Perspectives of Digital TV applications development in Russia

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Abstract

Russian government made principal decision on transition to Digital TV till 2015. This process has already started in several regions including Far East and North West of Russia. However this transition is considered as hang-the-expense action. At the same time some advanced technical solutions (including development of applications for TV) will allow implementing e-commerce oriented business model returning part of investments.

Engineers from Motorola Software Center in St.-Petersburg have significant experience in system engineering and development of applications for different digital television platforms used in the US and Europe. Analysis of major world trends in this area allows the authors preparing suggestions on application development as an important component of Digital TV deployment in Russia. Recommendations and estimations of necessary efforts are provided.

***Keywords**: Digital TV applications.*

Перспективы разработки приложений для цифрового телевидения в России

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Аннотация

Правительство России одобрило программу перехода на цифровое телевидение на территории всей страны к 2015 году. Этот процесс уже охватил Дальний Восток и Северо-Западный регион. Однако переход рассматривается как вложения без быстрой отдачи. В то же время внедрение более сложных технических решений (включая приложения для пользовательских приставок – сет-топов) позволяют использовать цифровое телевидение как платформу для различных коммерческих проектов и посредством этого частично вернуть инвестиции.

Системные инженеры и программисты из Санкт-Петербургского центра разработки программного обеспечения компании Моторола имеют опыт создания приложений для американских и европейских платформ цифрового телевидения. Анализ основных мировых тенденций в этой области дает авторам возможность предложить свое видение будущего разработки подобного ПО в России. Даны рекомендации и оценки необходимых трудозатрат.

***Ключеые слова**: приложения для цифрового телевидения.*

1. Introduction

In most cases TV functionality in Russia means access to several or dozens of TV channels. Currently some more features (like Video on Demand) are offered by advanced TV operators, but still the area of TV digitalization in Russia is considered in the first place as opportunity to extend TV experience ("more channels with better quality").

However digitalization of TV is much more. One of the most promising world trends is deliberate implementation of Digital TV hardware and software that provides the consumers with versatile entertainment capabilities as well as enormous e-

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commerce resources. A new concept is being developed, under which Digital TV becomes:

1) The family solution based on Home Network with one or more powerful Media Hubs (set-tops);
2) Entertainment center representing high definition TV, video, photo, audio content ("external" and "home-made"), games, etc.;
3) E-commerce and information platform.

Of course development of necessary hardware and software requires time, essential efforts and investments (including resources for application development). At the same time it will expand e-commerce coverage from PC users community to overwhelming majority of households.

In this article the authors accentuate development of one of the needed components – applications, the highest level of necessary infrastructure, basing on the experience of development performed in SPb center of Motorola. For software industry, digitalization of TV means creation of new market even more profitable than, for example, application development for mobile devices.

2. New Concept of Digital TV implementation

Let us consider what functionality is available to consumer in the framework of new concept, and what hardware and software components are necessary.

Presence of return (upstream) channel from home Media Hub and high-performance downstream channel are the major technical requirements for new Digital TV solution. Media Hub should be powerful enough, and its software platform (middleware) should allow installation (including downloading, etc.) and execution of applications. Of course, it is better to have the platform open for application development (not proprietary). Billing systems should be available in the framework of operator's infrastructure.

Though these requirements are rigid enough, significant number of Russian households are covered by such infrastructure (in the US these are the majority of households). So such consumers may have much more opportunities than just watching TV content, and providing these opportunities means development of appropriate applications. Not Electronic Program Guide but Entertainment Guide will provide access to VOD, photo, and music servers as well as to content uploaded from video and photo cameras. Information on received phone calls and e-mails will be presented on TV screen – as well as scheduled tasks synchronized with PC and mobile organizers. Local community information (emergency, weather, traffic jams, public transportation, aviation, local events, sales in the nearest supermarkets, cinema and restaurants availability, etc.) will be easily accessed via simplified user interface.

Finally, consumers may purchase railway and airline e-tickets or e-tickets to show or cinema, pay for cell phone or public utilities, order books or goods from internet shops. Payments will be provided via operator's bill, and fraud will be minimized because only trusted service providers will be permitted by operator to install their e-commerce applications on the set-tops.

Major Western operators already suggest some of such applications to the users or consider plans for their development.

3. Co-existence of Digital TV and PC

It is necessary to mention that Digital TV solution shall co-exist not substitute PC opportunities if PC is present at home. TV and PC may use the same infrastructure and should interact (the set-top content might be played on PC or data from PC might be exported to set-top applications) however each solution has its own niche. More generally, PC functionality is not replaced by Digital TV and vice versa because usually Digital TV applications have more presentation capabilities (HD TV set screen, etc.) but need simplified user interface as well as more customized and limited functionality. Such difference exists due to the following reasons: at least part of TV audience does not have technical knowledge (including PC usage techniques), and remote control allows very limited input capabilities. TV operators have also much more control on application deployment process - in other words, it is impossible to deliver and install application on the set-top without operator's permission. Relations between digital TV and PC functionalities remind relations between PC and mobile devices functionalities; in theory the functionalities might be similar but in practice they differ because of different usage scenarios, form factor, etc.

4. Who and why will invest money in application development?

One of the most interesting results of the Western TV markets is the conclusion that generally the consumer is not ready to pay for additional services and shall not do it directly. So initial investments in applications development are expected from the operators and providers of e-commerce services. Another interesting side might be advertisers. Let us consider benefits of these stakeholders.

Operators will have some interest from each transaction. For example, cell phone payments will generate benefits a priori exceeding income of payment terminal systems because each consumer

may pay from home using only his/her own set-top (security reasons are considered below).

Providers of e-commerce services will get access to the number of consumers comparable with the number of TV audience – including people leaving in distant and rural areas. Simplified interface shall allow usage of these services by people who are not ready to use them from PC.

Finally, advertisers may provide actually targeted commercials firstly because geographical location of the set-top in known, and secondly because it becomes possible to gather much more information on TV audience - through information submitted by the consumers (like personal profiles) and statistics (on purchases, etc.) gathered by operator.

Analysis of current situation in the US confirms this trend. Banks finance departments develop e-banking applications; operators spend money for applications with access to video, audio, photo content providers (making money on targeted advertisement, etc.). Of course, big operators have more resources and opportunities to attract big service-providers.

The situation in Russia has some specifics. Experts estimate that overwhelming majority of consumers is not ready to pay either for content or for hardware (Russian government considers Digital TV deployment as non-return investments including free distribution of set-tops and about 10 channels). For minority who may pay for content and high-end settops, operators shall suggest new and new services to maintain the sufficient APRU.

If "e-commerce-at-home" services are implemented in convenient, easy for access, and profitable for ordinary consumer way, we may expect their 100% penetration even in Russia (like it took place with relatively expensive cell phones). It is necessary to stress that good usability and look and feel of Digital TV applications are critically important requirements for the success of the whole Digital TV e-commerce concept.

It is necessary to mention that one more feature of Russian TV market – large number of low-profit operators with limited turnover and resources - forms actual need for consolidation of operators. Only big operators may spend money for application development. It is also an opportunity for big software companies (like Motorola) who may develop some common solution and suggest it to several small operators.

5. Recommendations for Digital TV applications development

Engineers from Motorola Software Center in St.-Petersburg have significant experience in system engineering and development of applications for different digital television platforms for the US, Europe, and Japanese markets (including open platform like OCAP and MHP). Recommendations below seem applicable to Russian market too.

First of all, optimization of risks and investments takes place in case of step-by-step development. Not all applications shall be developed simultaneously, development shall be permanently corrected based on operators feedback, permanent marketing analysis, and piloting results. Other operators' and developers' successes and mistakes need to be constantly tracked.

However development of separate applications (even allowed by platform) is not optimal solution. It is better to have long-term plans for development of the whole application suite so that functionality of its components would be agreed and consistent, UI would be unified, etc. In other words, the environment not the set of detached applications shall be developed from the beginning (of course, some components may be added or removed based on the marketing inputs). General principles of application management and downloading shall be implemented from the first steps of development.

Motorola engineers developed the set of applications for OCAP middleware including MotoGuide (extended EPG), integration with home phone, Medication reminder, YouTube, Music, Photo, Flickr applications and so on.

Application development requires years (and person*years of efforts) so it makes sense to start it almost in parallel with development of platform and hardware. It may also help to demonstrate hardware and platform advantages.

It is hard to create estimation model for a Digital TV application without knowledge of development specifics (engineers' experience in subject area; the application's complexity; availability of API to access to the provider's data, etc.) However it is possible to consider the following numbers as a first estimation: from 1 to 10 person*years for development of one e-commerce application, and from 10 to 100 person*years for development of Application Suite consisting of several dozens of applications. It includes efforts for system engineering and testing. Subject area specifics studying will usually take up to 3 person*months for qualified developer or tester. Significant reuse of technical solutions decreases specific laboriousness in case of Application Suite implementation.

Our experience also shows that usage of SDK significantly accelerates application development (like 5-10 times by usage of Motorola OCAP SDK in our case). In other words it makes sense to invest to development of SDK if many applications are planned to be created.

6. Challenges and Corresponding Solutions

Of course, a lot of principal problems prevent such scenario. First of all, operators infrastructure in Russia does not provide 100% coverage of households by return and high-performance downstream channel especially in rural regions and remote districts. However in such case creation of infrastructure should be more claimed for consumers and more profitable for operators and service providers (because of issues with access to other methods of payment – PC and Internet penetration is less in such regions than in Moscow). There are a lot of examples when Russian operators created new beneficial infrastructure in little towns (for several thousand householders). For rural areas it is possible to distribute set-tops with GSM modules supporting both downstream and return channels. Performance of all possible downstream and return channels shall be taken into account by application developers.

Another problem is considerable diversity of the consumers' hardware and software – settops and corresponding software platforms. For instance, majority of operators in Russia support their own proprietary set-top platforms. So Digital TV applications shall have flexible enough architecture allowing porting to new platforms (without significant redevelopment of logic, etc.) Analysis of the US and Europe trends shows that aspiration to optimize expenditures follows to transition to open platform like OCAP or MHP. It allows explosive increase of the number of developed application like it took place in computer world.

Application development will also require some actions from the services providers – for example, standardization of the data formats by different companies working in the similar subject area (airlines, cinemas, and so on).

Security reasons are also very important. In addition to technical barriers, some organizational methods shall prevent fraud. In contrast to Internet, TV operators will limit the cluster of e-commerce providers so the consumer might pay only to trusted companies. Usage of personal PIN code, binding to location and personality of the consumer (known to operator) shall be implemented on application level and will also help to prevent fraud (for example, e-tickets might be purchased only for predefined list of people; in other case additional confirmation is required). Some payment limitations (of single payment or monthly limit of operations) might be also supported by applications.

7. Conclusions

The following important recommendations for Russian market can be formulated from experience of system engineers and developers working in Motorola Software Center in St. Petersburg:

1) Digital TV can be considered a new entertainment and e-commerce platform providing the consumer with much more opportunities than watching TV content;
2) Digital TV e-commerce is supported by several dozens of applications; creation of the whole application suite is preferable; functionality of its components shall be agreed and consistent, UI shall be unified, application management and downloading shall be implemented from the first steps of development;
3) Development of such Application Suite requires at least a year and several dozens person*years, so it makes sense to start it almost in parallel with development of platform and hardware;
4) Usage of SDK like Motorola OCAP SDK allows up to 10 times acceleration of application development;
5) Open platforms are more promising for operators and e-commerce stakeholders than proprietary ones due to increase of the number of developed applications;
6) Digital TV solution and PC shall co-exist and interact and may use the same infrastructure however each solution has its own niche. Digital TV applications have more presentation capabilities (HD TV set screen, etc.) but need simplified user interface as well as more customized and limited functionality;
7) Only big operators may spend money for application development. However as Motorola experience shows, it is also an opportunity for big software companies who may develop some common solution and suggest it to several small operators.

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