A Technology Convergence Model Adopted in Tourism Relationship Marketing

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Abstract: - This paper proposes a technology interactivity model that enables the convergence of digital television with network multimedia systems. The proposed research approach is exploited in tourism relationship marketing, providing an efficient mechanism that facilitates marketers to accomplish optimum analysis of marketing data. Results of this analysis may be vital for an effective marketing strategy, targeting customers under a personalized scheme, enhancing their experience with specific brands. For this purpose, data mining methods, such as predictive visual analytics are exploited, towards enabling for an efficient processing of data, collected using the envisaged interactive networking systems. Analyzed data, revealing customers’ preferences, is proposed to be optimally displayed to marketers, by utilizing cutting edge web technologies that provide an actual mean to automatically customize services for individual market segments.

Key-Words: - Tourism Relationship Marketing, Technology Convergence Model.

1 Introduction
As one of the most progressive industries in information and communication technologies (ICT) adoption, travel and tourism sector provides an ideal context, towards investigating the influence of sophisticated technologies in relationship marketing. According to Buhalis [1], such technologies provide new business opportunities in establishing, enhancing and commercializing customer relationships through a better understanding of customers’ requirements and their requests fulfillment.

Furthermore, advances in interactive digital television, ICT, Web based technologies and their convergence could contribute efficiently towards, optimizing the process of collecting and analyzing data, regarding customers’ personal preferences. More specifically, interactive digital television (iDTV) elaborates on the development of emerging communication networks, able to provide multiple multimedia and Internet based services. On the other hand, Internet Protocol Multimedia Subsystem (IMS) is a promising technology that may be adopted in future mobile and digital television systems to provide advanced capabilities and added value data services. In this context, this paper proposes a technology interactivity model, elaborating on the convergence of IMS with iDTV systems, in order to enable for efficient data processing and analysis in tourism relationship marketing. As interactive relationship marketing relies upon customers’ information, the proposed mechanism facilitates tourism enterprises and organisations to track customers’ preferences and subsequently provides them superior added value via customized services. As a result, marketers will be able to base much more cost effective marketing decisions on a detailed knowledge of the behaviour and preferences of their existing or potential customers. Towards enabling for an efficient information analysis and processing, data mining methods are proposed, such as predictive visual analytics in order to optimally predict future purchasing patterns.

2 Tourism Relationship Marketing
The dominant approach to marketing practice used for many years, is the focus on the acquisition of new customers. Relationship marketing (i.e. RM) represents a paradigm of changes which take place in this practice. Cosic and Djuric [2] suggest that changes are mainly related to the shift from the focus at transactions to the focus at relationships. The overall target of RM is to enable marketers to create a two way communication channel with the...
existing and potential customers, in order to learn their needs and meet them successfully; offering a perceived value to them [3].

RM in tourism is directed to build brand loyalty. While in other economic sectors often there is no direct contact with consumers, majority of activities in tourism assume direct contact with them [2]. Buhalis [1] noted that traditionally a small number of data is kept by tourism organisations and is rarely used for interacting with consumers. A small number of hotels also keep guest histories but they are not proactively used to make customers feel special. On the other hand, the growth of loyalty clubs has enabled more tourism organisations, airlines and hotel chains in particular to know more about the consumer patterns of their customers. The airline industry was the first to adopt relationship marketing plans that aimed to bond customers to brands, through specific loyalty programs [4]. From the other side, hotel industry relationship marketing strategies have focused on transactional tactics, such as gifts for repeat guests and familiarization tours for meeting planners [5]. Gilbert, Powell-Perry and Widijoso [6] pointed out the suitability of RM for the hotel industry which is based upon the characteristics of the hotel marketplace whereby there is weak brand loyalty and a high level of business travel bookings. As for travel intermediaries, Buhalis [1] suggests that they are increasingly starting to offer RM and proactive functions, based on consumer profiles.

According to Bowie and Buttle [7], sophisticated ICT is a prerequisite, in developing a relationship marketing strategy. A strong need for databases is required that record customers’ information, such as demographics, preferences, attitudes and beliefs about services they buy, purchase behavior, reactions to marketing messages and promotions, the frequency of purchase and use, etc. Hsu and Powers [8] mention that building a customer database is an expensive and time-consuming process, but it offers several advantages. It allows an operation to segment customers, enabling communication with them on a personal basis, and offering products and services tailored according to their preferences.

3 Emerging Information Communication Technologies

Interactive media in digital television systems moves the viewer from a passive to an active participant, providing control and in some cases the ability to purchase goods. For marketers, interactive media is argued to increase viewer involvement with the media and thus the content, and it allows information to be presented in more aesthetically pleasing and entertaining ways, as well as being easily updated [9]. In this light, technological achievements have changed already to some degree the most discussed and common in use mean of communication: advertising and its future role on television. One evolutionary technological development is interactive digital television (iDTV), where tele-viewers are invited to move to a more interactive television world, to visit Web addresses and other Internet based applications. More specifically, interactive DVB-T (i.e. Digital Terrestrial Television) networking architectures [10] have been realized based on a generic interactivity model, enabling for the provision of asymmetric data transfer among the service provider and tele- viewers. In such cases, DVB-T channel provides forward data traffic, while reverse data traffic is transferred through several interaction channels (e.g. mobile, wireless or fixed networks) [11][12]. According to such configurations, a service provider may incorporate both interactive and one way digital television services. Interactive multimedia services include video and audio on demand and other Internet based applications. More specifically, interactive DVB-T (i.e. Digital Terrestrial Television) networking architectures [10] have been realized based on a generic interactivity model, enabling for the provision of asymmetric data transfer among the service provider and tele-viewers.

On the other hand, while the first generation of 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. Moreover, the requirements for the provision of multimedia services are expected to increase in coming years. The move towards a common Internet architecture for services and applications appears to be a strong trend. In this context, customers seem to wish access to personalized interactive multimedia services ubiquitously on any device. This trend introduces new requirements for a future network infrastructure. Towards fulfilling this requirement, the IP Multimedia Subsystem (IMS) was originally defined to bridge the gap between existing traditional telecommunication and Internet technologies and support operators to offer innovative services that will attract new subscribers. IMS is a core network architecture that enables communication between servers and clients using open standards that support Internet-based 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 multimedia services for and between any combination of wired and wireless end users. The development of the IMS framework defines how services connect and communicate with the underlying telecommunications network.

IMS-enabled TV systems support combined services and interactivity by joining different communications paradigms into a complete multimedia user experience. In this context, IMS was designed to provide a personal communication infrastructure with group communication, thus transforming TV experience from a personal, private domain to a social interactive experience. In particular, presence and profile management will form the basis of new personalized TV experiences. Operators and their marketing departments can build the most accurate profile of their users - their habits and needs. Having a single, standardized database, which is based on the cellular world model with additions to meet iDTV special needs, can be of great value for marketing purposes.

4 Technology Convergence Model in Tourism Relationship Marketing
Interactive communication is vital in relationship marketing, enabling the real needs of customers/users to be successfully met. Nowadays, sophisticated advances may be the mean, enabling for a vital interactive contact between the enterprise and its customers. In order for 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, so that 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, advances in iDTV, ICT, web technologies and their convergence could contribute efficiently towards optimizing the process of collecting and analyzing data that is vital in tourism RM [13].

Adopting the proposed approach, RM enables customers’ collaboration, by utilizing digital media and allows a company to use direct response communication, in order to build a relationship with them. Utilization of an interaction channel, according to the generic interactivity model [14], is essential in order to transfer customers’ requests to the service provider, enabling for the provision of real interactive services [15] through iDTV systems.

Fig. 1. Technology convergence model

More specifically, Figure 1 depicts digital television interactivity model, enhanced with IMS functionalities. The proposed convergence model enables for the real time collection of data stemming from customers’ premises. This data is stored in the IMS Module/Database of Figure 1, facilitating marketing analysis phase, in order to establish targeted and efficient advertising strategies. Data analysis is performed by exploiting data mining methods, such as predictive visual analytics, facilitating marketers to predict future probabilities and trends based on observed events. The proposed
approach encompasses a multi-perspective method that includes integrated reasoning, pattern recognition and predictive modeling associated with domain knowledge.

Analysing collected data, according to the proposed approach the attempt to better understand customers’ behaviour and predict future purchasing patterns, will be enhanced. The proposed data mining techniques are used to identify sales performance by geographical area, product type and buying characteristics, as well as channel strategies. Then demographics, lifestyle variables and purchasing behaviour are used to define for example what new products/services should be introduced into the tourism market. Finally, behavioural metrics developed using predictive analytics models can graphically reflect selected sales information and create what-if scenarios to define and confirm the right combinations of new tourism product distribution. In a general context, the goal of predictive visual analytics research is to turn information overload into an opportunity. Decision-makers should be enabled to examine massive, multi-dimensional, multi-source, time-varying information stream to make effective decisions in time-critical situations. For informed decisions, it is indispensable to include humans into the data analysis process to combine flexibility, creativity, and background knowledge with the enormous storage capacity and the computational power of today’s computers. Specific advantage of visual analytics is that decision makers in the field of tourism sector, may focus their full cognitive and perceptual capabilities on the analytical process, while allowing them to apply advanced computational capabilities to augment the discovery process. In order to address all these issues, in our dynamic world, the center of research for cutting-edge technology and breakthrough has shifted from data warehousing and mining to predictive visual analytics.

5. Web Technologies Exploitation
There are many technologies on iDTV systems for displaying information and allowing interactivity with users. Many platforms, each one with a different development Application Programming Interface (API) can make it really hard for a widely compatible system to be produced. However, recently, there is a clear movement towards the adoption of the familiar standard web technologies of HyperText Markup Language (HTML), Cascading Style Sheets (CSS) and JavaScript (JS) for every Connected TV device, either through their web browsers or even in their application development core. The combination of the latest version of these technologies is often referred to as HTML5, a term strongly advertised by Steve Jobs, which is the latest HTML version but also includes the latest CSS version 3 and JavaScript.

There are two main demands for the display of information. The first one is associated with the presentation on the client-side (i.e. iDTV viewers) while the second one elaborates on the presentation of the gathered information to marketers. For both cases, Web Technologies (HTML5/CSS/JS) can be utilized for optimum results. On the client side, the new capabilities of HTML5 can produce impressive, TV quality, graphics, effects, text and of course video [16], that respond to the user commands using JS. Information can be gathered in real-time using Ajax technology to send and receive data to/from the server database. On the marketers’ side, HTML5 can be exploited to achieve real-time, easy-to-read visualization of the gathered data. One important advantage of real-time data visualization is that it is highly customizable and interactive, to allow the extraction of the most useful information. Also, since such web technologies are compatible with most devices, and are not based on a platform specific API, the analytics will easily be available on numerous devices, such as regular PCs, TVs and also tablets and mobile devices.

6. Conclusion
This paper elaborates on the study of IMS, as a promising solution, that may be adopted in next generation networks and iDTV systems, providing advanced capabilities and added value services. Taking into account advances in both research fields, this paper proposes a technology convergence model, which may result to a novel research paradigm, able to be adopted in tourism RM. In an unstable and unpredictable environment of doing business at the tourist sector, characterized by strong competition and sophisticated demand, implementation of RM concept with focus at development of high quality relationships with consumers and stakeholders is becoming imperative of gaining a competitive advantage. Ensuring tourists’ satisfaction is a sure way to make current customers loyal and attract potential ones. The overall target of RM is to enable marketers to track existing and potential customers’ preferences and subsequently give them superior value via customized service. The proposed concept may enable for a more efficient process of collecting and
analyzing feedback data from viewers, which is vital for optimum marketing purposes. It might be the answer to the one of the top priorities in the marketers’ wishing list; 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. Finally, the proposed data mining methods and web technologies enhance the proposed research approach, towards facilitating for an effective marketing data analysis and an efficient way to automatically customize services for individual customers or market segments, respectively.

References: