Business Model Analysis and Evaluation Framework for PQoS-aware VoIP and IPTV Services of Mobile Operators

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Abstract

EC-Funded ICT-214751 ADAMANTIUM project has developed a management system called Multimedia Content Management System (MCMS) for optimizing the delivered perceptual quality level of VoIP and IPTV services offered by mobile operators. Given to the added value that the project offers to the involved players via the enhancement of the existing IMS infrastructure with novel PQoS-aware adaptation capabilities, this paper presents the business model perspectives of ADAMANTIUM, analyzing its aspects and impacts, as well as evaluating its effectiveness via the STOF model framework of analysis. The outcome of this paper is that the ADAMANTIUM solution can be both profitable and applicable by broadening the already existing business models of the communications sector.

Keywords

Business Model, STOF Model, VoIP, IPTV, IMS

1. Introduction

Nowadays, even though IMS technology entails novel business opportunities for the mobile operators through packet-switched services, such as VoIP and IPTV, it lacks of user-centric management mechanisms, which will guarantee the provision of Perceived QoS (PQoS) (Koumaras, 2008) at levels similar to the existing circuit switched (voice) services. Due to this QoS constraint, limited marketing share has been gained by the packet-switched/IMS services and mobile operators are skeptic in order to widely adopt the new services.

Towards enhancing IMS market share via PQoS-aware mechanisms in order to defeat the existing situation, ADAMANTIUM project (Koumaras, 2008) has developed an IMS-compatible Multimedia Content Management System (MCMS) focused on performing dynamic cross layer adaptations for optimization of the user experience in terms of perceptual quality for IPTV and VoIP services. More specifically by enhancing the existing IMS capabilities with PQoS-aware cross layer adaptation techniques, it comes to minimize the existing market threats and weaknesses of mobile VoIP and IPTV, towards creating the necessary circumstances for their commercial and marketing success.

Given that in the communications industry and in Telco market in particular, value-added services are slowly becoming a key source of revenues, ADAMANTIUM comes to alter the existing business models in the mobile telecommunication industry by introducing the framework for novel and intelligent media services, which are able to retain their perceptual quality levels at acceptable quality levels under any network condition. Such an ability can be proved as the tool by a business, marketing and financial aspect, through which an operator can increase customer retention and loyalty levels, and in parallel to increase the number of users accessing the mentioned services.

Within this newly generated business and marketing environment, it is created the need to analyze the new business models that ADAMANTIUM creates. In this framework, this paper presents a study on the ADAMANTIUM possible business models, considering the business case where the existing mobile operators are moving towards VoIP-based voice services and IPTV program offerings, through their existing well established IMS-compatible wireless access network.

2. ADAMANTIUM Business Model Definition

For mobile operators ADAMANTIUM proposed business model will be the means for increasing market penetration, market share, quality of innovative offered services and after all increasing revenues and profitability. For developing a suitable business model ADAMANTIUM has considered in details the current business and market perspective of mobile VoIP and IPTV services, and has consolidated and harmonized them within ADAMANTIUM's overall aims and scope.

The main role that is affected by ADAMATIUM is held by the mobile network operator. Network Providers' or Network Operators' business is based on users, who need communication and services. With an improved PQoS VoIP/IPTV service, more users will access the Network operator's mobile network and therefore they will get more profit from their network deployment (Network effects business model).

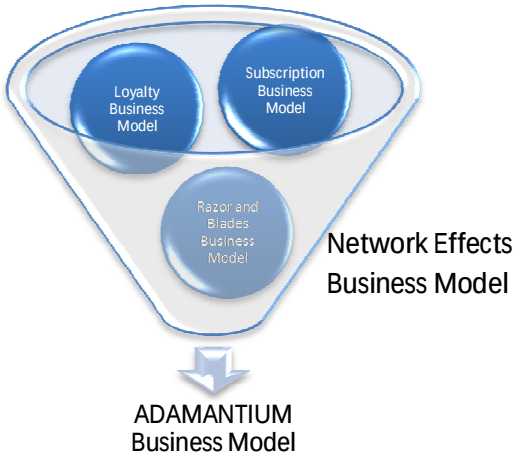

Figure 1 ADAMANTIUM business model main entities

The ADAMANTIUM business proposal aims to improving and further enhancing the network effects business model currently been used by the majority of mobile network operators. ADAMANTIUM does not aim to introduce a completely new and innovative business model, which currently established key actors will hesitate to adapt, but it targets to the business evolution of the existing ones within the newly defined market dynamics.

As already stated, mobile operators mainly fit into the network effects business model. This type of business model is based on the network effect, which causes a service to have a value to a potential customer dependent on the number of customers already owning/using that product or service. ADAMANTIUM proposed business model for mobile operators fits to an evolved network effects business model, which exhibits dominant enhancements and characteristics of:

- *The subscription business model* (a business model where a customer must pay a subscription price to have access to the product/service). In ADAMANTIUM case, a mobile operator will increase its subscribers' figures by offering innovative and quality aware services.
- *The loyalty business model* (a business model used in strategic management in which company resources are employed so as to increase the loyalty of customers). A typical value chain example of this type of model that ADAMANTIUM reinforces is: quality of offered service leads to customer satisfaction, which leads to customer loyalty, which leads to profitability and lower churn rate.
- *The razor and blades business model* (the concept of either giving away a product/service for nothing or charging an extremely low price to generate a continual market for another, generally complementary, item or service). The mobile operators may select not to charge an extra premium for the ADAMANTIUM improved quality if their offered VoIP and IPTV services aim to generate a continual market for additional/complementary services related to VoIP and IPTV (eg advertising, live events broadcasting, VoD)

Thus ADAMANTIUM business model, as it is depicted in Figure 1, may be considered as an enhanced and extended network effects business model, which broadens the scope of business and operation processes while defining mobile operators' steps for achieving operational excellence on quality delivery.

3. ADAMANTIUM Business Model Analysis and Impact

The basic assumption is that the ADAMANTIUM business model focuses on and examines the mobile services of VoIP and IPTV alongside with the mobile network operator as the key business actor of the value chain and services of the mobile communications sector. In parallel, evaluating the attractiveness of launching a PQoS-aware mobile VoIP and IPTV service requires consideration of specific market dynamics and business models. New technologies and evolved business models present significant opportunities and competitive threats for established mobile operators. ADAMANTIUM, based on innovative and enabling technologies, aims to establish:

- Strong cooperation with all market actors to ensure that current market requirements and business plans are sufficiently supported by the enabling technologies developed and proposed

- Strong cooperation in researching solutions for enabling technologies to provide better exploitation potential among all interested business actors
- The evolution of currently, successfully established business models towards the convergence of the different market segments
- Dissemination and training of relevant actors to promote the ADAMANTIUM proposed technologies to the dynamically newly formed and continuously changing business, marketing and socio-economical environment
- Sound foundations for achieving economies of scale, revenues increase and profitability attainment by those actors who become part of the new business value chain where innovative services such as mobile VoIP and IPTV are not just offered to end users but they are also PQoS and QoS standard enabled
- Standardisation which becomes the key to enable the wide adoption of such technologies
- The ability to offer "own customers" better service quality based on real-time content adaptation mechanisms. This can be achieved through the adoption of the MCMS system which will have the embedded intelligence of monitoring and adapting the context of the offered services in a way that will compensate for potential quality degradations.
- To increase competence in the mass market and enhance the prestige of the brand name. This competitiveness can be enhanced through the provision of dynamically adaptive services that will increase user satisfaction.
- The ability to attract potential new customers which up to now showed lack of interest for services like VoIP and IPTV over mobile.

The newly formed ADAMANTIUM business model also creates a new Marketing Mix for the mobile operators through which new market challenges are met and new targets are attained:

- **Product**
  An intelligent and PQoS-aware service, which is capable of adapting in real time its perceived level of QoS, aiming to provide optimized quality of experience in mobile VoIP and IPTV offered services.
- **Place/Distribution**
  Mobile network operators along with corresponding service providers have already a well-established network of sales points and agents which can accommodate and facilitate the promotion and selling of ADAMANTIUM achievements. No additional changes are required in the existing distribution network and used techniques. Similarly, local dealers who in the meanwhile should have been trained to become familiar with the new quality improved services of mobile VoIP and IPTV may facilitate the entire distribution-advertising process.
- **Price**
  The pricing models to be adopted by the market exploitation of ADAMANTIUM proposal should contribute towards balancing prices and demand, meaning that mobile operators as service providers should define the optimum strategy between charging high prices to increase margins, but not so high as to reduce the overall demand. This pricing strategy could also include the identification of the most profitable pricing plans for the services to be offered: monthly subscriptions, only by usage, packages of minutes, flat rates. Regarding flat rates, in pure mobile services, this pricing type has been introduced by some operators already, and the trend towards more flat rates pricing for all kinds of services is increasing.

§ **Promotion**
Mobile network operators already posses a well-established network of sales points and agents which can accommodate and facilitate the promotion of ADAMANTIUM proposed services at very low extra cost. Furthermore additional ways of promotion might be chosen like Web-site/Internet promotion, advertising means, and participation in several events of commercial interest as conferences, meetings, exhibitions.

ADAMANTIUM business model will give the chance to mobile operators, through quality of service for mobile VoIP and IPTV to leverage competitive strengths, given that there is a need to acquire not only the capability to source, package, manage and distribute content, whether voice or multimedia, but also to do it while specific quality standards (QoS, PQoS) are achieved.

4. ADAMANTIUM Business Model Evaluation

In this section, the STOF method (STOF stands for Service, Technology, Organization and Finance and it is a method offering a comprehensive way of modeling and analyzing a business framework) is used to further evaluate the proposed business model (Winkel, 2008). The business model concept in the STOF framework (Faber, 2003) is defined as a blueprint of how a network of cooperating business entities and processes intends to create and capture value from new, innovative services. A STOF model approach for ADAMANTIUM is depicted in Figure 2

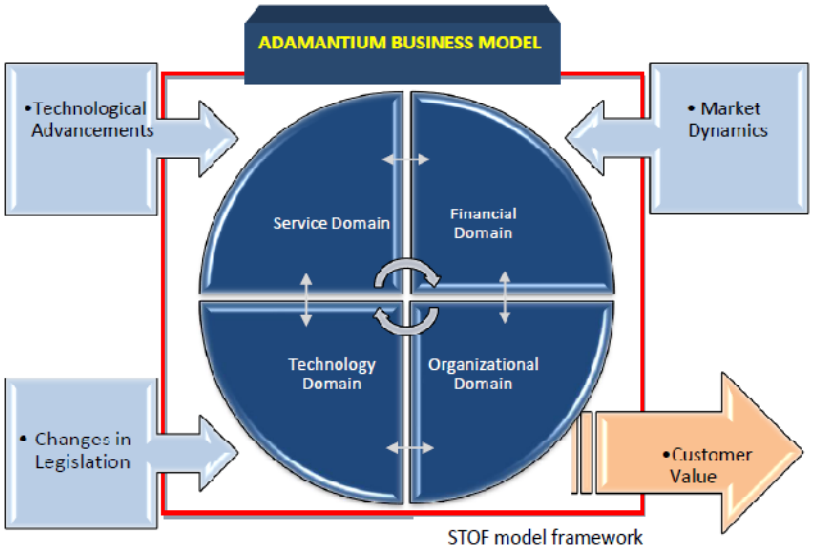

Figure 2 STOF Model for ADAMANTIUM Business Model analysis

The STOF-model consists of four domains:

- § service domain,
- § technology domain,
- § financial domain,
- § organization domain

Each of these domains constantly interacts with the others and is affected by external factors like:

- market dynamics,
- technological advancements,
- regulatory framework

Based on the STOF model and its dynamics, ADAMANTIUM business model is analyzed both externally (influences by external forces) and internally (four domains analysis). The four domains of the business model interact with each other and with external factors during the exploration and exploitation phases. Exploration implies mobile operators' behaviors characterized by search, discovery, experimentation, risk taking and innovation, while exploitation implies behaviors characterized by refinement, implementation, efficiency, production and selection of offered services.

Starting the analysis, we will first discuss the external forces that influence the proposed business model characteristics and attributes. These include the technology drivers for mobile VoIP and IPTV, market dynamics, and regulatory conditions briefly presented by the STOF framework of analysis.

- **Technological drivers for ADAMANTIUM VoIP and IPTV**
  - Innovative mobile communication advances and technologically enhanced mobile devices
  - An increase in effective mobile distribution capacity. The older capacity of mobile network was not sufficient to deliver streaming video and audio service with certain quality.
  - An increased ability to process user feedback via recently developed, innovative technologies that increase the feasibility of interaction even when on move. Recent technology developments make interaction more feasible in the mobile environment. The return channels, carrying messages from viewers to service providers, create possibilities to develop new, tailored and personal services for end-users and new revenue models for mobile operators like interactive advertisements.
  - An increase in storage and processing capacity controlled by end users ensure quicker innovations in the application layer, regardless of transmission bottlenecks
- **Market-related drivers and conditions**
  - Growing usage of mobile services
  - Growing market demand (Western Europe has proven to be one of the world's most vibrant markets with regard to mobile VoIP and IPTV)
  - A convergence of voice, internet, mobile services, information, telecommunication and TV industry that leads to fiercer competition but also to lower prices and greater variety of offered services
- **Regulatory conditions**
  - The regulatory climate in the telecommunication sector has changed from old rules to new policy. Technology development gradually transformed a world of spectrum scarcity, dumb terminals and natural monopoly to a world of abundant channels, intelligent terminals and unnatural monopoly. The distinctions between different services platforms are largely blurred due to digitization, mobility and therefore the

distinctive regulations for different sectors, telecommunications, are gradually being removed. Already, the EU made a distinction between regulation covering the distribution and audiovisual content in the recently approved directive on audiovisual media.

Technology, market and regulatory developments set the conditions under which the suggested ADAMANTIUM business model for mobile VoIP and IPTV is proposed to be developed given the current technological, market and regulatory framework. Based on the STOF model framework of analysis, the ADAMANTIUM business model of mobile VoIP and IPTV will be further evaluated in its exploration phase where critical choices in each of the four STOF domains will be analyzed, with particular emphasis on the tradeoffs and relationships between relevant design options.

- **Service Domain**
  Many mobile operators position VoIP and IPTV as a service that directly competes on the mass-market with other mobile services such as mobile Internet. Mobile operators expect they will be able to take advantage of their expertise and of consumer loyalty in the mobile market. They have to leverage their resources to increase the competitiveness of these services. There are three ways in which they can do so: (1) bundling these services with other already provided and widely used mobile services, (2) portfolio focusing on exclusivity or on a wide range of niche services, (3) offering more value added services with higher QoS as proposed by ADAMANTIUM.
- **Technology Domain**
  Within the technology domain, there are the layers of architecture when it comes to offering mobile VoIP and IPTV over the mobile network. Technical analysis of this architecture is beyond the scope of this paper but is worth mentioning that part of the technology domain of the ADAMANTIUM business model is the ADAMANTIUM project proposal of the innovative IMS-compatible Multimedia Content Management System - MCMS (focused on performing a dynamic cross layer adaptation for the optimization of the user experience in terms of the delivered PQoS level for IPTV and VoIP services).
- **Organization Domain**
  Key actors in the value network chain of mobile VoIP and IPTV services are considered telecom/mobile operators, content providers, telecom equipment, middleware providers, advertisers and consumers. Telecom operators participate in and organize the entire value delivery process. They produce or purchase the video content, and maintain the network (mobile or wire line) and the hardware and software components of various services/applications supported by equipment manufacturers. A content aggregator intermediates between content providers and the telecom provider. Advertisers can also be involved. Ownership of and control over successive stages of the value chain plays a decisive role in the way these services are marketed. Another relevant issue has to do with the extent to which the telecom provider wants to be involved in the production of content.
- **Financial Domain**
  Technical and service design choices determine the commercial exploitation cost of ADAMANTIUM project. Interactive services require financial investments to upgrade network equipment and to solve technical problems. In the current mobile market, most mobile operators use a flat rate subscription model (monthly subscription based on contract),

and they are slowly adopting pay-per-service models such as pay per view, pay per duration, as well as advertising in the case of VoD services of mobile IPTV. However, if more IPTV customized and personal services were to come available, a flexible pricing model would be more desirable and feasible to cover such characteristics like IPTV offering with quality standards or not.

As can be concluded from this STOF model analysis (technology drivers for VoIP and IPTV, market dynamics, and regulatory conditions, as well as the four STOF domains) of ADAMANTIUM business model, there are critical interdependencies between service design, technical architectures, organizational arrangement and financial performances. Telecom/Mobile operators have to balance their requirements in these domains and take into consideration the external factors and strategic interests so as to make the appropriate decision on the business model enhancements that they have to make into their business models in order to adapt ADAMANTIUM proposed services.

5. Conclusions

Concluding the analysis of the ADAMANTIUM business model, it is worth mentioning that ADAMANTIUM has the potential to succeed and lead mobile operators to new market segments with great opportunities for increasing market share and profitability. The presented analysis pinpointed different future possibilities and market conditions for successful market exploitation of ADAMANTIUM business model. In parallel, a framework for analyzing-evaluating the decisions related to the effectiveness of the proposed ADAMANTIUM business model as a means of commercially promoting and supporting ADAMANTIUM in the dynamic and full of uncertainties environment (market, socioeconomic, technological and legal environment) was developed.

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