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EXPLORING FACTORS AFFECTING THE ADOPTION OF IPTV: A LITERATURE REVIEW

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Abstract: *The evolution of Internet Protocol Television (IPTV) is quickening worldwide and provides substantial revenue opportunities depending upon user acceptance. Therefore, user acceptance of IPTV becomes an area of interest for IPTV service providers. This study reviewed different prior studies to investigate the driving forces of users' adoption of IPTV. Analyzing IPTV as a hedonic IT system, this paper emphasizes the importance of users' perception of IPTV-specific factors through technology acceptance model (TAM).Technology Acceptance Model is widely used to access users' usage in various information system fields. Learning the vital role of TAM can guide research workers to design different users' interface for different online consumers and accordingly achieve high user use in various application areas. The application areas of TAM are elaborated including individual and organization adoption, electronic service, mobile data service, self-service technology, electronic learning, World Wide Web, intranet, electronic commerce, online shopping and so on, but limited number of research was done to explain the acceptance factors of IPTV through TAM. We discussed the related studies to understand important factors for using and accepting IPTV indifferent corner of world. Further this study will help to implement IPTV successfully in India.*

Keywords: *Internet Protocol Television (IPTV), Interactivity, Technology Acceptance Model, Addressable advertising, Interactivity.*

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INTRODUCTION:

IP (Internet Protocol) and TV (Television) both are the two elements of Internet Protocol Television (IPTV).IP allows transferring information (data) to a point which is addressed earlier. Except the addressed point, no one can get this information. On the other hand, TV is a system where images, videos and sounds are transmitted via terrestrial, cable or satellite. IPTV is the addition of these two elements and the system is able to deliver video and sounds together through Internet. So, IPTV system having features of both, Internet and TV. IPTV is a real time distribution service for multimedia contents (either broadcast or on-demand) over an IP network. IP infrastructure is based on personal choices, depending on people's needs and interests (Jain, 2005). Therefore, IPTV has two-way interactive communications between operators and users, for example, streaming control functions such as pause, forward, rewind, and so on, which traditional cable television services lack. Triple play is a service operator's package including voice, video, and data.

As Technology Acceptance Model (TAM) has introduced for Information system, we can apply TAM (Davis, 1989) theory for IPTV also. TAM is a leading theory of technology acceptance in IS research. Lots of empirical study has indicated that TAM is a parsimonious and highly fitted model of technology acceptance behaviors in a large variety of IS(Information System).The original TAM model proposed by (Davis, 1989) don't adapt fully to the area of IPTV, because TV broadcast provide fun and usefulness at the same time. Subscribers of IPTV will expect to get information, amusement, and enjoyment at anywhere, anytime and in any devices. These intentions are different from Information system ones that is increasing performance (Shin, 2008).

RESEARCH METHODOLOGY:

For this research, academic and professional literature of leading telecom publications and organizations were studies to identify issues of importance relating to the subject. The research media will mainly come through Internet-based resources and IT Trade periodicals. As IPTV is relatively new concept, there is limited availability of IPTV literature in libraries outside of periodicals. Systemic and relative analysis and generalization of scientific literature were applied while theoretical studies of IPTV, TAM and interactive marketing were carried out.

IPTV:

Now a day's two main models of deployment of television are available: 1) The traditional broadcast model like cable TV and satellite TV, and 2) A new model, where the TV program distribution developed to a mixture of "linear" and "nonlinear" / "on demand" system in the IP networks with crucial element of interactivity and with new business models, where the television service provider have direct access to the end users (Tadayoni, 2006).

There are several IPTV service definitions exists. Some of these are given below.

1. "IPTV can be tentatively defined as a service that delivers media such as video via a network in real-time, or is used to retransmit stored media."(Lee, 2009).
2. "Digital video content, including television, which is delivered via the Internet Protocol (IP)." (Held, 2007).
3. "Delivery of digital television and other audio and video service over broadband data networks using the same basic protocols that support the internet." (Cooper et al. ,2006)

IPTV HISTORY:

Video distribution for PCs using the internet, started approximately in 1998. The name of this service was internet streaming. Internet streaming was an advanced service as it allowed for real-time video frames (Yamamoto, 2009).

The IPTV concept came-out in 1995 for the first time. In 1998, the AudioNet company initiated the first live webcasts with TV programs. In 2001, Kingston Communications was one of the first companies to introduce IPTV over ADSL and in 2003 Total Access Networks Inc. releases its IPTV service consisting 100 free access channels. In 2006, AT&T launched in US an IPTV service, named U-Verse, with more than 300 channels in 11 different cities. In 2009, AT&T announced the introduction of more than 100 HD TV channels(Rodrigues, 2010). Later it was introduced in Japan, Korea, China, India and in many more countries.

A recent study (Whitney, 2006) shows that there is a relationship between Television programming with a large number of household product positioning and the desire to remodel one's house. Mobile TV has the potential to modify the recent market for cellular services. Two future paths and scenarios are suggested; one where mobile TV is transmitted primarily over a dedicated broadcast network similar to conventional TV today. The other is a solution that uses the existing cellular networks that with some upgrades could support a

"broadcast-like" service where broadcasters and carriers can collaborate on technical hybrid solutions with broadcast streams being synchronized with mobile Internet usage (Bria, 2007).

Moote(2006) addressed that, basic difference between Internet TV and IPTV is that Internet TV allows access to content everywhere. Whereas IPTV is distributed within a closed environment, such as a city or regional area like a sub-division, basically a private network, which allow for restricted access of content in a close network. IPTV systems are changing the style television is broadcasted and used, offering large advantages to TV broadcasters and users. It is not only the little distribution and transportation costs, but also the possibility to offer distinguished interactive services (Rodrigues, 2010). Karantanis (2009) considered six domains for IPTV value chain, namely, Consumer Domain, Network Provider Domain, Platform Provider Domain, IPTV service Provider Domain, Content Provider Domain. Four different business models also proposed, namely, Triple play offerings (Traditional Triple Play, Hybrid Triple Play); IPTV bundled with VOD, VOD-only business model, Combination of IPTV-Internet TV business model.

Bouwman (2008) described two types of drivers, Technological drivers (an increase in effective distribution capacity, an increase in the ability to process user feedback, an increase in the storage and processing power controlled by viewers, and the separation of applications from transport) and Market drivers / Commercial drivers. Market drivers may be type of market demand, Convergence of Information and Telecommunication and TV industries, and competition. Different types of domain are incorporated within the IPTV business model such as service Domain, technical domain, organizational domain and financial domain etc.

Future effect of IPTV on the industry can be categorized into three areas:

Content - Availability of more content with easier access will be the main objective, Convergence - IP network will permit one application programs to be run over multiple end-user devices, in a single service network. Interactivity– The both-way type of the IP network will enable interaction among users, content providers, broadcasters and advertisers (BSF Broadband, 2006).

IPTV service providers need to have access to pleasing content to compete with cable and satellite pay TV providers (Thomson, 2006). By the advent of IPTV, users who used to be

'passive viewer' of the program of traditional television now became 'active selectors and users' of varied contents of IPTV (Kim and Kim, 2009).

IPTV ADVERTISING RELATED RESEARCH:

IPTV advertising has some inherent features like addressability, interactivity and measurability. TV advertising can be energized by IPTV, by using those features.

Addressability: Every internet subscriber has unique IP address. Using this notable attributes targetable advertisement is possible. Set-top-box is that equipment which allows reaching of specific content TV. A TV (generally known as smart TV) itself also can be an IP end-point. Due to its inbuilt addressability feature many hundreds or even thousands of IPTV advertisements can be broadcasted simultaneously during a single timeslot and can be targeted to large peoples, small groups or even individuals, and for viewers' responses to be collated (Hart, 2008). Advertiser need to decide whether the advertising content is appropriate for the recipient or not. It allows telecom operators to control where the ads go to, aim the major or minor groups, or even sets within a family. The ads can be calibrated to the people within a family who are most likely to be viewing at a certain time (Sur and Pandey, 2011).

Interactivity: One of the distinguished features of IPTV is its interactivity. Interactive TV will add services not yet delivered such as time shifting , Video-on-demand, network-based Digital Video Recorder (DVRs) , where the content is potentially stocked on the network and streamed to the device wherever it might be (Akerkar, 2010). Recently, a series of studies into interactivity were conducted (Rafaeli, 1988; Steuer, 1992; Zack, 1993; Ha and James, 1998; Liu and Shrum, 2002; Stromer-Galley, 2004; Johnson, 2006). Previous research into interactivity has focused only on cognitive area, and individual features such as trust and emotion were not studied prominently (Shin, 2011), and the reason was predominant TAM approach (Davis *et al*. 1989).

Measurability: Since IPTV technology permit feedback data to be received from a television household, real-time viewer measurement is possible. The study on return response can prove return on investment (ROI). IPTV advertising provides a new channel for user knowledge opportunities.

TECHNOLOGY ACCEPTANCE MODEL (TAM):

IPTV has characteristics of both information and media technology, for this reason we can say it's a convergent of those two technologies. It broadcasts different contents to subscribers via IP network. Moreover, users can use telecom services with same terminal. As such, IPTV using intent should be described in part by the technology acceptance model, TAM(Davis, 1989). TAM is a leading theory of technology acceptance in IS study. Large numbers of empirical research have established that TAM is a robust model of technology acceptance behaviors in a broad variety of IT. TAM hypothesizes the effects of external factors on intention to use by perceived usefulness (Gefen, 2003; Talyor and Todd, 1995b; Shin, 2008) and perceived ease of use (Venkatesh and Davis, 2000). TAM has been demonstrated its robustness through a range of empirical research in IS study (Davis et al. 1989; Legris, 2003) and applied across a variety of IT areas.

Original TAM model proposed by Davis (Davis, 1989) don't adapt the field of IPTV in full, reason is that TV broadcasts provide playfulness and usefulness at the same time. That means, subscribers of IPTV will expect to get entertainment information at anywhere, anytime, and any devices. These purposes are dissimilar from increasing performance. To suggest extended TAM model for Mobile IPTV, Shin (2008) added extra factors as flow experience, perceived enjoyment, perceived loss, and social norm.

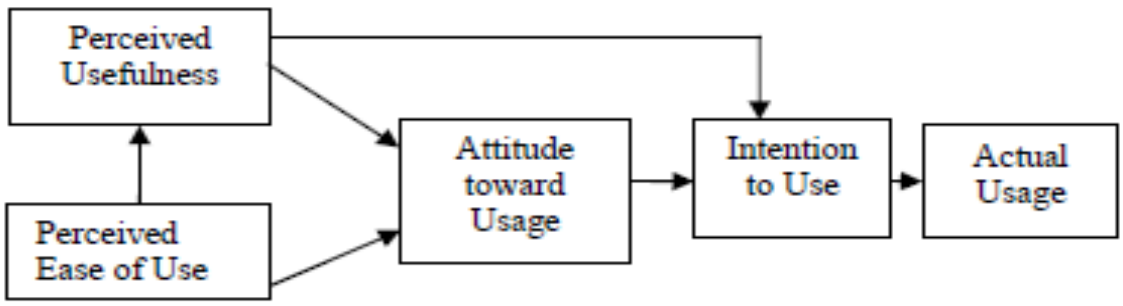

Figure 1. The Technology Acceptance Model (TAM) (Davis, 1989)

The original factor Perceived ease of use (PEU) was defined as "the degree to which a person believes that using a particular system would be free of effort". Perceived usefulness (PU) was defined as "the degree to which a person believes that using a particular technology would enhance his or her performance" based on the definition of TAM study (Davis, 1989). As per previous studies, PEU and PU were directly or indirectly associated to Behavioral Intention (BI)

(Davis, 1989; Karahanna, 1999; Venkatesh and Morris, 2000; Moon and Kim, 2001). In the case of mobile IPTV, efforts saved because of improved ease of use will enable an individual to use a newly service conveniently and frequently and user's sense of efficacy and personal control is proportional to use of easier technology (Shin,2008).

Perceived enjoyment can be defined as the degree to which a user perceives a system to be enjoyable in its own right after using it (Davis, 1989; Karahanna, 1999; Morris& Dillon, 1997; Segars& Grover, 1993; Yi & Hwang, 2003). Previous TAM research exposed that enjoyment is one of the most important factor of intention (Sun & Zhang, 2006a, 2006b; Yi & Hwang, 2003). Moreover, key purpose of TV is pleasure and enjoyment. Many research demonstrated that perceived enjoyment positively affected a user's attitude (Shin, 2008).Particularly, in case of interactive TV, TV features are enjoyment of using and ease of inducing interest (Kim& Moon 2001).They also proposed the `playfulness' concept as a person's intrinsic salient belief to describe the individual's intrinsically motivated behaviors. Perceived enjoyment is one of the salient factors of an IP TV service (Choi, 2010).

Some researchers have shown a negative relationship between price and perceived quality (Dodds, 1991).Online customers were price sensitive. Generally, customers measure the quality of aproduct or its value by monetary and nonmonetary paid. In the study Theory of Reasoned Action (Fishbein and Ajzen,1975) introduced an important factor subjective norm, which was defined as "person's perception that most people who are important to him think he should or should not perform the behavior in question". Many studies after the TRA (Fishbein and Ajzen, 1975) have demonstrated that subjective norm had a straight relation with Behavioral Intention. Since consumers have never experienced IPTV, this social influence also will affect behavioral intention (Karahanna, 1999).Another study (Shin,2008)showed that prior experiences of service, affect on service adoption procedure and prior services' similarity of new service also affect on service adoption.

TAM II was introduced in 2000 (Venkatesh and Davis, 2000; and Venkatesh, 2000), a new edition of original TAM. Social influence (subjective norms) and Cognitive Instruments (job relevance, image, quality, and result demonstrability)was introduced (Venkatesh and Davis,2000) as external variables of PU, whereas anchor (computer self-efficacy, perceptions of external control, computer anxiety, and computer playfulness) and

adjustments (perceived enjoyment and objective usability) was introduced as external variables of Perceived ease of use(PEOU)(Venkatesh ,2000).

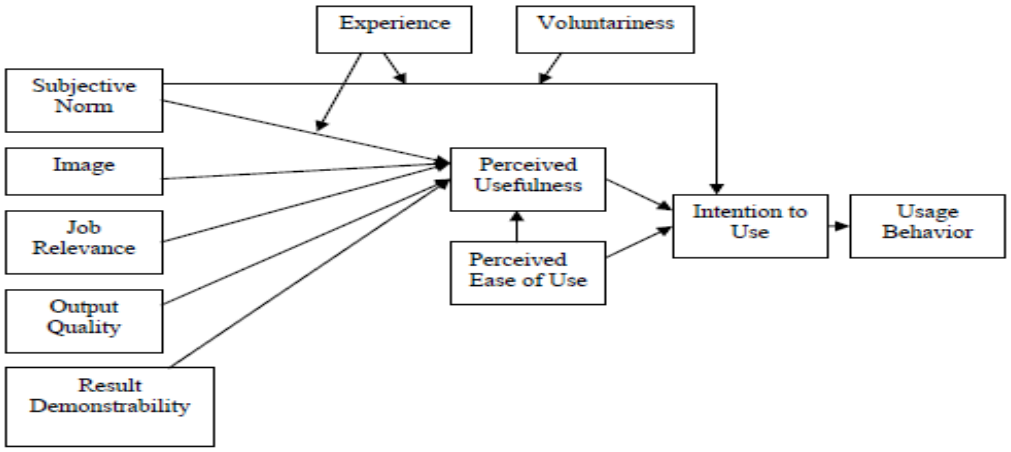

Figure 2. The Extended Technology Acceptance Model (TAM2) (Venkatesh and Davis, 2000)

Playfulness and personal innovativeness have important effects on cognitive absorption (Agarwal and Karahanna ,2000). Study of Gardner (2004) analyses the individual acceptance and usage of a website through extension of the TAM and they added two new constructs: perceived entertainment value and perceived presentation attractiveness. Where perceived usefulness, perceived entertainment value and website revisit has significant relation. This study showed that in case of website usage perceived usefulness and perceived entertainment value both are important factors.

Men's decisions were strongly determined by their perceptions of usefulness; whereas, ease of use and subjective norm were more important for women (Venkatesh and Morris, 2000). Usage of certain technology is mandatory for their employees in certain companies. However, some individuals will not agree to adopt such rules. Venkatesh & Davis, (2000) observed that voluntariness has an effect on the subjective norm on intention to use. Hence, behavioral intentions vary within mandatory and voluntary usage(Gardner, 2004).

TAM RESEARCH ON IPTV ADOPTION:

Ha (2009) pointed out that attitude, subjective norm and perceived behavior control that three factors influencing behavior intention. They also elaborated the TAM to the interactive TV based shopping, T-commerce. The results demonstrated that perceived enjoyment is the most influencing factor affecting attitude and behavioral intention towards T-commerce. Hence, the TAM is suitable for examining acceptance of IPTV. It is assumed

that Perceived price level and perceived enjoyment is will to play the most significant role in TAM acceptance (Weniger, 2010).

Davis (1989) defined Perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort" and Perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance" in original TAM study. Whereas Ha (2009) defined, PU is as “the degree to which a person believes that using IPTV would enhance a person’s performance without regard to time and space”, and PEU as “degree to which a person believes that using IPTV would be free of effort”. Similar to the original TAM, they also demonstrate a positive relationship from PEOU and PU to attitude toward IPTV.

Another study (Shin, 2009) incorporates perceived enjoyment to the TAM model. In addition to perceived usefulness and ease of use, perceived playfulness, content quality, system quality, internet experience and perceived price level are also employed (Cheong and Park, 2005).

‘TV viewing habit’ factors and 'Internet use habit' factors has been generally used to describe current media usage instead of new media adoption (HA, 2009). He also added since IPTV is convergence of TV and the Internet, they assumed that IPTV acceptance intentions would be also associated to habitual uses of TV and/or Internet. Thus, both ‘TV viewing habit’ factors and ‘Internet use habit’ factors, considered as critical aspects as to viewing IPTV or not. Their result showed that entertainment is stronger indicator than information motivation is in perceived usefulness of IPTV. The results of another study (Shin, 2011) evidently demonstrate that the trust and emotion of consumers should be considered from the MIS perspective in order to build user intentions to use the product. Similarly, other research (Fogelgren-Pedersen, 2005) has shown that stability of connection and geographical coverage are important factors of perceived relative advantage in wireless broadband. The perceived enhanced utility of mobile services is a powerful variable motivating use of t-commerce. Though these researches demonstrated important perceived variables, they still did not find factors particular to convergence technologies (Shin, 2009).He also added IPTV is a simpler system to use, and it is guessed that IPTV, as a variation of the Internet, presents little difficulty to consumers. In addition, because IPTV is a variety of television that provides enjoyment, interest, and pleasure.

Perceived usefulness is defined as a type of extrinsic motivation and enjoyment asa type of intrinsic motivation (Davis, 1992). Recently Heijden (2003) found that perceived enjoyment as a hedonic purpose powerfully influenced Web usage for entertainment purposes.

Extrinsic motivational factors on the behavioral intention have more influence for the experienced people than the inexperienced people and the influence of intrinsic motivational factors on the behavioral intention are more powerful for the inexperienced people than the experienced people (Choi, 2010). This study also identified four significant intrinsic motivational factors – ease of use, enjoyment, usefulness, and trialability – in the IP TV adoption behavior.

Some researchers advocated on Perceived content quality also (DeLone and McLean ,1992).The information quality is an important factor for building successful IS.

Perceived content quality along with other constructs was examined in evaluating Web-based reference systems (Shin, 2009).They found perceived content quality to be one of the important factors in the use of the reference systems. Recently, another study (Cheong and Park, 2005) employed perceived content quality to the acceptance model of mobile Internet. They showed content quality is a significant factor in the adoption of that technology.

Again some researchers said on Perceived system quality. Many individuals become reluctant to use IS when they experience delays in reply, frequent disconnection, limited access, and poor security and this is why it is an important construct. Also information quality, response time, and system accessibility as IS qualities and they said that these variables are useful predictors of perceived ease of use and perceived usefulness (Aladwani and Palvia,2002). Perceived system quality has positive causal relationships perceived usefulness (Cheong and Park, 2005).

Normative pressure is another important predictor which was revealed in studies based on the IS perspective (Hung, 2003). People often use technology in a social context in which they notice others' interaction and in which they must adapt to others' activities (Shin, 2009). Farther headed perceived cost variable as a significant predictor in developing the intention to use IPTV. In the construction of behavioral intention, subscribers compare the benefit from the service to the cost of utilizing the service. If the price exceeds the gain, they do not use the service. Though IP TV service has potential to become a crucial IT in the

future, only a few studies have been conducted related to adoption behavior for an IP TV service. IP TV services can easily go wrong if its service providers do not realize what users want from it (Choi, 2010). IP TV service has unique features of public utility and interactivity. Unlike conventional information systems (IS) used in organizational environments, television media do not target a particular group but tend to be shared by users in family environments. Because of this feature, IP TV service is dissimilar from conventional IT, in that its intention is not productivity.

MAJOR LIMITATIONS OF TAM STUDIES:

Self-reported usage is the most commonly reported limitation, most analysis trusted mainly on self-reported use accepting that self-reported usage successfully reflects real usage (Lee, 2003). Though, self-reported usage is known to be subject to the usual method bias (Agarwal and Karahanna, 2000), which distorts and magnify the causal relationship among independent and dependent variables (Podsakoff and Organ, 1986). The use of student subjects is another limitation and can affect on generalizability of the findings. The major problems of TAM studies are low explanations of variance (Lee, 2003).

IPTV service using a traditional TAM has some limitations in explaining IPTV subscribers' behavior, because an IP TV service is used in a different context and for a different intention than new technologies in a work environment (Choi,2010). Though there are various moderating factors, users' prior experience has been detected as an important factor in their behavior (Gefen, karahanna & Straub, 2003a; Taylor & Todd, 1995; Thompson, Higgins & Howell, 1994),the reason is experience has a strong consequence on determining attitude (Venkatesh, 2000).When experience increased, users have more familiarity with and knowledge about technology(Fishbein & Ajzen, 1975; Sun &Zhang, 2006b) and which can be change to different adoption behaviors.

LIMITATIONS:

As IPTV is still in nascent stage, various region has different infrastructure so getting the generalize behavior may not be possible. For this study, IPTV related data were gathered from different websites. As this study constructed on secondary data so there is the obvious chance that industry has undergone certain changes in the form of up gradation new research. Certain features of IPTV related data might not have been included in this study because all research data might not be available in web.

CONCLUSIONS:

Generally, IS system use in the work may become more routinized as experience grows, in the event of an IP TV service, growing experience increases the function of perceived enjoyment, because the service is primarily used to enjoy time instead of perform tasks (Choi, 2010). Enjoyment creates a less cognitive load because the users are feeling pleasure from the action and is willing to spend more effort on it(Sun & Zhang, 2006a, 2006b). TAM has tested to be an important theoretical model in helping to interpret and explain usage behavior in the IS implementation. In this article, we discussed the related research with Technology Acceptance Model and IPTV. Learning the vital use of Technology Acceptance Model can lead to research design on various users' interface for different online consumers and in different application areas. This study reviewed a number of studies (from 1975 to 2011) to understand the relation between IPTV adoption behavior and Technology Acceptance Model. We discussed the related research to clarify the extension of Technology Acceptance Model.

The future research may be extended using technology acceptance model to assess the IPTV technology contexts including 4G mobile data service, e-learning applications and hotel and hospital applications and so on.

IMPLICATIONS FOR BUSINESS MARKETING PRACTICE:

As IPTV is still in nascent stage, various region has different infrastructure so getting the generalize behavior may not be possible. The future research may be extended using technology acceptance model to assess the IPTV technology contexts including 4G mobile data service, e-learning applications, hotel and hospital applications and so on. Depending on targeted advertising, further the concept of behavioral targeting can be constructed, based on customers' behavioral attributes like interests, customers' preferences, lifestyle, etc.

Managerial implications on the topic can include the matching criteria of demographics' choice and advertisement's content. If the system can provide individualized ads to each participant, the ad-consuming rate may increase. Therefore, an interactive advertising platform that comprises this function can be counted a future work. Additionally when too many players will present in the market what will be the sustainable growth factor or what will be important customer retention factors.

The managerial implications of this research to the developing IPTV industry are several, as follows:

1. Identification of advantageous combinations of services, pricing options which improve the customer experience, and promote the customer's tendency to buy additive services and stay with the provider longer.
2. Assistance in developing effective marketing strategies which are more consumer-centric and therefore increase consumer satisfaction.
3. Assisting providers in developing innovative, value-laden, consumer-centric business models which maximize consumer satisfaction and ultimately, company financial performance.
4. It will provide a brief idea to Indian IPTV service providers, about recent IPTV market status and challenges of it.

REFERENCES:

1. Yamamoto, H (2009), "Standardization Trends of Internet Protocol Television (IPTV) and Activities Undertaken by OKI", *Oki Technical Review,*Vol.76,No.2, pp.86-89.
2. Jain, R (2005) ,"I Want My IPTV", *IEEE Multimedia*, vol.12, no.3, pp. 95–96.
3. Shin, D. H (2009), "An empirical investigation of a modified technology acceptance model of IPTV", *Behavior& Information Technology,* Vol. 28, No. 4, pp.361–372.
4. Davis, F (1989), "Perceived usefulness, perceived ease-of-use, and user acceptance of information technology", *MIS Quarterly*, September, pp. 319-340.
5. Shin, Y.; Jeon, H. and Choi, M (2008), "Analysis on the Mobil IPTV Adoption and Moderator Effect Using Extended TAM Model", *Networked Computing and Advanced Information Management,* September, pp.220-225.
6. Noam, E.M (2008), "TV or Not TV: Three Screens, One Regulation?", accessed 'http://www.crtc.gc.ca/eng/media/noam2008.htm' on 14.01.2011.
7. Singhal, A.; Doshi, J. K.; Rogers, E.M. and Rahman, S.A(1988). "The Diffusion of Television in India", *Media Asia*, Vol.15, No.4, pp. 222-229.
8. Melissa L. and Whitney, B.A (2006). "FROM TV TO THE MALL: A CROSS-GENDER ANALYSIS OF THE CORRELATION BETWEEN TELEVISION AND PRODUCT CONSUMPTION", accessed 'http://aladinrc.wrlc.org/dspace/bitstream/1961/3622/1/etd_MLW36.pdf' on 12.01.2011.

9. Bria , A.; Kärrberg, P. and Andersson,P (2007), "TV IN THE MOBILE OR TV FOR THE MOBILE: CHALLENGES AND CHANGING VALUE CHAINS", in '*The 18th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'07),* accessed 'http://stuff.carstensorensen.com/mobility/PIMRC07-IEEE-MobileTV.pdf' on 20.07.2011.
10. Rodrigues, J. ; Salvador, P. ; Nogueiray, A. and Rodrigues, J.J.P.C (2010), "IPTV Service with Automatic Channels Personalization" in*2010 IEEE 24th International Conference on Advanced Information Networking and Applications Workshops,* pp.1065-1070.
11. Moote,S(2006). "IPTV: the business opportunity for telcos", *IBE: International Broadcast Engineer*, June, pp.28-29.
12. Thomson, J (2006) , "Driving the Future of IPTV", accessed http://www.itu.int/osg/spu/stn/digitalcontent/4.9.pdfon 09/08/2011.
13. Lee ,J. H (2009), "A Review of IPTV Threats Based on the Value Chain", *KSII TRANSACTIONS ON INTERNET AND INFORMATION SYSTEMS* ,April, Vol. 3, No. 2, Pp.163-177.
14. Iyer, D. and Scherf, K (2006), "Making TV Meaningful: Consumers and IPTV applications" accessed 'http://www.parksassociates.com/free_data/downloads/parks_Making-TV-Meaningful.pdf' on 07.02.2011
15. Karantanis, S (2009), "IPTV evolution - Strategic issues for an IPTV provider in Greece" accessed 'http://www.aitdspace.gr/xmlui/bitstream/handle/123456789/231/Karantanis_Thesis.pdf?sequence=1' on 10.05.2011
16. BSF Broadband, (2006), "IPTV Explained" accessed 'http://www.broadbandservicesforum.org/images/Pages/IPTV%20Explained.pdf' on 10/01/2011
17. Bouwman, H.;Zhengjia, M,;Duin, P.V.D. and Limonard, S (2008), "A business model for IPTV service: a dynamic framework" accessed "http://www-users.cselabs.umn.edu/classes/Spring-2010/csci8211/Readings/IPTV-A%20business%20model%20for%20IPTV%20service%20--%20a%20dynamic%20framework.PDF" on 16/05/2011.
18. Kim,I. and Kim,J(2009), "A Study on factors providing strangeness in IPTV" accessed http://www.iasdr2009.org/ap/Papers/Orally%20Presented%20Papers/Interaction/A

%20Study%20on%20factors%20providing%20unfamiliar%20in%20IPTV.pdf14/07/2012.

19. Tadayoni , R. and Sigurdsson, H(2006), "IPTV market development and regulatory aspects" accessed 'http://orbit.dtu.dk/app?cdis=attachment%3B+filename%3D%22ITS2006_conference_version%5B1%5D.pdf%22&ctyp=application%2Fpdf&downloadOptionName=URL&service=download_records&url=http%3A%2F%2Furbit.cvt.dk%2Fcgi-bin%2Furbit_fulltext%2F192961%2F1%2F1%2Fd6f138fa9a4dd4878d5c577f91dfbd62' on 09/08/2011.
20. Newberry, T., and Joseph, W (2007), "IPTV: Revolutionizing the TV industry", *Broadcastengineering.com*, pp. 111-117.
21. Christian, P (2006), "Let a Thousand TV Channels Bloom", *Engineering &Technology* , Vol. 1 Issue 7, pp.28-31.
22. Hart, T (2008). "The Benefits of Addressable Advertising in Broadcast (Linear) TV over Telco Networks", accessed 'http://www.packetvision.com/dmdocuments/Packet%20Vision_Business%20Case%20-%20Addressable%20Advertising%20for%20IPTV_Tony%20Hart.pdf', on 22.09.2010.
23. Harte ,L (2009). **"**Addressable TV Advertising", accessed"http://www.iptvmagazine.com/IPTV_Magazine_Featured_Article.html", on 05.08.2010.
24. Akerkar, R (2010). "Interactive Digital TV Services in India", accessed 'http://www.ufam-automation.net/idtvec/acceptedpapers/W1_3_akerkar.pdf', on 19.08.2010.
25. Shin, G.; Ahn,J. and Kim,T(2011), "IPTV in Korea: The effect of perceived interactivity on trust, emotion, and continuous use intention" accessed http://www.globdev.org/files/AMCIS%20Proceedings%202011/Paper%206.pdf on 24/10/2011.
26. Rafaeli, S(1988), "Interactivity: From New Media to Communication", accessed 'http://gsb.haifa.ac.il/~sheizaf/interactivity/Rafaeli_interactivity.pdf' on 24/08/2012.
27. Steuer, J(1992), "Defining Virtual Reality: Dimensions Determining Telepresence ", *Journal of Communication,*Volume.42,No.4, pp.79-90.

28.Zack, M. H(1993) "Interactivity and Communication Mode Choice in Ongoing Management Groups", *Information Systems Research,Vol.*4,No.3, pp.207-239.

29.Liu, Y. and Shrum, L. J (2002), "What Is Interactivity and Is It Always Such a Good Thing? Implications of Definition,Person, and Situation for the Influence of Interactivity on Advertising Effectiveness", *Journal of Advertising, Vol.*31, No.4, pp.53–64.

30. Stromer-Galley. J(2004) "Interactivity as Process and Interactivity as Product", *The Information Society,*Vol.20, No.5,pp. 391-394.

31. Johnson, G,J. ; Bruner II,G.C. and Kumar,A (2006) "Interactivity and its Facets Revised", *Journal of Advertising,*Vol.35,No.4, pp.35-52.

32. Fishbein, M., &Ajzen, I (1975). "Belief, attitude, intention, and behavior: An introduction to theory and research", Accessedhttp://www.people.umass.edu/aizen/f&a1975.html on 09/02/2012.

33. Peattie, K. and Peters,L (1997), "The marketing mix in the third age of computing", *Marketing Intelligence & Planning*, Vol. 15, No 3, pp. 142-150.

34. Danaher, P.J. and Rossiter, J.R (2006), "A Comparison of the Effectiveness of Marketing Communication Channels: Perspectives from Both Receivers and Senders," accessed http://www.mailmarketing.com.au/files/AuspostDanahersFullReport_1_.pdf On 22/05/2012.

35. PQ-Media (2006), "Alternative Media Research Series II: Alternative Advertising & Marketing Outlook 2006" accessed http://www.pqmedia.com/execsummary/AlternativeAdvertisingMarketingOutlook2006-ExecutiveSummary.pdf on 18/07/2012.

36. Christian, P (2005), "Addressable IPTV Advertising: Dramatically Increasing Revenue per Viewer," *IPTV Magazine*, October, pp. 68-75. Accessed 'http://www.iptvarticles.com/iptvmagzine_2005_10_addressable_iptv_advertising.htm' on 21/01/2011.

37. Karahanna, E., Straub, D.W., &Chervany, N.L (1999). "Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs". *MIS Quarterly*,Vol.23, No.2, pp.183–213.

38. Morris, M.G. & Dillon, A (1997), "How user perceptions influence software use", *IEEE Software*, Vol.14, No.4, pp.58–65.

39. Segars, A.H. & Grover, V (1993), "Re-examining perceived ease of use and usefulness: A confirmatory factor analysis", *MIS Quarterly*,Vol.17, No.4,pp.517–525.
40. Yi, M.Y. & Hwang, Y (2003), "Predicting the use of web-based information systems: Self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model", *International Journal of Human-Computer Studies*,Vol.59, No.4, pp. 431–449.
41. Sun, H. & Zhang, P (2006a), "Causal relationships between perceived enjoyment and perceived ease of use: An alternative approach", *Journal of Association for Information Systems,* Vol.7, No.9, pp. 618–645.
42. Sun, H. & Zhang, P (2006b), "The role of moderating factors in user technology acceptance", *International Journal of Human-Computer Studies*, vol. 64,No.2,pp.53–78.
43. Dodds, W. B.; Monroe, K. B. &Grewal, D (1991), "Effect of price, brand and store information on buyers' product evaluations", *Journal of Marketing Research,* Vol.28,No.3, pp. 307-319.
44.Agarwal, R., and Karahanna, E (2000) "Time Flies When you're Having Fun Cognitive Absorption and Beliefs about Information Technology Usage", *MIS Quarterly,* Vol.24,no.4,pp.665-694.
45. Podsakoff, P.M. and Organ, D. W (1986) "Self-reports in Organizational Research Problems and Prospects", *Journal of Management Information Systems,* Vol.12, no.4, pp.531-544.
46. Venkatesh, V. & Morris, M.G (2000), "Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior", *MIS Quarterly*, Vol. 24, No.1, pp.115-139.
47. Venkatesh,V. & Davis, F.D(2000), "A theoretical extension of the technology acceptance model: four longitudinal field studies", *Management Science*, Vol.46,No.2,pp.186-204.
48. Cheong, J.H. and Park, M.C (2005), "Mobile internet acceptance in Korea", *Internet Research*, Vol.15, Issue.2, pp.125–140.
49. Fogelgren-Pedersen, A (2005), "The mobile internet: the pioneering users' adoption decisions", In: Proceedings of the 38th Annual Hawaii International Conference on System Sciences, Big Island, HI, 3, p. 84b. Accessed http://www.computer.org/comp/proceedings/hicss/2005/2268/03/22680084b.pdf

On 21/10/2011

50. Davis, F.D., Bagozzi, R.P., and Warshaw, P.R (1992),"Extrinsic and intrinsic motivation to use computers in the workplace",*Journal of Applied Social Psychology*, Vol.22, 1111–1132.
51. Heijden, H (2003), "Factors influencing the usage of websites: the case of a generic portal in The Netherlands", *Information and Management*, Vol.40,pp.541–549.
52. DeLone, W. and McLean, E(1992), "Information systems success: the quest for the dependent variable", *Information Systems Research*,Vol.3,Issue.1,pp. 60–95.
53. Aladwani, A and Palvia, P.C(2002), "Developing and validating an instrument for measuring user-perceived web quality", *Information and Management*,Vol.39,pp.467–476.
54. Hung, S.Y.; Ku, C.Y. and Chang, C.M (2003), "Critical factors of WAP services adoption: an empirical study", *Electronic Commerce Research and Applications*, Vol.2, pp. 42–60.
55. Gefen, D.; Karahanna, E. & Straub, D.W (2003a), "Inexperience and experience with online stores: The importance of TAM and trust", *IEEE Transactions on Engineering Management*, Vol.50, No.3, pp.307–321.
56. Taylor, S & Todd, P.A (1995), "Assessing it usage: The role of prior experience." *MIS Quarterly*, Vol.19, No.4, pp. 561–570.
57. Thompson, R.L, Higgins, C.A., & Howell, J.M (1994). "Influence of experience on personal computer utilization: Testing a conceptual model", *Journal of Management Information Systems*, Vol.11, No.1, pp.167–187.
58. Venkatesh, V (2000), "Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model", *Information Systems Research*, Vol.11, No.4,pp. 342–365.
59. Legris,P., Ingham, J. and Collerette, P (2003), "Why do people use information technology?A critical review of the technology acceptance model", *Information & Management,* Vol. 40, pp.191–204.
60. Moon,J.W.; Kim,Y.G (2001), "Extending the TAM for a World-Wide-Web context", *Information & Management,* Vol. 38,pp. 217-230
61. Choi, H.; Kim, Y. and Kim, J (2010), "An acceptance model for an Internet protocol television service in Korea with prior experience as a moderator" ,*Service Industries Journal*, Vol. 30 Issue 11, pp.1883-1901.

62. Lee, Y.; Kozar, K. A. and Larsen, K. R. T (2003), "The Technology Acceptance Model: Past, Present, and Future",*Communications of Association for Information Systems,*Vol. 12, pp.752-780.

63. Gardner, C and Amoroso, D.L(2004), "Development of an Instrument to Measure the Acceptance of Internet Technology by Consumers" in *Proceedings of the 37th Hawaii International Conference on System Sciences*, accessed 'http://www.computer.org/comp/proceedings/hicss/2004/2056/08/205680260c.pdf ' on 03/11/2011.

64.Ha, I. and Yook, S(2009), "The Effects of Media Characteristics on IPTV Adoption", in *Proceedings of Portland International Conference on Management of Engineering and Technology,* accessed 'http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=5230479' on 23/11/2010

65. Weniger, S (2010), "User Adoption of IPTV: A Research Model", in *'23rd Bled eConference eTrust: Implications for the Individual, Enterprises and Society',* Slovenia, pp.154-165. Accessed 'http://www.bledconference.org/proceedings.nsf/Proceedings/1C44208F6E0E30E8C12577570039155D/$File/12_Weniger.pdf' on 24/10/2011.

66. Sur, S. and Pandey, M (2011), "Addressable Advertising: Future of Television Advertising", *Advertising Express,*Vol.11,Issue.3,pp.41-44.

67.G. Held, (2007),"Understanding IPTV," Taylor & Francis Group.

70. W. Copper and G. Lovelace, (2006), "IPTV Guide," Inform itv and Lovelace Consulting Limited.