as they have with their home TV services. When the consumers are on the move, they expect to receive the TV signal roughly in same place where they have mobile/cellular network coverage.

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Open mobile TV ecosystem development for HK: The cost efficient way to build infrastructure for Mobile TV is to promote use of hared distribution network with obligation to rent capacity. This model has been implemented in Finland and Germany is planning to do the same.

Adopting of global, open technology standards is key to provide affordable devices and services to consumers. DVB-H is winning market share. Europe is adopting that as the mobile TV technology across Europe; all big Asian countries are relying on DVB-H as mobile TV technology. North America is split market between MediaFlo and DVB-H. Both technologies are standardized in US by TA. MediaFlo is seen as 1st implementation in the market but WiHire and Modeo and looking work option to bring DVB-H based Mobile TV to the market. Latin America development is at early stage, but DVB-H is tested there as well. These selections prove that DVB-H will be winning standard for mobile TV that is used globally. Cost efficient product and service supply ecosystem has been created based on DVB-H ensuring state of art, competitive supply of product to consumer and trade customers.

2 Responses to key questions:

2.1 We welcome your views on the allocation of one multiplex in UHF band and two multiplexes in Band III for the development of mobile TV services. We also welcome your views on the release of frequency spectrum L band and S band for the purpose.

Nokia sees that the position proposed by the CTB does rather well take into account the points made originally by Nokia in our answer for the first round of consultations. As shown in our answer the UHF-band seems to be the most suitable band for mobile TV applications for several reasons. Firstly the technical radio propagation characteristics of the band combined with the possibilities to build rather efficient integrated antennas in the terminals together make the UHF the most cost efficient band to deploy mobile TV. Secondly, it is recognised by the market all over the world and most of the mobile TV networks are built in the UHF, the terminal mass market will be in the UHF-band capable devices. Current consideration of one UHF frequency might not be enough for the high quality of mobile TV broadcasting in Hong Kong. Considering that high quality is the basic of end user need, a minimum of 2 UHF frequencies will be having enough bandwidth for adequate number of channels. . This ensures smooth market start as terminals will be available from several vendors with competitive pricing. We see that the VHF III band does not offer similar benefits although spectrum may be readily available. Low frequencies like the VHF III would be much better suited for fixed DTTV applications as the rather large antennas pose no problem in fixed reception. Also the available capacity will be rather low.

For the higher frequencies like the L-band as S-band we support the proposed position of the CTB to reserve these bands for future market needs. For the L-band we were showing in our first round response that the L-band mobile TV network deployment would cost 300% more than a UHF-network deployment. It is also highly improbable that the L-band would be used in any other mobile TV mass market. It is true that in Europe the commission has indicated several times that the L-band could be a fast way to start mobile TV services as the spectrum would be readily available. However, this has been

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going on for some time now and simultaneously UHF have been made available in most of the European countries without any major problems. Therefore it is highly unlikely that any commercial L-band deployment in Europe would happen in the next few years regardless of the position of the commission. Therefore we see that reserving this band subject for future market needs.

For the S-band we see that the most valuable use of the band is the future expansion of the 3G mobile services. However, as stated in the Second Consultation on the Development of Mobile Television Services, there are some constraints set by the Mainland CMMB service as the satellite part of this will cover also Hong Kong.

2.2 We welcome your views on whether the pro-mobile TV approach should be adopted, whereby 50% of the transmission capacity should be used to carry mobile TV content.

Nokia fully supports TA of Hong Kong to take the pro-Mobile TV approach with 50% of the transmission capacity requested to carry Mobile TV Content. Mobile TV as typical convergent service, its adoption has been seen to ramp up in very fast manner globally in coming years, it will enable personal multimedia consumption to bring the exciting business opportunity to the industries and best audiovisual experience to consumers to enrich their personal digital life. Consumer is always expecting Mobile TV could bring them uncompromised TV viewing experience as they gained from Home TV, especially expects at least as one of choice they could consume the same channel and same content with the same brand as they have in Home TV consumption environment . In this regards, to have no less than 50% of transmission capacity to carry Mobile TV content will greatly fulfil consumer's expectation, also the most important is, it could guide the ecosystem and industry players around Mobile TV business to share the same business focus with best commitment and effort to give maximum utilization of the licensed frequency and its capacity to deliver a mobile-centric TV consumption offering to consumers.

But with the constant evolution of personal multimedia consumption experience offering to consumers together with the development of technologies and services, in very soon the consumers will enjoy the Mobile TV service and content in more advanced way like Mobile HDTV which is offered further by network convergence (e.g. LTE, WiMAX, next generation of Mobile broadcast network, even technology beyond 4G…). In this possible scenario, current Mobile broadcast TV service shall have very good flexibility and scalability to share maximum resource and investment with the coming Mobile broadband services which also targets to offer the Mobile TV and video centric service with high quality to consumers. So it's very necessary and essential for current Mobile TV service offering to have right planning even in its beginning to allow the right evolution path towards the future Mobile broadband services. Then Nokia is proposing TA of Hong Kong could encourage the industry players for MobileTV in Hong Kong to consider selecting IP (Internet Protocol) as common transportation layer on top of current Mobile broadcast wireless technology to well prepare for further evolution of convergence of Internet, telecom and broadcasting networks.

When IP could be considered or chosen as common transportation layer for Mobile TV even from its introduction phase, the consumer and industry will benefit from the following:

- IP is the primary technical approach to create convergence among Internet, telecomm and broadcasting networks. Internet is surely based on full IP, telecom domains are starting to migrate its infrastructure to full-IP-support, IPTV paves the way to introduce IP transmission to one of domain for TV digitalization, Mobile TV transmission based on IP on the top of different bearer technologies is also seen as main stream approach for MobileTV industrialization for different bearers, for example, DVB-H is based on IP to have IPDC (IP Datacast) as application layer, T-DMB is developed further to have DAB-IP to allow the service could be deployed based on full IP transmission, DVB-SH is also based on full IP transmission, OMA Bcast is based on full IP with bearer agnostic…
- IP leaves the way open to have Mobile TV service evolution towards future technologies. Along with the development of Mobile broadband (LTE, WiMAX, the next generation of mobile broadcast network…) and home networking technologies, and with the everything supporting IP, it could easily have these coming mobile broadband technologies share the existed resource, services and applications with current Mobile TV infrastructure still to make a smooth experience and service migration transparently to new technologies platform.
- IP is the most proven, robust and economic technologies. After its born for more than 20 years, its wide use by the industries has proven IP is the most flexible, reliable and cheap transportation layer for each technologies and services.
- Also with IP introduction, it leaves the room that wireless technology and service/application could have separate evolution path without good dependency to allow the fast adoption for any possible innovative mobile broadband technologies in future.

Thus Nokia is proposing TA could encourage IP technology to be used in later Mobile TV infrastructure planning and deployment as common technology transportation layer to build flexibility, scalability and robustness for further evolution of MobileTV infrastructure, application, service and consumer experience.

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2.3 We welcome your views on the adoption of market-based approach for the development of mobile TV services and the assignment of spectrum and levy of Spectrum Utilization Fee through auctions.

Nokia see that the costs of building mobile TV business system have to in balance with assumed revenues. This is the only way to create sustainable new business. MobileTV is an opportunity to create new value for the consumers.

Global experiences from Mobile TV trials and commercial deployment show that consumers are willing to invest 3 – 30 EUR per month to mobile TV services to get quality new services. However each market seems to have also its unique characteristics. Regarding to HK mobile TV market, the business fundamentals are not know in details. Which business models will work: ad based, time subscription based, pay-per-view based, etc. Consumer's real willingness to invest into mobile TV is unknown. And forecasted subscriber adaptation rate is also unknown.

The costs side of the business is easier to forecast. Content fees, network construction costs, customer acquisition costs may be estimated quite accurately. This should be the case with Spectrum Utilization Fee (SUF).

All in all, the spectrum acquisition fee and spectrum utilization fees should forecastable and adjustable cost item for Mobile TV business case. Being able to come out with that sort arrangement, this would be win-win situation both for HK government/tax payers and to mobile TV business entrepreneurs.

2.4 We welcome your views on the two light-handed regulatory approached, and your suggestions on which approach should be adopted for mobile TV

Nokia welcomes TA's proposal on having light-handed regulatory approach for Mobile TV in this nascent phase. Based on Nokia's experience and lessons gained from the support given to mobile TV service development in other global markets, we do believe the positive support given from regulatory point of view by the government could give short time-to-market and quick deployment for mobile TV service introduction to consumers. It not only sets good confidence level to the industry players to invest also make business friendly market to allow the industry players to invest consistently to ramp up mobile TV services.

Nokia is neutral on whether a self-regulatory approach or licensing Mobile TV under BO to be adopted. But Nokia would recommend to take a approach which could not only take care of the interest from both TA and the later licensee in current stage for content provisions for Mobile TV service, but also could allow the licensee to have its effort in maximum focus on Mobile TV infrastructure setup and service deployment instead of having possibility on its deployment being slowed down in near future by the complicated or time-consuming regulatory approach whatever to be taken later for content provision.

2.5 Access to Hilltop Transmission sites and Geographic coverage for broadcast-type mobile TV

Transmission sites at traditional Hong Kong hilltop sites plays and important role in getting overall mobile TV coverage build for Hong Kong in an efficient manner, thus access to sites should be arranged to the network broadcasters. With hilltop transmitters and with appropriate transmission power it is possible to build outdoor network coverage for mobile TV. In addition to outdoor coverage, the indoor coverage is critical to mobile TV. From our study, 2/3 of the use cases with mobile TV happen indoors, i.e inside offices and homes. The best antenna locations, to build indoor coverage for mobile TV, are to use cellular network providers' sites. Same applies to build coverage to MTR, shopping malls and public buildings.

In considering how hilltop sites will be made available and shared, the same logic should apply to access to other sites.

2.6 We welcome your views on the requirement that mobile TV should provide the same geographical coverage as free-to-air broadcasters.

Nokia supports having the requirement that Mobile TV should provide the same geographical coverage as free-to-air broadcasters in the agreed coverage rate and timetable. Nokia is also proposing that in-door coverage requirement for geographical coverage also shall be imposed in the agreed timetable when out-door coverage requirement is indicated.

Based on the learning from global Mobile TV trials and commercial service launch in different markets, it's observed that consumers always have expectation to consume Mobile TV services based their existed consumption experience from Mobile telecommunication service

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and Home TV viewing services, these expectations normally leads to two typical uses cases for Mobile TV service and network planning:

1) Subscribers expects to be able to use Mobile TV service where she/he could make a call with current cellular service
2) Subscribers also expects to be able to use Mobile TV service where she/he could receive TV services from current broadcasters via either cable TV or satellite TV or terrestrial TV even IPTV etc…

It means in most markets close to 50% use cases for Mobile TV service usages happens in in-door environment, this also has been proven in the different Mobile TV trial and commercial operation in worldwide. In this regards in-door coverage (e.g. 50% within 6 months and 75% within 12 months) is also crucial for Mobile TV service to serve the consumers from the early stage of its launch to support the quick ramp-up of installed base towards mass market deployment. The exact requirement shall be discussed and agreed during mobile TV frequency license process since normally the major portion of investment for Mobile TV infrastructure built-up is always spent on building in-door coverage.

So based on the regulatory intention from TA for geographic coverage requirement, **Nokia is proposing to impose separately the requirement for in-door coverage in agreed timetable when out-door coverage is requested. The exact coverage rate for in-door and out-door shall be discussed and agreed by the TA and licensee candidate during the license process.**