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# Optimizing Interactive Marketing in Digital Television Systems

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## ABSTRACT

Interactive broadcasting elaborates the realization of novel next generation network technologies, able to provide multiple interactive multimedia and Internet based services, utilizing Digital Video Broadcasting advances. On the other hand, IP multimedia subsystem is a promising solution that may be adopted in next generation networks providing advanced capabilities and added value data services. In this context, this study investigates interactive broadcasting systems and IP multimedia subsystem convergence and proposes a novel research rationale which could be adopted towards optimizing interactive marketing. The proposed approach may enable for a more efficient process of collecting and analyzing feedback data from users/viewers. This process is vital for optimum marketing and advertising purposes, since potential information data, collected by utilizing sophisticated technologies, may be used effectively to target customers in a more efficient way.

**Key words:** Interactive marketing, interactive broadcasting, marketing optimization, technology convergence

## INTRODUCTION

Interactive communication is vital in marketing, enabling the real needs of customers/users to be successfully met. Traditionally, enterprises try to maintain contact with customers/users via phone, e-mails and Internet based networks. Nowadays, sophisticated advances may be the mean, enabling for a vital interactive contact between the enterprise and its customers. In order to a more efficient cooperation and relationship to occur between these two parties, a first part of an IT strategy in an enterprise, is to integrate business systems using a common interface. In this way, customers can interact and report back directly their needs. The second component of this strategy is a database analysis. The results may define the basis for models aimed at understanding the real customers' needs. In this context, the convergence in interactive broadcasting systems (Crinon *et al*., 2006) and IP Multimedia Subsystem (IMS) (Camarillo *et al*., 2007) could contribute efficiently towards optimizing the process of collecting data from users/viewers.

Furthermore, Interactive marketing enables customers' collaboration utilizing a digital media and allows a company to use direct response communication in order to build a relationship with them. In a general context, long-term communication strategies should be planned carefully, otherwise the client can develop a negative view of the company (Barwise and Farley, 2005). For instance, if a company has come into contact very often with the clients with no real purpose, the customers will likely ignore the related notices in the future. In order to avoid this, potential customers are asked for feedback regularly. Despite the promotion of risks taken by companies, they wish to have great opportunities to promote their products to individual customers. Some companies'

websites utilize already call back images giving the opportunity for customers to contact them. Such information can be delivered directly to the company through fast and easy to complete research or through an independent third party.

Moreover, interactive broadcasting elaborates on the realization of novel television networks (Pallis *et al*., 2006; Mastorakis *et al*., 2006) able to provide multiple interactive multimedia and Internet services (Pallis *et al*., 2007), utilizing Digital Video Broadcasting (DVB) advances (Reimers, 2006). The first existing networking architectures based on interactive broadcasting enabled the provision of IP data casting offering offline interactivity (Linder *et al*., 2000; Kellerer *et al*., 2000). According to these infrastructures, a large volume of data is pushed with constant bit rate to the end user's terminals through DVB channels (Reimers, 2006) with a repeated process (data carousel). Data is then received offline by the end user via a graphic interface and there is no real interactivity in such systems, since the end user is not able to receive real time interactive services (e.g., Internet based services). The utilization of an interaction channel according to the generic interactivity model (ETSI ETS 300 802, 1997), was essential in order to transfer end user's requests to the service provider, enabling for the provision of real interactive services (Gardikis, 2004; Mastorakis *et al*., 2007).

Furthermore, the IP Multimedia Subsystem (IMS) (Poikselka and Mayer, 2009) is considered as a promising solution to fulfill a number of requirements in next generation networks and broadcasting systems. IMS refers to a functional architecture for providing multimedia services based on Internet Protocols (Bertrand, 2007). The goal is to merge Internet technologies and wireless networks, to enable rich multimedia communications as well as a number of other functionalities. The first version of IMS was focused on facilitating the development and deployment of new services in mobile networks. It was later extended by the European Telecommunications Standards Institute (ETSI) (Sultan, 2009), including utilization in Next Generation Networks (i.e., NGN). A standardization body of ETSI, namely the Telecommunications and Internet converged Services and Protocols for Advanced Networking (i.e., TISPAN) standardized a subsystem of IMS, regarding NGN.

In this context, this study investigated the convergence of interactive broadcasting systems with IMS and proposes a novel research approach which could be utilized in interactive marketing, towards a more efficient process of collecting and analyzing feedback results from potential users/viewers of an interactive television enterprise.

## INTERACTIVE MARKETING AND DIGITAL VIDEO BROADCASTING

Marketing is the process used to determine what products or services may be of interest to customers and the strategy to use in sales, communications and business development. Marketing generates the strategy that underlies sales techniques, business communication and business developments and it is an integrated process through which companies build strong customer relationships and create value for their customers and for themselves. Marketing is used to identify the customer, satisfy the customer and keep the customer. In this context, several approaches have been proposed (Hutter and Hoffmann, 2011; Alsamydai *et al*., 2010; Leung, 2009). With the customer as the focus of its activities, marketing management is one of the major components of business management. Marketing evolved to meet the stasis in developing new markets caused by mature markets and overcapacities in the last 2-3 centuries. The adoption of marketing strategies requires businesses to shift their focus from production to the perceived needs and wants of their customers as the means of staying profitable (Shiraishi and Razaq, 2005; Javadein *et al*., 2011; Jehangir *et al*., 2011).

The overall target of interactive marketing is to enable advertisers to target customers' needs more successfully. Towards this scope, a number of advances/developments have been achieved, that may change the role of advertising on television in the future. Currently, viewers are invited to move to a more interactive world of television or are invited to visit a Web address or call a phone number. This means that the signals from the enterprises may become more personalized and interactive with their customers. The most of the features of the media are not able to achieve this personalization. However, they encourage viewers to participate in more reactive, interactive or personalized channels. They are able to ensure, that such disclosures would be consumed by interested customers.

Other communications with customers are dynamic including, that digital or physical location of a person is enough to achieve communication. Digital communication can be identified when a person has visited a page and this information is able to be used in order to find out what viewers are now interested. In a general context, interactive marketing systems were developed to such an extent, that allow large companies to achieve the best possible relationship with their customers, offering numerous choices to meet their needs (Chaffey and Smith, 2008).

More familiar with the TV concept and without the need of being an IT expert, the audience has the ability to interact easily with the concept and content of iDTV (Lee and Lee, 1995). This interaction is mostly concerned with shopping, browsing through VOD and advertising concepts, banking, gambling, playing games sponsored by brands. In this way, there is a real participation to broadcasting programmes like voting or expressing their opinions as members of a community, completing questionnaire and chatting. Text information services, e-mail (with IPTV) and offline contact options are available to users/viewers to communicate with other viewers (i.e., dating) or companies. They also present a good way to advertisers to count the impact of their campaign as they get the permission "contact me" from the user.

It is very important to create an interactive community and target this niche market with new forms of advertisements like microsites, logos/banners or websites' illustration on screen or Dedicated Advertising Location (DAL, mini-DAL) formats. That will enable impulse response to direct marketing promotional material like coupons, samples or brochures. Furthermore, the old forms of advertising like product placements in programmes, sponsoring, virtual advertising, on-screen banner advertisement during programs and advertainment (a program totally made by an advertiser) are also essential to increase brand awareness of a product and improve costumers' experience with a brand (Boddy, 2004; Deighton and Barwise, 2001; Deighton and Blattberg, 1991; Smilansky, 2009; McDonald and Wilson, 2002).

People using the TV box-set as a mean to calm and relax which is usually arouse their emotions. For them its interaction aspect is not only a convenient and instant way of buying or responding to a promotional or informational content, it lets them to have the sense of control in marketers' beleaguerment which take place in traditional media (Stewart, 2004). On the other hand, the emerged data of personal and household interests gives to marketers a significant amount of advantages to turn in account such as direct response to mass market advertising. They also offer highly accuracy to targeted audiences according to the ad-hoc strategy of the company and access to those who adopt an impulse decision making process to complete instantly their buying. Furthermore, they increase the engagement of viewers, building positive brand image and enhance the brand's world of mouth impact in the formed community. They reformulate an ineffective advertising strategy by measuring the achieved goals, offer better promotional and customer service in a "walled-garden" platform (as TV is perceived) in contrast to websites. Finally,

they are allowing to manage the primary objective of better money allocation avoiding the waste of money on disinterest viewers or improper contents (Chaffey and Smith, 2008). Nevertheless, advertisers seem to be mistrustful against these opportunities mainly due to audience unfamiliarity with them, the luck of their technology experience and the high cost these new advertising forms are presented (Cauberge and De Pelsmacker, 2006).

Additionally, interactive DVB systems may enable end users to interact with service provider by utilizing interactivity channels established between customers' premises and the broadcasting system (Mastorakis *et al*., 2010). More specifically, interactive DVB-T (i.e., terrestrial systems) networking architectures (Xilouris *et al*., 2002) have been realized based on a generic interactivity model, enabling for the provision of asymmetric data transfer among the service provider and the end users. In such cases, DVB-T channel provides forward data traffic, while reverse data traffic is transferred through several interaction channels (e.g., PSTN, ISDN, DECT, GSM, GPRS, UMTS, xDSL, LMDS, MMDS) (Gardikis *et al*., 2002, 2003). According to these configurations, the service provider's side may incorporate both an interactive service provider and a broadcast one. The former may enable access to interactive multimedia services such as video and audio on demand or may provide Internet facilities such as WWW access, e-mail services etc. The latter is responsible for the distribution of broadcast services, such as TV programmes, that utilize digital transmission formats (i.e., MPEG-2). Both interactive and broadcast services are multiplexed into one transmission stream and distributed to the users via the broadcasting delivery media according to the DVB-T standard. Each user receives the multiplexed broadcasts via a broadcast interface module (e.g., antenna, front-end amplifier etc.) that passes the appropriate data to an end user module (TV receiver, PC screen, PC station etc.) via a Set Top Unit (de-multiplexer, decoder etc.). The user's requests for interactive services are forwarded by the Set Top Unit to an interactive interface module that may utilize wired or wireless access technology depending on the interaction media's specifications. The interaction media, in turn, passes the user's requests to the integrated service provider via the interactive network adapter that forwards them to the interactive service provider.

An interactive DVB-T system may be also utilized to provide interactive services to mobile users. UMTS Forum and DVB-UMTS Ad-Hoc Groups define proposals and reports studying interactivity among DVB-T and UMTS for the provision of broadband interactive multimedia and networking services (Cosmas *et al*., 2002). Alternative solutions for the return channel in an interactive DVB system may utilize LMDS or DVB-RCT (Faria and Scalise, 2001) in order to support interactivity to fixed users. Further GPRS has also been proposed to be utilized together with broadcasting networks (Rauch *et al*., 2001).

## IP MULTIMEDIA SUBSYSTEM (IMS)

While the first generation of the Internet was mainly devoted to the transfer of data to non-real time services, sophisticated systems and new services now require interactivity and strict Quality of Service (QoS). Moreover, the requirements for the provision of multimedia services are expected to increase in coming years (Labed and Boufaida, 2007; Sharma *et al*., 2006; Darvishan *et al*., 2008). The move towards an all IP architecture for services and applications appears to be a strong trend. In this context, customers seem to wish access to personalized interactive multimedia services on any device, anywhere. This trend introduces new requirements for a network infrastructure.

Towards fulfilling this requirement, the IP Multimedia Subsystem (IMS) was originally defined by the 3GPP and 3GPP2 wireless operators working bodies. The main focus was to provide a new

mobile network architecture that enables convergence of data, voice and technology in a mobile network over an IP-based network infrastructure (Kinder, 2005). The IMS was designed to bridge the gap between existing traditional telecommunications technologies and Internet technology and support operators to offer new and innovative services that will attract new subscribers and maintain its existing base.

IMS is a core network architecture that enables communication between servers and clients using open standards that support IP network interfaces and fixed-mobile convergence. IMS consists of a layered and integrated architecture that manages the media as it moves through the network and provides the systems integration required to provide any IP multimedia services for and between any combination of wired and wireless end users. The core network contains reusable functions that manage media services in application servers. Application servers host the services and IMS defines monitoring services, routing, protocols and the loading processes across the network. The development of the IMS framework defines how services connect and communicate with the underlying telecommunications network. IMS also defines how services are integrated with the provider of systems back-end (IP Unity, 2005).

One aim of IMS is to make the network management easier. Therefore, it separates control and bearer functions. This means that IMS features an overlay service delivery network on top of a packet switched infrastructure. Moreover, IMS should allow the migration of Circuit Switched services like voice telephony to the Packet Switched domain. As a result, IMS should lead to network administration savings, because an all-IP integrated network is easier to manage. IMS is an end-to-end architecture that must support several kinds of equipment. In addition, IMS is intended to be access agnostic which means that service delivery should be independent of the underlying access technology. Thus, the use of open Internet Protocols is specified in IMS for better interoperability. The level of QoS that can be provided in IMS networks determines the services that can be deployed in such networks. QoS delivery is therefore critical in IMS networks. As a result, QoS management functionalities are integrated in the IMS architecture (Bertrand, 2007).

Today's telecom users are increasingly demanding. They are more individualistic, independent, informed and involved than ever before and they welcome services that appeal to their emotions as well as their practical needs. New, exciting services and enhancements to existing services have a key role to play in making the communications experience much more like interacting face-to-face. New advanced terminals and communication mechanisms adapted for user needs will enable this and hide technical complexity (Ericsson, 2001). Users are now used to access information, entertainment and other content-rich services through a variety of channels. Telecom operators have a great opportunity to integrate and extend the multimedia experience through new highly personalized person-to-person, person-to-content and group services. The widespread adoption of mobile telephony, SMS and Instant Messaging shows how readily users adopt services that fulfill an emotional need to communicate in a variety of ways.

Commercially available IMS services are still in their infancy and providers are working on the implementation of IMS in both network's and user's side. As usually, implementations may face interoperability issues since the IMS specification is flexible to allow differentiation, as stated in. In particular, QoS solutions are not enforced by the specification, although QoS requirements are well defined. Other non-technical challenges include defining the business model. As IMS enables the provision of commercial services by the operator and third parties, another challenge is defining billing schemes for charging services, as the value chain and impact on final services' price have to be determined. Operators are likely to create an "IMS broker", interconnecting operators and

third-party service providers via SLAs (Service Level Agreements), so agreements would only take part between the IMS broker and each operator and service provider, simplifying the commercial scenario.

However, the success of IMS or any other convergence enabler technology depends on the provision of value-added services that take advantage of all the core services it provides (presence information, session transfer, QoS, etc.). Currently, all the IMS services planned are ports of existent services like the voice service, walkie-talkie (Push To Talk), presence and instant messaging, etc. thus not showing the advantages of the convergence yet. Maybe new highly interactive multiuser multimedia applications like online gaming and collaborative work will unleash the power of IMS.

## CONCLUSION

This study investigates novel interactive broadcasting systems, able to provide multiple interactive multimedia and Internet based services utilizing Digital Video Broadcasting advances. Additionally, it elaborates on the study of IP Multimedia Subsystem (IMS) as a promising solution, that may be adopted in next generation networks and broadcasting systems, providing advanced capabilities and added value data services. Taking into account the advances in both research fields, it proposes the convergence of interactive broadcasting systems with IMS which may result to a novel research paradigm, able to be adopted in interactive marketing field. The proposed concept may enable for a more efficient process of collecting and analyzing feedback data from users/viewers which is vital for optimum marketing purposes. This might be the answer to the one of the top priorities in the marketers' wishing list. That is to move forward to one to one marketing communication with the desired audience, gain their attention and interest, create their desire and end in the covetable impulse or well thought-out action of buying.

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