

# EVALUATION OF NEW DISTRIBUTION CHANNELS FOR IP INTERACTIVE QOE BASED SERVICES

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**Abstract:** The current paper focuses on the definition and evaluation of IP interactive services as new distribution channels to establish a closer relation with end-users. These services present features which make them to be an attractive distribution media that requires the analysis of the cognitive and affective aspects experienced by end users during the interaction with them. To evaluate these channels an IPTV (IP-Television) based service has been developed including different existing situations. To this target, previous analyses have been driven to establish the most relevant variables which define users' behavior during the purchasing process. The obtained results may lead enterprises' relationships with their clients, increasing their implication and growing their loyalty.

## 1 INTRODUCTION

Multimedia services are rapidly evolving towards an "as you wish/when you wish" concept, unveiling to Telecom new business opportunities (Aznar, 2011). These types of services not only consist of passive multimedia applications but also include new personalization and interactivity features which improve users' willingness to pay.

In terms of technology, EPs (Equipment Providers), CPs (Content Providers) and Telecom operators are expected to handle much higher traffic levels, offering improved quality to the customers. Several initiatives are taking place to this respect. For instance, network based on the development of complex network infrastructures and next generation photonic architectures (Oliveira, 2009) support a significant growth of video-based content. Other suitable solutions consider that advocate for the implementation of new functional blocks within the current architectures to optimize end-user experience through engineering techniques. One example of this trend is the RUBENS architecture (RUBENS, 2010).

The evolution of e-business models is a direct consequence of the convergence of these technologies and multimedia services. This convergence definitely impacts end-users' possibilities: for instance, users are capable to access

to certain TV content from different channels (cable, satellite, household broadband connection, etc.) and terminals (TV, desktop, smart phone). Thus, the evolution towards interactive services and the development of new distribution channels have important implications.

In this work, we address the implementation of IPTV (IP-Television) as a new service distribution channel bringing together both technological and business perspectives. To this target, we first propose the development of an IPTV-based platform over which generic multimedia services can be provided. The platform is based on an application which enables the user to make use of several IP services. Secondly, we define and evaluate the acceptance of a concrete purchasing service which, as new distribution channel, enables to establish a closer relation with consumers. The service has been embedded within the platform and it has been analyzed to derive practical conclusions concerning users' affinity with IPTV services and the impact of advertisers on users' behavior.

The remainder of this paper is organized as follows: In section 2, personalization and interactivity variables are presented. In section 3, the platform and the IPTV-based service are explained. The experimentation process is detailed in section 4. Main results findings are discussed in section 5.

Section 6 concludes the paper.

## 2 PERSONALIZATION AND INTERACTIVITY FEATURES

The recent evolution of technologies and improvement of new applications have enabled to deploy more sophisticated online environments that make easier the enterprise-client interaction and facilitate the achievement of relations among them. In this context, the main target consists of analyzing the effect generated by two new aspects related to the online environments: personalization and interactivity.

Personalization, as a variable related to the users' purchasing behavior has been addressed by marketers during the last two decades. The development of new technologies has increased the customization possibilities, facilitating the compilation and analysis of information.

Concerning the interactivity, this has experienced a great evolution. Some works focused on the technological implications of it have meanwhile other works analyzed users' perception perspective (Wu, 2000). It is also noticeable the contribution of (Kiousis, 2002), which examines communication and no-communication perspectives, considering the technological aspects relative to users perception. Thus, interactivity makes reference to the degree that a certain communication technology enables to design within a controlled environment, in which users have the opportunity to exchange messages.

## 3 PURCHASING CHANNEL DESIGN

### 3.1 Platform Performance

The experiment consists of several IP-based services gathered within an IPTV platform, to be offered to end-users. These services comprise the access to online broadcast TV contents and the visualization of series and other off-line contents, together with the traditional broadband Internet connectivity. The advertising industry has been also incorporated. TV channels are provided from a streaming server directly connected to a DTTV (Digital Terrestrial TV) receiver and offline contents are stored in a data base which is accessed by the application. Figure 1 shows the IPTV platform scheme. The common

device to visualize the platform is the TV. Nevertheless, since we aim to test through an experiment, the platform has been installed in desktops.

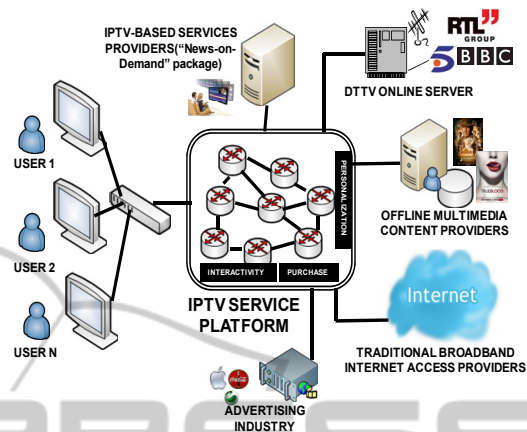


Figure 1: scheme of the multimedia IPTV platform.

The user accesses the platform, which acts a service distribution channel, to request for certain offline content (series, documentaries, movies) to online DTTV programs or to access other IP based services. (e.g. the one proposed in section 3.2).

### 3.2 "News-on-Demand" IP Interactive Service

In order to evaluate the platform as new distribution purchasing channel a novel specific IPTV service has been developed and integrated in the test-bed platform, since IPTV based services present novel features which may improve users' affinity and consequently willingness to pay.

The IPTV service we propose consists of the visualization of a "News-on-Demand" package. The package includes a compilation of most relevant news, gathered in different categories (e.g. sports, society, economics, etc.) offered to the end-user whenever he/she is requested to start the service.

Several personalization and interactivity features have been incorporated to the service. For instance, it offers the possibility to configure another package to be visualized the following day, selecting the number of news of each type that he/she is interested on and conferring a higher personalization degree. The client is also capable to send a certain visualized "New-on-Demand" through e-mail, share it in a social network or introduce a commentary concerning about it. Thus, the end-user is also capable to interact with pairs. Finally, the "purchase" button enables the user to acquire the

“News-on-Demand” package for the following day. Figure 2 shows a snapshot of the “News-on-Demand” package service.

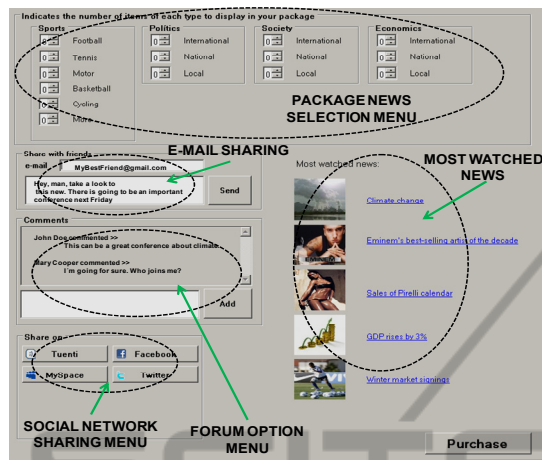


Figure 2: “News-on-Demand” service snapshot.

#### 4 EXPERIMENTATION PROCESS

The experiment has been carried out by 50 participants from the University of Zaragoza with ages among 20 and 30 years old. The selection of this user-profile is based on the fact that this sector is one of the most involved one in its relation with new trend technologies. According to (Telefonica, 2009), the average profile of the European Internet user is a person in the range of 16-24 years old (82%) with high education attainment (85%) and students (91%). In figure 3, it is shown the block diagram of the experimentation process including interactivity, personalization and purchasing options.

First, the user enters the platform and interacts with it to make it familiar. The user configures several personalization items (such as the type of preferred contents or the main menu wallpaper) and selects a certain offline or online content from the selected “favorite IPTV contents” to be visualized.

Once the visualization finishes, the user has to select the “News-on-Demand” service. Within the service, the user visualizes a “News-on-Demand” package that was configured by default when he/she entered the application.

The user controls the reproduction through several control options (“forward”, “redwing”, “play”, etc.). Between each single item of news, a 2-second advertisement has been inserted in order to latter test the users’ behavior while introducing advertisers in the service.

After experiencing the service, the user acquires the “News-on-Demand” package for the following day and answers a questionnaire that enable us to measure the level of affinity and willingness to pay.

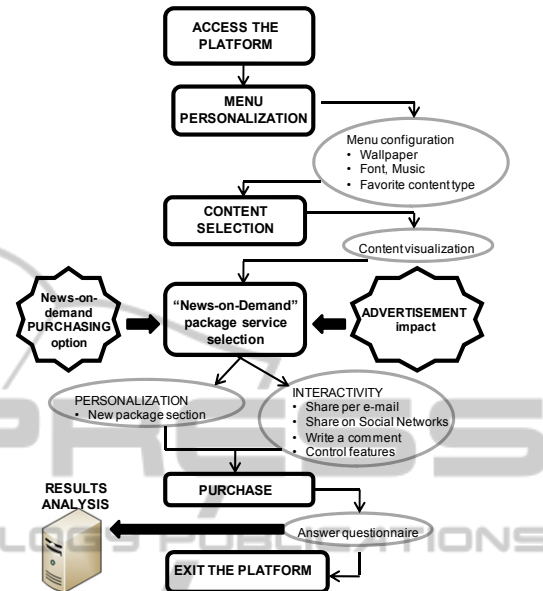


Figure 3: Block diagram of the experimentation process.

#### 5 RESULTS AND FINDINGS

The experiment pretends to study the platform as a service-oriented distribution channel for which end-users can be billed. Thus, the study has been driven to evaluate relevant aspects of the services. The main studied aspects which this work has studied are the affinity of end-users with new IPTV services, the influence of advertisers on both the service and the user, the possibility to store the content once it has been visualized and different billing options which could be considered. The results are practically relevant since they represent the direct experience of users while evaluating an IPTV service from the perspective of the willingness to pay. The following conclusions have been obtained.

In figure 4 it can be observed users’ willingness to pay in case end-users were charged by a weekly, monthly or annual rate options. The rates have been configured based on a previous research. It can be appreciated, that end-users will not pay more than 3 Euros (78%) for a weekly subscription rate, but while talking about monthly or annual rates, they are not clear about how much they would be willing to pay. Thus, from an e-business perspective, monthly or annual rates are recommended since they range of

prices which could be established are higher than for a weekly rate.

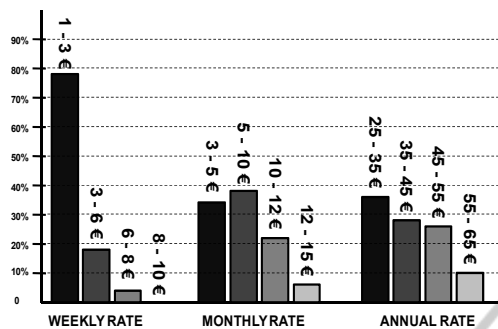


Figure 4: Users' willingness to pay for the News-on-Demand IPTV service.

The second evaluated service feature is the possibility to incorporate 2-second advertisements between "News". Advertisements are a very common practice which usually impacts users' experience. Nevertheless, as it can be observed in Figure 5(a), over the 60% of those polled do not consider a 2-second advertisement as an impairing feature and only 16% have been impaired. Moreover, this behaviour is subsequently confirmed in figure 5(b), since 72% of polled people would rather visualize advertisements instead of paying to remove them from the service. This fact is highly remarkable, since IPTV service providers may incorporate advertisements in their platforms charging for it to advertisers and billing for it.

The "News-on-Demand" package has been evaluated as an attractive service for which polled people would be willing to pay. On users' side personalization and interactivity enhance users' experience. On e-business side, the "News-on-Demand" service enables opportunities to bill both end-users (for the service provided) and advertisers.

## 6 CONCLUSIONS

The convergence of technologies and multimedia services has brought up the possibility to deploy an IPTV based platform which comprises traditional Internet services and new multimedia services.

Personalization and interactivity features, definitely impacts users' perception. The IPTV platform designed has been proved to be a suitable distribution channel to support new IP services.

The concrete IPTV service analyzed shows a good predisposition at the side of users to pay for these services. Results obtained show the practical

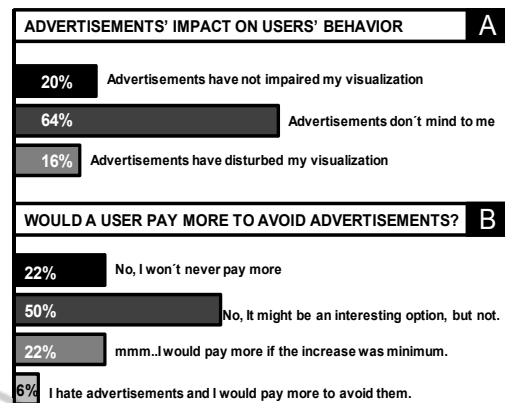


Figure 5: Impact of advertisements on users' behaviour.

nature of both the platform and the IPTV service.

They should also encourage to business stakeholders to bet for the development of new e-business strategies focused on the personal user satisfaction. Further steps may comprise the platform optimization and the evaluation of other services (Video on Demand, online gaming).

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