A Study of Design Aspects of Web Personalization for Online Users in India

A Thesis submitted to Gujarat Technological University

for the Award of

Doctor of Philosophy
in
Management

By

Darshana Desai
Enrollment No: 129990992004

Under supervision of

Prof. Dr. Satendra Kumar

GUJARAT TECHNOLOGICAL UNIVERSITY
AHMEDABAD

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ABSTRACT

Website is prominent source for information exchange for users and business tool for E-tailors' and social media worldwide. In recent years, information on website is proliferated with the higher rates in ecommerce and social networking websites, diversity of its users and complexity of web application lead to information overload and one-size-fits-all issue. Web portals with personalization features are used by information system designers of web portals to overcome information overload problem and researched in various disciplines. Web portals are using website personalization features to attract and retain online users with expectation of high return in business but very little is researched about what to personalize and what is its effect on users behavioural response. This research addresses this gap to identify different personalization aspects used web portals and its impact on users' behavioural response of satisfaction and intention to revisit personalized website through cognitive and hedonic experience. This study proposes research framework based on Stimulus Organism Response model of environmental psychology stating personalization features which stimulate users organism state of cognitive and hedonic experience leading to satisfaction and intention to revisit the personalized website. The model is tested with the data collected from personalized ecommerce and social networking website users. 547 out of 600 data from ecommerce and 541 out of 600 valid responses from social websites were used for analysis and for testing the model. Exploratory Factor Analysis of responses extracted seven factors information, presentation, navigation personalization, cognitive experience, hedonic experience, satisfaction and intention to revisit. Confirmatory Factor Analysis confirms model with RMSEA, CFI, NFI value near to .9 and indicates good model fit for ecommerce and social networking websites. Structural Equation Modelling results indicates correlation between personalization aspects i.e. information, presentation, navigation personalization and users satisfaction and intention to revisit through cognitive and hedonic experience. The findings have important implications for Information Systems (IS) research and managerial decision making on personalization implementation issues in website design. Some of these findings are complementary to those of previous research, and unique in the less explored context of Web Portals. A thorough discussion of the theoretical and practical implications of the findings is contained at the end of this dissertation.

Keywords: Information Personalization, Presentation Personalization, Navigation Personalization, Customization, Cognitive Experience, Hedonic Experience, Perceived Ease of Use, Perceived Usefulness, Enjoyment, Control, Satisfaction

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Appendix A: Questionnaire

List of Abbreviations

IP - Information Personalization

PP - Presentation Personalization

NP - Navigation Personalization

PEU - Perceived Ease of Use

PU - Perceived Usefulness

ENJ - Enjoyment

CON - Control

SOR - Stimulus Organism Response

TAM - Technological Acceptance Model

IS - Information System

TRA - Theory of Reasoned Action

HCI - Human Computer Interface

ABDSS - attribute-based decision support system

EFA - Exploratory Factor Analysis

CFA – Confirmatory Factor Analysis

SEM- Structural Equation Modeling

CRM – Customer Relationship Management

ICT - Information and Communication Technologies

OOHDM - Object Oriented Hypermedia Modeling

UML - Unified Modeling Language Modeling

WebML – Web Modeling Language

CF - Collaborative Filtering

IIT - Image Interactivity Technology

PAD – Pleasure Arousal Dominance

KMO - Kaiser-Meyer-Olkin

AVE - Average Variance Extracted

CR – Composite Reliability

GOF - Goodness of Fit

NFI - Normed Fit Index

RFI - Relative Fit Index

CFI - Comparative Fit Index

TLI - Tucker Lewis Index

RMSEA - Root Mean Square Error of Approximation

RMR - Root Mean Square Residual

NPAR - Number of parameters

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Appendix A: Questionnaire

CHAPTER- 1

Introduction

1.1 Overview:

With the advent of internet, website has invaluable source for information exchange for users and E-tailers. Today every part of business and social media worldwide are using the website as an integral part of business to interact with the customer, brand promotions, marketing, after sales services and support. Social media networking is used by many users and business owners for information sharing through different categories of websites like Google+, Yahoo!! , Face book. In recent years, information on website is proliferated with the higher rates in ecommerce and social networking websites. Diversity of its users and complexity of web application leads to information overload and one-size-fits-all issue. Cognitive limitation of user information processing lead to lost users in the world of information and result into inefficiency in decision making. Effective Website Design is considered as an important aspect to minimize the information overload problem. Website personalization has emerged as an effective solution to overcome this problem of information overload in recent years. Many firms are developing personalized websites by investing in development of personalization tools to attract the users and retain the customers. Personalized services are provided by E-tailers with online websites to attract the users, retain existing customers and to be competitive in the business environment. Ecommerce websites like amazon.in, flipkart.com, ebay.in etc provide personalization features, personalized offerings with categories of products and services to attract and retain users. Personalization has also gained interest of researcher over decades. Previous research shows significant effect of perceived usefulness of personalized e-services (Liang et al. 2012), users interest in personalized services (Kosba et al. 2007), and indicated that different personalized services have different effect on customer satisfaction (Alpert et al.2003). Social networking sites like www.facebook.com, google+ and ecommerce websites like amazon.in etc use different personalization strategies to manage the

information overload problem and satisfy users' need. Web personalization has become a pervasive phenomenon in a wide range of web applications, e.g. Internet banking, e-commerce and Web portals for different domains like education, e-tailing and other related domains. Customers have become increasingly aware of these personalization features and have learned to demand them (Oulasvirta and Blom 2008). Accordingly, a boom in research on real-world implementation of personalization features has been witnessed recently (Kwon et al. 2012; Liang et al. 2009; May Wang 2010; Kamis et al. 2008; Lai et al. 2008;Sunikka and Bragge 2008; Éthier et al. 2008; Tam and Ho 2006; Fan and Poole 2006; Komiak and Benbasat 2006; Kramer et al. 2000; Kumar et al. 2004; Liang et al. 2006;Blom and Monk 2003; Chau and Lai 2003; Eirinaki and Vazirgiannis 2003; Mobasher et al. 2000; Wu et al. 2003), typically focusing on the impact of isolated, one-dimensional personalization features on users. These studies have focussed on one or two dimensions of web personalization adopted in websites and its effect on user with respect to information processing and affective reaction with customer retention (Kwon et al. 2012, Liang et al. 2009, Wang et al. 2010). In general, it has been recognized that necessary and well designed personalization features facilitate the effectiveness, perceived usefulness, perceived ease of use and efficiency as well as the feeling of enjoyment, control and satisfaction while using a website. Such features have become increasingly diverse and multifaceted in Information System (IS) and Human Computer Interaction (HCI) Research. In light of this, and in view of a continuing gap in the contemporary literature, we would like to investigate different personalization aspects, the role played by these aspects of personalization used in ecommerce and social networking website design and how they impact the user intention to revisit or reuse the website. We would also like to study personalization design aspects of e-commerce and social networking websites and its impact on user information processing and aspects related to it.

1.2 Motivation:

Personalization as a phenomenon is probably as old as customer relationship in any trade or business. Researchers as well as practitioners have been even looking more into personalization for helping to improve performance of information, communication technology (ICT), Servicing and marketing function of web portals like e-commerce and Social Networking. In the context of website, personalization fulfils users' needs by

upholding the sense of transferring website to "my website", providing unique treatment, supporting effectiveness of user's activities, and provide relevance through personalizing the appearance through interface, information and structure of the website. A new study published by Brilliance, indicates that up to 31% of ecommerce site revenues were generated from personalized product recommendations during Q4 2014. The worldwide average of website revenues generated from product recommendations was 12%. Web personalization in e-commerce has seen revenue increases of up to 52% (Brilliance 2014). Firms which adopted personalization successfully have improved its cross-selling and customers accepted 76% of the recommended items (Cohan 2000). Personalization has been used in website design and is used on the Internet, e.g. personalized tools, personalized search results and recommendations, personalized interfaces and web structures. In practice, personalization costs much more than running a comparable adaptive site and not many (i.e. 14%) users think that personalization lead them to purchase frequently (Jupiter Research 2003). E-commerce website (e.g. www.amazon.in, Netflix.com and www.eBay.in and social network website (e.g. Facebook.com, gmail.com, Yahoo.com etc) update website design frequently with providing different personalization strategies implemented and keep user noted of their revision. Personalization has been used as an important marketing strategy to attract the user and retain the customers by providing special treatment in the form of product or information recommendation and specialized services.

Though personalization is such a significant issue in practice, there is little behavioural research investigating the different roles played by distinctive design aspects of personalization (i.e. information personalization, presentation personalization, navigation personalization) used in e-commerce and social networking websites. Some researchers have focussed on one or two of these aspects, e.g. information content (Fabian et al. 2013,Tsekouras et al. 2011,Liang et. al. 2007, Tam and Ho 2005), or interface (Kamis et al. 2008). Few studies have investigated the mechanism by which different aspects of personalization and its influence on the decision process of Internet users (Kwon et al. 2012, May Wang 2009). In this section, we look into what have been done in personalization research and what are the important issues that are still missing.

1.2.1 Brief Summary of Previous Research:

As per earlier research trends, Personalization Research can be broadly categorized into three streams (Oulasvirta and Blom 2008). The first examines process oriented aspects of personalization technologies with different algorithms and methods e.g. adaptive and adaptable personalization, data mining techniques, cookies, and push technologies. The second examines user-centered personalization, e.g. user tasks, privacy issues, and application context. The third investigates user personalized presentation of website and the effectiveness of personalized websites (May Wang 2009, Kumar et al. 2004). In the third stream, personalization has been understood as the process that changes the functionality, interface, information content, or distinctiveness of a system to increase its personal relevance to the individual (Blom and Monk 2003,Fan and Poole 2006). It is in this sense, the fine-tuning of those aspects of a website are presented to a user which match user's needs (Wu et al. 2003). This dissertation shall be mainly concerned with this design aspect of personalization used in ecommerce and social networking websites and analyzing its effect on users' decision making to reuse or revisit to these websites.

Previous research has approached personalization from several dimensions in last few decades, which, in summary answers the questions 'what', 'who', 'how,' 'to whom' , 'to what extent'', 'when,' and 'based on what,' in personalization research which we have elaborated as follows in Table 1.1:

Table 1.1: Personalization classification and evaluation Research

Dimensions	Explanation	References
What should be personalized(object), who does(subject) and to what extent(level)	Content , Interface and to whom i.e 1-1/1-N/1-all, who does(system initiated or user initiated)	Kwiseok Kwon, Cookhwan Kim (2012)
What should be personalized & Personalize to whom	Content, interface, functionality, Channel ,personalization to whom i.e 1-N and 1-1	Chao wen, victor prybutok & chenyan xu (2011)
Perceived risk on intention to buy & What should be personalized	Reduction of perceived risk enhances customer satisfaction and purchase intention	Narongsak Thongpapanal & Abdul Rehman (2011)
What should be personalized	Information/Content, Interface, Navigation Personalization effect on decision process of the user	WANG Ying(2009)

What should be personalized Who does Personalization & Personalize to whom	Content, interface, functionality, Channel , Individuals or categories of Individuals	(Sunnika and Bragge 2008)
What should be personalized To Whom Personalize & Who does Personalization	Content, interface, functionality, Channel, 1-1,1-N, Implicit or Explicit	(Tam Ho 2008;Fan and Poole 2006)
Personalize to whom	Individuals or categories of Individuals	(Fan and Poole 2006)
Who personalizes	Implicit or explicit personalization user or system personalization	(Bunt et al. 2007; Fan and Poole 2006)
When to personalize	Static or dynamic	(Bunt et al. 2004)
Personalize on the basis of what? How to personalize?	Frequent task; usage data, content, structure;	(Bunt et al. 2004)
How much can be personalized	Number of personalization options(e.g. breadth and depth)	(Wu et al. 2003)

As shown in Table 1.1 ,Kwon et al. 2012 studied personalization in dimensions of object(What should be personalized), subject(Who does) and (to what extent)level with respect to customer retention. (May Wang 2009) studied What to personalize, its cognitive effect and affective reaction on users. (Wu et al. 2003) scored level of personalization based on the breadth and depth of the personalization options on offer. The "what" to personalize represents objects to be personalized i.e. information/content, website interface, structure/functionality/navigation. (Bunt et al. 2004) also classified Personalization as static or dynamic based on when personalization can be enacted according to the object/objects for which personalization has been designed to individual or group. Personalization can also be examined based on the degree to which personalization is automated and (implicit or explicit) user involvement (Bunt et al. 2007; Fan and Poole 2006).

Among all the issues pertaining to personalization, "what" to personalize is the most fundamental problem researched for the effective personalized website design. Different design aspect of personalization may have different impact on users' information processing and decision making. Moreover, the different roles played by different personalization features in website design have not been comprehensively investigated.

1.2.2 Gap in Existing Research:

Personalized website design is an effective strategy for web portals to satisfy users need and offering unique user experience. Various personalization techniques has been implemented to provide special treatment to the users and to gain users attention with the expectation of high return in business. Personalization has been researched and implemented in the field of Human Computer Interaction, Information System, Computer Science and Marketing. Research in area of computer science and it focuses on different techniques and algorithm to implement personalization and also measures the performance of personalization such as recommender systems, with accuracy metrics (e.g., mean, rank, absolute error, precision, and recall). Researches in Information System design broadly focus on behavioural and cognitive aspect of personalization with optimum design, implementation and its affective reaction on users decision making (Kamik et al.2008). Fan and Poole (2006) studied personalization aspects with respect to Information system design , Tam and Ho(2006) investigated the impact of personalization on user information processing and its decision outcomes. However, the perceived usefulness and ease of use of personalization is a significant factor in attracting new users. Komiak and Benbasat (2006) examine the effects of perceived personalization and familiarity on cognitive trust and emotional trust in the context of the technology acceptance theory (Venkatesh 2009 research extension of TAM). Murthi and Sarkar (2003) suggested more research directions to study online personalization in the context of management science. They noted that one of the questions most frequently asked by practitioners in Web personalization is, "Which items should be offered to influence individual customers' consideration sets?" (Murthi & Sarkar, 2003). May Wang (2009) investigate as to how a Web personalization strategy influences the formation of user's consideration sets and final choice outcomes. Kwon, K., & Kim, C. (2012) researched the fundamental question of How to design personalization in a context of customer retention. Recently research has gained increasing attention on interactive way of Human Computer Interaction. Effective personalized website design is an important issue to be researched to meet the expectation and dynamic need of the users. Different design aspects of personalization impact differently on user's perception, and fulfil different kinds of user requirements. However in previous literature, studies often have focussed on only one or more aspects of personalization, e.g. information personalization (Dabholkar and Sheng 2012, Kwon et al. 2012, May Wang 2009, Komiak

and Benbasat 2006, Liang et al. 2006, Tam and Ho 2006) or visualization (Blom and Monk 2003, Nadkarni and Gupta 2007) but little is researched on effectiveness of the design aspects of personalization. Few studies investigate the roles played by multiple dimensions of personalization (May Wang 2010). In fact, the existing literature has serious deficit in actionable guidance on personalization design issues and effective personalized web design. To address these gaps in research, this study comprehensively reviews literature in personalization and develops methodologically constructed framework for personalized website design and test the impact of different aspects of personalization. Based on environmental psychology theory and TAM, this thesis investigates the different roles played by dimensions of personalization, i.e. information personalization, presentation personalization, and navigation personalization. This research is focusing on interdisciplinary nature of personalized website design and its effect on users intention to revisit the website from the field of IS and HCI.

1. 3. Research Objective:

1.3.1 Research Questions:

This dissertation is motivated to address the increasing needs for actionable guidance in personalization design, and a gap in existing research regarding different personalization design aspects implemented in web portals, and the different roles they play in users' decision making. This study aims to address the following research questions:

(a) Which are different personalization design aspects implemented in different ecommerce and social networking websites?

(b) How different personalization aspects impact on users' satisfaction with utilitarian/cognitive and affective reaction?

(c) How satisfaction with personalized design aspects influence in users' decision making to revisit the website?

1.3.2 Research Objectives:

The current research aims to identify the important design aspects of web personalization and to investigate the roles played by these aspects. Ecommerce and Social Networking Web Portal sites have been chosen because these sites typically incorporate a rich array of personalization features, e.g. information personalization, presentation personalization and navigation personalization. This study emphasizes a user- centered view, trying to explain and predict users' acceptance of personalized web information system. A deeper understanding of users' psychological and behavioural incentives, as well as of their behaviour, attitude and intention, will help systems designers and managers to provide better systems and services. This study is primarily based on widely used and accepted theories – in particular the Technology Acceptance Model (Davis et al. 1989b), the theory of planned behaviour (Ajzen 1991), and the theory of diffusion of innovation (Rogers 1995). Based on the theories of environmental psychology (stimulus-organism-response(S-O-R), flow theory), updated Information System success model and Technology Acceptance Model (TAM), this dissertation investigates different personalization design aspects having impact on users cognitive/utilitarian experience (Perceived Ease of Use, Perceived Usefulness, enjoyment) and hedonic experience(control) and ability to enhance user's satisfaction and to influence users intention to revisit website.

1.4. Expected Contribution:

1.4.1 Theoretical Contribution:

This study significantly contributes in identifying different personalization aspects like information personalization, navigation personalization and presentation personalization with development of scale. The measurements of the study are conceptually grounded in the vast body of previous research in environmental psychology, cognitive science and website personalization. This research contributes towards measuring important dimensions of personalization i.e. what to personalize and identifying various aspects of personalization used in information system design of websites like ecommerce and social networking web portals. This Research also throws light on how this personalization aspect

impacts the users' satisfaction and their decision making of revisiting website with cognitive and hedonic influence on experience. Prior studies in research in website design has also provided valuable insights into different dimensions of personalization and their impact on user's experience e.g., information personalization or interface design and visualization. But there is limited research in personalized website design in previous literature, its implementation and roles of personalization aspects on users' satisfaction and experience. To address this gap in the previous researches in environmental psychology and technology acceptance model (TAM), this research (i) develops an integrated research model of environmental stimuli of information, presentation and navigation personalization and the internal decision making process which leads to the intention to continue to use the website; (ii) empirically tests the integrated model with ecommerce and social networking website users; and (iii) suggests a personalization model to enhance the psychological factors affecting satisfaction and inspiring the intention to continue to use a website. In particular, we have investigated the roles of information personalization, presentation personalization, and navigation personalization on enhancing the cognitive and affective determinants of the intention to continue to use a website. This study provides a theoretical contributions to the field of IS, as well as other reference disciplines, e.g. environmental psychology. This dissertation complements (May Wang 2009), (Venkatesh and Bala 2008) and (Koufaris 2002) studies on behavioural intention by adding the identification of various dimensions of personalization, and those interactions between users cognitive/utilitarian experience and hedonic experience which result on satisfaction and intention to revisit personalized web portals like ecommerce and social networking websites

1.4.2 Practical Contribution:

The findings from the present research have important implications for IS system Designers, and developers. It is worthwhile for information system designers to identify which personalization features are useful to users and attract users for leveraging business. It also helps in redesign of existing website personalization features and catering user's dynamic needs with personalization features enhancement. It provides a valid and reliable measure of personalization dimensions at the level of conceptual design. This research identifies three major design aspects i.e., Information, Presentation and Navigation

Personalization used in web portals of ecommerce like amazon.in, flipkart, eBay.in and social networking websites like google+, msn.in, my Yahoo!. The present research proposes a framework for effective design of personalized website in information system development. The proposed framework is tested with data of the users of two categories of website: ecommerce and social networking portals. It also identifies motivating factors for satisfaction and intention to revisit websites with perceived ease of use, perceived usefulness, enjoyment and control.

As the dimensions detailed in this research are directly related to the conceptual design process, it is possible that these findings can serve as the basis of actionable guidance on personalization design issues. For example, presentation personalization will contribute to more enjoyment. Navigation personalization will relate to perceived usefulness, perceived ease of use, as well as control. Our results support the hypothesis that elements of personalization impact on users' satisfaction and intention to revisit through enhancing positive cognitive perceptions of, and hedonic reactions to a website. This implies that by effectively managing a website's level of personalization, a firm can differentiate its website from others and produce a compelling experience for users.

1.5. Thesis Structure:

The remainder of the dissertation is as follows: Chapter 2 discusses previous studies on personalization, defines the personalization in previous studies, and clarifies different but related concepts of personalization. Chapter 3 reviews important theories related to this dissertation. Chapter 4 presents the research framework and corresponding hypotheses. Chapter 5 describes the instrument development, research methodology and research design. Chapter 6 summarizes the results of the data analysis with EFA, CFA, and SEM. Finally, Chapter 7 discusses major findings, theoretical and practical contributions, limitations, and possible directions for future work.

CHAPTER - 2

Literature Review

2.1 Overview:

In recent era of web evolution, website is considered as a mandatory medium for information dissemination, entertainment and communication and for the reach out to large community of users in various domains like business, e commerce, education, social media, banking etc. While the websites have been proliferated with the information, content on the websites are same for all types of users like one- size fits for all issues. This does not satisfy user's individual need as well as creates information overload. Effective Website Design has become prominent issue to manage the problem of information overload which limits users' information processing, cognitive skill and decision making capabilities. In information and communication technologies (ICT) Web Personalization has been adopted as a significant strategy to overcome the problem of information overload and one size fits all issue. Personalization is used by marketer to satisfy individual users' need, to be competitive in market and efficient information management. Effective personalization design is critical to improving the performance (perceived usefulness, ease of use, enjoyment, satisfaction and control) and its impact on users' intention to revisit the personalized website. In the field of Information System Design and Human Computer Interaction (HCI), researchers as well as web designers have thus been paying increasingly close attention to personalization issues in design and development of personalized websites; satisfy the need of the user by serving the user with more relevant information. However, personalized web development and software development significantly varies in number of key areas like dynamic nature of website design and development to cater customers' need, their information system structuring and design(Mendes and Mosley 2006). Information architecture, presentation and navigation functionality are dynamic and more complex in personalized web development compare to software development. These significant differences targeted study is the focus of this dissertation by addressing the

distinctiveness of personalization issues in the website design and development process. In the next section we will review and analyze how personalization aspects are designed, its implementation and development process of Website, and review the different definitions of personalization in website personalization with prominent vast body of interdisciplinary nature.

2.2 Website Design & Development:

Web site design & Development has increased the need of special attention to use it as an effective marketing tool for attracting large number of users and retaining existing customers. Effective website design strategies and implementation has been researched over last two decades with the era of dot com. Recently Adaptive and Personalized Websites has gained attentions of researchers and business owners. Personalization has been used as an effective marketing strategy which overcomes the problem of information overload and increase users cognitive decision making skills. Websites can be broadly categorized in four types: Adaptive/Personalized Web hypermedia Application, web hypermedia application, web software applications, and web applications (Peter Brusilovsky et al. 2007, Briand et al. 2000; Mendes (Eds) and Mosley 2006; Mendes and Mosley 2006). Web hypermedia application is a non-conventional application characterized by the authoring of information using nodes, links, and delivery over the web. Kobsa (2001b) defines a hypermedia system "as an interactive system that allows users to navigate a network of linked hypermedia objects. In the case of the WWW, these hypermedia objects are Web pages." Hypermedia objects consist of information chunks, which can be different media types such as text, images, audio clips, video clips, and etc (Kobsa et al. 2001b) .Web software application is a conventional software application that relies on the Web or uses the Web's infrastructure for execution. Many e-commerce and social networking web applications fall into this category. Typically these employ development technologies (e.g. DCOM, ActiveX), database systems, and development solutions (e.g. J2EE). Web application is an application delivered over the Web that combines characteristics of both Web hypermedia and Web software applications. Adaptive/ Personalized Web Application, which is the object of this study, that is, Web Applications which comprises of personalization features implemented in the development

process based on user modeling and other algorithms based on the business need. An adaptive hypermedia system tries to anticipate the actions of individual users based on their prior Internet behaviour, and will help them to navigate in many ways by hiding links, limiting the hyperspace or by showing appropriate link annotations (Brusilovsky et al. 2007). Essentially, the idea of adaptive hypermedia is based on monitoring what the user is doing and, when necessary, asking questions. In other words, the system tries to learn how the user will behave. The goal of adaptive hypermedia is to increase the functionality of hypermedia by making it personalized (Brusilovsky 1996b). This requires the system firstly to collect comprehensive information about the user, and secondly to adapt the content, information structure and/or presentation according to this user information, and thirdly to provide the user with the results of this adaptation. Systems that perform these steps automatically are called adaptive.

Personalized or Adaptive Web Application development, Web development and conventional software development differ with regards to their application characteristics, primary technologies, development process drivers, application availability, customers (stakeholders), update rate (maintenance cycles), their architecture and network, their academic foundations, legal, social, and ethical issues, and information structuring and design (Mendes and Mosley 2006). Some of these comparisons were tabulated follows:

Table 2.1. Adaptive/Personalized Web Application, Web Application and conventional software Web Application

	Personalized/Adaptive Web Application	**Web Application (Mendes & Mosley 2006)**	**Conventional Software Application (Mendes & Mosley 2006)**
Disciplines involved	Adaptive Hypermedia System Design, User Modeling, Personalization Algorithms, Cognitive & Decision Science(HCI), Software engineering, hypermedia engineering, requirements engineering, usability engineering, information engineering, graphics design, and network management	Software engineering, hypermedia engineering, requirements engineering, usability engineering, information engineering, graphics design, and network management	Software engineering, requirements engineering, and usability engineering
Development process drivers	Ease of Use, Perceived Usefulness, Reliability, usability, and security	Reliability, usability, and security	Time to market takes priority over quality Groups
Customers	Wide range, known and unknown users, marketers	Wide range, known and unknown users	Groups confined within the boundaries of departments, divisions, or organizations
Update rate (maintenance cycles) People	Frequently without specific releases, maintenance cycles of hours or days based on user modeling , navigational behaviour	frequently without specific releases, maintenance cycles of days or even hours Web	Specific release, maintenance cycles ranging from a week to years
People involved in development Information	Web Designers, Web Mining Business Intelligence experts, Domain Experts, Graphic Designers, writers , artists, Database Designers, Project Managers, Data Scientist, network security experts, usability experts,	Web designers, Programmers, graphic designers, librarians, database designers, project managers, network security experts, usability experts, artists, writers	IT professionals with knowledge of programming, database design, and project management
Information structuring and design	Personalized Content, Structure and Interface of Web page , Structured and unstructured content, use of hyperlinks to build navigational structures	Structured and unstructured content, use of hyperlinks to build navigational structures	Structured content, seldom use of hyperlinks

Website design creates tidy experience to user which results from a whole set of decisions—some small, some large—about how the website looks, how it behaves, and what it allows you to do. These decisions build upon each other, informing and influencing all aspects of the user experience (Garrett 2003). In study of website development by Garrett (2003), he proposed theory that defines five layers between an abstract level and a concrete plan. The five layers of user experience of websites are: the surface plane (visual design), skeleton plane, structure plane, scope plane and strategy plane. The *surface plane* is a series of Web pages, made up of images and text. The *skeleton plane* concerns the placement or layout of the buttons, tabs, photos, and block of text. The *structure plane* defines the navigation plan i.e. how the user gets to the page in question and where they could go next. The structure defines the way in which the various features and functions of the site fit together. The *scope plane* encompasses features and functions (included or not), which fit together to define the structure. The scope is fundamentally determined, however, by the strategy of the site. This *strategy plane* incorporates not only what the people running the site want to get out of it but what the users want to get out of the site as well (Garrett 2003). Another tripartite subdivision proposed by Garrett (2003) distinguishes interface design, navigation design and information design. User interface design regards the visible elements of interface; navigation design refers to the way information is presented using, in both ways, information design, which establishes effective communication with the user (Lauzer; Fragoso, 2011).

Among all these features, information architecture and navigation are unique to web development, whilst hypermedia has more complex presentations than conventional software. Personalized/Adaptive website presents different information architecture, interface design and navigation based on the type of user categorized in user modeling and business rules. Adaptive hypermedia systems can be defined as "all hypertext and hypermedia systems which reflect some features of the user in the user model and apply this model to adapt various aspects of the system to the user" (Brusilovsky 1996b). In the next section we will review how personalization is developed in the website design process, and how different disciplines investigate the topic of personalization.

2.3 Personalization:

Personalization is the process of catering tailored content, website structure and look & Feel of Website with presentation by identifying users' implicit and explicit needs. Personalization has been researched by large community of researchers from diverse fields; research in personalization can be classified into three streams (Oulasvirta and Blom 2008). The first examines personalization technologies e.g. data mining, cookies, adaptive and adaptable personalization, and push technologies. The second examines user-centered personalization, e.g. users' tasks, privacy issues, and the application context. The third investigates presentation features which users personalize, and how the effectiveness of the website should be measured (Kumar et al. 2004). In different areas personalization has been defined as a toolbox, a feature, or a process.

2.3.1 Personalization Definitions:

In previous literature, there exist at least three perspectives in interpreting the effect of personalization: information and effort reduction, personal persuasion, and relationship building (Liang et al., 2009b). The relationship building perspective adopts the concept of relationship marketing, and treats personalized services as a tool for building a close relationship between the sender and the receiver. Personalized messages intend to develop positive affection between the sender and the receiver. This feeling may include care, trust, and other related emotions. For instance, Komiak and Benbasat(2006) proposed a trust-centered perspective in studying the adoption of personalized recommendation agents. Both cognitive trust and emotional trust have been found to influence the intention to adopt personalization agents. This finding indicates that personalized services can give rise to an individual's emotional process and give the user a sense of togetherness with the personalized service and its provider. In addition, Liang, et al. (2009a) found that perceived care (an emotional factor) was more influential than transaction costs reduction (a rational factor) on the perceived usefulness of personalized services offered by online bookstores. These findings suggest that personalization may have significant affective influence on consumer.

We found different definition of web personalization on different field of research. These sources represent three relevant areas in which personalization has been studied: marketing/e-commerce; computer science/cognitive science; and information science which give different definition of web personalization written in Table 2.2. This range of definitions reflects the multidisciplinary nature of web personalization research.

Table 2.2: Personalization Definitions in different Research Area

Research Area	**Definitions**
Marketing/ e-commerce	1) "Personalization is the combined use of technology and customer information to tailor electronic commerce interactions between a business and each individual customer" [Personalization Consortium (2003)]. 2) "Personalization is about building customer loyalty by building a meaningful one-to-one relationship; by understanding the needs of each individual and helping satisfy a goal that efficiently and knowledgeably addresses each individual's need in a given context"[Riecken D 2000].
Cognitive science/Human Computer Interaction	3) Personalization is "a system that makes explicit assumptions about users' goals, interests, preferences and knowledge based on an observation of his or her behaviour or a set of rules relating behaviour to cognitive elements" [Kosba et al. 2001]. 4) Personalization is the process of providing relevant content based on individual user preferences or behaviour [Vignette Corp 2002]. 5) Personalization is the "explicit user model that represents user knowledge, goals, interests, and other features that enable the system to distinguish among different users" [Brusilovsky et al. 2002]. 6) Personalization is the understanding of "the user, the user's tasks, and the context in which the user accomplishes tasks and goals" [Karat J. et al. 2003].
Computer science	7) "Personalization is a toolbox of technologies and application features used in the design of an end-user experience" [Kramer et al. 2000]. 8) "Personalization system is any piece of software that applies business rules to profiles of users and content to provide a variable set of user interfaces" [Instone 2000]. 9) Unifying platform embedded in any type of computing devices that support individualized information inflow and outflow [Riecken D. 2000]. 10) Personalization is a process that ''changes the functionality, interface, information content, or distinctiveness of a system to increase its personal relevance to an individual'' [Blom , Monk 2003].
Information science	11) "Delivering to a group of individuals relevant information that is retrieved, transformed, and/or deduced from information sources" [Kim W. 2002].

	12) Personalization is adapting Web content and layout to ‘‘deliver the right content to the right person in the right format at the right time’’ [Ho and Tam 2005]. 13) Personalization can be defined as the ability to proactively tailor products and product purchasing experiences to tastes of individual consumers based upon their personal and preference information.[Chellappa et. el 2005].

2.3.2 Personalization Classification:

There are three major categories of research on personalization in the information systems area. The first focuses on examining different types of personalized services and their potential applications in different marketing domains (e.g., Brusilovsky et al., 2007). The second is dedicated to designing technologies for personalized services with an emphasis on the receiver’s profile, and then matching the personalized service with the receiver’s needs by using tools such as data and text mining (Shahabi and Banaei-Kashani, 2003; Zhang et al., 2007). The third category evaluates the effect of personalized services on the receiver's’ attitudes and acceptance of recommendation intention (Komiak and Benbasat, 2006; Liang et al., 2006; Tam and Ho, 2005; Tam et al., 2006).

Personalization can also be classified as static or dynamic based on when personalization can be enacted according to the object/objects which personalization has been designed (individual or group) for. The degree of personalization has been scored based on the breadth and depth of the personalization options on offer (Wu et al. 2003). Personalization can also be analyzed based on the degree to which personalization is automated or user involved (implicit or explicit). Kwon, K., & Kim, C. (2012) research identified the four important dimensions for implementing personalization: subject, object, level, and learning method on customer retention—customer satisfaction and customer loyalty—was completed.

Personalization can also be classified based on user involvement i.e. who initiate personalization like user initiated personalization and system initiated personalization. User initiated personalization; website provides different options of customization features

to select such as news preferences, user interface preferences like themes, font size, color. User can also select preferred page layout, structure of navigation links, or the display of number of information, whether forecast, horoscope etc. User initiated personalization provides more privacy and control to user as user are more aware of personalization preferences and can make a decision to use its features. System or website initiated personalization presents personalization features by understanding users implicit need from their navigational behaviour and analyzing demographics based on users' profile.

2.3.3 Personalization Dimensions & Design Aspects:

Personalization is the process of presenting tailor made website in the form of information, website layout and structure, which is generated either implicitly or explicitly by asking the user in the form of feedback form or demographic details. Personalization is presented as three dimensions of implementation: (a) the aspect of the information system that is manipulated to provide personalization (what is personalized), (b) the target of personalization (to whom to personalize), and (c) who does the personalization (explicit vs. implicit i.e., the user or the system) (Fan & Poole 2006).

For the first dimension, what is personalized, we can distinguish four aspects of Information System (IS) design that can be personalized: the information itself (*content*), how the information is presented (*user interface*), what link structure of the website is presented *(navigation*) and what users can do with the system (*functionality*)(Wang 2009, 2010). What to personalize is the fundamental of website IS design which can be dynamically presented in a personalized system to make the system more personally relevant to the users' implicit need. This dimension focuses on the particular parts like website information, presentation and layout/navigation of the system that deliver personalization to the user. (Wu et al. 2003) define web personalization as the adjustment and modification of all aspects of a website that are displayed to a user in order to match the user's' needs and wants. In addition to user interface and content, the hypermedia links that are presented to the user are included in the definition. (McCarthy et al. 2001) concentrates on various dimensions of content: (1) different sources of content; (2) the arrangement of content on the screen; (3) the delivery mechanisms (system or user

initiated) and the delivery vehicles (web browser, mobile phone, pager, etc.). Web personalization may be implemented in the form of: personalized content presentation and/or content delivery (inserting or removing thematic units/sections/paragraphs, optional explanations or detailed information, personalized recommendations /offers/ prices/ products/ services), personalized structure (sorting, hiding, un hiding, adding, removing or highlighting links) e.g. yahoo.com (Manber et al., 2000), personalized website layout presentation and media format (from images to text, from text to audio).

The second dimension, the target of personalization, can be either an individual or a group of individuals with common characteristic like demographics, behaviour etc. Insofar as an individual user identifies with this category one to one, he or she is likely to perceive that the system is personalized for them. Individuated or one to one personalized system design to adapt and cater to the implicit or explicit needs of a single user. It is targeted to a specific individual, and its goal is to deliver goods, services, or information unique to each individual as an individual. Furthermore, research(Fan Poole 2006) has indicated that people react differently when they are focused on their unique identity as an individual (individuated) as opposed to how they act if their focus on their identity as members of a social group (categorized). When people focus on category membership, their motivation revolves around values and concerns of the social group; they are more influenced by group norms than by individual considerations; they tend to make judgments based on perceived group standards; and they may be stereotype members of our groups, groups they view as opposed or different from their own (Fan and Poole 2006).

In the view of third dimension, (Blom et al. 2000) further examined the user- initiated customization (explicit) and system-driven personalization (implicit), and concluded that customization is less threatening to the privacy and security of consumers. (Shyamsundar 2010) identifies Customization as user initiated personalization and Personalization as system initiated.

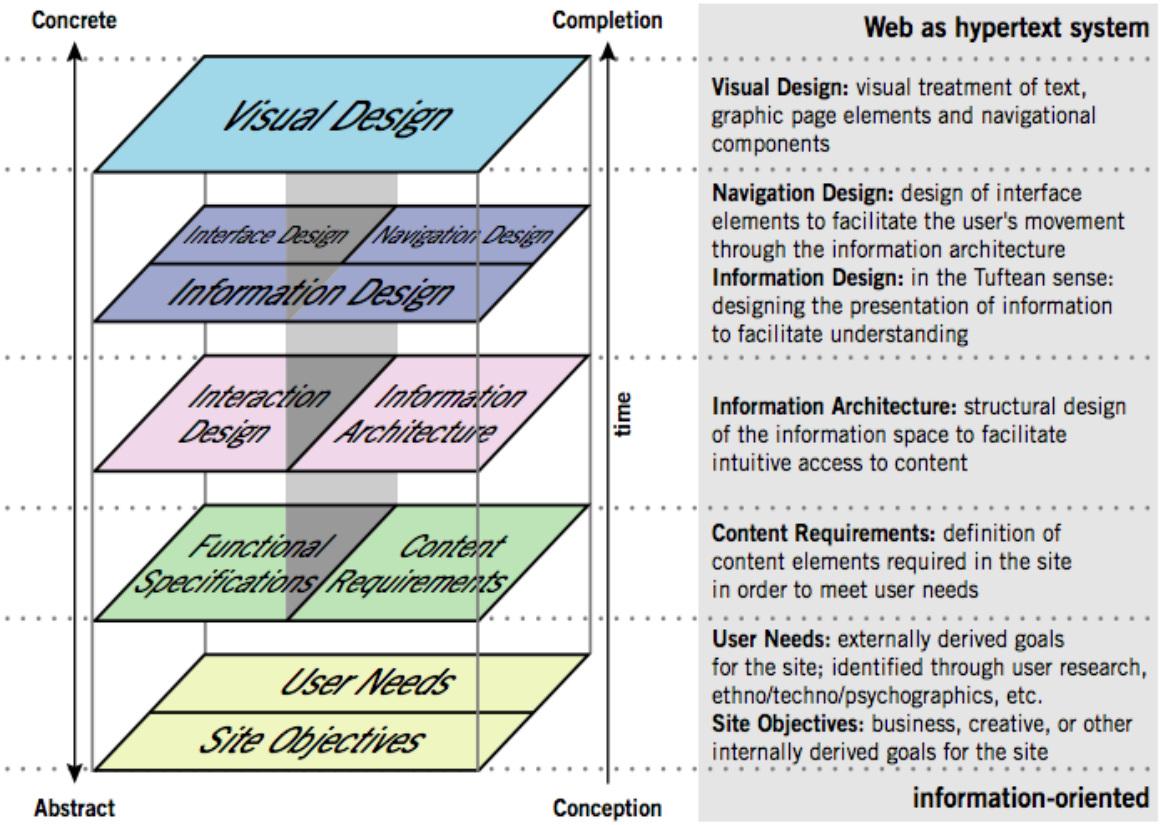


Figure 2.1: User Experience Design (Garrett 2003).

As the Table 2.3 below illustrates, this classification also fits in other classification of personalization in other disciplines. In this research we would like to investigate different personalization design aspects and how this design aspects plays role in decision making and behavioural change in user.

Table 2.3: Personalization Dimension Paradigm in previous research

Information	Presentation	Navigation	References
Content	Interface	Structure	(Kwon et al.2012)
Content	Interface (e.g. theme, background color, look & feel and visual appeal)	Navigation Structure (e. g. .website architecture)	(Wang 2009)
Content, i.e. credibility, currentness, relevance, sufficiency.	Design, i.e. the visual appeal of the website; interactivity, i.e. the extent to which the site is personalized to the user.	Navigation ,i.e. structural consistency of the website	(De Wulf et al. 2006)
Content e.g. Self relevance	Form	System Functionality	(Fan and Poole 2006)

2.4 Personalization in different Area:

2.4.1 Personalization in Web Designing/Engineering:

Personalization in Web engineering is a multi-disciplinary area, influenced by several communities such as multimedia, adaptive hypertext/hypermedia, human-computer interaction, software engineering and, information engineering. Information on the Adaptive Web is disseminated by means of hypermedia (i.e. textual content, images, video or audio sequences, layout and presentation) which is actively interconnected by links. Website system design is engineered and modeled by considering several usability issues, navigation and interaction support. Website is a repository of associative and non-linear browsable objects or items which are accessed through navigational links, interrelation of objects done through website modeling. Personalized or adaptive web modeling have been studied covering different aspects of website design including data structures and modeling using entity relationship model, data relationship methodology , object oriented hypermedia design modeling using Web Modeling Language, hypermedia design with combining object relationship model and website design method. Web Modeling is applying Unified Modeling Language Modeling (UML) based on web objects, which is based on object oriented system. WebML have been studied thoroughly in recent years.

Object Oriented Hypermedia Modeling (OOHDM) uses proprietary notations with design framework like notations with small set of primitives for personalized attributes and methods using object oriented hypermedia modeling concepts, different user modeling and business rules. OOHDM adapts the user class in conceptual model and present the relevant information and subsequently present adaptive navigation class model to adjust information to the user. WebML specifies personalization rules in its conceptual model which consist of page request; activation rule specific to different business rules and condition along with evaluation parameter in context with previously acquired information adaptation of hypertext user interface design. WebML has also been extended with use of different models to support adaptivity. The UWE is UML based Web Engineering model which is defined in the form of Unified modeling Language using object-oriented approach and model driven approach. It follows the principles of Unified Software Development Process and systematic development of adaptive web application by focusing system specific personalization rules.

UML based Web Engineering focuses on personalization features based on user model and an adaptation model design. It also focuses on adaptive navigation features depending on user explicit preferences, user modeling which is based on prior knowledge of user's implicit preferences and browsing history. User Model is represented as class diagram stating interactions of different classes of user model including user's attributes and their functionalities with respect to adaptive or personalized web application. User model should be designed by keeping in mind users dynamic need and preferences which is time and context specific. Personalized website is designed based on basic three models like domain model, user model, personalization model. Domain model is the structure of domain data based on business rules. User model is the structure derived from analyzing users' demographic profiles and navigation behaviours using website. Personalization model consists of three sub models: information model, navigation model and presentation model. Personalization model is designed based on business related personalized policies, presenting personalized website with content based on user model, user interface and navigation structure. Information model is structure of generating dynamic content based on user model. Navigation model defines the structure and behaviour of the navigation based on domain data, also presentation model is the layout of website user interface with hypermedia navigation structure and look n feel. Information captured about the user and knowledge base with business rules are foundation for personalization actions which is

described in personalization model. Web-based application development is characterized usually as an integrated set of activities producing three products of a Web application: application domain models, navigation models, and presentation models (Dolog P (2006)). Application domain model comprises abstract concepts, which are provided as information in a Web-based system. Navigation models usually describe possible navigation paths and navigation support through information space determined by the application domain model. Presentation model for a Web application describes visual characteristics of information presented by Web application, such as the layout configuration of information items presented and their appearance (Dolog P (2006)).

Adaptive website designs conceptual modeling with integration of user modeling, domain modeling, and personalization modeling with information, structure, and presentation. (Adomavicius, Tuzhilin, 2008) suggested recommendations for information modeling based on contextual user modeling by inferring user's contextual states based on most recent behaviour in website browsing of links and utilize sequential information in user's history of interaction to identify, predict the need and adapting the system's recommendations to users interest with respect to context. Relevant personalized information plays important role in modeling based on user's implicit and explicit need. Researchers have studied for recommender systems using different algorithms for relevant recommendations based on collaborative filtering (Schafer et. al. 2007), Hybrid Filtering, page rank based filtering (Eirinaki M, Vazirgiannis M 2005). Adaptive websites designs have number of design pages like types of adaptation, customization vs. transformation, content based vs. access-based adaptation and degree of automation (Perkowitz and Etzioni 2000). Adaptive website improves and transforms site organization and presentation based on user's' website access pattern and user profiling. Personalized websites adapts website information, navigation structure and presentation by applying mining techniques and analyzing Web Server logs and generate rules for adaptation. Websites generates recommendation for adaptive content based on different techniques like rule based filtering, collaborative filtering and hybrid filtering. For example, Amazon.in adapts website with collaborative filtering techniques and recommends users with different items searched and purchased with similar interest. Website recommendations are also generated based on users demographic profiles like income, gender, age etc and how closely product features match with users implicit or explicit

preferences, degree of matching for order of presenting product and rule based filtering techniques.

Effective website structure design is one of the prominent issues across many application domains on the World Wide Web in design engineering. The navigation structure of the personalized website are dynamic as per users need which should be easy to search and locate needed information with minimum cognitive efforts, ease of navigation and joyful. The success of any website can be measured with various criteria like number of clicks for URL, frequency of use and time spent on website for e-commerce website number of items purchased, ratings and recommendations by user. Richi Nayak 2010 studied computational parameter for measuring success of personalized website with trust, ease of disclosing information by user, and ease of use. Ease of use, enjoyment and efficiency of navigation are the key factors for website success. Website navigation structure and semantics are defined with Static Hypermedia Design and Object Oriented Hypermedia Design Method (OOHDM).

Personalization is a toolbox of technologies and application features used in the design of a user-orientated experience. Personalization features classification ranges from displaying user's name with greetings(Facebook, Yahoo! etc) on a web page to restructuring website complex navigation structure of catalogs and customization with different features with personalized user interface by offering theme, catalog, font, page layout and look & feel preferences based on deep models of users' need and behaviour. The personalization technologies range from accessing user information from databases, cookies, and generating dynamic web page as per users implicit and explicit need by pattern matching and machine learning algorithms, rule based inferencing and web data mining techniques(Kramer et al. 2000). Web data mining techniques uses web content/ information, website structure, web server logs generated with web data usage and user profile data. (Srivastava 2000, Eirinaki and Vazirgiannis 2003). The web personalization process comprises of major five modules like user profiling, website log analysis and web usage mining, information or knowledge acquisition, information management and website publishing. Web Usage Mining is the process of applying mining techniques on website logs data which consist three phases after cleaning website logs in data pre processing stage which is also known as data preparation stage, pattern discovery and pattern analysis phases. The pattern analysis is used for deriving rules of personalization and user

modeling. Mobasher et al. 2000, classified the website data in four different categories: content data, structure data, usage data, and user profile.

2.4.2 Personalization in Information Systems:

Personalization has been researched widely in the field of Information system design by keeping in view of various cognitive and hedonic factors influencing users behaviour and decision making process. Information system design research indicates positive influence of web information system design with appropriate user interface design and relevant personalization affects like, ease of use and usefulness (Lai et al. 2008, Blom and Monk 2007; Wang 2009) Personalized offerings, recommendations and services attracts customer, increases intimate experience with perceived care and influence in decision making to revisit or return (Thongpapanl et al. 2011, Liang et al.2009, Liang et al.2012, Sunikka and Bragge 2008). Personalized information system design is powerful in handling information overload of user (Liang et al. 2006) by generating more useful and relevant content (Fan Poole 2006), and increases the attention of user with one to one services.

Table 2.4 : Personalization related research in IS Author

Author /Yr	**Research Questions**	**Research Theory**	**Research Findings**
Bodoff and Ho 2014	Users attitude towards personalization agents, how web personalization can be managed to increase revenue	Elaboration Likelihood Model (ELM) Consumer Search Theory (CST)	Personalized item sampling and item selection affect revenue. Personalization offer a basis for generating revenue because users are generally willing to sample and select personalized items as their final choice, but the amount of personalized sampling diminishes with attitude confidence, while selection of a personalized item depends on it.

Liang et al. 2012	Study dual core theory that takes into account both economic factors (measured by perceived reduction in transaction costs) and emotional factors (referred to as the perceived care) in their effect on the perceived usefulness of providing personalized customer services	Information Overload Theory	Personalized customer services can generate higher perceived usefulness as compared to non-personalized ones. Perceived care had the highest impact on the perceived usefulness of customer services.
Benelian 2012	effects of content and design personalization cues on users' willingness to stick to a website and to pay for website offerings	Stimulus Organism Response	Design personalization cues exert their effects on website stickiness only through perceived enjoyment. willingness-to-pay (WTP) are mediated by both preference fit and perceived enjoyment
Yang 2009	Effect of personalization on users information processing and willingness to return	Stimulus Organism Response, Theory of Reasoned Action, Information Overload	The decision processes affecting the intention to continue to use a websit e are determined by different dimensions of personalization factors
Oulasvirta and Blom 2008	Motivations in personalization, what needs does it fulfill.	Theory of Self-Determination	Personalisation features can align the psychological resources with the user's action and therefore enhance performance and enjoyment of use with autonomy,competence and relatedness.
Komiak and Benbasat 2008	Effects of perceived personalization and familiarity on cognitive trust and emotional trust in an RA.	Theory of reasoned action	Perceived personalization significantly increases customer's intention to adopt by increasing cognitive trust and emotional trust.
Tam Ho 2006	Personalization effect on a user's information processing and decision making.	consumer research and Social cognition theory	Content relevance, self reference, and goal specificity effect the attention, cognitive processes, and the decisions of web users.

Blom and Monk 2003 define Personalization as a process that changes the functionality, interface, information content, or distinctiveness of a system to increase its personal relevance to the individual users need. Personalization is the adjustment and modification of all aspects of a website that are displayed to a user in order to match user needs (Wu et

al. 2003). Research in personalization has been approached from different aspects like what to personalize, how to personalize, level of personalization and when to personalize(Kwon 2012, Fan Poole 2006; Wu et al.2003)

Personalized web information system design in website varies with different purposes of website, users expectation or goal while using like experimental (hedonic) and goal-directed tasks (utilitarian). The trends in the recent researches suggest that website must provide wide range of personalization features, hedonic and utilitarian tasks. Different websites like social networking sites(msn.com, My Yahoo, iGoogle and Facebook.com), ecommerce sites(amazon.in, ebay.in) support both hedonic tasks to provide enjoyment, control and utilitarian task benefits like ease of using website and useful information recommendation. Users of personalized websites gain hedonic benefits and might performs hedonic behaviour (e.g. Impulsive buying) (valacich et al. 2007; Liang et al. 2012). Personalized services offer right product recommendations at the right time to cater users need and makes decision making process easier and more enjoyable (Pappas et al. 2012).

2.4.3 Personalization in E-commerce & CRM:

Recent growth in online business has resulted in increased use of different personalized services to develop one to one customer relationship, effective marketing, and to attract user and retain customers. Ecommerce websites use personalization as an effective strategy by providing one to one services like product recommendation, information and ratings of the product by satisfying individual users need. Websites like Amazon.in, and Ebay.in provide product recommendations based on collaborative filtering technique and also suggest some frequently buy items with people having similar interest in products. User's' navigational behaviour and search is analyzed and extracted knowledge is used to target user by showcasing advertisements catering their implicit need e.g. Facebook.com, and gmail.com. Previous research has also found that personalization technologies are powerful means to handle information overload (Liang, Lai, and Ku, 2006, Liang et al. 2012), to make websites more usable to users (e.g., better user satisfaction), and to help online businesses establish personal relations with their customers (one-to-one marketing and CRM). Vendors are also using personalization to match advertising and promotions

with customers' individual needs and preferences in what is known as *targeted* or *behavioural* advertising. The purpose of this study was to explore whether different personalized services would result in different effects on users' perceived usefulness. Online bookstores were chosen as the research domain due to their success recently. In previous literature, there exist at least three perspectives in interpreting the effect of personalization: information and effort reduction, personal persuasion, and relationship building (Liang et al., 2009b). The relationship building perspective adopts the concept of relationship marketing, and treats personalized services as a tool for building a close relationship between the sender and the receiver. Personalized messages intend to develop positive affection between the sender and the receiver. This feeling may include care, trust, and other related emotions. For instance, Komiak and Benbasat (2006) proposed a trust-centered perspective in studying the adoption of personalized recommendation agents. Both cognitive trust and emotional trust have been found to influence the intention to adopt personalization agents. This finding indicates that personalized services can give rise to an individual's emotional process and give the user a sense of togetherness with the personalized service and its provider. In addition, Liang, et al. (2009a) found that perceived care (an emotional factor) was more influential than transaction costs reduction (a rational factor) on the perceived usefulness of personalized services offered by online bookstores. These findings suggest that personalization may have significant affective influence on consumer buying behaviour

2.4.4 Personalization in HCI or Cognitive Science:

Human computer Interaction approach with personalization explores how different technologies influence users perception and behaviour. Recently Human Computer Interaction field research has gained more attention to improve the experience of the user with the computer medium by designing user friendly interface, increasing usability and reducing cognitive efforts while operating with computer system(Tam and Ho 2006; Wang and Benbasat 2005, Liang et al. 2009). User interface is the medium of interaction between information system and user so need more attention in designing information system to improve cognitive experience. Researchers use Stimulus- Organism -Response paradigm which suggest that atmospheric cues influence users through altering their

cognition and affect, which ultimately affects their behaviour like repeated use of website and decision making (Eroglu et al., 2001, 2003: Fan H. 2007). Cognitive experience of user can be improved with more ease of use, usefulness of content and usability by implementation of personalization features in information system (Liang et al. 2012, Kamis et al. 2008, Tam Ho 2006). Usability reduces the cognitive efforts of the user and increases ease of use to operate and navigate through the system. Usefulness of personalized information displayed on user interface enhances user experience and facilitates ease of use of system interaction. Personalization improves human computer interaction (Tam and Ho 2005 ; Liang et al. 2009) by providing personalized information (e.g. recommendations, ratings) , presentation personalization with customization facility to improve look and feel of user interface as per user's need and facilitating with personalized navigation and layout of website with quick links. Personalized information reduces human efforts of information search and increases user's cognitive experience which attracts user to revisit the website (Wang 2009).

2.5 Measuring Personalization:

Personalization success or effectiveness of web information system is measured through metrics using computational intelligence having different algorithms and techniques in the field of computer science research. In information system feedback technique is used for measuring success or effectiveness of system which is focusing on user's behaviour while interacting with the system based on theoretical foundations from diverse research disciplines such as cognitive science, computer science, psychology and statistics with Information System. Richi Nayak and Mohd Afandi 2010 proposed model for personalization based on components classification and categorization. Data mining techniques classification and categorization are used to personalize the content and recommending services based on classification rules defined. Personalization effects are also measured based on techniques like page ranking, click stream analysis and website log analysis of user's navigation pattern (Mobasher et al. 2005). Personalization success is also measured by firms in the form of return on investments and revenue.

2.6 Personalization Related Terms:

2.6.1 Customization:

Customization and personalization both refer to the process of tailoring web content for each user satisfying his need; however, customization would be one approach to implementing personalization. (Kwon et al. 2012 and Fan Poole 2006) stated customization as user initiated personalization(explicit), referred as user initiated actions for personalizing web content whereas personalization is system initiated tailoring of web content. Customization is often comprised of a suite of template-driven, finite set of options from which users choose (Fan Poole 2006).

(Shuk Ying. Ho 2009) distinguish personalization and customization with two dimensions: level of automation and level of individualization. Level of automation refers to user control in the process of generating recommendations. The two ends are user-driven and machine-driven. Level of individualization refers to the degree of differentiation of recommendations from one person to another person. Some recommendations are offered for a group of people, whereas some are tailored for each individual. This research refers customization as a part of personalization process to provide control over personalization process to the users.

This research considers customization as user initiated personalization which focuses on direct user control. In this, user controlled customization process provides user different choices or set of options for personalizing user interface with themes, fonts, color and background, user chooses options as per his or her interest and website changes appearance by user's preferences. For example yahoo.com and google.com provide users different choices to customize webpage with offered background themes and color options along with font size, style selection. Also information can be personalized by catering choices to user about user's need e.g. news, weather forecast, horoscopes selection etc. eBay, amazon and flipkart e commerce website search engines allows user to build customized, sophisticated search terms by choosing from a list of specified parameters to narrow down search results Customization of website structure is also provided by offering user with quick links like news by explicitly gathering choices of user.

2.6.2 Adaptation:

Personalization term is closely related with the term adaptation .In Human computer interaction research, this term refers to system's properties that can automatically adjust its behaviour and interact as per users need (Fan Poole 2006, M. Schneider 1993). Personalization can be addressed by two major approaches: adaptability and adaptivity. The adaptability enables users to adapt the content, layout and navigation supports to their preferences by themselves while the adaptivity enables the system to make an automatic adaptation for users (Treiblmaier et al., 2004; Frias-Martinez et al. 2009). The adaptive system is designed with explicit cognitive modeling of the user based on his projected needs and to enable the system to distinguish among different users. Adaptable systems, on the other hand, require the users need which is explicitly collected in the form of options from the user to present the system different. The distinction between adaptable and adaptive systems is similar to the distinctions between explicit personalization (customization) and implicit personalization and static and dynamic personalization (Fan and Poole 2006) that can be found in descriptions of commercial systems for personalization (Karat et al. 2003). The different terminology represents different perspectives presented in previous research. This research adopts the widely accepted term personalization (implicit or explicit) to represent, the adaptive or adaptable system based on previous research.

2.7 Personalization Techniques:

Personalization process comprises of two phases data collection and learning phase of data modeling. Data collection phase consist of obtaining the information pertaining to user interests and a learning phase user profiles are constructed from the data collected. Learning from data can be classified into memory based learning and model based learning depending on whether the learning is done online while the system is performing the personalization tasks or offline using training data (Mobasher 2007).

2.7.1 Collaborative Filtering:

Collaborative filtering is widely adopted technique to personalize web portal like Amazon.in, ebay.in use it to offer personalized recommendation of items in ecommerce web portal and friends list recommendations and personalized offerings in social networking web portals. Collaborative Filtering (CF) is the process of filtering or evaluating items through the opinions of other people. CF technology brings together the opinions of large interconnected communities on the web, supporting filtering of substantial quantities of data (J.B. Schafer et al. 2007). Collaborative filtering systems produce predictions or recommendations for a given user and one or more items. Items can consist of anything for which a human can provide a rating, such as art, books, CDs, journal articles, or vacation destinations. Ratings in a collaborative filtering system can take on a variety of forms (J.B. Schafer et al. 2007). Collaborative filtering uses the assumption that people with similar tastes will rate things similarly. Content-based filtering uses the assumption that items with similar objective features will be rated similarly. Collaborative Filtering Technique used for recommendation system works in two steps; firstly, it tracks users behaviours while browsing website and transactions across website. The recommendation software interprets user's preferences with comparison of information about the user's behavioural data against other user's similar behaviours. Second, it identifies the closest peers for each user having similar preferences and uses the ratings from those likeminded users.

Recommender systems of personalized web portal use collaborative filtering technique to alleviate the problem of information and product overload. Recommender systems feature two basic entities: the user and the item. A specific user who utilizes the recommender system by providing his/her opinion about past items will be called the active user. As a reward for his/her input into the system, the active user may request a number of suggestions regarding new items. A specific item for which one may request a recommendation will be called the active item. The process of generating recommendations is based on the input provided, which is usually expressed in the form of ratings from the active user, and the filtering algorithm, which is applied on that input.

2.4.2 Rule Based Filtering:

Rule based filtering technique is used to personalize the website based on the rules derived from information about the user and decision rules. Rule-based filtering systems rely on manually or automatically generated decision rules that are used to recommend items to users. Many existing e-commerce Web sites that employ personalization or recommendation technologies use manual rule-based systems. Such systems allow Web site administrators to specify rules, often based on demographic, psychographic, or other personal characteristics of users. In some cases, the rules may be highly domain dependent and reflect particular business objectives of the Web site. The rules are used to affect the content served to a user whose profile satisfies one or more rule conditions. Like most rule-based systems, this type of personalization relies heavily on knowledge engineering by system designers to construct a rule base in accordance to the specific characteristics of the domain or market research. The user profiles are generally obtained through explicit interactions with users. Some research has focused on machine learning techniques for classifying users into one of several categories based on their demographic attributes, and therefore, automatically derive decision rules that can be used for personalization (Mobasher 2007, Pazzani 1999). The primary drawbacks of rule-based filtering techniques, in addition to the usual knowledge engineering bottleneck problem, emanate from the methods used for the generation of user profiles. The input is usually the subjective description of users or their interests by the users themselves, and thus is prone to bias. Furthermore, the profiles are often static, and thus the system performance degrades over time as the profiles age.

2.4.3 Hybrid Recommendation based Filtering:

Different filtering techniques has their advantages and disadvantages like collaborative filtering based recommendation is limited when information about users preferences and ratings are not available which is referred as cold-start problem. To overcome this problem for recommendation hybrid recommendation based filtering is adopted which generates recommendation for personalization of information by combining two different

recommendation techniques. While traditional collaborative filtering only uses rating data, hybrid collaborative approaches that utilize both content and user rating data have also been proposed(Mobasher 2007). A common approach to resolving the "new item problem/cold start" is to integrate content characteristics of pages with the user-based data (i.e., navigational or rating data). Generally, in these approaches, keywords are extracted from the content on the Web site and are used to either index pages by content or classify pages into various content categories. In Web personalization, this approach would allow the system to recommend pages to a user, not only based on similar users, but also (or alternatively) based on the content similarity of these pages to the pages user has already visited.

2.4.4 Content Filtering:

In Content-based filtering systems, a user profile represents the content descriptions of items in which that user has previously expressed interest. The content descriptions of items are represented by a set of features or attributes that characterize that item. The recommendation generation task in such systems usually involves the comparison of extracted features from unseen or unrated items with content descriptions in the user profile. Items that are considered sufficiently similar to the user profile are recommended to the user. In most content-based filtering systems, particularly those used on the Web and in e-commerce applications, the content descriptions are textual features extracted from Web pages or product descriptions and also from users search text using website.

2.8 Research Gap & Scope of our research:

Research in personalization is broadly categorized as what to personalize, how to personalize and who does personalization as mentioned earlier. The dimension of what to personalize is the prominent aspect for designing web personalization with web portal which includes target of personalization based on business rules designed by website owners. Personalization is provided with the balance of providing flexibility to the users to

customize user interface by providing users choice and control to navigate through website. We identified that what to personalize is fundamental area to be researched and how this personalization affect users decision process.

This study investigates different personalization components in website architectural design with reference to HCI field. The functionality of website is fundamentally determined by the strategy of website (Garrett 2003). Functionality term is not used in this research as it represents functions at different level, scope of system and user experience which is context dependent on user requirement. The figure 2.1 of user experience design principle (Garrett 2003) shows functionality design of system at different level with interface, navigation and information model design. So webs consider only navigation, interface and information model design. Navigation plays an important role in website conceptual and architectural design. Therefore, we classify website design in three components for personalization, i.e. Information/Content, presentation/interface and navigation design.

CHAPTER - 3

Related Theories

3.1 Overview:

Based on research in previous literature on web personalization and related theories on environment psychology like stimulus-organism-response(S-O-R), flow theory, Information overload theory, Technology Acceptance Model (TAM) and updated Information System success model, this study adopts web personalization centered design aspects, utilitarian (cognitive), hedonic (affective) and control perspective to investigate its effect on user satisfaction and intention to revisit the website. This chapter summarizes the related theories in previous literature with personalization reference.

Table 3.1. Personalization related theory summary

Research Stream	Major Theory	Explanation	References
Environmental Psychology	SOR theory	Environmental psychology states that emotional response to the environment mediate the relationship between the environment and one's behaviour	(Mehrabian and Russell 1974) (Donovan and Rossiter 1982) Donovan et al. 1994) (Kim et al. 2007) (Wu et al. 2008)
	Flow theory	A stimulating experience is likely to induce a flow experience, which in turn leads to more exploratory behaviour.	(Koufaris 2002) (Finneran and Zhang 2003) (Zhang and Dillon 2003) (Sicilia et al. 2005) (Huang 2006) (Zhang et al. 2006) (Hwang and Kim 2007)
Information System	TAM	It posits that individuals' behavioural intention to use an IT is determined by two beliefs: perceived usefulness (PU), and perceived ease of use (PEU). Information	(Davis 1986; Davis 1989b) (Hong et al. 2001) (Chau and Tam 1997) (Hong et al. 2006) (Venkatesh and Bala 2008)
	D&M IS Theory	Success of information system measured with information, system and service quality, use, satisfaction and net benefit. Users' intention to use the system is interrelated with Satisfaction.	(McLean DeLeon 2003) (McLean Deleon 2013)

Cognitive Psychology	Information Overload	Users are given more information than they can handle within a given time frame.	(Newell and Simon 1972) (Vessey 1991) (Ho and Tang 2001) (Hong et al. 2004) (Shaft and Vessey 2006) (Liang et al. 2006,2007) (Nadkarni and Gupta 2007) (Kamis et al. 2008) (Chau et. al 2011)
	User Involvement Theory	User involvement in information system design and development leads to successful implementation and improves decision making	(Ives and Olson 1984) (Baroudi et al. 1986) (Mclean 1996)

3.2 Environmental Psychology:

3.2.1 S-O-R:

(Mehrabian and Russell 1974) research in Environmental psychology posits that user's behaviour is mediated by users emotional response to the environment. Users' emotional response is mediator to the environmental cues which influence users behaviour (Eroglu 2001, 2003, Kim et al. 2007, Benelian 2015). Stimulus-Organism-Response(S-O-R) model postulates that the environment (i.e. stimulus) influences users' cognitive and affective experiences (i.e. organism) that mediate user's response e.g. Avoidance or approach desire to stay/revisit (Mehrabian and Russell 1974; Kim et al. 2007). In our research framework, stimuli refer to the environmental stimuli based on personalized design (personalization features) that are used to create the personalized web portal. Organism is represented by cognitive and affective states of users experience and processes that moderate the relationship between the environmental stimuli and user's' response, which is user intention to continue to use the website portal.

S-O-R Model has been comprehensively studied in cognitive science and marketing research, e.g. "consumer response to online shopping" model in (Eroglu 2001) and "cyberscape" model in (Russell and Miriam 2004 Jacoby 2002). The online store environmental information will influence shoppers' organismic states, which then affect

their shopping outcomes of approach and avoidance behaviour (Eroglu 2001, 2003). Stimuli of a retail website were found to influence cognitions and affect that have an impact on approach response (Bitner 1992; Mehrabian and Russell 1974; Eroglu 2001, 2003). Therefore, website stimuli need to be planned and designed with web personalization dimensions to engender approach behaviour (i.e. decision to reuse the website) (Russell and Miriam 2004, Fan 2007).

In the field of information system research, researchers have increasing interest in identifying relationship between website stimuli and user behaviour (Lee et al. 2008, Tam and Ho 2006). The S-O-R model has been used to examine the effects of design factors on online environment of websites (Benlian 2015, Fan 2007, Wu et al. 2008). Website content has been conceptualized as a mix of stimuli that take the form of text, images, audio, animations or video (Tam and Ho 2006, Tsekoura et al. 2011). An aesthetically well designed website can improve visual appeal (Kim et al., 2007) and provide pleasant and positive shopping outcomes (Kim, Kim, & Kandampully, 2009).The level of image interactivity technology (IIT), such as zoom-in functions and 3D virtual models can enhance consumers' online shopping experiences (Kim et al. 2007). Website with personalized information reduces the cognitive load of user and enhances user's performance during website surfing (Ho and Bodoff 2014, Thongpapanl et al. 2011).

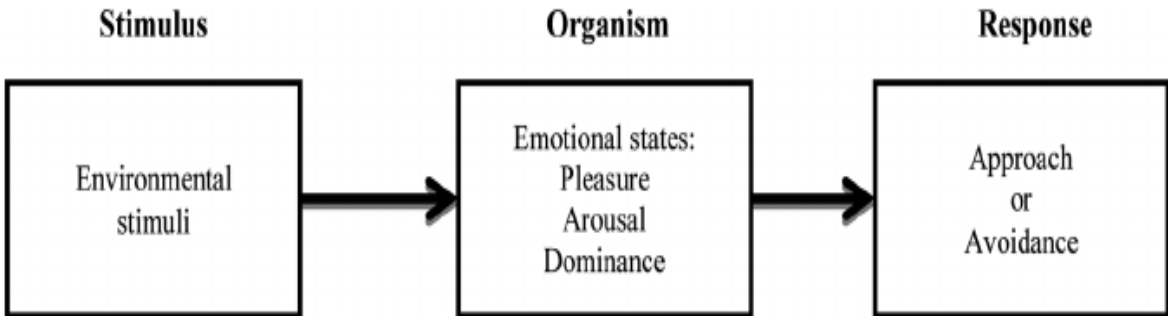


Figure 3.1: Original S-O-R model developed by Mehrabian and Russell (1974).

3.2.1.1 Definitions of Stimulus, Organism, and Response:

In S-O-R model stimulus is conceptualized as an influence that arouses the individual and affects his or her internal, organismic states (Mehrabian and Russell 1974, Eroglu 2001, 2003). In the context of personalized website designing, we define the stimulus as the total of all the website cues presented in the form of visual and aural sensory contents like text, images, audio, video animations and look & feel of user interface. Stimuli are cognitive and affective sensory experience generated during website browsing from website content and how it is designed. For web designers, generating experience of flow to user, both breadth of visual and aural sensory content provided (e.g. rich media) and the depth of sensory information provided (the quality and amount of information embedded in the presented stimuli, images) are significantly important (Wang 2009, Russell and Miriam 2004).

Previous research in environmental psychology showed that taxonomy design and development of stimulus was extremely difficult because of the existence of a great deal of stimuli involved in the environment. Website environmental taxonomy designing of stimuli is given more importance in website designing with personalization features as personalization targets users' individual need which is dynamic in nature. Mehrabian and Russell (1974) by deriving information theory suggests general measure of environmental stimulation containing various physical and social settings as the load of an environment, with the degree of complexity and novelty involving unexpected, new or unfamiliar things.

Environmental cues of website are categorized as lean and rich media based on media richness theory. Lean media are characterized by unequivocal and unambiguous information while richer media contain more emotional, ornamental, and emphatic features (Walther, 1992). Sautter et al. (2004) propose website environmental cues (elements) for online atmospheric studies like vividness, interactivity, symbolism, and social elements. Complexity of website refers to the number of elements or features, its layout and extent of motion or change experienced while browsing. Donovan and Rossiter(1982)'s present model describe the load of an environment as users' behavioural response in stimulated, excited, and alert.

According to the S–O–R paradigm, organism represents user's emotional experience, it is an intermediary state that intervene the relationship between the stimulus and user's responses (Mehrabian and Russell, 1974, Eroglu 2001). User's emotional experience is characterized as cognitive and affective states representing three dimensions pleasure, arousal and dominance (i.e. control) in environmental psychology (Mehrabian and Russell, 1974, Eroglu 2001, 2003). In retail website design, common scales indicators pleasure, arousal, and control are used to represent effect of atmospheric cue. Pleasure is the feeling of satisfied, happy, enjoy, relaxed, and content. Arousal is the feeling of aroused, stimulated, alert, surprised, excited, interested, and rewarded. Dominance (i.e. control) is feeling of influential, controlled, important, dominant, or submissive (Lee et al. 2008, Wang 2009). These three dimensions come together under the common acronym PAD (pleasure-arousal-dominance) (Mehrabian and Russell 1974). Control dimension is omitted when studying consumer emotions based on expectation of low predictive value (Eroglu 2003, Donovan and Rossiter 1982; Lee et al. 2008).

Users' behavioural response is presented in approach or avoidance. Approach behaviour refer to all positive actions that might be directed toward a particular setting, for example, intentions to stay, explore, and affiliate, while avoidance concerns the opposite (Eroglu 2001;Mehrabian and Russell, 1974; Bitner, 1992). Approach-avoidance behaviours are considered to have four aspects: (i) a desire physically to stay in or to get out of the environment; (ii) a desire or willingness to explore the environment or a tendency to avoid interacting with the environment; (iii) a desire or willingness to communicate with others in the environment or a tendency to avoid interacting with others; (iv) the degree of enhancement or hindrance of performance and satisfaction with task performance (Donovan and Rossiter 1982). In this study, the approach behaviour is presented as satisfying condition and intention to reuse or revisit the personalized website.

3.2.1.2 Stimulus and Organism:

The website environmental cues stimulate user's cognitive state and influence users perception and beliefs about the environment of website, the organization, and its service quality. Pleasant environmental cues attract user to spend more time and motivate to reuse

or revisit the website. Environmental psychology states that user's emotional response to the environment mediate the relationship between the environmental stimuli and user's behaviour of approach or avoidance (Mehrabian and Russell 1974). Koufaris 2002 elicit that physical and social stimuli in the environment influence the individual's emotional state and its emotional state is represented in three experimental variables defining person's feeling of pleasure, dominance, and arousal, that, in turn, influence behaviour such as job performance, satisfaction and social interaction. Website atmosphere or preference to environment is based on website complexity, mystery and coherence (Bitner 1992).

3.2.1.3 Organism and Approach Responses:

Environmental psychology theory suggest that users response to the environment is in the form of approach or avoidance based on cognitive and affective experience of environmental stimuli(Mehrabian and Russell 1974). Approach behaviour of user signifies positive response and experience like desire to revisit or continue to use, explore and affiliate with the environment (Mehrabian and Russell 1974). Personalization of a website offers utilitarian benefits of saving time/efforts and increasing likelihood of finding desired information and hedonic benefit of enjoyment, which in turn will have an impact on intention to return (Koufaris 2002). Prior research shows that shoppers affective states, e.g. enjoyment and control, influence several approach behaviours like willingness to purchase, spending more time and money, number of items purchased, desire to revisit and satisfaction of personalized recommendation (Wang 2009, Bitner 1992, Éthier et al. 2008).

3.2.2 Flow Theory:

Flow theory illustrates "flow as emotional state that leads to exploratory behaviour and sustained interest". (Csikszentmihalyi 1990) defined "flow "as holistic experience people feel when they act with total involvement. The individual experience flow when they become absorbed in their activity, people feel carried away with the activity without

conscious awareness about his or her involvement. Russell and Miriam (2004) cites that Flow does not usually occur during relaxing moments or passive entertainment rather it occurs when we are actively involved in a task or activity which stretches our mental and/or physical abilities. Website environmental cues affect the consumer's emotional response, such as shopping enjoyment in apply flow theory and TAM (Koufaris 2002). Website atmosphere induces users' active involvement with enjoyment while browsing personalized website (Wang 2009). Hwang and Kim 2007 apply flow theory to investigate the affective variables to understand the relationship between information systems development and e-trust Flow is too broad and ill defined because of the numerous ways it has been operational, tested, and applied (Koufaris 2002).

Previous research in IS, HCI, Marketing, Education and other disciplines have applied Flow theory, to understand human behaviour with computers and thus inform better ICT design, training and use over last decades. Finneran and Zhang 2005 proposed model describing role of flow in computer mediated environment based on flow theory states that flow can yield in increased learning, improved attitudes, increased computer use, and overall, positive experiences within a computer-mediated environment.(Finneran and Zhang 2005) Website environmental factors like layout, aesthetic, design and navigational control are found to affect the consumer's emotional response, such as shopping enjoyment in apply flow theory and TAM (Koufaris 2002; Dailey (2004)). Hwang and Kim 2007 apply flow theory to investigate the affective variables to fully understand the relationship between information systems development and e-trust (2007).

Research on flow indicates that an interaction acting as stimulating experience is likely to induce a flow experience, which in turn leads to more exploratory behaviour (Koufaris et al. 2001). Interactivity also facilitates flow by giving the user a sense of control. Active involvement of the user participating in an interaction creates a strong bonding experience. Previous study has presented that higher interactivity generated higher flow scores amongst respondents (Hoffman and Novak 1996; Russell and Miriam 2004).

3.3 TAM (Technology Acceptance Model):

Technology Acceptance Model (TAM) proposed by (Davis 1986) has been widely referenced and adopted in Information System research (Davis 1986). TAM posits that individuals' behavioural intention to use an IT is determined by two beliefs: perceived usefulness (PU), and perceived ease of use (PEU). Perceived Usefulness and Perceived Ease of Use is cognitive state of users experience while using the system. Davis (1986) defined Perceived Usefulness (PU) as" the degree or the extent to which a person believes that using IT system will be enhancing his or her job performance". Perceived Ease of Use (PEU) is defined as "the degree or the extent to which a person believes that using IT system will be free from efforts". (Venkatesh and Bala 2008) extend TAM and further theorizes that the effect of external variables (e.g. design characteristics) on behavioural intention will be mediated by perceived usefulness and perceived ease of use. Extended TAM posits that perceived enjoyment is intrinsic motivation that leads to intention to use technology (Davis 1989; Davis et al. 1992). Over the last two decades, there has been substantial empirical support of TAM (Adams et al. 1992, Venkatesh and Bala 2008, Venkatesh 2012, Fan 2007). Venkatesh and Bala 2008 synthesized determinant of PU and PEU as individual differences, system characteristics, social influence, and facilitating conditions of user. Personalization has salient features of system which help to develop favourable perceptions about Perceived Usefulness and Perceived Ease of Use of System. TAM consistently explains about 40% of the variance in individual's' intention to use an IT and actual usage. The TAM model is extended to research IT adoption and its use by users by researchers to provide extended theories and explanations of determinants use in decision making(Venkatesh and Bala 2008; Fan and Poole 2006; Venkatesh 2000).

Technology Acceptance Model is based on Theory Reasoned Action (TRA) Model by Fishbein and Ajzen 1975. TRA posit that an individual's behaviour is predicted by his or her intention to perform this behaviour. The intention is influenced by two factors: attitude toward this behaviour, which is a function of beliefs about consequences of this behaviour, and subjective norms concerning this behaviour, which are a function of normative beliefs about this behaviour. Attitude toward the behaviour is a person's positive or negative feelings (evaluative affect) about performing the behaviour; a subjective norm is a person's perception that most people who are important to him or her think he or she should or

should not perform the behaviour (Fishbein and Ajzen 1975). One of the most common criticisms of technology acceptance model (TAM) has been the lack of actionable guidance to practitioners. Venkatesh and Davis 2000 extended TAM with categorizing external variable as Computer self efficacy, external control, playfulness, perceived enjoyment and objective usability.

All three theories (i.e. TAM, environmental psychology, and flow theory) posit number of emotional and cognitive responses to the environment which influence individual behaviour. Koufaris 2002 apply TAM and flow theory to online consumer behaviour signifies effect of website environment on consumers' behaviour to use online website influence cognitive and affective experience which is reflected by consumer behaviour. This type of research in context of online environment helps to understand user's response and behaviour.

3.4 Information Overload Theory:

Information Overload is the cognitive load user experience i.e. number of information processed by user Information overload, means users are given more information than they can handle within a given time frame and are likely to remove some information to reduce effort of finding information(Liang et al. 2007). Human has cognitive limitation of processing information at one time which generates the information overload when information is presented to the user in complex form or it requires more efforts to the user to process that information. In the context of user's interaction with the website, user experience cognitive load while locating information or searching information, complex layout of website which affects users decision making. Complexity of web information system is one of the measures to identify cognitive load. Web information system design with less complexity increases user's efficiency and performance with relevant personalized recommendation (Liang et al. 2006). Perceived Website complexity is measured with two dimensions structural complexity which comprises of range and dissimilarity of structural elements and Interactive or navigational complexity comprising of navigational ambiguity and probabilistic hyperlink outcomes (Nadkarni and Gupta 2007).

Website with good amount of complexity is important for website structure which enhances customer relationship and effectiveness in interaction with website. Good complexity in website design is required for personalization of services provided to user which help to induce customer loyalty. Malfunctioning of personalization like irrelevant and biased recommendation affects inversely with users intention to use and satisfaction (Chau et. al 2011). Liang et al. 2009, based on information overload theory, argue that personalized services can reduce the complexity of consumer choice. Liang et al. 2007 identifies theories related to the use of personalized content services and their effect on user satisfaction. Three major theories have been identified—information overload, uses and gratifications, and user involvement. The information overload theory implies that user satisfaction increases when the recommended content fits user interests (i.e., the recommendation accuracy increases).

Information overload affect decision making in two ways (Liang et al. 2006). Due to sheer volume, users are unable to locate what they need most; often making them overlook what they consider critical (Herbig and Kramer 1994), user also fail to use the relevant information at hand leading to the inefficient use of decision making time (Wang et al. 2003, Farhoomand and Drury 2002, Wilson 1995). Ho and Tang found three factors cause of information overload – information quantity, information quality, and information format. Technology is useful in alleviating information load (Ho and Tang 2001). Information customization and information push along with search engines, information agency and brand identification can deal with information overload (Berghel 1997). Usage of knowledge maps could reduce information overload on Web browsing. Liang et al. found that both the number of items recommended to the user and the recommendation accuracy have significant effects on the satisfaction of the user and increase of effectiveness in search of information. In addition, Liang et al. 2006 confirm that personalized services can increase user satisfaction through accurate recommendation of relevant contents and that the effect of recommendation accuracy on user satisfaction is moderated by different information usage modes.

Some studies suggest an inverted U relationship between website complexity and communication effectiveness (Geissler et al. 2001; Nadkarni and Gupta 2007; Stevenson et al. 2000). Whether complexity enhances or inhibits user experience may be depended on user online task goals and the level of complexity (Nadkarni and Gupta 2007). The

inverted U relationship is not the focus of current research and this theory is applied for explaining related findings.

3.6 User Involvement Theory:

"User involvement" refers to user participation in the system design and development process by representatives of the target user group. Ives and Olson 1984 proposed theory of user involvement for successful information system design. Research in organizational behaviour shows that user involvement leads to improved chances of successful system implementation. Ives and Olson 1984 considered two areas of theory particularly relevant are participative decision-making and planned organizational change (Ives and Olson 1984). (Ives and Olson 1984; Mclean 1996) presented, empirically research showed relationship between user involvement and indicators of systems success. "User involvement" in information system development is generally considered an important mechanism for improving system quality and ensuring successful system implementation. The results demonstrate that user involvement in the development of information systems will enhance both system usage and the user's satisfaction with the system (Baroudi et al. 1986). Kappelman et al. 1992 proposed that users' involvement is psychological state which is important in understanding information system success and mediated in participation success relationship of behavioural-attitudinal model. Research based on user involvement theory shows that user involvement in the design of an information system leads to increased system usage, more favourable perceptions of system quality, or greater user information satisfaction (Baroudi et al. 1986).

The user involvement theory implies that users prefer content recommended by a process in which they have explicit involvement. User involvement in the process of creating personalized content affects user satisfaction (Liang et al. 2007). Personalized information system design requires personalization rules and strategies.These strategies can be derived based on users need. User involvement in personalization rules design is increased by acquiring explicit feedback and users' demographic information. Customization is explicit or user initiated personalization which requires users involvement and feedback to personalize system e.g. google+,yahoo.com website explicitly ask users interest by offering

choices for customizing user interface with look and feel, font, background themes and color. User's information and feedback plays important role in information system design. User satisfaction will be higher for recommendation systems that use explicit user feedback for personalization than for systems that do not require explicit user feedback (Liang et al. 2007).

3.7 Information System Success model:

Information System Success model is very well researched in the area of information system design. DeLone and McLean 1992 proposed model for measuring success of information system, which states that success of information system depends on two aspects of system, i.e., information quality mediated by user satisfaction and system use. Delone and Mclean 2013 in updated information system success model propose six success dimensions to measure success of IS with information quality, service quality, satisfaction, usage and net benefit by using system. The model proposes that information quality and service quality of information leads to usage and satisfaction which in turns produce net benefit to user. Updated D&M IS Success model presents that "use" and "user satisfaction" are closely interrelated. "Use" must precede "user satisfaction" in a process sense, but positive experience with "use" will lead to greater "user satisfaction" in a causal sense. Similarly, increased "user satisfaction" will lead to increased "intention to use," and thus "use".

Delone and Mclean 2013 defined system quality measures for success of ecommerce website as usability, availability, reliability, adaptability and response time (e.g., download time) which are valued by ecommerce users. "Information quality" of web content should be personalized, complete, relevant, easy to understand , secure to initiate transactions via the Internet and return to our site on a regular basis. "Service quality" (Delone and Mclean 2013) defined as the overall support delivered by the service provider to improve customer relationship. "Usage" measures everything from a visit to a Web site, to navigation within the site, to information retrieval, to execution of a transaction. User experience satisfaction with information, service and system quality are more satisfied, increases usage and receives net benefits.(McLean and Delone 2013). Personalization has been adopted as

important strategy used to improve system, information and service quality while information system designs. Richi Nayak et al. 2010 developed theoretical acceptance model for measuring personalization success and identified three components for success of personalization measure. The first measure is the ability to classify and categorize the Popular Features of the Website, the second measure is competitiveness and the third is acceptance among user. Personalization strategy for information system design can be developed for success based on three user's focal behaviour: acquiring information through personalized website, giving personal details on the personalized website (e.g. filling online form for registration on e-commerce website), and navigating through personalized website (Richi Nayak et al. 2010). Personalized website designs features like information, presentation and structure based on users need with the information provided by user in the form of feedback or demographic information shared by user. User's willingness to share personal information measures trust in personalized website (Benbasat et al. 2007).

CHAPTER - 4

Research Framework/Model

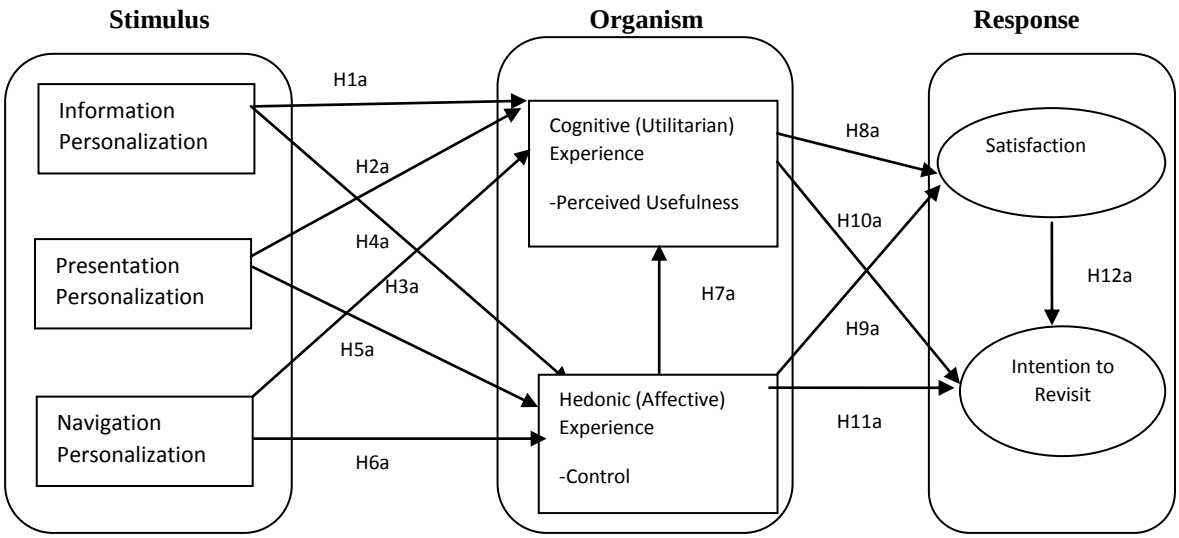
4.1 Overview:

Research framework is presented in this chapter based on theory of environmental psychology, updated Information System success theory and TAM with empirical evidences in previous research. This study aims to examine the effect of personalized environmental cues on the user's hedonic and utilitarian states that in turn influence users response behaviours, i.e., satisfaction and intention to revisit the website. We proposed model based on S-O-R model (Mehrabian & Russell, 1974) as it provides theoretical foundation to identify the personalized website environmental cues as stimulus and it also enables to investigate mediating role of personalization dimensions on user's decision process of cognitive and affective states along with dominance. The response is presented in the form of user's satisfaction and intention to revisit or reuse the personalized website. Personalized environmental cues for website are with information, navigation and presentation personalization as stimulus in this research.

4.2 Research Framework:

This research aims to study, firstly various personalization design aspects i.e. information personalization, presentation personalization, and navigation personalization used in websites which are web stimuli, secondly impact of personalization aspects (Web Stimuli) on hedonic, utilitarian state of user, thirdly its effect on user’s behavioural response and satisfaction. Moreover, interaction among cognitive/hedonic experience, utilitarian/affective state, satisfaction and intention to revisit are also taken into consideration, which is missing in prior literature.

The proposed research model is derived from the environmental psychology theory, S-O-R (Stimulus- Organism-Response) theory, Information Overload theory, TAM (Technology Acceptance Model) and Information System success model. Definitions of different personalization design aspects are presented based on environmental psychology. Impact of different aspects of personalization effects on decision making process, is described with cognitive/ hedonic and utilitarian experience of user like perceived ease of use, perceived usefulness, enjoyment and control. User with positive hedonic and utilitarian experience has more satisfaction and is likely to revisit / reuse the personalized websites. More specifically, this study focuses on how user perceives personalization aspects and their influence in decision making to reuse the website. Hypotheses are proposed to address the research questions.



[Figure 4.1: Research Framework for website personalization]

4.3 Definitions:

4.3.1 Environmental Stimuli – Dimensions of Personalization:

Borrowing from information theory, Mehrabian and Russell (1974) proposed a general measure of environmental stimulation applicable across many and various physical and social settings: the information rate or "load" of an environment. They define the load of an environment as its degree of novelty and complexity. Novelty involves the unexpected, the surprising, the new, and the unfamiliar. Complexity refers to the number of elements or features and to the extent of motion or change in an environment. Eroglu et al. (2001) defined website stimuli e.g. environmental cues as high task-relevant and low task-relevant online cues. High task-relevant cues include verbal or pictorial contents and low task-relevant cues, on the other hand, are peripheral contents like color, background patterns, typestyles, fonts and images. Even though low task-relevant cues can lead to a more pleasant online shopping experience, these cues do not directly influence the completion of the shopping task. Low task-relevant cues function to create a mood or an image for the online website.

Personalization is the process of tailoring website by satisfying user's implicit and explicit need (Desai and Kumar 2016). The goal of web personalization is to deliver individualized right content to users at the right time to induce a favourable response to the personalized offerings and to increase user loyalty for future interaction. Personalization is the extent to which a site is perceived to provide information / interface / navigation personalized to the unique needs of each user. Information personalization is the extent to which information can be catered according to user's' implicit or explicit requirement (Desai 2015). Users can specify their requirements of the information through customization choices to search or get recommendations from the website. Presentation personalization is the extent to which interface can be modified according to user implicit or explicit requirement (e.g. color, layout, background, themes etc.). Navigation personalization is the extent to which navigation can be modified in according to user requirement (e.g. new tabs and re-organized the elements to new tabs). User can reorganize the website structure by creating new categories and move information into them or generating quick links.

4.3.2 Organism - Hedonic/Affective and Utilitarian/Cognitive state:

As postulated in the S-O-R model by Mehrabian and Russell 1974, organism is intermediary state and processes which mediate the relationship between stimulus and user's response. User's internal state represents cognitive/utilitarian and hedonic/affective experience with website stimuli i.e. website environmental cues. Most work in environmental psychology conceptualized the affective states along three dimensions (Eroglu et al. 2003), i.e. pleasure, arousal, and dominance (PAD). Cognitive state refers to user internal mental processes and states including attitudes, beliefs, attention, comprehension, memory, and knowledge. User's cognitive or utilitarian and affective/hedonic states are induced by environmental stimuli and also influence response. Users experience utilitarian benefit with the relevant personalized information reduces information search.

User's cognitive experience is associated with user's perceived ease of use and usefulness of the system (Davis 1989). Enjoyment is the user's emotional experiential state and defined as the extent to which using a system is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated (Carroll, 1988). Davis et al. (1992) classified enjoyment as an intrinsic motivation for adopting technology. Enjoyment was also shown to induce perceptions of ease of use with subjects, thus enhancing technology adoption (Venkatesh, 2000).TAM3 also includes enjoyment as a determinant of ease of use (Venkatesh and Bala 2008). So we consider perceived ease of use, enjoyment and perceived usefulness as user's cognitive or utilitarian experiential state which represent pleasure and arousal state as per environmental psychology. Lee et al. 2006 posit significant indirect effects of level of Image Interactivity Technology (IIT) on attitude and behavioural intention toward the online retailer mediated by direct effects of TAM's perceived usefulness, perceived ease of use, and perceived enjoyment.

Perceived Control is user's emotional response representing hedonic state of user. User's perceived control has been defined as the level of one's control over the environment and one's actions in flow research (Koufaris 2002). Perceived control is also similar to the emotional response of dominance from environmental psychology, where it is defined as feeling "unrestricted or free to act in a variety of ways" in a specific situation and environment (Mehrabian and Russell 1974). In fact, an adapted scale for dominance has

been used to measure perceived control in flow research (Novak et al. 2000). Though it is expected that users demand more control, less effort, and higher efficiency during shopping, perceived control is found not significantly related to intention to return in online shopping in some research (Koufaris 2002). Other theoretical framework also use perceived control under different variations, e.g. perceived locus of control, perceived control in achievement motivation theory, self-efficacy, and perceived behavioural control in the theory of planned behaviour. Sundar (2008) points out that, aside from providing a sense of identity and ownership, self-as-source can provide a real sense of control to the user, which in itself can be a motivating force. In fact, need for control is correlated with the amount of customization among users (Marathe, 2007). But, not everyone desires control; users may feel increased levels of control when they are given the option to customize a Webpage themselves rather than having the Website personalize it for them (Sundar 2010).

4.3.3 Approach Behaviour Satisfaction and User Intention to Revisit:

Research based on environmental psychology theory posit that users response to the environment is in the form of approach or avoidance based on cognitive and affective experience of environmental stimuli(Mehrabian and Russell 1974). Approach behaviour of user signifies positive response and experience like desire to revisit or continue to use, explore and affiliate with the environment (Mehrabian and Russell 1974). Intention to revisit or continue to use a website is an important user behavioural intention in online environments (Kamis et al. 2008; Koufaris 2002). User's high utilitarian or cognitive and hedonic/ affective experience leads to satisfaction which is motivating factor to revisit the website (Benelian 2015, Yoon 2012, Eroglu 2003). The increase in number of new visitor and retaining existing visitor produces business in web portal with the medium of online advertisements, sponsors so providing good experience to the user is vital for adding business value for web portal.

Users' intention to revisit is positively associated with intention to return or revisit (Eroglu 2003, Yoon 2012). A user with good experience with web portal is more satisfied and

likely to revisit the web portal, given their original premise that environmental cues affect consumers' response behaviours both in a traditional and an online retailing context. Eroglu et al. (2003) tested how online environmental cues influence consumers' affective (hedonic) and cognitive (utilitarian) states, as well as consumer responses. Perceived online environmental cues (i.e., high task-relevant and low task-relevant cues) had significant effects on consumers' affective states such as pleasure and arousal. Overall, the affective states induced by online cues had a greater influence on consumer attitudes toward the online store and response behaviours such as satisfaction and approach/avoidance behaviours (Eroglu et al., 2003). Yoon 2012 research results indicated that consumer attitudes had positive influences on response behaviours. Compared to the respondent's hedonic attitudes, utilitarian attitudes played a stronger role in influencing their satisfaction and purchase intention.

This research focuses on different personalization design aspects used in personalized web portals like ecommerce and social networking websites, also we investigate causal relationship of personalization aspects on user's intention to revisit the website and its intermediary states based on S-O-R model.

4.4 Hypotheses:

Hypotheses are drawn in the research framework presented in previous section. Table 4.1 depicts details of theories and empirical evidences are presented in the following sections to support the hypotheses. Personalization features on website serve as the environmental stimulus, and evoke user's utilitarian/cognitive experience (perceived usefulness, perceived ease of use and enjoyment) and hedonic/affective reactions (control), which in turn have an impact on user's satisfaction and intention to continue to use this website. Updated Information System (IS) success theory, Flow Theory and TAM theory serve as the major theories in proposing the hypotheses.

Table 4.1 : Research Hypotheses

Hypotheses	Supported Theories	Supported Data	References
Personalization and Cognitive/Utilitarian experience (Perceived Ease of Use, Perceived usefulness, Enjoyment)	TAM , Environmental psychology and flow theory	TAM research, this study argues that the degree to which the website is perceived to be easy to use affects the perception of the usefulness. Website content and organization positively relate to enjoyment.	(Davis et al. 1989) (Chau and Lai 2003) (Eroglu et al. 2003) (Eroglu et al. 2001) (De Wulf et al. 2006) (Nadkarni and Gupta 2007)
Personalization and Affective/Hedonic experience(Control)	Environmental psychology and flow theory	Website content and organization positively relate to enjoyment. Direct effect of environmental cues (e.g., high or low task relevant information) on hedonic or affective response (control)	(Eroglu et al. 2003) (De Wulf et al. 2006) (Nadkarni and Gupta 2007)
Hedonic experience-> Cognitive Experience	Empirical evidence in HCI	Greater customer control of the shopping experience increased the pleasure and convenience of shopping. Users with a high level of perceived control are likely to feel more a high comfort level with the activity. Thus they would be more inclined to feelings of enjoyment and to use the web more.	(Manuel and Joaquina 2004) (De Wulf et al. 2006) (Lindley and Monk 2008)
Cognitive/Utilitarian experience-> Satisfaction	Environmental psychology, Information System Success Model	User experience with high quality relevant information reduces his cognitive efforts with ease of use of system and usefulness of relevant information which in turn induces loyalty and satisfaction	(Childers et al. 2001) (Koufaris 2002) (DeLone and McLean 1992, 2003) (Eroglu et al. 2003)
Affective/Hedonic experience-> Satisfaction	Environmental psychology, Information System Success Model	Users' Affective (hedonic) states will be positively related to consumers' satisfaction	(Koufaris 2002) (Yoon 2012)
Satisfaction->Intention to revisit	Information System Success Model , Empirical evidence in HCI	Users' intention to reuse the system is highly associated with Satisfaction.	(Childers et al. 2001) (Eroglu et al. 2003) (DeLone and McLean 1992, 2003)

Environmental psychology theory states that emotional response to the environment mediate the relationship between the environment and one's behaviour (Mehrabian and Russell 1974). According to this theory, physical and social stimuli in the environment influence the individual's emotional state (Koufaris 2002). Perception of environment also elicits cognitive responses that influence beliefs about the website evaluation (Bitner 1992). Eroglu et al (2001) used S-O-R framework and categorized website environmental cues used in online stores to understand how they affect customer's organism and behaviours. The website design factors were categorized as having either low or high task relevance. High task relevant cues enable the browsing or searching task by providing the necessary flexibility to find information easily, such as the option to reorganize the structure of the elements, recommendation of information. Low task relevant cues creates pleasurable experience and feeling of joy while browsing e.g. cues such as color, background patterns, typestyles and fonts can not only serve the function of making the verbal content easy (or difficult) to read, they can also create a mood or an image for the site. Information personalization and navigation personalization are high task relevant since they directly improve user effectiveness and efficiency in retrieving information. Presentation personalization may also help since the adjustment of layout also help user to find their target content. Personalization also makes the website ease to use by giving Internet users more flexibility and control. Therefore, we propose that information personalization and navigation personalization will improve Perceived Usefulness and Perceived Ease of Use. They will also have an impact on enjoyment and control as user may experience flow during the personalization process (Koufaris 2002). Eroglu et al. (2001) found that the presence of low task relevant cues positively affect the organism, e.g. pleasure. Therefore, the presentation personalization can arouse the enjoyment. Personalisation has been defined as a process that changes the functionality, interface, information content, or distinctiveness of a system to increase its personal relevance to an individual (Blom 2000). Personalization reduces cognitive efforts of user by personalized information provided which decreases search time of user and increases efficiency. Also, relevant personalized information induces perceived usefulness. This research has considered control as important aspect of PAD emotional experience of pleasure, arousal and dominance as intervening organismic state. User's positive cognitive and hedonic experience with personalization aspects lead to satisfaction (Eroglu 2003, Yoon 2012). (Tam Ho 2006) proposed conceptualization of web personalization and posit that the effectiveness of personalization is determined by the use of self- referent cues and the

timely display of content relevant to the processing goal of the user. Such a conceptualization captures many of the functionalities of contemporary personalization agents such as adaptive content generation, customer profiling, web mining, and click stream analysis.

4.4.1 Personalization and Cognitive/Utilitarian Experience:

(Perceived Ease of Use, Perceived Usefulness and Enjoyment)

Web site success is measured by consumer satisfaction, likelihood of return, and frequency of use, was positively related to the following usability features: download delay, navigation, content, interactivity and responsiveness (Palmer 2002, Ethier 2008). Personalization tailors website content and offers right information, to the right person, in right form satisfying individual implicit and explicit need. Personalized Structure of information presentation and navigation/orientation positively influence the consumer's overall evaluation of the online shopping episode (Ethier 2008). With personalization, every element of the site blends together to enable a visitor to accomplish tasks quickly (Chau and Lai 2003). Davis et al. 1989 in Technology Acceptance Model (TAM) posits that individuals' behavioural intention to use an IT is determined by two beliefs, i.e. Perceived Usefulness and Perceived Ease of Use. Perceived Usefulness is defined as the extent to which a person believes that using an IT will enhance his or her job performance. Perceived Ease of Use is defined as the degree to which a person believes that using an IT will be free of effort (Venkatesh and Bala 2008; Davis et al. 1989). It further theorizes that the effect of external variables (e.g. design characteristics) on behavioural intention will be mediated by perceived usefulness and perceived ease of use. The interactivity of personalization feature may improve the attractiveness of the Web Portal and users may feel special with the personalized treatment. Moreover involvement in the personalization process will enhance user's' cognition of perceived usefulness and perceived ease of use.

Prior studies have shown significant effect of website design and structure on users information processing (Tam and Ho 2006), decision making (Liang et al. 2009), purchase with website (Eroglu 2003). Web site interface features act as determinants of the cognitive processes that trigger emotions during online shopping episodes. It has been found that the predicted structure of information presentation and navigation/orientation positively and

significantly influence cognitive appraisals (Either 2008, Eroglu 2003). Kumar et al. (2004) also demonstrated that Web site interface design features such as colours, amount of information, arrangement of the information on the screen, and the steps needed to complete the buying process, are important determinants of Web site ease of use. Liu et al. (2003) found a strong relationship between Web site interface elements (e.g., company information, search engine, and privacy statement) and Technology Acceptance Model (TAM) ease of use and user perceptions of usefulness constructs.

In environmental psychology theory, the correlation between cognitive experience and personalization features has been researched with few studies. Wang 2010 empirically identified positive relationship between enjoyment, perceived ease of use and perceived usefulness. Davis et al. (1992) and Koufaris (2002) found that both usefulness and enjoyment were significant determinants of behavioural intention. Venkatesh (2000) showed that enjoyment influenced usefulness via perceived ease of use and did not assess its direct effect. It is well known that when people are intrinsically motivated, they become productive and effective (Csikszentmihalyi 1975; Csikszentmihalyi and LeFevre 1989). Agarwal and Karahanna found that enjoyment, which is one of the sub-dimensions of cognitive absorption, improves usefulness (Agarwal and Karahanna 2000). Enjoyment was found to have positive influence on usefulness, ease of use, and application-specific self-efficacy in a Web-based class management system (Yi and Hwang 2003). In cognitive psychology and HCI field, it is found that what is beautiful can be useful also (Ben-Basat et al. 2006, Jarvenpaa et al. 2000). This study has considered enjoyment as cognitive experience more than hedonic experience as it is strongly influenced by perceived ease of use and usefulness as per previous research studies. According to the utilitarian perspective, consumers are concerned with purchasing products in an efficient and effective way in ecommerce website (Childers et al., 2001).

Previous research found that enjoyment was positively related to Perceived Ease of Use (PEU) (Yi and Hwang 2003). TAM3 also includes enjoyment as a determinant of ease of use (Venkatesh and Bala 2008). Emotion will affect user memories of products and decision process (Norman 2002). In Web Portal, the emotion aroused during personalization process, plays a more important role in facilitating effective and efficient use of the website. Enjoyment was also classified as a type of intrinsic motivation by previous studies (Davis et al. 1992) and Venkatesh also showed that the effect of enjoyment on ease of use became stronger as users gained more direct experiences

(Venkatesh 2000). Their findings indicated that the ease of use perceptions are influenced by the degree to which people perceived using the system is enjoyable.

Information Personalization refers to the degree to which customers are provided with uniquely tailored information on the basis of their own individual needs as gathered from the consumer's interaction with the provider (Chellappa and Sin 2005; Liang et al. 2007). Personalized content decreases the cognitive effort needed in order to assess the information and personalized customer services, relevant information and customized content can offer much convenience to users and generate higher perceived usefulness as compared to non-personalized ones (Liang et.al.2012; Chau and Lai 2003). Users are more receptive towards personalized information provided with self referent messages, relevant content (recommendations and ratings) and are found more useful which is elaborated to a larger extent resulting in more and stronger memory traces (Liang et al 2012;Tam and Ho 2006). Personalized website design is with high task relevance, which enables the searching or browsing task by providing the necessary flexibility to find information easily, such as re-organized the structure of the elements. Low task relevant cues like user interface presentation will positively affect the organism, e.g. pleasure, enjoyment and user experience flow with the system (Wang 2010, Koufaris 2002, Eroglu et al., 2001) Information and navigation personalization are high task relevant cues since they directly improve user's effectiveness and efficiency in retrieving information with enhanced utilitarian experience. Therefore, if personalized information can provide relevant content, self relevance and larger range of choices to user, will lead to higher perceived usefulness, increases ease of use by reduced cognitive efforts of user. User experiencing perceived usefulness of information and ease of use of website are more likely to enjoy using ecommerce website and creates positive shopping experience. So we can say that users' cognitive/utilitarian experience is associated with perceived usefulness, ease of use and enjoyment. Personalization Content refers to the degree to which customers are provided with uniquely tailored information on the basis of their own individual needs as gathered from the consumer's interaction with the provider (Chellappa and Sin 2005; Liang et al. 2007;Tsekouras et al. 2011). Personalizing content decreases the cognitive effort needed in order to assess the information. Therefore, we propose hypotheses:

H1a: Users' Cognitive Experience is positively associated with Information personalization.

The perceived ease of use of the website layout influences consumers' internal states and behaviour (Manganari et al. 2011, Egle et al. 2013). Wang 2009 posit that Navigation personalization is positively related to user's' cognitive state perceived usefulness and ease of use. Navigation personalization facilitates users with system initiated personalized structure that reduces users efforts of searching for information. Also, it provides quick links to minimize navigations, resulting in less cognitive load, user feel enjoyment and increased cognitive experience with perceived ease of use and usefulness. User initiated personalization can be produced by explicitly giving users choice of quick links and producing personalized website structure. So we propose hypothesis:

H2a: Users' Cognitive Experience is positively associated with presentation personalization.

Modification of the interface to users' need helps, reduce information processing complexity and facilitate the effectiveness and efficiency with which user can personalize a website (Kamis et al. 2008). When there are more choices in modifying the presentation feature, e.g. layout and background, the higher level of personalization will give more flexibility in alleviating the complexity. Therefore, more presentation personalization facilitates the user task effectively. Personalized interface induce positive cognitive feeling in user with improved aesthetics, finds ease of use and enjoy operating with the personalized system (Monk et al. 2007). So we posit hypothesis:

H3a: Users' Cognitive Experience is positively associated with navigation personalization.

4.4.2 Personalization and Hedonic experience (Control):

User involvement in personalization process is also referred as personalization interaction (Tsekouras 2011), user initiated personalization (Blom and Monk 2007, Wu et al. 2003) or user initiated customization (Shyam and Sundar 2010). Personalization interaction is the dimension which captures the degree to which users have to actively engage with the process of information search. The degree of interaction is based on the degree of effort of the user in the process (passive versus active) as well as the control of information flow in the personalization process i.e. system driven versus user driven (Tsekouras 2011). Users

feel more engaged and motivated when a website creates a dynamic environment with high interaction and consequently they are likely to form a more complete perception of the usefulness of the website (Tsekouras 2011, Jiang and Benbasat 2005, Jiang and Benbasat 2007a). We expect that even though passive personalization interaction requires less effort from the users, it may have a positive direct effect on website evaluation and intention to revisit a website. Personalized Web sites must provide users the feeling and the reality of control over the information contained in, and the use of, their personal profiles (Alpert et al. 2003).

Perceived control is also similar to the emotional response of dominance from environmental psychology, where it is defined as feeling "unrestricted or free to act in a variety of ways" in a specific situation and environment (Mehrabian and Russell 1974). In fact, an adapted scale for dominance has been used to measure perceived control in flow research (Koufaris 2002, Novak et al. 2000). When users experience a higher level of personalization content that provides more focused and relevant information can have more favourable subsequent behaviours (Tsekouras 2011).

Hedonic experience is driven by users' intrinsic feeling and arousal as response to use of the website. Personalized information can be generated with wide variety of choices presented to get the personalized content, helps user in information search and reduces efforts. Control is deep intrinsic feeling of user which provides the user flexibility to have command over information access, website interaction and its presentation with good look and feel. This can be provided by explicitly asking users need and providing user different choices to customize content, website user interface(font, themes, color etc) and structure with related choices in (news, products etc). Personalization provided with the choices to users generates high level of perceived control and users experience flow with personalization process(Koufaris 2002) are more likely to have comfort level and enjoy(Manuel and Joaquina 2004) the interaction with the website. So we postulate hypotheses

H4a: Users' Hedonic Experience is positively associated with information personalization.

Udo and Marquis (2002) found that ease of navigation and use of graphics positively influenced users' perception of a Web site's effectiveness, as measured by repeat visits.

Finally, Semeijn et al. (2005) found a positive relationship between the quality of navigation on the Web site and the perception of its value. To achieve usability and effectiveness, a Web site must provide adequate support in the form of a strong sense of structure and place in order to let consumers know where they are and where they can go (Nielsen, 2002). Based on these results, Palmer made three recommendations to Web site managers: appropriate sequencing, layout and arrangements of Web sites in order to increase navigability, and the possibility for users to customize their experience and interact with the Web site. Structure of information presentation and navigation positively influence the consumer's perception of being in control during the online shopping episode (Éthier 2008). So, we propose:

H5a: Users' Hedonic Experience is positively associated with presentation personalization.

H6a: Users' Hedonic Experience is positively associated with navigation personalization.

4.4.3 Cognitive/Utilitarian Experience and Hedonic Experience:

Previous research found that enjoyment was positively related to Perceived Ease of Use (PEU) (Yi and Hwang 2003). TAM3 also includes enjoyment as a determinant of ease of use (Venkatesh and Bala 2008). Emotion will affect user memories of products and decision process (Norman 2002). In Web Portal, the emotion aroused during personalization process, plays a more important role in facilitating effective and efficient use of the website. Enjoyment was also classified as a type of intrinsic motivation by previous studies (Davis et al. 1992) and Venkatesh also showed that the effect of enjoyment on ease of use became stronger as users gained more direct experiences (Venkatesh 2000). Their findings indicated that the ease of use perceptions are influenced by the degree to which people perceived using the system is enjoyable.

Greater customer control of the shopping experience increased the pleasure of shopping (De Wulf et al. 2006). Users with a high level of perceived control are likely to feel more a

high comfort level with the activity. Thus, they would be more inclined to feelings of joy using the website more frequently (Manuel and Joaquina 2004). Studies in Human Computer Interaction also found that more control correlates with enjoyment (Lindley and Monk 2008). Therefore, we propose that:

H7a: Users' Cognitive Experience is positively associated with hedonic experience.

4.4.4 Cognitive/Utilitarian Experience effect on Satisfaction and intention to revisit:

Web information system success is measured with the satisfaction level of user while interacting with web portal. DeLone and McLean updated IS Success Model (2003) posit that information quality and system quality is associated with system use, user satisfaction, and net benefits within the e-commerce context (DeLone and McLean 1992, 2003). User experience with high quality relevant information reduces his cognitive efforts with ease of use of system and usefulness of relevant information which in turn induces loyalty and satisfaction in user's interaction with website. Perceived ease of use, perceived usefulness and enjoyment are important parameter for measuring user's cognitive state. Koufaris 2002 identified perceived usefulness as an important factor for a new customer's intention to return (Koufaris 2002).

Oliver (1997) defined satisfaction as both the "consumer's fulfilment response", judgment of "consumption-related fulfilment", and consumers' perceptions result from the pleasurable fulfilment of their transaction experiences. Woodruff (1997) defined satisfaction as the consumer's overall feelings in relation to evaluations of experiences with a product. Satisfaction depends on their assessment about service quality; consumers' favourable assessment of service quality can contribute to favourable intention behavior (Zeithaml, Berry, & Parasuraman, 1996). Perceived Usefulness is the degree to which a person believes that using the personalization agent would enhance his/her performance in product selection (Van der Heijden 2004). User with the high cognitive experience like perceived usefulness and perceived ease of use enjoys using website; also it leads to higher satisfaction as a response to organism state. Mummalaneni (2005) applied the S-O-R model to investigate the relationships among website cues, consumers' affective states, and

responses. The results revealed the significant influence of affective states on the online consumer's satisfaction. Mummalaneni (2005) also found that pleasure and arousal fully mediated the relationship between website cues and satisfaction.

Childers et al. (2001) mentioned the cognitive (utilitarian) dimension as a consumer's interest in purchasing items in an efficient and timely manner to achieve their shopping goals with a minimum of irritation. Utilitarian shopping benefits are significantly associated with the consumers' cognitive states. Lorenzo-Romero et al. (2011) conducted a similar study that examined the effects of hedonic and utilitarian dimensions on consumer responses. Navigational structure and music were used as the website environmental cues. These two cues influenced significantly both consumers' affective and cognitive states. The results indicated that consumer attitudes had positive influences on response behaviours. Compared to the respondent's hedonic attitudes, utilitarian attitudes played a stronger role in influencing their satisfaction (Yoon 2012). We believe that the cognitive experience, i.e. Perceived Usefulness and Perceived Ease of Use in TAM, can also be successfully applied in the context of Web portal in predicting users' satisfaction and users' intention to return. We expect that customer believes that personalizing the Web portal will enhance their browsing effectively. In previous research Liang et al. 2006, investigated the use of a personalized content provision in a news website, and found that the increase in user satisfaction from such a service was primarily due to effort reduction. The more accurate the recommendation content, the higher was the user satisfaction. User satisfaction is higher when the accuracy of hitting user interests increases (Liang et al. 2007). DeLone and McLean (1992) reported that user satisfaction has been widely employed in practice as a surrogate measure of information systems effectiveness. So, we posit:

H8a: Users' satisfaction is positively associated with cognitive experience using personalized website.

In previous research of store atmosphere, enjoyment has been found a significant predictor of extra time spent in the store and unplanned purchasing (Donovan et al. 1994). Enjoyment has been proved to be an important determinant of online customer intention to return (Eighmey and McCord 1998, Jarvenpaa and Todd 1996, Jarvenpaa and Todd 1997; Koufaris 2002; Rice 1997) as well as offline. Also, flow research indicated that intrinsic enjoyment can positively impact the web use (Koufaris 2002; Novak et al. 2000), repeat

visit, and word-of-mouth communications (Ladhari 2007). Prior research suggested that emotions mediate the impact of environment on user intention (Kaltcheva and Weitz 2006; Lee et al. 2008). We expect the effects on using a Web Portal to be similar. If the users enjoy their experience in interacting with the Web Portal, they are more likely to visit the Web Portal again. Echoing TAM3 research study which argues that the degree to which the website is perceived to be easy to use affects the perception of the usefulness and the intention to continue to use this website (Chau and Lai 2003).

H9a: Users' intention to revisit is positively associated with cognitive experience using personalized website.

4.4.5 Hedonic Experience with Satisfaction and Intention to revisit:

Control refers to interaction with the environment in ways that produce desired outcomes and prevent undesired outcomes (Skinner, 1995; Monk 2007). Personalization is referred as customization or user initiated personalization (Sunder et al. 2010) in which user initiates personalization, also known as explicit personalization (Desai 2015). User initiated personalization provides more privacy and control to user as user are more aware of personalization preferences and can make a decision to use its features. Users while using web portals like content-filtering and refinement of web based on information explicitly provided by them which is driven by explicit control of user (Kosba 2001). User with perceived control is positively linked to intention to return to a website (Koufaris 2002). User without involvement and reduced interactivity may frustrate consumers and decrease their pleasure (Dailey 2001, Sautter 2004) instead. User with opportunity for enhanced interactivity, regardless of realization, may yield perceptions of greater navigational ease and enhance pleasure derived from online experiences (Childers et al. 2001). Enhanced control should also boost feelings of dominance/control when interacting with personalized websites. Users with a high level of perceived control are likely to feel more comfort level with the activity. So we propose that user with hedonic experience leads to user's response behaviour of satisfaction and intention to revisit the website.

Many studies in IS have dealt with investigating the importance of information and system quality and how they influence users' behavioural and attitudinal outcomes (DeLone & McLean 2003; Nelson et al 2005; Palmer 2002; Tsekouras et al 2011). These construct are closely related to users' satisfaction (Abdinnour-Helm et al. 2005). Satisfaction has been shown to be a driving force in online purchases and is therefore of critical interest to online marketers (Yoon, 2012). User involvement in the process of creating personalized content positively affects user satisfaction (Liang et al. 2007).Personalization offered with the balance of providing flexibility to the users to customize user interface with various choice and control to navigate through website satisfies users need and generate feeling of satisfaction with control over browsing and involvement. Research shows that accurate personalization process reduces information overload, increases user involvement with increase efficiency, performance and satisfaction (Liang et al. 2007, Kwon et al. 2012, Thongpapanl et al. 2011, Desai 2016). User with positive hedonic experience of control with personalization features like user interface, information, and navigation over website with involvement using website is more satisfied and likely to revisit the personalized website. So we propose hypothesis:

H10a: Users' satisfaction is positively associated with hedonic experience (Control) using personalized website.

H11a: Users' intention to revisit website is positively associated with hedonic experience (Control) using personalized website.

4.4.6 Satisfaction and User Intention to Return:

Satisfaction is intrinsic feeling of overall experience about using product or browsing website. Satisfaction in previous research has shown positive impact on users online purchase with website and repeated usage (Zviran et al. 2006). Website dimensions (i.e., information content and website personalization) positively influence customer satisfaction and increases users purchase intention (Thongpapanl et al. 2011, Dabholkar 2012). DeLone

& McLean's (1992) identified satisfaction and usage of system to measure the Information system success which is found as an antecedent of information and system quality. DeLone & McLean's (2003) in Updated IS Success Model states that user's intention to reuse the system is highly associated with Satisfaction. So we propose hypothesis as:

H12a: Users' intention to reuse/revisit the personalized website is positively related to user satisfaction.

CHAPTER - 5

Research Methodology

This chapter Research Methodology presents the development of constructs and instruments designed to measure user's perceptions developed with the use of web portals having personalization features. Web portals of ecommerce and social networking websites are chosen due to increased popularity amongst users and use of different personalization features. The survey method is used for data collection to test the proposed research model/framework. We collected data from web users using both ecommerce and social networking websites having personalization features on their web portal. We selected most popular and frequently visited ecommerce and social networking personalized websites for study. Besides dimensions of personalization (i.e. information personalization, presentation personalization, and navigation personalization), all other research variables are measured using multiple-item scale adapted from prior studies. Constructs of information personalization, presentation personalization, and navigation personalization are developed from previous literature that relates to the definition of personalization in our context. This research is descriptive research with qualitative nature of study as we investigate effect of personalization on user's behavioural intentions and satisfaction.

We examine the population of overall Internet Web user and use student sample, which is a typical segment of Internet Users and widely used in previous studies. We collect data through online questionnaire form filling as well as manual form filled by respondents. This process is following the guidelines of effective research suggested by Churchill and Straub (Churchill 1979; Straub 1989).

5.1 Research Design:

Research Design presents plan of research work for collecting data based on nature of research qualitative or quantitative and exploratory or descriptive research. Research design can be categorized like (1) research design in case of exploratory research studies; (2) research design in case of descriptive and diagnostic research studies, and (3) research design in case of hypothesis testing research studies (C. R. Kothari, 2004, Malhotra and Das 2009). Exploratory research studies are also termed as formularize research studies. The main purpose of such studies is that of formulating a problem for more precise investigation or of developing the working hypotheses from an operational point of view. The major emphasis in such studies is on the discovery of ideas and insights. As such the research design appropriate for such studies must be flexible enough to provide opportunity for considering different aspects of a problem under study. Inbuilt flexibility in research design is needed because the research problem, broadly defined initially, is transformed into one with more precise meaning in exploratory studies, which may necessitate changes in the research procedure for gathering relevant data.

Research can also be categorized based on nature of the data: qualitative and quantitative. Quantitative research is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity. Qualitative research, on the other hand, is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind like investigating reasons for human behaviour, Motivation Research which aims at discovering the underlying motives and desires. Qualitative research is especially important in the behavioural sciences where the aim is to discover the underlying motives of human behaviour. Through such research, we can analyze the various factors which motivate people to behave in a particular manner or which make people like or dislike a particular thing. It may be stated, however, that to apply qualitative research (C.R.Kothari 2004).

This research is descriptive research with qualitative nature of study as we investigate effect of personalization on users' behavioral intentions and satisfaction. We used SPSS 20.0 statistical tool and SPSS Amos 21.0 for the analysis of data.

5.2 Questionnaire\Instrument Development:

We adopt a three-step method of instrument development given by Moore and Benbasat 1991, i.e. scale creation, scale development and scale testing for identifying design aspects of personalization and measuring user's perception about web personalization via factor analysis in pilot tests and main study. The first step is literature synthesis and item creation. In this stage, pools of items for each personalization dimension are created by identifying items from existing scales and additional items that fit the construct definitions. The second step is scale development through card sorting, in which panels of judges sort the items from the first stage into separate categories, based on the similarities and differences among items. After eliminating the inappropriately worded or ambiguous items in stage two, the various scales are combined into an overall instrument for testing (Moore and Benbasat 1991). This instrument testing stage includes three separate steps. First, the instruments are distributed to a sample of 20 respondents to obtain an initial indication of the scales' reliability. Second, another pilot test is conducted with 50 Internet users (Moore and Benbasat 1991). Finally, the scales will be carried out in the main study. Development of valid and reliable measures requires careful analysis, as they become the building blocks for generating valid relationships among a system of variables (Straub 1989, Torkzadeh and Dhillon 2002, Wang 2009 & 2010).

Table 5.1 Instrument/Questionnaire Development Stages			
Stage	**Details**	**Objective**	**Result**
Stage One Scale Creation	Literature Synthesis and Item Creation for construct	Scale Creation is to create pools of items for each personalization dimension from existing literature to ensure validity of content.	Initial measurement items and construct attributes.
Stage Two Scale Development	Card Sorting and Scale Development	To develop scale of items with identification of similarities and differences through card sorting and to achieve construct validity to identify ambiguous items, and obtain qualitative responses	Addition or removal of items with refinement of terminologies used for items.
	Card Sorting First Round	In all sorting rounds, a different set of judges was used. Each judge creates their own categories and sorts the card into categories and labeled the categories of items independently.	Elimination of ambiguous items.
	Card Sorting Second Round	New judges sort the remaining items based on provided construct definitions.	Ensure level of agreement among judges and reduce the items.
Stage Three Instrument Testing	First Round Pilot Study	To ensure adequacy of questionnaire with initial reliability assessment of the scales	Items with good wording, instructions, and appropriate length.
	Second Round Pilot Study	To ensure the scales demonstrated appropriate level of reliability for items	Final questionnaire with appropriate item of scale.

5.2.1 Stage One – Literature Synthesis and Item Creation:

Literature review and synthesis is considered an important step for making references and associations with the existing validated instruments available in literature. It is also clear that well-defined constructs are based on theory, and the operation of these constructs through measures with high degrees of validity and reliability is a prerequisite for the beginning of a cumulative tradition (Moore and Benbasat 1991). The objective of item creation from previous research is to ensure content validity. An initial item pool is generated and items considered too narrow in focus and applicable only in particular situations were removed.

Wu et al. (2003) have categorized the websites based on the breadth and depth of personalization capability they offered. Among them, web portals and e-commerce websites are of highest level of personalization, e.g. amazon.com and my.yahoo.com. The previous work, as summarized above, provides us an initial pool of items for further scale development. Harnisch et al. (2013) have classified personalization constraint in digital business environment with implicit (business or system initiated) and explicit personalization (user initiated). They also have categorized personalization features used in websites based on content, user interface, channel/information access and functionality. Based on rigorous review of previous research work and using different personalization features used in different web portals of ecommerce and social networking sites, we have categorized design aspects of personalization features used in this websites as information personalization, presentation personalization and navigation personalization.

Table 5.2 : Website personalization dimension references

Personalization Dimension	Definitions	References
Interface	Adaptable user based customized or Adaptive system controlled personalization of user interface with knowledge base	(Andrea Bunt et al. 2007,2010)
System functionality	different features a system provides to a use	(Judith and Franz 2006)
Coordinative range	The choice of both image and text clicks was broad – narrow	(Nadkarni & Gupta 2007)
Complexity	The range of the alternative links to find information was broad – narrow	
Coordinative range	The variety of information clusters was low - high.	
Recommendation & Relevant Information	Personalized Recommendation effect on users behaviour and response	(Shuk ying Ho 2014)
Functionality, Presentation, Content, channel, user interface	Good design and the use of interactive features on a website help users identify relevant information quickly and easily, thereby making information more usable.	(Rahimnia 2013) (Harnisch 2013)
Interactivity and navigation	Interactivity and navigation have a significant association with the success of corporate websites. In	(Palmer 2002)
Navigational design	How websites enable consumers to navigate to a desired section and view pages.	(Manganari et al. 2009) (Egle et al.2013)

5.2.2 Stage Two –Scale Development:

We follow the method proposed by (Davis 1989a) and (Moore and Benbasat 1991) to develop the constructs of information personalization, presentation personalization, and navigation personalization which is also developed by Wang 2010. We designed items for constructs based on usage of e commerce and social networking websites. We identified two categories of web portals as e-commerce and social networking websites based on frequency of usage and popularity. We identified different personalization features used in both web portals and designed different items set for ecommerce and social networking websites for information personalization, presentation personalization and navigation personalization constructs.

We selected four judges from different background to ensure that a range of perceptions would be included to sort the items of constructs (Moore and Benbasat 1991). We asked judges to select any one social networking and ecommerce website which they are familiar with, using it frequently. We asked them to try three tasks about information personalization, presentation personalization, and navigation personalization before the card sorting process.

We designed similar set of items for both ecommerce and social networking websites describing personalization features. In the first card sorting process, judges were asked to provide their own labels for the constructs without revealing underlying construct for the items. Prior to sorting the cards, judges were asked to read a standard set of instructions and a trial sort was done by each judge on samples items unrelated to the constructs of the study. We dropped some items identified as either being too ambiguous (fitting in more than one category) or too indeterminate (fitting in no category), and remaining items then be passed to the next sorting round. If the number of categories created by the judges, the labels assigned to them, and the items included in them, were consistent, then it could be said that the scales based on these categories demonstrate convergent and discriminant validity (Moore and Benbasat 1991). At the beginning, there are total 30 items in the constructs of information personalization, presentation personalization, and navigation personalization for each category of personalized ecommerce and social networking websites. This study focuses on the breadth dimension of personalization not on depth dimension of personalization. So we included items related to breadth aspect of

personalization e.g. how many information selections (e.g. financial news, whether, etc) are there for users to choose from. We removed repeated and ambiguous items. Twenty four remaining items were included in both categories of websites for next step.

Table 5.3 Sorting First Round(judges labeling of constructs)

Personalization Constructs	Judge 1	Judge 2	Judge 3	Judge 4
Information Personalization	design/Information	Information/ Content and scope design	Information Architecture Personalization	Information diversity/Variety personalization
Presentation Personalization	Personalized Look & Feel design	Website interface personalization	Personalized Recommendation	Interface customization
Navigation Personalization	Personalized Structure	Personalized links	Website Structure and links modification	Structure customization

After first round of card sorting we renamed some ambiguous terminology and revised questions. For second round of card sorting four different judges sorted the remaining items and labels the constructs for information personalization, presentation personalization, and navigation personalization. Third card sorting round result is mentioned in table 5.4 with details of constructs labeled by judges. After the first and second rounds, the final refinement of the scales was to reduce items for pilot test. Some wordings are revised to remove the ambiguity and no more items were removed in the third and final round.

Table 5.4 Sorting Third Round(judges labeling of constructs)				
Personalization Constructs	**Judge 1**	**Judge 2**	**Judge 3**	**Judge 4**
Information Personalization	design/Information personalization	Information/Content design	Information Setting	Information personalization/ Customization
Presentation Personalization	Personalized design & Appearance	Website interface personalization	Personalized look and feel	Interface look & feel modification /customization
Navigation Personalization	Personalized navigational structure	Navigation personalization/ Personalized layout	Personalized website navigation	Website Structure customization

5.2.3 Stage Three – Instrument Testing:

Pilot test presents guidelines, authenticity of questionnaire reliability and roadmap for further research using main survey. Pilot test was conducted in two rounds to verify the survey instruments. The first pilot test was to ensure adequacy of questionnaire compilation and its consistency. The second pilot test targets to ensure that various scales and constructs demonstrate the appropriate levels of reliability.

5.2.3.1 First Round Pilot Study:

A convenient sample of 20 users of e commerce and social networking websites gave responses to the questionnaire and comments on its language, length, and understanding of instruction. The first pilot test was conducted to assess initial reliability and verification of the scales. Based on comments by users about questionnaire, several kinds of revisions are made to the questionnaire, i.e. ambiguous terms and wording.

5.2.3.2 Second Round Pilot Study:

After the first round pilot test, the ambiguous statements were revised. After the revision, most of the respondents stated that the questions were easy to understand. The second pilot study aims to ensure that the various scales demonstrate appropriate levels of reliability. From target population of users on ecommerce and social networking websites, 50 respondents were selected for second round of pilot study. The accepted level of reliability depends on the purpose of the research. Before any item was deleted, a check was made to ensure that the domain coverage (i.e. content validity) of the construct would not suffer. Finally we get 34 items for three constructs of personalization: information personalization, presentation personalization and navigation personalization for both ecommerce and social networking web portals. The reliability is above the recommended benchmark 0.6 in the pilot test (Moore and Benbasat 1991, Nunnally 1967).

Second round of Pilot study conducted with 50 online users (Students, Business owners, IT Professionals, and Housewives) who have used ecommerce and social networking web portals. We select ecommerce websites for study as it adapts all the aspects of personalization features implemented in websites like Amazon.in, eBay.in, flipkart.com, Facebook.com, Google+, myYahoo.com. The purpose of the pilot study was to (1) check for the reliability of the questionnaire items, and (2) determine, if survey items needed to be clarified or changed. Responses from fifty users were collected through questionnaires by asking them about their general online shopping experiences with personalized websites, their perceptions and attitudes towards different personalization aspect when using ecommerce and social networking websites.

The Cronbach's Alpha coefficient for assessing reliability of survey items(variables) and analysis result indicate that all survey items were in the range of 0.70~0.93, indicating a high level of internal consistency for the scales of questionnaire items used within this survey. According to Nunnally (1978), reliability coefficients of 0.70 or more are considered as a criterion for an internally consistent scale constructs of survey items. Thus, all survey items in Table 5.5 were reliable and appropriate to use in an actual research study.

Table:5.5 Construct Reliability after Final Pilot Test			
Web Portal	**Constructs**	**No. of items**	**Cronbach's Alpha**
Ecommerce Questionnaire	Information Personalization	6	0.777
	Presentation Personalization	6	0.816
	Navigation Personalization	5	0.767
	Utilitarian/Cognitive Experience (Perceived Ease of Use, Perceived Usefulness, Enjoyment)	9	0.892
	Hedonic Experience(Control)	2	0.772
	Satisfaction	2	0.945
	Intention to Revisit	3	0.989
Social Networking Questionnaire	Information Personalization	6	0.856
	Presentation Personalization	6	0.841
	Navigation Personalization	5	0.777
	Utilitarian/Cognitive Experience (Perceived Ease of Use, Perceived Usefulness, Enjoyment)	9	0.883
	Hedonic Experience(Control)	2	0.964
	Satisfaction	2	0.977
	Intention to Revisit	3	0.972

5.3 Main Survey:

5.3.1 Population and Sampling:

Malhotra and Das (2009) classified sampling design method into two types, non-probability sampling and probability sampling. Probability sampling method includes simple random sampling, stratified random sampling, systematic sampling, cluster (area) sampling, and multistage sampling. Non-Probability sampling includes deliberate (quota sampling), convenience sampling, and purposive sampling. Non-probability sampling is that sampling procedure which does not afford any basis for estimating the probability and

ascertaining that each item in the population has the same probability of being included in the sample. In this type of sampling, items for the sample are selected deliberately by the researcher; his choice concerning the items remains supreme. In other words, under non-probability sampling the organizers of the inquiry purposively choose the particular units of the universe for constituting a sample on the basis that the small mass that they so select out of a huge one will be typical or representative of the whole. Probability sampling is also known as 'random sampling' or 'chance sampling'. Under this sampling design, every item of the universe has an equal chance of inclusion in the sample. Non-probability sampling is that sampling procedure which does not afford any basis for estimating the probability that each item in the population has the same probability of being included in the sample.

We adopted Non-Probability sampling method i.e., convenience sampling as a method of data collection for main survey for online users of e commerce and social networking websites in India. The population for the study is the online users of e commerce and social networking web portals in India. After completion of pilot study in two stages, final questionnaire was developed with several revisions. Final questionnaire form was made available online from the month of February 2015 to September 2015 using Google docs form features. We collected 600 responses through online form filling both by mailing users using social media sites and also visiting users personally from all over India. The demographic details of responses from all over India are discussed next in this chapter.

5.3.2 Sample Size calculation to Ensure Statistical Power:

A valid sample and adequate sample size represents the target population and helps in generalizing results of research for target population. A valid sample is a representative subset of the target population. We identify valid sample for the research as an online users of personalized ecommerce and social networking website. In SPSS package, a convenient option is offered to check whether the sample is big enough: the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO-test). The sample is adequate if the value of KMO is greater than 0.5. Furthermore, SPSS can calculate an anti-image matrix of covariance's and correlations. All elements on the diagonal of this matrix should be greater

than 0.5 if the sample is adequate (Field 2000). KMO test values for both ecommerce and social networking websites data was greater than .9 which also ensures sample size adequacy.

We derived sample size with the formula of calculating samples for infinite population. Population represented as infinite if it is greater than 50,000 as per descriptive statistics principles. Significance level is the probability cut-off (usually 0.05 or 5%) used. It is chosen in advance of performing the test, and the cut-off level depends on how much safeguard is required against accidentally rejecting the null hypothesis when it is in fact true.

Cochran's formula for calculating sample size when the population is infinite:

Cochran (1977) developed a formula to calculate a representative sample for proportions as

Sample Size Formula.

Sample Size - Infinite Population (where the population is greater than 50,000)

$$\textbf{Sample Size} = \frac{z^2 \times (p) \times (1 - p)}{e^2}$$

Z = Z-value is the selected critical value of desired confidence level, 1.96 for a 95 percent confidence level

P = Percentage of population picking a choice, expressed as decimal is 0.5

e = Confidence interval, expressed as decimal is also the desired level of precision

(e.g., .04 = +/- 4 percentage points)

A Z-values (Cumulative Normal Probability Table) represent the probability that a sample will fall within a certain distribution. The Z-values for confidence levels are:

1.96 = 95 percent confidence level

Calculation of Sample Size $= \frac{(1.96)^2 \text{ x}0.5\text{x}0.5}{(0.04)^2}$

$= 3.8416 \text{ x } .5 \text{ x } .5/.0016$

= 600

5.3.3 Measurement:

We adopted multi item scales to measure user's cognitive/ utilitarian and hedonic experience like perceived usefulness, perceived ease of use, enjoyment and control which is adopted from previous literature (Wang 2009; Kamis et. al.2008). Construct satisfaction and intention to revisit is adopted from (Mc Lean 2003). All construct items use five point likert scale. Scales of personalization generated from the card sorting are also presented. Information personalization is amount of tailored content in the form of product recommendation and ratings satisfying explicit or implicit need. Personalized information also can be generated by explicitly providing choices to produce filtered information and customize the information. Presentation personalization is the extent to which website interface can be modified according to user's' implicit or explicit requirements (e.g. color, layout, background, font, themes etc.). Navigation personalization is the extent to which navigation of website can be modified in accordance to user's requirement (e.g. new tabs and re-organized the elements to new tabs). User can reorganize the website structure by creating new categories and move information into them based on his preferences specified explicitly or implicitly by website designers by analyzing user profile. We use both levels of personalization, i.e., system initiated and user initiated personalization for this study, i.e., design aspect of web personalization, its impact on user's satisfaction and intention to revisit the website. The perceived complexity level of the Websites affects the user's behaviour like; users find website appealing and satisfying (Nadkarni and Gupta 2007).

Table: 5.6 Survey items with references for ecommerce websites

Constructs	Items	References
Information Personalization	How many choices do you feel you were offered in terms of (ECIP1) information selection to personalize the website? How many choices do you feel you were offered in terms of (ECIP2) range of information to personalize the website? How much variety do you think there was in the (ECIP3) information selection? How much variety do you think there was in the (ECIP4) information group or cluster (e.g. price, categories etc in ecommerce websites)? How much variety do you think there was in the (ECIP5) personalized product recommendation offered in e-commerce website. Please rate the website on the following criteria of Information Personalization.(ECIP6) The amount of information personalized to my unique needs is very adequate	(Berlyne 1970) (Wood 1986) (Campbell 1988) (Bitner 1992) (de Groote 1994) (Russell and Miriam 2004) (Nadkarni and Gupta 2007) (May Wang 2009) (Desai 2016)
Presentation Personalization	How many choices do you feel you were offered in terms of (ECPP1) choices offered with different presentation attributes (e.g. colors, font, themes) to personalize the interface of website? How many choices do you feel you were offered in terms of (ECPP2) the number of alternatives color (e.g. 256 colors), fonts, and backgrounds to personalize interface? (ECPP3) How much variety do you think there was in personalizing the layout? (ECPP4) How much variety do you think there was in personalizing the look and feel of the website? (ECPP5) How much variety was the presentation personalized by website to my unique needs?	
Navigation Personalization	(ECNP1) Navigation components (e.g. quick links) can be adjusted to my interest to a large extent. (ECNP2)The variety of ways to personalize the navigation of different website sections is adequate. (ECNP3)The link structure can be personalized based on my preferences to a large extent.	

	(ECNP4)The Personalized Structure of website is adequate.	
Utilitarian/ Cognitive Experience	(ECPEU1)Learning to use the personalized website is easy for me . (ECPEU2)My interaction with this Web Portal is clear and understandable. (ECPEU3) It would be easy for me to become skillful at using the Web Portal. (ECPEU4) I find this personalized website is easy to use. (ECENJ1) I enjoy my visit with the personalized website. (ECENJ2) I find my visit of personalized website interesting. (ECPU1) Using these selected personalized website reduce time consumption for accomplishing tasks or browsing information. (ECPU2)Using these selected personalized websites enhance my effectiveness in accomplishing tasks or browsing information. (ECPU3)I find using these personalized websites useful.	(Ghani and Deshpande 1994) (Venkatesh and Davis 1996) (Koufaris 2002)
Hedonic Experience	(ECCON1) I feel in control using the website. (ECCON2) I feel ownership of my work using this website.	(Ghani and Deshpande 1994) (Koufaris 2002)
Satisfaction	(ECSAT1)I found personalized information provided on the website satisfied my need. (ECSAT2)The personalized web page design provided with website satisfied my needs. (ECSAT3) I found personalized features provided in websites satisfactory.	(DeLone and McLean 1992, 2003) (Childers et al. 2001) (Eroglu et al. 2003)
Intention to Revisit	(ECINT1)I intent to continue using the Web Portal in the future. (ECINT2) I expect my use of this Web Portal continue in the future. (ECINT3)It is likely that I will return to the Web Portal in the future.	(Agarwal and Karahanna 2000)

Survey items for Social networking Websites

Table: 5.7 Survey items with references for social networking websites

Constructs	Items	References
Information Personalization	How many choices do you feel you were offered in terms of (SNIP1) information selection (e.g. horoscope, weather forecast, news, friends list etc) to personalize the website? How many choices do you feel you were offered in terms of (IP2) range of information (e.g. horoscope, weather forecast, news, friends list etc) to personalize the website? How much variety do you think there was in the (SNIP3) information selection? How much variety do you think there was in the (SNIP4) information group or cluster (e.g. horoscope, weather forecast, news, friends list etc in social networking websites)? How much variety do you think there was in the (SNIP5) personalized friends recommendation offered in social networking website. Please rate the website on the following criteria of Information Personalization. (SNIP6) The amount of information personalized to my unique needs is very adequate.	(Berlyne 1970) (Wood 1986) (Campbell 1988) (Bitner 1992) (de Groote 1994) (Russell and Miriam 2004) (Nadkarni and Gupta 2007) (May Wang 2009) (Desai 2016)
Presentation Personalization	How many choices do you feel you were offered in terms of (SNPP1) choices offered with different presentation attributes (e.g. colors, font, themes) to personalize the interface of website? How many choices do you feel you were offered in terms of (SNPP2) the number of alternatives color (e.g. 256 colors), fonts, and backgrounds to personalize interface? (SNPP3) How much variety do you think there was in personalizing the layout? (SNPP4) How much variety do you think there was in personalizing the look and feel of the website? (SNPP5) How much variety was the presentation personalized by website to my unique needs? Pls Rate the website in the criteria of Presentation Personalization. (SNPP6)The personalized presentation offered with website design was having good look and feel.	

Navigation Personalization	(SNNP1) Navigation components (e.g. quick links) can be adjusted to my interest to a large extent. (SNNP2)The variety of ways to personalize the navigation of different website sections is adequate. (SNNP3)The link structure can be personalized based on my preferences to a large extent. (SNNP4)The Personalized Structure of website is adequate.	
Utilitarian/ Cognitive Experience	(SNPEU1)Learning to use the personalized website is easy for me. (SNPEU2)My interaction with this Web Portal is clear and understandable. (SNPEU3) It would be easy for me to become skillful at using the Web Portal. (SNPEU4) I find this personalized website is easy to use. (SNENJ1) I enjoy my visit with the personalized website. (SNENJ2) I find my visit of personalized website interesting. (SNPU1) Using these selected personalized website reduce time consumption for accomplishing tasks or browsing information. (SNPU2)Using these selected personalized websites enhance my effectiveness in accomplishing tasks or browsing information. (SNPU3)I find using these personalized websites useful.	(Ghani and Deshpande 1994) (Venkatesh and Davis 1996) (Koufaris 2002)
Hedonic Experience	(SNCON1) I feel in control using the website. (SNCON2) I feel ownership of my work using this website.	(Ghani and Deshpande 1994) (Koufaris 2002)
Satisfaction	(SNSAT1)I found personalized information provided on the website satisfied my need. (SNSAT2)The personalized web page design provided with website satisfied my needs. (SNSAT3) I found personalized features provided in websites satisfactory.	(DeLone and McLean 1992, 2003) (Childers et al. 2001) (Eroglu et al. 2003)

Intention to Revisit	(SNINT1)I intent to continue using the Web Portal in the future. (SNINT2) I expect my use of this Web Portal continue in the future. (SNINT3)It is likely that I will return to the Web Portal in the future.	(Agarwal and Karahanna 2000)

5.3.4 Procedure:

To test the Nomological network which is a representation of the concepts (constructs) of interest in a study, their observable manifestations, and the interrelationships among and between these, an empirical study using an online questionnaire was administered to Web users. The website selected for current study is Personalized Web Portals and ecommerce website, i.e. iGoogle.com, MyYahoo.com and amazon.in and ebay.in. They are selected for several reasons:

(1) These sites comprehensively incorporate information personalization, presentation personalization and navigation personalization.

(2) Yahoo and Google are found to be most favoured for total sample of Internet Users as well as heavy Internet users, who use the web for 20 hours a week or more (Assael 2005).

(3) These sites require no registration before usage and guaranteed shorter usage time for first-time users.

We collected data from online users (students, IT professional, housewives and business owners) of social networking and ecommerce web portals by asking them to answer questionnaire who have used personalized social networking web portals (iGoogle.com, My Yahoo.com) and ecommerce web portal(amazon.in, flipkart.com and eBay. in.).

To ensure that respondents have visited the Web Portal, we design questions to check whether they have knowledge about the features in the websites. For example what kind of personalization feature they have tried. Asking respondents to subjectively report their patronage has been widely adopted in previous marketing and IS literature (Li et al. 2006).

5.4 Data Collection Using Electronic Survey:

After completion of card sorting method and pilot study in two stages, final questionnaire was developed with several revisions. Main study was conducted with final questionnaire items were conducted from February 2015 to September 2015 using Google docs form features. By the beginning of October 2015, we collected total 1200 responses from the online users of both personalized ecommerce and social networking web portals.

5.4.1 Participant Response and Data Screening:

We collected 600 responses from ecommerce website users and 600 responses from social networking website users in India. Incomplete and inconsistent data from responses were cleaned in data screening process. After initial screening of data, further responses with less standard deviation (i.e. below .30) were also removed to get valid responses. Before proceeding with the final analysis data was cleaned by removal of incomplete and inconsistent data from both responses of ecommerce and social networking website out of which 547 valid responses were used from ecommerce and 540 responses from social networking websites for further analysis. We received responses from 5 regions (Central, East India, West India, North India, and South India) of India as shown in table 5.8.

Table 5.8 REGION wise Responses

		Ecommerce Website		Social Networking Website	
		Frequency	Percent	Frequency	Percent
Valid Responses	Central	92	16.8	91	16.9
	East India	99	18.1	98	18.1
	North India	89	16.3	87	16.1
	South India	63	11.5	63	11.7
	West India	204	37.3	201	37.2
	Total	547	100.0	540	100.0

As shown in table 5.9 below, 86% users were aware about personalization from all 100% users using personalization features used in ecommerce website

Table 5.9: Personalization awareness in users					
		Ecommerce Website		Social Networking Website	
		Frequency	Percent	Frequency	Percent
Valid Responses	Not Aware	75	13.7	74	13.7
	Aware	472	86.3	466	86.3
	Total	547	100.0	540	100.0

Table 5.10 depicts users' frequency of using ecommerce and social networking websites as below:

Table 5.10 : Frequency of using ecommerce and social networking personalized website					
		Ecommerce Website		Social Networking Website	
		Frequency	Percent	Frequency	Percent
Valid Responses	Daily	482	88.1	475	88.0
	Every Month	2	0.4	2	0.4
	Occasionally	19	3.5	19	3.5
	Once in a Week	43	7.9	43	8.0
	Once in Few months	1	0.2	1	0.2
	Total	547	100.0	540	100.0

5.3.2 Descriptive Statistics of Data:

As mentioned in table 5.11, 77.5 % of responses were from the age between 18 to 25 years which means that the maximum number of users from India is young students, IT professionals. Responses from the age group 26 years to 35 years were 14.8% and remaining 7.7% responses were having age above 36.

Table 5.11: Age wise responses of users					
		Ecommerce website		Social Networking Website	
		Frequency	Percent	Frequency	Percent
Valid Responses	18-25	424	77.5	418	77.4
	26-35	81	14.8	81	15.0
	36-50	40	7.3	40	7.4
	above 60	2	0.4	1	0.2
	Total	547	100.0	540	100.0

Table 5.12 shows responses percentages from different categories of users based on their profession. Students have maximum percentage of usage which is 71.7% for ecommerce websites and 71.5% for social networking websites.

Table 5.12: Responses based on profession of users

		Ecommerce website		Social Networking Website	
		Frequency	Percent	Frequency	Percent
Valid Responses	Business/ Self Employed	17	3.1	17	3.1
	Housewife	18	3.3	18	3.3
	Retired Person	2	0.4	1	0.2
	Service	118	21.6	118	21.9
	Student	392	71.7	386	71.5
	Total	547	100.0	540	100.0

Table 5.13 shows that 33.1% and 33% of female responses were received for ecommerce and social networking websites. 66.9% and 67% of male users responded for ecommerce and social networking websites respectively.

Table 5.13: Responses based on gender of users

		Ecommerce website		Social Networking Website	
		Frequency	Percent	Frequency	Percent
Valid Responses	Female	181	33.1	178	33.0
	Male	366	66.9	362	67.0
	Total	547	100.0	540	100.0

CHAPTER - 6

Data Analysis

In this chapter the analysis of the data on the frame of reference of this thesis is presented. First the empirical analysis of the proposed theoretical model using Exploratory Factor Analysis method is presented and then the Confirmatory Factor Analysis technique is used to confirm the factors and validate the model. SEM is presented for both ecommerce and social networking websites to test the hypothesis later in chapter after verifying construct reliability and validity. The chapter concludes with hypothesis testing and comparison of both models as obtained from the responses for ecommerce and social networking websites.

6.1 Research Data:

After completion of card sorting method and pilot study in two stages, final questionnaire was developed with several revisions. Main study was conducted with final questionnaire items from February 2015 to September 2015 using Google docs form features. By the beginning of October 2015, we received total 1200 responses from the online users of both personalized ecommerce and social networking web portals taken together. We used SPSS 20.0 for analysis of data . We also used SPSS Amos 21.0 for structural equation modelling (SEM) technique to empirically validate proposed model. Incomplete and inconsistent data was removed from the data-set during the data screening process. After initial screening of data, further responses with less standard deviation (i.e. below .30) were also removed to get valid responses. Thus, we found 547 valid responses for ecommerce and 540 responses for social networking websites which were used in the final analysis. The model of personalization consists of 33 items for ecommerce and social networking website responses each. .

6.2 Factor Analysis:

We used factor analysis technique to summarize data, to interpret the relationships and understand the patterns of variables. This technique is used to regroup the variables in set of clusters based on their shared variance. We used exploratory factor analysis to identify the number of factors with group of variables and named that factors or constructs. Confirmatory Factor Analysis (CFA) is used to find interrelationship among constructs. CFA attempts to confirm hypotheses and uses path analysis diagrams to represent variables and factors, whereas Exploratory Factor Analysis (EFA) tries to uncover complex patterns by exploring the dataset and testing predictions (Child, 2006).

6.2.1 Reliability Test:

Reliability can be defined as the degree to which construct measurements are free from error and yield consistent results. Reliability, led consistency and reproducibility, is defined in general as the extent to which a measure, procedure, or instrument yields the same result on repeated trials (Carmines & Zeller, 1979). A construct with Cronbach's alpha value greater than 0.6 shows good reliability is appropriate for exploratory analysis. As shown in the table 6.1 below, all constructs with item scales are above the recommended benchmark 0.6 (Nunnally 1967). The Cronbach's alpha values are acceptable and the result demonstrated good reliability of the constructs used for both ecommerce and social networking web portals in the study.

Table 6.1: Construct Reliability of final constructs			
Web Portal	**Constructs**	**No. of items**	**Cronbach's Alpha**
Ecommerce Questionnaire	Information Personalization	6	.850
	Presentation Personalization	6	.816
	Navigation Personalization	5	.828
	Utilitarian/Cognitive Experience(Perceived Ease of Use, Perceived Usefulness, Enjoyment)	9	.900
	Hedonic Experience (Control)	2	.772
	Satisfaction	2	.945
	Intention to Revisit	3	.989
Social Networking Questionnaire	Information Personalization	6	.856
	Presentation Personalization	6	.841
	Navigation Personalization	5	.777
	Utilitarian/Cognitive Experience(Perceived Ease of Use, Perceived Usefulness, Enjoyment)	9	.883
	Hedonic Experience(Control)	2	.964
	Satisfaction	2	.977
	Intention to Revisit	3	.972

6.2.2 Exploratory Factor Analysis:

Exploratory Factor Analysis method is dimension reduction technique which explores the number of factors. This method is used to identify number of factors falling under the items when there exists not enough knowledge of the components of the factors under study.EFA explore the possible underlying structure of a set of interrelated variables without imposing any preconceived structure on the data (Child, 1990). As a result, the number of latent variables and the underlying factor structure can be identified.

In this study, EFA is needed to explore different aspects or dimensions of personalization and items of satisfaction. We used maximum likelihood method of extraction as it gives correlation between factors in addition to factor loadings and promax oblique rotation technique is used because it is relatively efficient in achieving a simple oblique structure. The larger the sample size, smaller loadings are allowed for a factor to be considered significant (Stevens, 2002). Factor loading score of variable above 0.32 is statistically

significant for sample size above 300 (Tabachnick & Fidell 2007). The factor loadings in the table 6.2 of ecommerce and social networking websites show fairly desirable factor loadings above 0.32. We considered variables or items with loading above 0.32 for further analysis in EFA. As we collected responses from users of both ecommerce and social networking websites, we used EFA technique for both set of data.

6.2.2.1 EFA for Ecommerce website:

Kaiser-Meyer-Olkin Measure of Sampling Adequacy plays an important role for accepting the sample adequacy. While the KMO ranges from 0 to 1, the world-over accepted index is over 0.6. Results in table 6.2 shows KMO value 0.926 which is above 0.6 depicts good sampling adequacy for our research.

Table 6.2: KMO and Bartlett's Test(Ecommerce Website)		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.926
Bartlett's Test of Sphericity	Approx. Chi-Square	12420.300
	Df	496
	Sig.	0.000

In table 6.3 Communalities show the proportion of each variable's variance that can be explained by the factors (e.g., the underlying latent continua). It is also noted that Chi-Square can be defined as the sum of squared factor loadings for the variables. I**nitial** maximum likelihood factoring, the initial values on the diagonal of the correlation matrix are determined by the squared multiple correlation of the variable with the other variables. Final Extraction values in this column (Table 6.3) indicate the proportion of each variable's variance that can be explained by the retained factors. Variables with high values are well represented in the common factor space, while variables with low values are not well represented. [1]Table 6.3 shows all variables communalities above 0.3 with some of the variables communalities greater than 0.8 shows good correlation between variable items.

Table 6.3: Communalities of variables

Communalities[a]

	Initial	Extraction
ECCON1	.539	.821
ECCON2	.517	.516
ECINT3	.963	.966
ECINT2	.947	.951
ECINT1	.973	.992
ECIP1	.388	.402
ECIP2	.541	.624
ECIP3	.528	.566
ECIP4	.497	.540
ECIP6	.427	.427
ECIP5	.408	.428
ECNP1	.486	.541
ECNP2	.543	.669
ECNP3	.473	.530
ECNP4	.495	.512
ECENJ1	.624	.620
ECENJ2	.626	.619
ECPEU1	.571	.590
ECPEU2	.514	.483
ECPEU3	.523	.488
ECPEU4	.655	.683
ECPU2	.424	.349
ECPU3	.497	.429
ECPU1	.536	.508
ECPP1	.520	.496
ECPP2	.537	.518
ECPP3	.564	.627
ECPP4	.508	.503
ECPP5	.590	.654
ECPP6	.472	.480
ECSAT1	.866	.966
ECSAT2	.865	.886

Extraction Method: Maximum Likelihood.

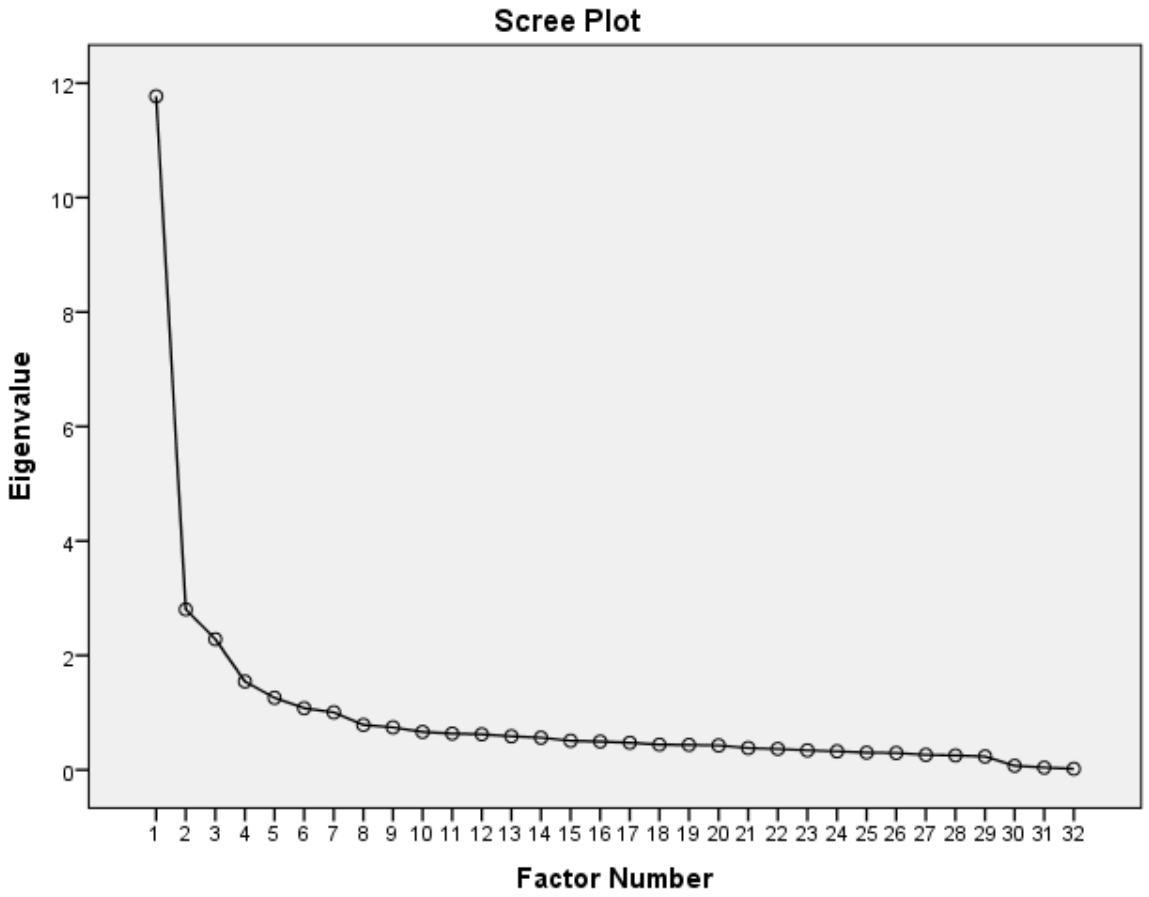


Figure 6.1: Scree plot graph of Exploratory Factor Analysis for ecommerce website

The Eigen values and scree test (i.e., scree plot) are used to determine how many factors to retain. Kaiser's criterion suggests retaining all factors that are above the Eigen value of 1(Kaiser, 1960) which is a rule of thumb. Exploratory Factor analysis explores number of factors based on total variance explained table which mentions factors, Eigen values, percentage of variance and cumulative percentage with extraction and rotation sum of square loadings. This table helps researcher to decide number of factors retained for his research based on Eigen value and cumulative percentage of variance. Number of factors to be retained can also be identified based on scree plot mentioned in figure 6.1. The scree plot graphs the Eigen value against the factor number. Above scree plot graph clearly shows seven factors were having Eigen value above 1. From the seventh factor on, the line is almost flat, shows that each successive factor is accounting for smaller and smaller amounts of the total variance. Table 6.4 shows 67.940 % of cumulative variance for seven factors.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings [a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	11.770	36.783	36.783	8.515	26.608	26.608	9.732
2	2.803	8.759	45.541	1.876	5.861	32.469	7.670
3	2.283	7.133	52.674	3.979	12.436	44.905	5.056
4	1.544	4.826	57.500	2.112	6.601	51.507	7.249
5	1.259	3.934	61.434	.812	2.538	54.044	6.149
6	1.077	3.366	64.800	1.152	3.599	57.643	5.793
7	1.005	3.140	67.940	.939	2.935	60.578	5.112
8	.785	2.453	70.393				
9	.742	2.318	72.711				
10	.663	2.071	74.783				
11	.634	1.982	76.765				
12	.622	1.942	78.707				
13	.586	1.831	80.538				
14	.562	1.757	82.295				
15	.508	1.588	83.882				
16	.495	1.547	85.430				
17	.474	1.482	86.912				
18	.440	1.374	88.286				
19	.436	1.364	89.649				
20	.427	1.333	90.983				
21	.382	1.192	92.175				
22	.366	1.143	93.318				
23	.341	1.065	94.383				
24	.324	1.012	95.395				
25	.301	.941	96.336				
26	.296	.924	97.260				
27	.262	.819	98.079				
28	.252	.788	98.867				
29	.234	.731	99.599				
30	.071	.222	99.820				
31	.040	.126	99.946				
32	.017	.054	100.000				

Extraction Method: Maximum Likelihood.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 6.4: Total Variance Explained for ecommerce websites

Table 6.5 states factor loadings of through pattern matrix generated with maximum likelihood extraction method and promax rotation method. Pattern matrix result gives all the factors, their loadings with items with similarity in exploratory factor analysis. Appropriate name of the factors were given based on nature of the questions and measuring variables falling under each factors. We were able to derive seven factors and named factors as information personalization, navigation personalization, presentation personalization, cognitive\utilitarian experience, hedonic experience (control), satisfaction

and intention to revisit. Table 6.5 below mentions factor loadings of variables with underlying constructs of ecommerce and social networking web portals' personalization design aspects and its interrelationship with users cognitive experience, control, satisfaction and intention to revisit.

Table 6.5: Factor loadings with ecommerce website

Constructs	Variables	Factor						
		1	2	3	4	5	6	7
Cognitive Experience	ECPEU4	.820						
	ECPEU1	.820						
	ECENJ1	.801						
	ECENJ2	.772						
	ECPU1	.661						
	ECPEU3	.594						
	ECPEU2	.555						
	ECPU3	.473						
	ECPU2	.463						
Presentation Personalization	ECPP5		.837					
	ECPP3		.813					
	ECPP2		.674					
	ECPP1		.657					
	ECPP4		.629					
	ECPP6		.628					
Information Personalization	ECIP2			.813				
	ECIP3			.755				
	ECIP4			.717				
	ECIP6			.633				
	ECIP1			.631				
	ECIP5			.627				
Intention to Revisit	ECINT1				.970			
	ECINT3				.947			
	ECINT2				.916			
Navigation Personalization	ECNP2					.838		
	ECNP1					.706		
	ECNP3					.674		
	ECNP4					.619		
Satisfaction	ECSAT1						.983	
	ECSAT2						.914	
Control	ECCON1							.875
	ECCON2							.502
	Extraction Method: Maximum Likelihood. Rotation Method: Promax with Kaiser Normalization.							
	a. Rotation converged in 7 iterations.							

The communality estimate is the estimated proportion of variance of the variable that is free of error variance and is shared with other variables in the matrix. These estimates reflect the variance of a variable in common with all others together

(Gie Yong 2013). Residuals are computed between observed and reproduced correlations in exploratory factor analysis with maximum likelihood extraction method. There are 20 (4.0%) non-redundant residuals with absolute values greater than 0.05. A model that is a good fit will have less than 50% of the non-redundant residuals with absolute values that are greater than .05 which is true for our example. We can also compare the Reproduced Correlation Matrix with the original Correlation Coefficients Matrix. If the model is a good fit, we should expect small residuals between the two matrices. Our research shows 4% of residual which shows good model fit of factors.

ECPEU2	.006	-.040	.004	.008	-.002	-.020	.008	.014	-.017
ECPEU3	-.002	.004	-.012	.010	.001	.018	.003	-.033	.012
ECPEU4	.002	.001	-.002	-.006	.001	-.014	.007	-.024	.012
ECPU2	.016	.027	.003	-.004	.000	-.005	.050	-.052	-.010
ECPU3	.008	.034	.010	.002	-.003	-.019	-.013	.009	.001
ECPU1	-.005	.024	.002	-.002	-4.815E-005	-.039	-.012	.045	-.024
ECPP1	-.014	.014	-.002	-.006	.002	-.024	-.011	.034	-.011
ECPP2	-.004	-.008	-.006	-.006	.003	-.003	.027	.002	.009
ECPP3	-4.219E-005	-.001	-.001	-.001	.000	.011	-.011	-.014	.047
ECPP4	-.004	.001	.001	.004	-.001	.025	-.015	-.066	-.008
ECPP5	.003	.005	-.005	.005	.000	.006	.001	.019	-.029
ECPP6	.010	-.035	.013	.005	-.004	-.012	-.001	.024	-.007
ECSAT1	.000	.001	.000	.000	.000	.002	-.002	.003	.000
ECSAT2	.002	-.004	.001	.001	-.001	-.007	.005	-.009	.005

Extraction Method: Maximum Likelihood.

a. Reproduced communalities

b. Residuals are computed between observed and reproduced correlations. There are 20 (4.0%) nonredundant residuals with absolute values greater than 0.05.

Table 6.6: Non redundant Residuals with ecommerce website

Factor Correlation Matrix

Factor	1	2	3	4	5	6	7
1	1.000	.609	.447	.664	.561	.576	.529
2	.609	1.000	.392	.419	.568	.434	.441
3	.447	.392	1.000	.248	.257	.260	.282
4	.664	.419	.248	1.000	.427	.531	.512
5	.561	.568	.257	.427	1.000	.330	.351
6	.576	.434	.260	.531	.330	1.000	.455
7	.529	.441	.282	.512	.351	.455	1.000

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.

Table 6.7: Factor Correlation Matrix

Above table 6.7 shows correlation matrix of all seven identified matrix with good correlations amongst factors. Information, navigation, presentation personalization is highly correlated with cognitive, hedonic experience, satisfaction and intention to revisit.

6.2.2.2 EFA for Social Networking Website:

Exploratory Factor Analysis result for Social Networking websites shows KMO value 0.929 which shows good sample adequacy in KMO Bartlett's Test.

Table 6.8 :KMO and Bartlett's Test(Social Networking Website)		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.929
Bartlett's Test of Sphericity	Approx. Chi-Square	11929.356
	Df	496
	Sig.	0.000

Table 6.9: Communalities of factors in SPSS

Communalities[a]		
	Initial	Extraction
SNPU1	.473	.429
SNPU2	.471	.429
SNPU3	.438	.433
SNENJ1	.581	.616
SNENJ2	.595	.596
SNPEU1	.501	.504
SNPEU2	.504	.482
SNPEU3	.546	.556
SNPEU4	.581	.611
SNINT3	.874	.902
SNINT2	.856	.887
SNINT1	.894	.937
SNIP1	.520	.541
SNIP2	.455	.459
SNIP4	.542	.590
SNIP3	.498	.560
SNIP5	.508	.479
SNIP6	.540	.535
SNNP1	.523	.606
SNNP2	.447	.516
SNNP3	.434	.515
SNNP4	.487	.534
SNPP1	.480	.497
SNPP2	.516	.553
SNPP3	.496	.535
SNPP4	.521	.558
SNPP5	.515	.537
SNPP6	.522	.534
SNCON1	.881	.999
SNCON2	.877	.872
SNSAT2	.917	.920
SNSAT1	.922	.994

Extraction Method: Maximum Likelihood.

Table 6.9 Communalities of factors in SPSS shows communalities of all variable above 0.3 which shows adequacy data for further analysis.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	12.093	37.790	37.790	6.545	20.455	20.455	9.842
2	2.553	7.979	45.769	3.020	9.437	29.891	7.897
3	2.296	7.175	52.944	2.904	9.074	38.965	6.152
4	1.406	4.393	57.337	3.457	10.805	49.770	7.238
5	1.243	3.883	61.221	1.831	5.721	55.491	7.075
6	1.174	3.669	64.890	1.100	3.436	58.927	5.734
7	1.093	3.416	68.306	.860	2.689	61.615	5.824
8	.787	2.461	70.767				
9	.744	2.326	73.093				
10	.653	2.040	75.133				
11	.595	1.860	76.993				
12	.590	1.844	78.837				
13	.563	1.760	80.597				
14	.543	1.697	82.293				
15	.501	1.566	83.860				
16	.492	1.537	85.396				
17	.471	1.473	86.869				
18	.436	1.361	88.231				
19	.424	1.325	89.556				
20	.413	1.292	90.848				
21	.402	1.256	92.104				
22	.384	1.201	93.304				
23	.350	1.094	94.399				
24	.330	1.031	95.430				
25	.322	1.007	96.436				
26	.298	.932	97.368				
27	.295	.922	98.289				
28	.268	.838	99.127				
29	.102	.317	99.445				
30	.075	.234	99.679				
31	.062	.194	99.873				
32	.041	.127	100.000				

Extraction Method: Maximum Likelihood.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 6.10: Total variance explained for social networking websites

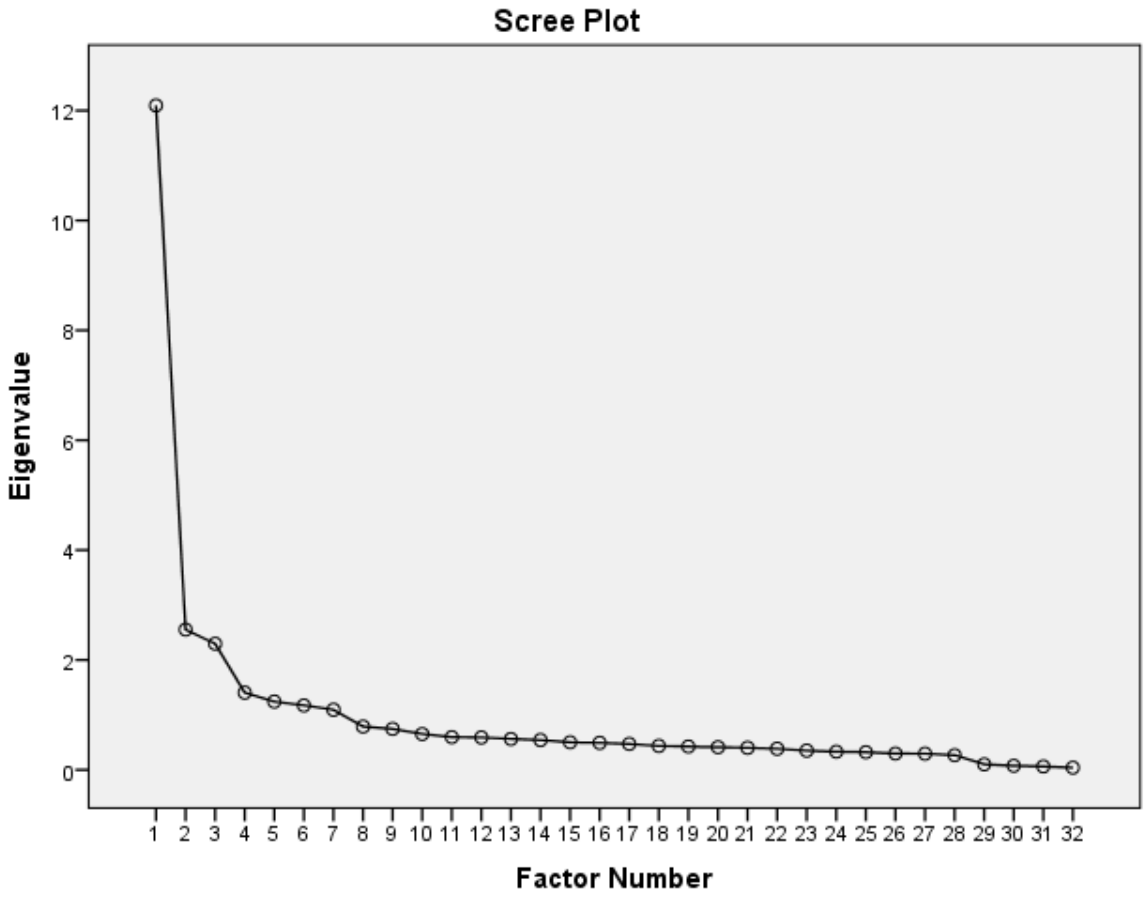


Figure 6.2: Scree plot graph for social networking websites

The eigen values and scree test (i.e., scree plot) are used to determine how many factors to retain. One criterion that can be used to determine the number of factors to retain is Kaiser's criterion which is a rule of thumb. This criterion suggests retaining all factors that are above the eigen value of 1 (Kaiser, 1960). Figures 6.5 shows total variance explained for social networking websites. After exploratory factor analysis, 68.302 % of variance observed with identifying seven factors having Eigen value greater than 1. We were able to derive seven factors for social networking websites which is similar to ecommerce website as information personalization, presentation personalization, navigation personalization, utilitarian/ cognitive experience, hedonic experience (control), satisfaction and intention to revisit. Figure 6.6 scree plot graph of social networking website response shows clear identification of seven factors having Eigen value more than 1 so we can retain seven factors as per thumb rule.

Table 6.11 shows factor loadings of all variables of constructs we retained all the variable items having factor loading greater than .3.

Table 6.11 : Factor loadings with social networking website

Constructs	Variables	Factors						
		1	2	3	4	5	6	7
Cognitive Experience	SNENJ1	.818						
	SNPEU4	.796						
	SNPEU3	.794						
	SNPEU2	.742						
	SNENJ2	.698						
	SNPEU1	.594						
	SNPU1	.531						
	SNPU2	.528						
	SNPU3	.339						
Presentation Personalization	SNPP4		.766					
	SNPP2		.763					
	SNPP3		.727					
	SNPP5		.721					
	SNPP6		.664					
	SNPP1		.659					
Information Personalization	SNIP1			.783				
	SNIP3			.773				
	SNIP4			.719				
	SNIP2			.718				
	SNIP6			.625				
	SNIP5			.590				
Intention to Revisit	SNINT2				.940			
	SNINT1				.933			
	SNINT3				.900			
Navigation Personalization	SNNP3					.778		
	SNNP1					.760		
	SNNP2					.726		
	SNNP4					.639		
Satisfaction	SNSAT1						.980	
	SNSAT2						.945	
Control	SNCON1							.982
	SNCON2							.902
	Extraction Method: Maximum Likelihood. Rotation Method: Promax with Kaiser Normalization.							
	a. Rotation converged in 7 iterations.							

SNPP4	.027	.028	.007	.010	.046	.005	-.021	-.036	-.029	-.004	.011	-.004
SNPP5	-.011	.001	-.012	.001	-.017	.018	-.005	-.009	.029	-.011	.002	.005
SNPP6	.027	.002	-.019	.001	-.024	-.008	.059	.007	-.017	.006	.002	-.006
SNCON1	-9.311E-05	1.695E-05	-6.005E-06	-2.353E-05	2.115E-05	2.410E-05	4.689E-05	5.628E-05	-6.249E-05	2.587E-05	3.582E-05	-3.160E-05
SNCON2	.012	-.003	.002	.001	-.003	-.003	-.008	-.005	.010	-.004	-.005	.005
SNSAT2	.011	-.007	.002	-.003	-.003	-.004	.004	.005	.000	-.002	.005	-.002
SNSAT1	-.001	.000	.000	.000	.000	.000	-8.796E-05	.000	.000	.000	.000	7.895E-05

Extraction Method: Maximum Likelihood.

a. Reproduced communalities

b. Residuals are computed between observed and reproduced correlations. There are 17 (3.0%) nonredundant residuals with absolute values greater than 0.05.

Table 6.12: Non redundant Residuals with social networking websites

Residuals are computed between observed and reproduced correlations in exploratory factor analysis with maximum likelihood extraction method. There are 17 (3.0%) non-redundant residuals with absolute values greater than 0.05. A model that is a good fit will have less than 50% of the non-redundant residuals with absolute values that are greater than .05 which is true for our example. We can also compare the Reproduced Correlation Matrix with the original Correlation Coefficients Matrix. If the model is a good fit, we should expect small residuals between the two matrices. Our research shows 3% of residual which shows good model fit of factors.

Factor Correlation Matrix

Factor	1	2	3	4	5	6	7
1	1.000	.607	.482	.662	.567	.574	.601
2	.607	1.000	.446	.426	.657	.403	.437
3	.482	.446	1.000	.401	.469	.298	.361
4	.662	.426	.401	1.000	.431	.506	.445
5	.567	.657	.469	.431	1.000	.404	.386
6	.574	.403	.298	.506	.404	1.000	.400
7	.601	.437	.361	.445	.386	.400	1.000

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.

Table 6.13: Factor Correlation Matrix for social networking website

6.3 Structure Equation Model:

Structural Equation Modelling (SEM) is a multivariate technique that estimates a series of inter-related dependent simultaneously amongst constructs. Structural Equation Modelling shows causal relationship amongst constructs with series of structural (i.e. regression) equations under study modeled pictorially to enable a clearer conceptualization of the study. SEM technique is used to test the hypothesized model statically with simultaneous analysis of the entire system of variables in underlying constructs to determine that to which extent model is consistent with data. If the result of goodness-of-fit is adequate, the model shows plausibility of postulated relations among the construct variables. SEM has two types of model: the Measurement model and the structural model.

The measurement model defines relations between the observed and unobserved variables. It provides the link between scores on a measuring instrument (i.e. the observed indicator variables) and the underlying constructs they are designed to measure. The measurement model represents the Confirmatory Factor Analysis (CFA) that specifies the pattern by which each measure loads on a particular factor. The measurement model through CFA concentrates on validating the model and does not explain the relationships between constructs. CFA represents how the measured variables come together to represent constructs which are used for validation and reliability checks. In other words CFA is a way of testing how well the measured variables represent a particular construct. The purpose of CFA is twofold: first, to confirm a hypothesized factor structure, and second to be used as a validity procedure in the measurement model

The structural model defines relations among the unobserved variables which can be further categorized in dependent and independent variables of constructs. The structural model also specifies the manner by which particular latent variables directly or indirectly influence (i.e. ‘cause’) changes in the values of certain other latent variables in the hypothesized model. It is concerned with how constructs are associated with each other which is further used for hypotheses testing to test the proposed model or framework.

This research has analyzed data using Anderson and Gerbing's (1988) two step approach in which the estimation of the confirmatory measurement model precedes the estimation of the structural model. Before evaluating the model fit, it is necessary to present the analysis of the psychometric properties of the instrument through measurement model. The next section does so by presenting the validation and reliability checks of the instrument.

6.3.1 Measurement Model Validation (Psychometric Checks):

A Confirmatory Factor Analysis (CFA) was performed using SPSS AMOS 21.0. Measurement model validity depends on establishing acceptable levels of goodness-of–fit for the measurement model and finding specific evidence of construct validity. The constructs used in this research were evaluated in terms of reliability and validity. Reliability can be defined as a variable's ability to accurately measure what it is supposed to measure. Hair et al. (1998) argue that "reliability is an assessment of the degree of consistency between multiple measurements of a variable". In this research, Construct Reliability was examined based on the Cronbach alpha indicator which needs to be higher than 0.7 for every factor as mentioned earlier in this chapter. Validity is defined as the extent to which data collection methods accurately measure what they were intended to measure (Saunders and Thornhill, 2003). Validity can be defined as a measurement's (including questions or items) ability to prevent systematic or non-random error (Hair et al. 1998). Thus validity is dependent on how accurately and well the content of the measure represents the concept of the study we are measuring. To satisfy the validity procedure, we carried out following validity and reliability checks:

- Content Validity
- Convergent Validity
- Composite Reliability
- Discriminant Validity
- Construct Reliability

6.3.1.1 Content Validity:

Content validity describes how well the content of the measure matches with the conceptual definition of the phenomena under study (Nunnally 1978, Alkula et al. 1994). This requires the researcher to try to ensure that the measure used (including items, questions etc.) will measure what it is intended to (Hair et al. 1998). Content validity aims to eliminate several errors related to, for example, the sampling, measurement or analysis of the variables. Content validity may have an important influence on the interpretation and generalization of the results. In this study we have tried to ensure content validity by using measures which are derived from theory and assessed by experts in the information technology field and in the target company, in an attempt to ensure that the content of the measure is consistent with the concept we are studying. Content validity was also tested statistically by measuring inter-item correlation. All the inter-item correlation values were positive, suggesting that the measures have good content validity. Content validity was also tested statistically by measuring inter-item correlation. All the inter-item correlation values were positive, suggesting that the measures have good content validity, construct validity can show how well a selected measure matches with the suggested hypotheses, and can indicate whether the measure behaves as expected (Nummenmaa et al. 1997). Nunnally (1978) emphasizes that when ensuring construct validity one should take care that the measures of the model measure the same thing. In this research, the selected measures described the represented model of the study very well. Factors incorporated into the model were also tested using factor analysis, which is a powerful method when studying the interrelationships of the factors and when analyzing the developed model. Moreover, item-to-total correlations of the variables were carried out. Both statistics suggested good construct validity for data.

6.3.1.2 Convergent Validity:

Convergent validity is shown when each measurement item correlates strongly with its assumed theoretical construct. In other words the items that are the indicators of a construct should converge or share a high proportion of variance in common. The value ranges

between zero and one (0 – 1). The ideal level of standardized loadings for reflective indicators is 0.70 but 0.50 is considered to be an acceptable level (Barclay et al., 1995). In Structural Equation Modeling, for the convergent validity the factor loadings and Average Variance Extracted (AVE) should be greater than 0.5 (Fornell and Larcker, 1981). The average variance extracted (AVE) for each of the factors is calculated manually for all the constructs using the formula suggested by Hair et al., (1995) as given below:

$$AVE = \frac{(\sum_{i=1}^{n} \lambda_i^2)}{(\sum_{i=1}^{n} \lambda_i^2) + (\sum_{i=1}^{n} \delta_i)}$$

Where, λ is the standardized factor loadings and indicator measurement error. δ is measurement indicator error. This can be put forth in simple terms as sum of squared standard loadings divided by sum of squared standard loadings plus sum of indicator measure errors. The AVE scores for the all the factors of ecommerce and social networking websites are displayed in table below:

Table 6.14 : AVE Score of Ecommerce and Social Networking Websites

	Ecommerce		Social Networking	
	Factor Loadings	**AVE**	**Factor Loadings**	**AVE**
Information Personalization (IP)	0.696	0.488	0.924	0.501
Presentation Personalization (PP)	0.706	0.526	0.701	0.530
Navigation Personalization (NP)	0.709	0.550	0.962	0.533
Cognitive Experience (Cog_Exp)	0.662	0.505	0.717	0.504
Hedonic Experience/Control (CON)	0.948	0.630	0.944	0.931
Satisfaction(SAT)	0.688	0.924	0.649	0.958
Intention to Revisit (INT)	0.944	0.969	0.726	0.907

The Average variance extracted and the construct factor loadings are presented in table 6.14 which shows that all most all AVE values are above 0.5 except Information Personalization for ecommerce websites and factor loadings are greater than 0.6. For all the constructs, all items have high loadings, with majority above 0.70 therefore

demonstrating convergent validity. This study satisfied this criterion hence convergent validity is established in our study for both ecommerce and social networking websites.

6.3.1.3 Composite Reliability:

Composite reliability (CR) measures the overall reliability of a set of items loaded on a latent construct. Value ranges between zero and one and values greater than 0.70 reflect good reliability. Between 0.60 – 0.70 is also acceptable if other indicators of the construct's validity are good (Hair et al., 2006).

The internal reliability of the measurement models was tested using Fornell's composite reliability (Fornell and Larcker, 1981). Reliability of the factors was estimated by checking composite reliability. Composite reliability should be greater than the benchmark of 0.7 to be considered adequate (Fornell and Larcker, 1981). The formula for calculating composite reliability is as follows:

$$\text{Composite Reliability } (\rho) = \frac{(\sum \lambda_i)^2}{[\ (\sum \lambda_i)^2 + \sum(\delta_i)\ ]}$$

Where, λ is the standardized factor loadings and indicator measurement error and δ is measurement indicator error. This can be explained as square of sum of standardized factor loadings divided by square of sum of loadings plus sum of indicator measurement errors. The AVE scores for the all the factors of ecommerce and social networking websites are displayed in table below:

Table 6.15 : Composite Reliability of Ecommerce and Social Networking Websites				
	Ecommerce		Social Networking	
	Factor Loadings	CR	Factor Loadings	CR
Information Personalization (IP)	0.696	0. 850	0.924	0.857
Presentation Personalization (PP)	0.706	0.869	0.701	0.871
Navigation Personalization (NP)	0.709	0.830	0.962	0.820
Cognitive Experience (Cog_Exp)	0.662	0.901	0.717	0.901
Hedonic Experience/Control (CON)	0.948	0.773	0.944	0.964
Satisfaction(SAT)	0.688	0.961	0.649	0.979
Intention to Revisit (INT)	0.944	0.989	0.726	0.967

The Composite Reliability and construct factor loadings are presented in table 6.15 which shows that all composite reliabilities of constructs have a value higher than 0.70, indicating adequate internal consistency.

6.3.1.4 Discriminant Validity:

Discriminant validity is the extent to which a construct is truly distinct from other constructs. It means that a latent variable should explain better the variance of its own indicators than the variance of other latent variables. In other words the loading of an indicator on its assigned latent variable should be higher than its loadings on all other latent variables. Discriminant validity check is done by comparing the AVE's with the squared correlation for each of the constructs. The AVE of a latent variable should be higher than the squared correlations between the latent variable and all other latent variables. The rule of thumb for assessing Discriminant validity requires that the square toot of AVE be larger than the squared correlations between constructs (Cooper & Zmud, 1990, Hair et al., 1998).

Discriminant validity is shown when each measurement item correlates weakly with all other constructs except for the one to which it is theoretically associated. To examine discriminant validity, the shared variances between factors were compared with the

Average Variance Extracted (AVE) of the individual factors (Fornell & Larcker, 1981). The proof of discriminant validity is presented in table 6.16 and 6.17 as shown below.

Table 6 .16: CR,AVE score showing discriminant validity of Ecommerce Website

	CR	AVE	SAT	Cog_Exp	PP	IP	INT	NP	CON
SAT	0.961	0.924	**0.962**						
Cog_Exp	0.901	0.505	0.594	**0.710**					
PP	0.869	0.526	0.446	0.639	**0.725**				
IP	0.850	0.488	0.252	0.450	0.388	**0.699**			
INT	0.989	0.969	0.562	0.709	0.448	0.269	**0.984**		
NP	0.830	0.550	0.375	0.609	0.616	0.284	0.456	**0.742**	
CON	0.773	0.630	0.570	0.662	0.589	0.347	0.613	0.479	**0.794**

Table 6 .17: CR,AVE score showing discriminant validity of Social Networking Website

	CR	AVE	SAT	Cog_Exp	PP	IP	INT	NP	CON
SAT	0.979	0.958	**0.979**						
Cog_Exp	0.901	0.504	0.602	**0.710**					
PP	0.871	0.530	0.415	0.643	**0.728**				
IP	0.857	0.501	0.328	0.521	0.477	**0.708**			
INT	0.967	0.907	0.537	0.710	0.434	0.415	**0.952**		
NP	0.820	0.533	0.416	0.595	0.682	0.476	0.409	**0.730**	
CON	0.964	0.931	0.414	0.627	0.466	0.381	0.470	0.389	**0.965**

The diagonal items in the table represent the square root of AVE's, which is a measure of variance between construct and its indicators, and the off diagonal items represent squared correlation between constructs. As seen from the factor correlation matrix in Table 6.16 & 6.17, the AVE score for both ecommece and social networking websites constructs were lower than the squared correlation between any pair of constructs. This analysis showed that the shared variance between factors were lower than the AVE's of the individual factors, which confirmed discriminant validity amongst factors.

6.4 Confirmatory Factor Analysis:

After validation of the measurement instrument was satisfied, the results of the Confirmatory Factor Analysis (CFA) using SPSS AMOS 21.0 was used to evaluate the model fit of the measurement model to confirm the hypothesized structure. Confirmatory Factor Analysis (CFA) is used to validate and confirm the relationship amongst the factors discovered after EFA. We postulates relations between the observed measures and the underlying factors 'a priori', based on knowledge of the theory and proposed framework in earlier chapters. This study is empirical research, to tests this hypothesized framework statistically. Because the CFA model focuses solely on the link between factors and their measured variables, within the framework of SEM, it represents what is called as a measurement model. In this study, the model was developed 'a priori', hence only the CFA was used. The Confirmatory Factor Analysis process determines whether the hypothesized structure or model provides a good fit to the data, or in other words, that a relationship between the observed variables and their underlying latent, or unobserved, constructs exist (Child, 1990). The CFA would also provide evidence that all items are properly aligned with the correct latent variables within the general construct being measured.

6.4.1 Model Identification:

The hypothesized model is recursive as it shows straight forward, uni-directional causal relationship between constructs in ecommerce and social networking websites. Structural models are of three types like just-identified, over-identified, or under-identified. A just identified model shows one-to-one correspondence between the data and the structural parameters. That is, the number of data variances and co-variances equals the number of parameters to be estimated. An under-identified model is one which the number of parameters to be estimated exceeds the number of variances and co-variances. As such the model would contain insufficient information for attaining a solution. An over-identified model is one which the number of estimable parameters is less than the number of data

points (i.e. variances and co variances of the observed variables). This results in positive degrees of freedom that allow for rejection of the model thereby rendering it of scientific use. The aim in SEM therefore is to specify a model which is over-identified. There are two basic requirements for the identification of any kind of Structural Equation Model: firstly there must be at least as many observations as free model parameters ($df \geq 0$), and second every unobserved (latent) variable must be assigned a scale (metric).

The proposed models in this study is an over-identified model as it shows positive degrees of freedom shown in table 6.18 drawn from the AMOS output of both ecommerce and social networking websites data.

Table 6.18: Model identification

	Ecommerce Websites	Social Networking Websites
Number of distinct sample moments	496	528
Number of distinct parameters to be estimated	83	85
Degrees of freedom (df)	413	443

6.4.2 Model Estimation Method:

We used widely used estimation method Maximum Likelihood (ML) estimation which describes the statistical principle that underlies the derivation of parameter estimates: the estimates are the ones that maximize the likelihood (the continuous generalization) that the data (the observed co variances) were drawn from this population. That is, ML estimators are those that maximize the likelihood of a sample that is actually observed (Winer, Brown, & Michels,1991). In this study the minimum iteration was achieved, thereby providing an assurance that the estimation process yielded an admissible solution, eliminating any concern about multicollinearity effects for ecommerce and social networking websites model.

6.4.3 Model Evaluation Criteria:

Structural Equation Modeling is used to verify the extent to which a hypothesized data "fits", i.e. adequately describes the sample data. The process to find model fit involves is determined by identifying the goodness-of fit between the hypothesized model and the sample data. Goodness of fit (GOF) indicates how well the specified model reproduces the observed covariance matrix among the indicator items (i.e. the similarity of the observed and estimated covariance matrices The Chi square goodness of fit metric is used to assess the correspondence between theoretical specification and empirical data in a CFA. Degrees of freedom represent the amount of mathematical information available to estimate model parameter. The degrees of freedom in SEM are based on the size of the covariance matrix, which comes from the number of indicators in the model. CFA results for deciding model fit is obtained by different indexes prescribed by researcher with its indication values for model fit. Next section provide evaluation of our model based on this criteria like The Goodness-of-fit Index (GFI & AGFI), Normed Fit Index (NFI), Relative Fit Index (RFI), Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), Root Mean Square Residual (RMR).

6.4.4 CFA Model and Evaluation of Ecommerce Website:

The results shown in table 6.19 provide a quick overview of the model fit, which includes the value CMIN(988.269), together with its degrees of freedom (413) and probability value (0.000). In the table NPAR stands for Number of parameters (83), and CMIN is the minimum discrepancy and represents the discrepancy between the unrestricted sample covariance matrix S and the restricted covariance matrix. Df stands for degrees of freedom and P is the probability value.

Table 6.19: AMOS output of model fit for ecommerce website

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	83	988.269	413	.000	2.393
Saturated model	496	.000	0		
Independence model	31	12386.171	465	.000	26.637

In SEM a relatively small chi-square value supports the proposed theoretical model being tested. In this model the CMIN value is 988.269 and is small compared to the value of the independence model (12386.171). Hence the CMIN value is good but it is better to verify with other index values. Chi-square (CMIN) divided by degrees of freedom is suggested as a better fit metric (Bentler and Bonnett, 1980). It is recommended that this metric should not exceed 5 for models with good fit (Bentler, 1989). For the current CFA model, as shown in table 6.19, CMIN⁄DF is 2.393which shows acceptable model fit. The other different common model-fit measures used to assess the models overall goodness of fit as explained earlier is shown in table 6.20.

Table 6.20 Fit Statistics of Measurement Model for ecommerce website

Fit statistics	Recommended	Obtained
CMIN	-	988.269
DF	-	413
CMIN Significance	p < = 0.05	0.000
CMIN/DF	< 5.0 (Bentler and Bonnett, 1980)	2.393
GFI	> 0.80 (Joreskog & Sorbom, 1981	0.897
AGFI	> 0.80 (Joreskog & Sorbom, 1981	0.876
NFI	> 0.90 (Bentler and Bonnet 1980)	0.920
RFI	> 0.90 (Bollen, 1986)	0.910
CFI	> 0.90 (Hu and Bentler 1999)	0.952
TLI	> 0.90 (Tucker and Lewis, 1973)	0.946
RMSEA	< 0.06 (Browne and Cudeck, 1993)	0.051
RMR	<0.02 (Hu and Bentler 1999)	0.027

Our result of CFA for ecommerce website shows Minimum Discrepancy which is chi-Square divided by degree of freedom i.e. CMIN/DF 2.393 which should be less than 5 so my parsimonious model is fit. All NFI, RFI and TLI are nearer to 0.9 which is good. RMSEA is 0.051 which is less than 0.06 so the model is having good fit. The Root Mean Square Error of Approximation (RMSEA) is related to the residuals in the model. RMSEA values range from zero to one with a smaller RMSEA value indicating better model fit. Good model fit is typically indicated by an RMSEA value of 0.06 or less (Hu & Bentler, 1999). The results of the model estimation are shown in Figure below. The confirmatory factor analysis showed an acceptable overall model fit and hence, the theorized model fit well with the observed data. It can be concluded that the hypothesized factor CFA model fits the sample data very well.

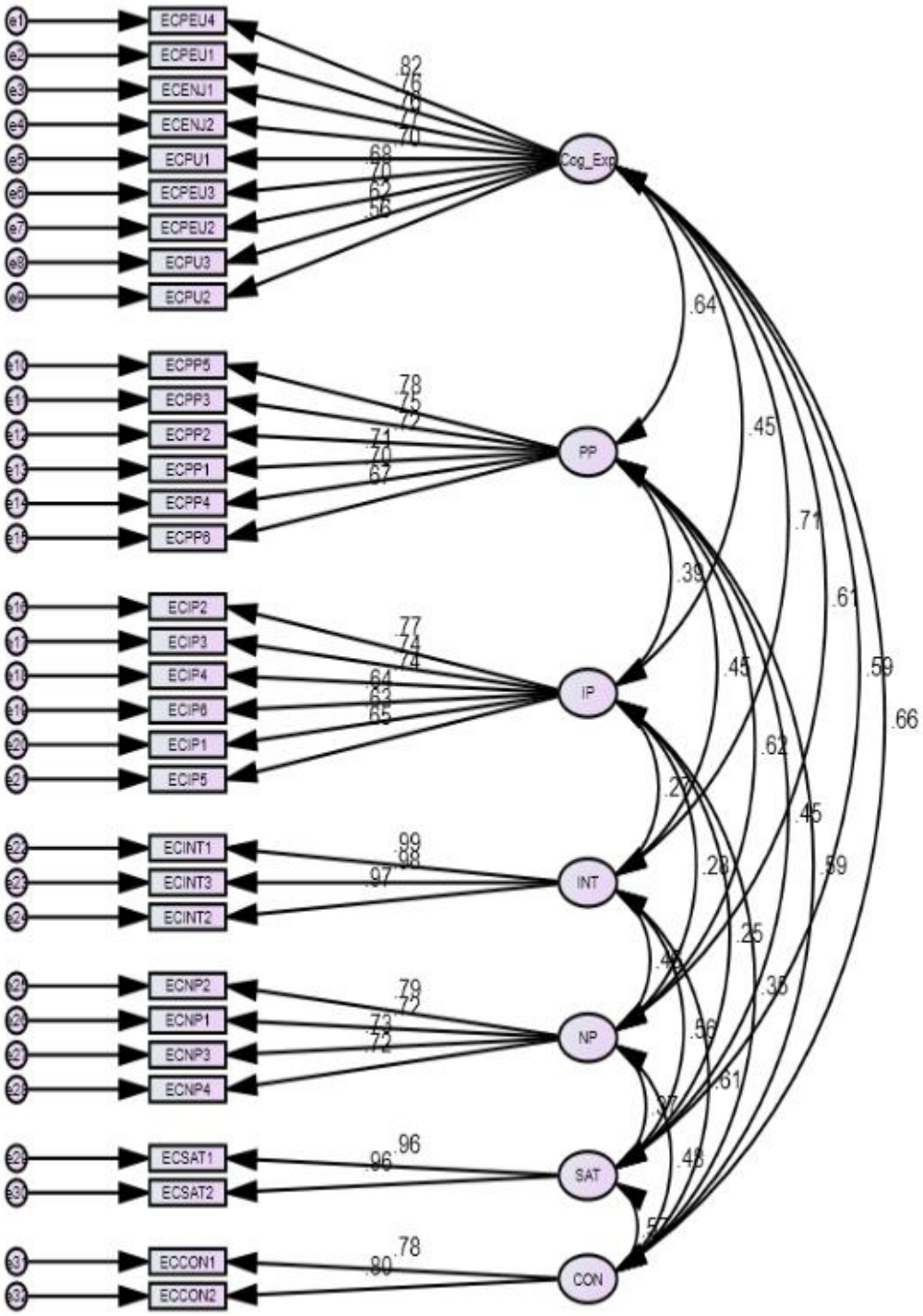


Figure 6.3: CFA model for ecommerce websites

6.4.5 CFA Model and Evaluation of Social Networking Website:

The results shown in table 6.21 shows model fit, showing the value CMIN(851.757), together with its degrees of freedom (443) and probability value (0.000). In the table NPAR stands for Number of parameters (85), and CMIN is the minimum discrepancy and represents the discrepancy between the unrestricted sample covariance matrix S and the restricted covariance matrix. Df stands for degrees of freedom and P is the probability value.

Table 6.21: AMOS output of model fit for social networking website

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	85	851.757	443	.000	1.923
Saturated model	528	.000	0		
Independence model	32	12189.428	496	.000	24.575

In SEM a relatively small chi-square value supports the proposed theoretical model being tested. In this model the value is 851.757 and is small compared to the value of the independence model (12189.428). Hence the CMIN value is good but it is better to verify with other index values. Chi-square (CMIN) divided by degrees of freedom is suggested as a better fit metric (Bentler and Bonnett, 1980). It is recommended that this metric should not exceed 5 for models with good fit (Bentler, 1989). For the current CFA model, as shown in table 6.21, CMIN⁄DF is 1.923 which suggest acceptable model fit

The other different common model-fit measures used to assess the models overall goodness of fit as explained earlier is shown in table 6.22.

Table 6.22: Fit Statistics of Measurement Model for social networking website		
Fit statistics	**Recommended**	**Obtained**
CMIN	-	1105.057
DF	-	443
CMIN Significance	p < = 0.05	0.000
CMIN/DF	< 5.0 (Bentler and Bonnett, 1980)	2.494
GFI	> 0.80 (Joreskog & Sorbom, 1981	0.888
AGFI	> 0.80 (Joreskog & Sorbom, 1981	0.867
NFI	> 0.90 (Bentler and Bonnet 1980)	0.913
RFI	> 0.90 (Bollen, 1986)	0.902
CFI	> 0.90 (Hu and Bentler 1999)	0.946
TLI	> 0.90 (Tucker and Lewis, 1973)	0.939
RMSEA	< 0.06 (Browne and Cudeck, 1993)	0.052
RMR	<0.02 (Hu and Bentler 1999)	0.028

CFA for social networking website shows chi-Square divided by degree of freedom i.e. CMIN/DF 2.227 which should be less than 5 so my parsimonious model is fit. All NFI, RFI and TLI are nearer to 0.9 which is good. The Root Mean Square Error of Approximation (RMSEA) is related to the residuals in the model. RMSEA values range from zero to one with a smaller RMSEA value indicating better model fit. Good model fit is typically indicated by an RMSEA value of 0.06 or less (Hu & Bentler, 1999). The results of the model estimation are shown in Figure 6.4 below. RMSEA is 0.041 which is less than 0.06 so the model is having good fit.

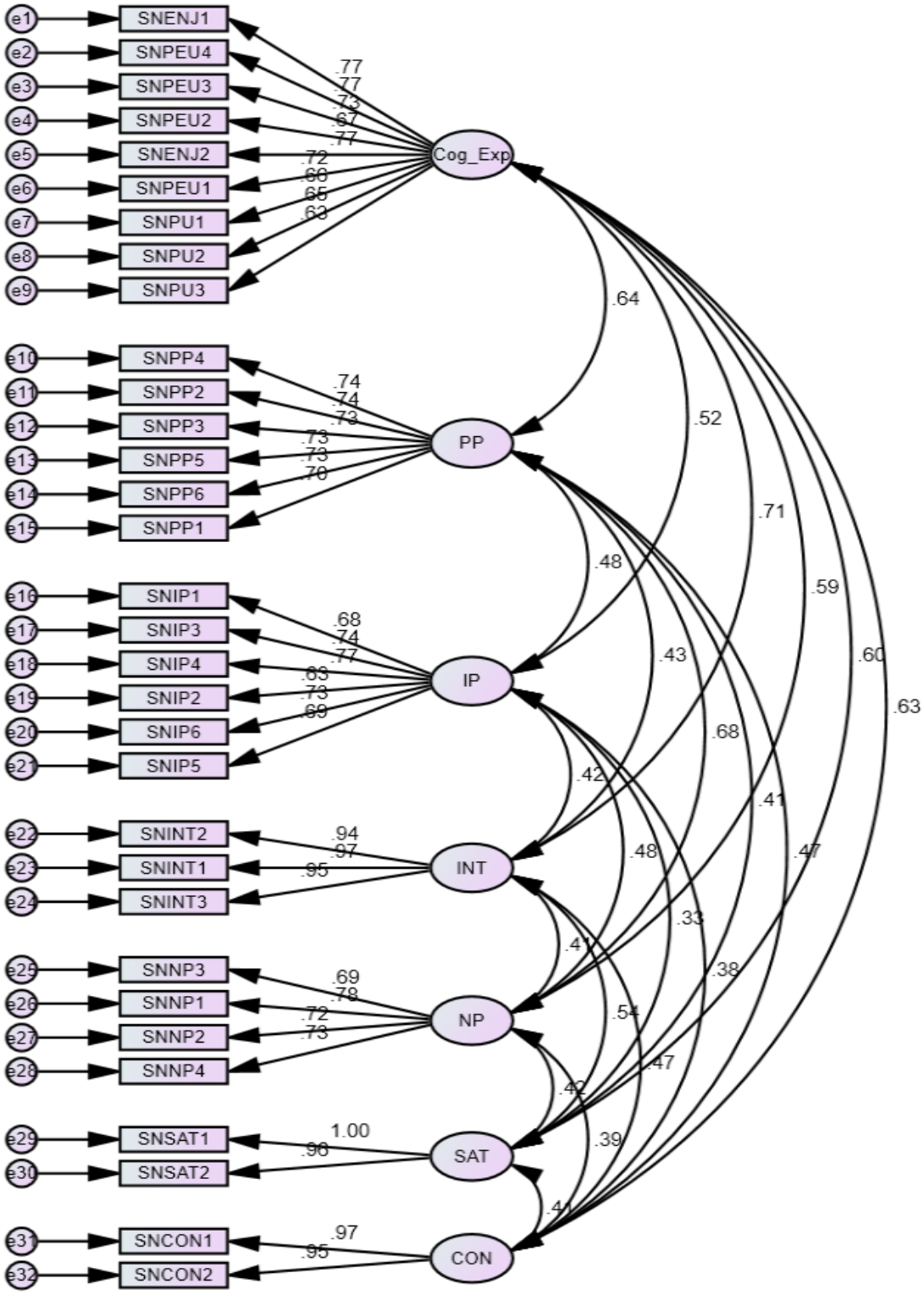


Figure 6.4: CFA model for social networking websites

6.5 SEM Results:

6.5.1 SEM result for Ecommerce website:

Structural Equation Modeling (SEM) technique tests the models where causal relationships are hypothesized to exist between latent variables. Structural Equation Modelling of ecommerce website data shows that all the hypotheses are supported. This indicates that personalized ecommerce website has positive effect on users satisfaction and intention to revisit website through positive cognitive and hedonic experience

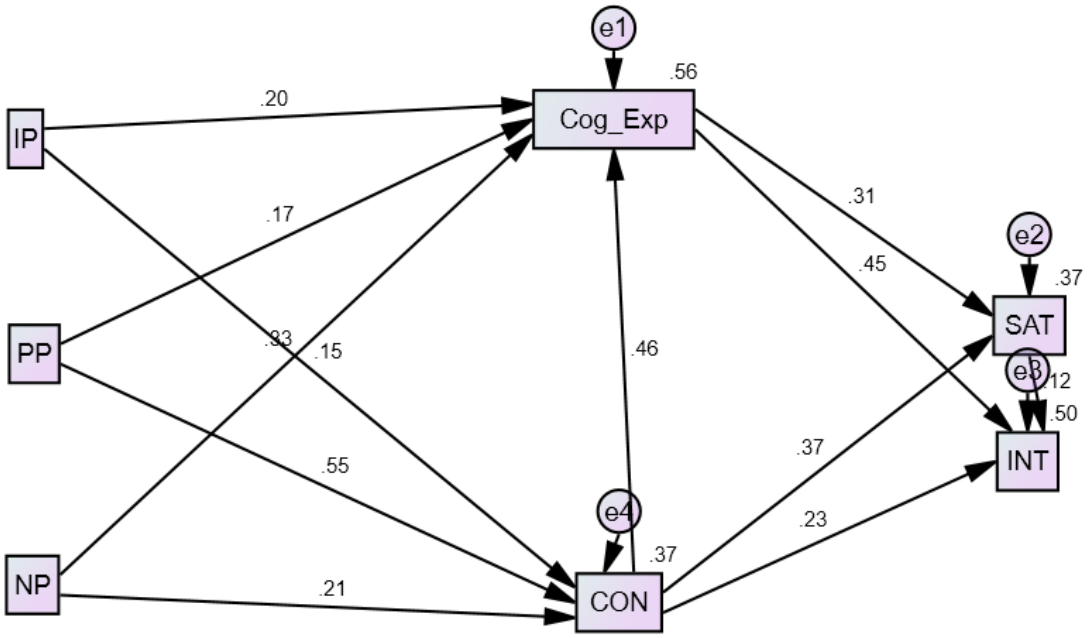


Figure 6.5: SEM for personalized ecommerce website

This section presents the results of path coefficients in the research model and draws a picture of the overall data analysis results. As can be seen from the table and figure that, different dimension of personalization plays a different role in the decision making process by placing different impact on cognitive experience and hedonic experience of control which further lead to satisfaction and intention to revisit. The R^2 values ranges from 0.37 to 0.56. In PLS analysis, examining the R^2 scores and the structural paths assesses the explanatory power of a structural model. In this study, the model accounts for 37 to 56 percent of the variances (R^2). The following table 6.12 summaries the hypotheses testing results and reports the significant level at 0.001.

6.5.2 SEM result for Social Networking Website :

SEM result for social networking website is shown in figure below which shows that personalization aspects information, presentation and navigation affect users' cognitive and hedonic experience leading to satisfaction and intention to revisit. The result shows that Navigation personalization does not affect hedonic experience of control and control is related with satisfaction also shown that hedonic experience of control negatively affect intention to revisit of user.

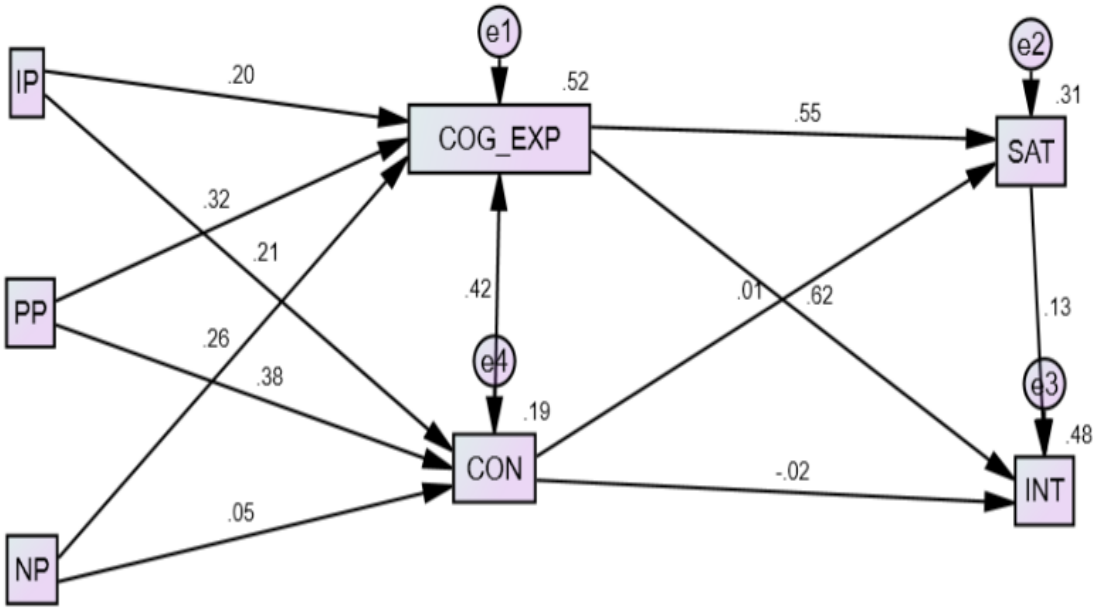


Figure 6.6: SEM Hypothesis Testing Result for personalized social networking website

[**IP-I**nformation **P**ersonalization **PP -P**resentation **P**ersonalization
NP-Navigation **P**ersonalization **CON-Con**trol (Hedonic Experience)
Cog_Exp -Cognitive Experience **SAT**-Satisfaction **INT-**Intention to Revisit]

Figure 6.12 shows that, different dimension of personalization plays a different role in the decision making process by placing different impact on cognitive experience and hedonic experience of control to lead to satisfaction and intention to revisit. The R^2 values ranges from 0.19 to 0.52. In PLS analysis, examining the R^2 scores and the structural paths assesses the explanatory power of a structural model. In this study, the model accounts

for 19 to 52 percent of the variances (R^2). The following table 6.12 summaries the hypotheses testing results and reports the significant level at 0.001.

6.6 Hypothesis Testing Results:

6.6.1 Hypothesis Testing Result of Ecommerce website:

Table 6.23: Hypothesis testing result with SEM for ecommerce website

Hypotheses	Estimate	Standard Error (S.E.)	Critical Ratio(C.R.)	P Value	Hypothesis Testing Result
CON<--- IP	0.146	0.034	4.322	***	Significant
CON<--- PP	0.511	0.032	16.087	***	Significant
CON<--- NP	0.198	0.033	6.055	***	Significant
COG_EXP<--- IP	0.19	0.027	6.949	***	Significant
COG_EXP<--- PP	0.15	0.031	4.884	***	Significant
COG_EXP<--- NP	0.306	0.027	11.431	***	Significant
COG_EXP<--- CON	0.44	0.034	12.954	***	Significant
SAT<--- COG_EXP	0.508	0.062	8.212	***	Significant
SAT<--- CON	0.447	0.065	6.926	***	Significant
INT<--- COG_EXP	0.61	0.056	10.899	***	Significant
INT<--- CON	0.3	0.055	5.494	***	Significant
INT<--- SAT	0.112	0.036	3.141	**	Significant

All estimates whose P-value is less than 0.001 are indicated by *** and ** indicates p-value <0.01 so they are significant estimates

6.6.2 Hypothesis testing Result for Social Networking Website:

Table 6.24 : Hypothesis testing result with SEM for social networking website

Hypotheses	Estimate	S.E.	C.R.	P Value	Hypothesis Testing Result
CON<--- IP	0.268	0.05	5.328	***	Significant
CON<--- PP	0.571	0.057	9.93	***	Significant
CON<--- NP	0.07	0.056	1.24	0.215	Not Significant
COG_EXP<--- IP	0.152	0.024	6.47	***	Significant
COG_EXP<--- PP	0.28	0.029	9.809	***	Significant
COG_EXP<--- NP	0.222	0.026	8.593	***	Significant
COG_EXP<--- CON	0.247	0.02	12.571	***	Significant
SAT<--- COG_EXP	0.954	0.077	12.447	***	Significant
SAT<--- CON	0.011	0.046	0.245	0.807	Not Significant
INT<--- COG_EXP	0.947	0.067	14.218	***	Significant
INT<--- CON	-0.016	0.035	-0.454	0.65	Not Significant
INT<--- SAT	0.116	0.033	3.528	***	Significant

*** indicates p value < 0.001

SEM hypothesis testing result for ecommerce website and social networking website is shown in the table below:

Table 6.25: Comparative Result of Hypothesis Testing for both Websites

Sr. No.	Hypothesis	Result (Ecommerce website)	Result (Social networking website)
H1a	Users' Cognitive Experience is positively associated with Information personalization.	Significant(Null Hypothesis not accepted)	Significant(Null Hypothesis not accepted)
H2a	Users' Cognitive Experience is positively associated with Presentation personalization.	Significant(Null Hypothesis not accepted)	Significant(Null Hypothesis not accepted)
H3a	Users' Cognitive Experience is positively associated with Navigation personalization.	Significant(Null Hypothesis not accepted)	Significant(Null Hypothesis not accepted)
H4a	Users' Hedonic Experience is positively associated with Information personalization	Significant(Null Hypothesis Accepted)	Significant(Null Hypothesis not accepted)
H5a	Users' Hedonic Experience is positively associated with Presentation personalization.	Significant(Null Hypothesis not accepted)	Significant(Null Hypothesis not accepted)
H6a	Users' Hedonic Experience is positively associated with Navigation personalization.	Significant(Null Hypothesis not accepted)	Not Significant(Null Hypothesis Accepted)
H7a	Users' Cognitive Experience is positively associated with hedonic experience.	Significant(Null Hypothesis not accepted)	Significant(Null Hypothesis not accepted)
H8a	Users' satisfaction is positively associated with cognitive experience using personalized website	Significant(Null Hypothesis not accepted)	Significant(Null Hypothesis not accepted)
H9a	Users' satisfaction is positively associated with hedonic experience (Control) using personalized website.	Significant(Null Hypothesis not accepted)	Not Significant(Null Hypothesis Accepted)
H10a	Users' intention to revisit is positively associated with cognitive experience using personalized website.	Significant(Null Hypothesis not accepted)	Significant(Null Hypothesis not accepted)
H11a	Users' intention to revisit website is positively associated with hedonic experience (Control) using personalized website.	Significant(Null Hypothesis not accepted)	Not Significant(Null Hypothesis Accepted)
H12a	Users' intention to reuse/revisit the personalized website is positively related to User satisfaction.	Significant(Null Hypothesis not accepted)	Significant(Null Hypothesis not accepted)

Next chapter discusses the hypothesis testing results in detail.

CHAPTER – 7

Discussion and Conclusion

7.1 Overview:

Our findings from research can be summarized as follows: a) in the area of presentation personalization, evidence supports our hypotheses regarding the relationship between personalization and, respectively; user's cognitive experience with perceived ease of use, usefulness, enjoyment and hedonic experience with control. A significant positive correlation was reported, however, between the presentation personalization and users cognitive experience defining perceived ease of use, usefulness and enjoyment in both ecommerce and social networking personalized websites b) for navigation personalization, the degree of personalization showed a significant correlation with cognitive experience (perceived ease, enjoyment and perceived usefulness) in ecommerce and social networking personalized websites and shows significant effect of personalization on hedonic experience(control) in ecommerce website but shows no significant effect on users hedonic experience with social networking websites c) the hypotheses regarding information personalization were significantly supported on cognitive experience in ecommerce and social networking website and a positive correlation was observed between the information personalization and hedonic experience(Control) in ecommerce website also shows positive correlation with personalized social networking websites. Information personalization has proved to be very effective in improving cognitive experience perceived usefulness, perceived ease of use and enjoyment. These cognitive beliefs are utilitarian-oriented and users attach more importance to efficiency and effectiveness in visiting both types of Web Portals. Navigation personalization does not exhibit a significant correlation to hedonic experience factor in social networking websites. In the context of the both personalized Web Portals of ecommerce and social networking, cognitive experience improves satisfaction in user and intention to revisit to website by increasing the perceived usefulness and perceived ease of use of the Web Portal. It is

evident that the relationship between hedonic experience (control) using social networking websites with satisfaction and intention to revisit is not as vital as that in ecommerce websites.

7.2 Results and Findings:

7.2.1 Personalization and Cognitive/Utilitarian Experience:

Information, Presentation and Navigation personalization in this study shows significant positive relationship to the cognitive/utilitarian experience under investigation with perceived usefulness, ease of use and enjoyment in both ecommerce and social networking web portals. Overall, information personalization is effective, Personalization reduces cognitive efforts of user by personalized information provided which decreases search time of user and increases efficiency. Also, relevant personalized information induces perceived usefulness, ease of use so user enjoy while browsing experience positive cognitive experience. Navigation and Presentation personalization, proved to be very effective in improving perceived usefulness, perceived ease of use and experience enjoyment while working with personalized ecommerce and social networking websites. These cognitive beliefs are utilitarian-oriented and users attach more importance to efficiency and effectiveness in visiting Web Portals. Thus all three personalization aspect information, presentation and navigation personalization is significantly correlated with user's cognitive or utilitarian experience while browsing ecommerce and social networking personalized web portals.

7.2.2 Personalization and Hedonic Experience (Control):

Research study results show that information personalization is positively correlated with hedonic experience of user in ecommerce website and significantly correlated with hedonic experience with social networking website. However, presentation personalization is significantly correlated with hedonic experience of user with both ecommerce and social networking personalized websites. Navigation personalization is significantly related to hedonic experience i.e. control in ecommerce websites. It is obvious that a higher level of navigation personalization control translates into more effective and efficient use of ecommerce web portals. Navigation personalization is not significantly related with hedonic user experience.

7.2.3 Cognitive Experience, Hedonic Experience and Satisfaction:

In consistence with prior studies this research has found significant correlation between users' cognitive experience like enjoyment and hedonic experience of control in ecommerce and social networking personalized websites. Users' satisfaction is significantly in relation with his cognitive experience in both personalized ecommerce and social networking web portals in accordance with prior research of Eroglu 2003, Yoon 2012 and McLean 2013. User with the high cognitive experience like perceived usefulness and perceived ease of use enjoys using website, and therefore, derives higher satisfaction as a response to users' organism state. Users' satisfaction is found to be positively correlated with hedonic experience in ecommerce website which is in consistence with prior studies which show significantly negative correlation with social networking websites of users' satisfaction with hedonic experience. Users hedonic experience i.e. control is not significant factor for satisfaction in personalized social networking website while it is found as determining factor with ecommerce websites where user needs more hold over personalization aspects while browsing.

7.2.4 Cognitive Experience, Hedonic Experience and User Intention to Revisit:

It is consistent with previous findings, that is, cognitive experience of perceived usefulness and perceived ease of use is a major factor in determining the intention to return. Supporting evidences exist when investigating the relationship between enjoyment and user intention to return as is the case with prior research (Donovan et al. 1994; Koufaris 2002; Wu et al. 2008). This research shows significant correlation between user's cognitive experience and intention to revisit for both ecommerce and social networking personalized websites. On the other hand, it shows that user intention to revisit with positive hedonic experience while using personalized ecommerce websites supports prior study of Koufaris 2002 which states that user with perceived control is positively linked to intention to return to a website. Enhanced control is likely to boost feelings of dominance/control when interacting with personalized websites. Users with a high level of perceived control are likely to feel more comfort level with the activity. Sundar (2008) points out that, aside from providing a sense of identity and ownership, self-as-source can provide a real sense of control to the user, which in itself can be a motivating force. In fact, need for control is correlated with the amount of customization among users (Sundar and Marathe, 2010). But, not everyone desires control; users may feel increased levels of control when they are given the option to customize a Webpage for themselves rather than having the Website personalize it for them (Sundar and Marathe, 2010). Our finding with social networking websites states that users' hedonic experience is not significantly related with satisfaction and intention to revisit the personalized social networking website as user may not feel control as motivating factor for satisfaction and return to website. Some of the major findings are highlighted in following sections and discussed in more detail.

7.2.5 Major Findings:

The amount of variance explained in this study is comparable to that reported in previous related research. The table 7.1 summarized below provides a summary comparison of the findings by related research. Wang (2009)'s study is on effect of cognitive and affective responses to intention to reuse personalized websites. Kamis et al. (2008) have compared an online attribute-based decision support system (ABDSS) for product interface display with an alternative-based system. Koufaris (2000) focused on investigating the impact of both cognitive and affective responses to visiting a Web-based store on user intention and unplanned purchases and also tested the impact of some individual and website factors, such as Web skills, challenges, and search mechanisms, on the cognitive beliefs and affective reactions. Abbreviations used in table 7.1 as PEU-Perceived Ease of Use, PU-Perceived Usefulness, ENJ-Enjoyment.

Table 7.1: Comparison of Variance explained(R^2) with prior studies

Construct Studied	This dissertation		Wang 2009	Kamis et al. 2008 in MISQ	Koufaris 2002 in ISR
	Ecommerce website	Social Networking website			
Cognitive Experience (PEU, PU, ENJ)	**0.56**	**0.52**	PEU-0.46	PEU-0.31	N/A
			PU-0.36	PU -0.09	N/A
			ENJ-0.21	ENJ-0.13	ENJ-0.28
Hedonic Experience (Control)	**0.37**	**0.19**	0.10	0.12	0.07
Satisfaction	**0.37**	**0.31**	N/A	N/A	N/A
Intention to Revisit	**0.50**	**0.48**	0.35	0.39	0.45

We will illustrate and emphasize some of the major findings in the following section.

7.2.5.1 Information, Presentation and Navigation Personalization:

Information, Presentation and Navigation Personalization is done explicitly by the user by providing choice for personalization and preferences and also done implicitly by website with the knowledge of users' implicit and explicit need and tailor these needs into the website. Information Personalization refers to the degree to which customers are provided with uniquely tailored information on the basis of their own individual needs as gathered from the consumer's interaction with the provider (Chellappa and Sin 2005; Liang et al. 2007). Users are more receptive towards personalized information provided with self referent messages, relevant content (recommendations and ratings). Information personalization which is elaborated to a larger extent resulting in more and stronger memory traces is found more useful as per previous researches by Liang et al 2012, Tam and Ho 2006. These researches show that information personalization increases users' cognitive experience with personalized ecommerce and social networking websites. On support, information personalization is also significant for hedonic experience of control in ecommerce personalized web portal, and significant with social networking websites. This shows that users prefer to have control over information in social networking websites for personalization also likes to have personalized information with control and implicitly in the form of automated recommendation, ratings and relevant information with ecommerce websites. Information personalization and navigation personalization are high task relevant since they directly improve user effectiveness and efficiency in retrieving information. However, low- task relevant cues like user interface presentation will positively affect the organism, e.g. pleasure, enjoyment and user experience flow with the system (Wang 2010, Koufaris 2002, Eroglu et al., 2001). Information and navigation personalization are high task relevant cues since they directly improve user's effectiveness and efficiency in retrieving information with enhanced utilitarian experience. Therefore, if personalized information can provide relevant content, self relevance and larger range of choices to user, it will lead to higher perceived usefulness, and will increase the ease of use by reduced cognitive efforts of user. Presentation personalization may also help since the adjustment of layout also help user to find their target content.

Presentation personalization induces positive cognitive and hedonic experience in both ecommerce and social networking website. This study also reveals that presentation personalization reduces cognitive efforts with relevant look and feel of website user interface satisfying users' implicit and explicit need. Facilitating effective navigation is a key design objective, especially for information-seeking activities. Accordingly, navigation personalization has been found to have a salient impact on enhancing positive cognitive/utilitarian and hedonic perceptions. Navigation features are furthermore unique for websites, not being included effectively in most software technologies. This research reveals that all design aspects identified in research information, presentation and navigational personalization help the Internet user to use the web more effectively and efficiently through positive cognitive experience in both categories of websites i.e. ecommerce and social networking web portals in this study. Moreover, it also enhances user control though modifying the navigation structures in ecommerce websites but may not be controlled due to the hedonic nature of the task: to locate information effectively and efficiently in social networking websites.

7.2.5.2 Cognitive Experience and Hedonic Experience:

As postulated in the S-O-R model by Mehrabian and Russell 1974, organism is intermediary state and processes which mediate the relationship between stimulus and user's response. User's internal state represents cognitive/utilitarian and hedonic/affective experience with website stimuli i.e. website environmental cues. Most work in environmental psychology conceptualized the affective states along three dimensions (Eroglu et al. 2003), i.e. pleasure, arousal, and dominance (PAD). Cognitive state refers to user internal mental processes and states including attitudes, beliefs, attention, comprehension, memory, and knowledge. User's cognitive or utilitarian and affective/hedonic states are induced by environmental stimuli and also influence response. Users experience utilitarian benefit with the relevant personalized information reduces information search.

User's cognitive experience is associated with user's perceived ease of use and usefulness of the system (Davis 1989). Enjoyment is the user's emotional experiential state and defined as the extent to which using a system is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated (Carroll, 1988). Davis et al. (1992) classified enjoyment as an intrinsic motivation for adopting technology. Enjoyment was also shown to induce perceptions of ease of use with subjects, thus enhancing technology adoption (Venkatesh, 2000). TAM3 also includes enjoyment as a determinant of ease of use (Venkatesh and Bala 2008). In support with prior research, our results reveal that perceived ease of use, enjoyment and perceived usefulness are same as user's cognitive or utilitarian experiential state which represent pleasure and arousal state as per environmental psychology. Perceived Control is user's emotional response representing hedonic state of user. User's perceived control has been defined as the level of one's control over the environment and one's actions in flow research by Koufaris 2002. Perceived control is also similar to the emotional response of dominance from environmental psychology, where it is defined as feeling "unrestricted or free to act in a variety of ways" in a specific situation and environment (Mehrabian and Russell 1974). In fact, an adapted scale for dominance has been used to measure perceived control in flow research (Novak et al. 2000). Though it is expected that users demand more control, less effort, and higher efficiency to enjoy during shopping, our research reveals that users cognitive experience significantly is correlated with hedonic experience of control while browsing both ecommerce and social networking web portal which is in support of earlier research of environmental psychology.

7.2.4.3 Satisfaction and User Intention to Continue to Use:

Satisfaction is intrinsic feeling of overall experience about using product or browsing website. Satisfaction in previous research has shown positive impact on user's online purchase with website and repeated usage (Eroglu 2003, Zviran et al. 2006). Website dimensions (i.e., information content and website personalization) positively influence customer satisfaction and increases users purchase intention (Thongpapanl et al. 2011, Dabholkar 2012). DeLone & McLean's (1992) identified satisfaction and usage of system

to measure the Information system success which is found as an antecedent of information and system quality. DeLone & McLean's (2003) in Updated IS Success Model states that user's intention to reuse the system is highly associated with Satisfaction. In accordance with previous research findings, this study states that user with higher satisfaction is likely to revisit the personalized websites. Result in research reveals that user experiences satisfaction with personalization features through cognitive and hedonic experience and will tend to return with personalized ecommerce and social networking websites.

7.3 Conclusions and Discussions:

This study has addressed two related research questions: what and how personalization features have impacts on the cognitive and hedonic experience determining users' satisfaction and intention to continue to use a website. Our results suggest that different design aspects of personalization play a different role in this decision making process. Users experience greater enjoyment when the level of presentation personalization is perceived to be higher. Users also appreciate information, presentation and navigation personalization very much since it enhances the perceived usefulness, perceived ease of use of a website, enjoyment and give users the experience of control. Among all the decision variables, cognitive experience with perceived ease of use, perceived usefulness and enjoyment are found to be the most important antecedent factor determining the decision to continue using a website. Some of the findings in the thesis are consistent with previous research, while others stand in contrast to other studies. The section below now discusses these results in detail, and attempt to explain the reasons for the contrasts observed.

7.3.1 Personalization, Cognitive experience and hedonic experience:

Environmental psychology theory states that emotional response to the environment mediate the relationship between the environment and one's behaviour (Mehrabian and Russell 1974). According to this theory, physical and social stimuli in the environment influence the individual's emotional state (Koufaris 2002). Perception of environment also elicits cognitive responses that influence beliefs about the website evaluation (Bitner 1992). Eroglu et al (2001) used S-O-R framework and categorized website environmental cues used in online stores to understand how they affect customer's organism and behaviours.

The website design factors were categorized as having either low or high task relevance. High task relevant cues enable the browsing or searching task by providing the necessary flexibility to find information easily, such as the option to reorganize the structure of the elements, and recommendation of information. Low task relevant cues creates pleasurable experience and feeling of joy while browsing e.g. cues such as color, background patterns, typestyles and fonts can not only serve the function of making the verbal content easy (or difficult) to read, they can also create a mood or an image for the site. Information personalization and navigation personalization are high task relevant since they directly improve user effectiveness and efficiency in retrieving information. Presentation personalization adjust the layout of user interface and provide content with good look and feel in the form of personalized themes, font and background color generating ease of use and enjoy while browsing personalized ecommerce and social networking websites. Navigation Personalization also makes the website ease to use by giving internet users more flexibility and control. Result shows that information, presentation and navigation personalization increases Perceived Usefulness, Perceived Ease of Use and enjoyment inducing positive cognitive experience with both ecommerce and social networking website. Our result supports finding by Koufaris 2002 that have an impact on enjoyment and control as user may experience flow during the personalization process. Eroglu et al. (2001) found that the presence of low task relevant cues positively affect the organism, e.g. pleasure, our results Therefore, the presentation personalization can arouse the enjoyment. Personalization has been defined as a process that changes the functionality, interface,

information content, or distinctiveness of a system to increase its personal relevance to an individual (Blom and Monk 2008) and this finding is in line with our research findings.

7.3.2 Cognitive Experience, Hedonic Experience, Satisfaction and Intention to Revisit:

Major findings of our research show that personalization reduces cognitive efforts of user by personalized information provided which, in turn, decreases search time of user and increases efficiency. Also, relevant personalized information induces perceived usefulness with increased ease of use and enjoyment, user experience flow using personalized ecommerce and social networking websites. Also, users feel satisfied with positive cognitive experience with personalized websites and likely to revisit the website, and this finding is consistent with similar findings in earlier research (Eroglu 2003, Koufaris 2002, and Wang 2009). Tam Ho 2006 proposed conceptualization of web personalization and posit that the effectiveness of personalization is determined by the use of self- referent cues and the timely display of content relevant to the processing goal of the user. Such a conceptualization captures many of the functionalities of contemporary personalization agents such as adaptive content generation, customer profiling, web mining, and click stream analysis. Earlier research considers control as important aspect of PAD emotional experience of pleasure, arousal and dominance as intervening organismic state. User's positive cognitive and hedonic experience with personalization aspects lead to satisfaction (Eroglu 2003, Yoon 2012). In accordance with previous research findings this study finds that user with higher satisfaction is likely to revisit the personalized websites. Result in this research reveals that users who experience satisfaction with personalization features through positive cognitive and hedonic experience, intend to return with personalized ecommerce and social networking websites.

7.4 Contributions:

This study answers the two research questions stated at the beginning of the thesis from the finding that three distinct design aspects of personalized website design information, presentation and navigation personalization, plays an important role in forming user's cognitive experience and improve users perceived ease of use, usefulness and induce enjoyment while browsing personalized website; information personalization is of great importance since careless design of information personalization will increase users' cognitive load and users will avoid using this feature and cannot enjoy the personalization feature at all; presentation personalization is related to cognitive feeling of enjoyment and hedonic experience of control using this website. Therefore, the questions what are personalization design aspects used in ecommerce and social networking websites and how these design aspects affect in decision making process to revisit are investigated thoroughly in this study in a personalized Web Portal context.

7.4.1 Theoretical Implications

This study significantly contributes in identifying different personalization aspects like information personalization, navigation personalization and presentation personalization with development of scale. The measurements of the study are conceptually grounded in the vast body of previous research in environmental psychology, cognitive science and website personalization. This research contributes towards measuring important dimension of personalization i.e. what to personalize and identifying various aspects of personalization used in information system design of websites like ecommerce and social networking web portals. Research also throw light on how this personalization aspect impact on users satisfaction and their decision making of revisiting website with cognitive and hedonic influence on experience. Prior studies in research in website design has also provided valuable insights into different dimensions of personalization impact on user experience e.g., information personalization or interface design and visualization. But there is limited research in personalized website design in previous literature, its implementation

and roles of personalization aspects on users' satisfaction and experience. To address this gap, from the previous research in environmental psychology and technology acceptance model (TAM), this research (i) develops an integrated research model of environmental stimuli of information, presentation and navigation personalization and the internal decision making process which leads to the intention to continue to use the website; (ii) empirically test the integrated model with ecommerce and social networking website users; (iii) suggest a personalization model to enhance the psychological factors affecting satisfaction and inspiring the intention to continue to use a website. In particular, we have investigated the roles of information personalization, presentation personalization, and navigation personalization in enhancing the cognitive and hedonic determinants of the intention to continue to use a website.

This study provides a theoretical contributions to the field of IS, as well as other reference disciplines, e.g. environmental psychology. This dissertation complements May Wang 2009, Venkatesh and Bala 2008 and Koufaris 2002 studies on behavioral intention by adding the identification of various dimensions of personalization, and the interaction between users' cognitive/utilitarian experience and hedonic experience result on satisfaction and intention to revisit personalized web portals like ecommerce and social networking websites. Therefore, this study suggests interplay between the cognitive experience and hedonic experience to a personalized website.

7.4.2 Practical Implications:

The findings from the present research have important implications for IS system Designers, and developers. It is worthwhile for information system designers to identify which personalization features are useful to users and attract users with leveraging business. It also helps in redesign of existing website personalization features and catering user's dynamic needs with personalization features enhancement. It provides a valid and reliable measure of personalization dimensions at the level of conceptual design. This research identifies three major design aspects i.e., Information, Presentation and Navigation Personalization used in web portals of ecommerce like amazon.in, flipkart,

eBay.in and social networking websites like google+, msn.in, my Yahoo!. The present research proposes a framework for effective design of personalized website in information system development. The proposed framework is tested with data of the users of two categories of website: ecommerce and social networking portals. It also identifies motivating factors for satisfaction and intention to revisit websites with perceived ease of use, perceived usefulness, enjoyment and control.

The dimensions detailed in this research are directly related to the conceptual design process, so it is possible that these findings can serve as the basis of actionable guidance on personalization design issues. For example, presentation personalization will contribute to more enjoyment. Navigation personalization will relate to perceived usefulness, perceived ease of use, as well as control. Our results support the hypothesis that elements of personalization impact on users' satisfaction and intention to revisit through enhancing positive cognitive perceptions of, and hedonic reactions to a website. This implies that by effectively managing a website's level of personalization, a firm can differentiate its website from others and produce a compelling experience for users.

7.5 Limitations:

The first limitation of this study is that it is cross-sectional. A longitudinal survey is preferred to identify the changing role of different aspects of personalization in website as users become more and more experienced. The second limitation is that personalization design aspects changes frequently in website and should be investigated on experimental basis. The intention to continue to use the website might be driven by the web application category which the participants were interested. The effect of brands in Web Portal should be high. The third limitation lies in that users might love or prefer Google or Yahoo social networking websites also preferred ecommerce personalized websites so that measurement of perceived personalization might be biased because of reflecting the intentions toward a particular brand.

Previous research also used multidimensional measurements for the approaching response, e.g. recommendation to others, would like to return, meet my expectations, like the store, etc. This study involves both new users and existing experienced users in contrasting with using new users (Koufaris 2002). Existing users' use the website more due to different beliefs, as the post-adoption antecedent of behavioural intention differs from that of pre-adoption (Karahanna et al. 1999). Karahanna et al. (1999) found that some antecedent of behavioural intention, e.g. result certainty, ease of use, and visibility cease to be important after individuals adopt the technology. Moreover, the significance of the environmental stimulus is "stronger for inexperienced customers or new employees and when few intrinsic cues are available on which to categories or base beliefs" (Bitner 1992). Therefore, we may also take this into consideration in future research.

7.6 Scope for Future Research:

Future research can be conducted in several directions. First, different methodology can be applied to cross-validate the findings in current study. Longitudinal study is expected to investigate the changing role of personalization features as user gains more experience. Second, other dimensions of personalization from different perspective are also interesting and may be the subject of investigation, e.g. personalization strategies. Then, more mediating and moderating factors could also be taken into consideration.

7.6.1 Methodological Directions:

Future work can consider experimental method to explore the role of low, medium, and high level of personalization in impacting the decision process. Then, longitudinal study is expected to investigate the changing role of personalization features as user gains more experience. A second-order latent variable can represent overall personalization and be compared with previous studies.

7.6.2 Other Dimension of Personalization:

Besides the dimensions of information personalization, presentation personalization, and navigation personalization, other dimensions from different perspective are also of great interest. Previous work indicates that the effect of personalization depends on such factors as service nature, behavior and personalization strategy. For example, implicit and explicit personalization improve evaluation of website through different mechanisms, and different level of personalization, e.g. standardization (identical to all users), categorization (mass customization), and individualization, can be applied for different users or user groups in difference contexts. Current research did not distinguish the implicit and explicit personalization as during the modification of information, presentation, and navigation personalization, both user and system are involved in providing recommendations and facilitating decisions. These personalization strategies may be investigated in much more detail in future research.

Tam and Ho (2006) research identified three personalization strategies, i.e. user-driven personalization, in which a user specified in advance the desired web layout and content; transaction-driven personalization, in which personalized layout and content are generated by the online merchant; context-driven personalization, in which very adaptive mechanism is employed to personalize content and layout for each individual user. We think that implicit and explicit personalization strategies improve evaluation of website through different mechanisms. System initiated personalization in the Web site design is predicted to improve perceived system quality by: firstly providing a more accurate and complete assessment of user information requirements based on user profile, preference, and user transaction history, Secondly by providing relevant information of recommendation by similar consumer, thirdly by providing automatic and alternative choices to consumers. User initiated personalization in the Web site design is supposed to improve perceived system quality in the following ways, like providing a more interactive process for user to configure the content, interface and functionalities by them, improving user understanding of the Web system, leading to ownership by users. System quality can also be improved by

investigating the trade off to classify different level of user involvement and measuring level of involvement or degree of involvement which refers to the amount of influence the user has over the final product.

7.6.3 Other Cognitive and Hedonic Factors:

This research has considered perceived ease of use, usefulness, enjoyment and control as cognitive and hedonic experience as mediating factors of organism. There are several other cognitive and hedonic factors which can be of interest for investigation. For example, the information quality, system quality, and service quality of the personalization, may also play a role in determining user satisfaction and the intention to continue to use (DeLone and McLean 1992, DeLone and McLean 2003, DeLone and McLean 2004).

When different personalization aspects are considered as stimulus, approach behaviour in organism can be considered with cognitive and hedonic factors to generate response of approach or avoidance. Pleasure and Arousal is significant predictor of response behaviour of user with approach or avoidance according to S-O-R model Mehrabian and Russell (1974). However, as predicted by the M-R model, arousal has been found to vary in its effects across different studies and has an interactive effect with pleasantness such that arousal would be positively related to approach behaviours in pleasant environment, but negatively related in unpleasant environments (Donovan et al. 1994). There are insufficiently unpleasant environment to adequately test the pleasure-arousal interaction in unpleasant environments in current study. Therefore, future research might consider an experimental design to include both pleasant and unpleasant scenarios to investigate the interactive effect of enjoyment and arousal. As emotion is a multifaceted phenomenon, other emotional factors may also have an impact on satisfaction and intention to return (Kim et al. 2003a). Future research might take this into considerations to develop website which target users' emotions more effectively.

7.6.4 Other Moderators:

There are many other factors that can influence the user's experience and intentions, e.g. user characteristics (e.g. variety seeking tendency, mood, curiosity, gender, age, major in college, etc.), environment characteristics (e.g. culture); connection technologies (e.g. broadband or dial-up). Demographic factors such as age, gender and social class are likely to influence the liking for the stimuli within the environment (Wang 2009, Oh et al. 2008). These can be classified into personal and situational moderators that will determine the strength and direction of the relationships (Russell and Miriam 2004). For example, some individuals are arousal-seekers, while others are not, with regard to personality traits. Some individuals tend to screen environmental stimuli better than others. With regard to situational factors, plan or purpose for being in the environment may influence the response. In this sense, Elaboration Likelihood Model may have a good implication for introducing the user capability (e.g. experience in using Web Portals) and motivation (e.g. personal relevance) as moderators to investigate the impacts of stimulus on user decision process. Moreover, mood states and expectations for an environment are also likely to influence behavioral intention.

7.6.5 Interaction with Other Factors:

Personalization is closely related to other interesting factors. It has been suggested in previous study that familiarity might interact with personalization (Komiak and Benbasat 2006). Personalization and community are also closely related. Communities provide resources for collecting comments and user profile information that are needed for personalization. Personalization is concerned with building a long-term relationship between user and the website .Online task goals may also be taken into consideration, e.g. goal-directed and experiential categories, which is one of the ways of classifying task goals (Nadkarni and Gupta 2005). Liang et al. concluded that personalized service would be more useful for the websites whose users intend to find specific information than the

websites whose users come for escape or entertainment (Liang et al. 2006). Web Portal context provides rich resources for personalization, which other applications may not provide. However, some of the application may not need that many personalization features. It is not always appropriate for companies to invest in highly complex website (Palmer and Griffith 1998; Wu et al. 2003). There should be a business reason for why or why not a company would provide personalization features on the Web page. For instance, transactional website (e.g. e-banking) emphasis on efficiency in performing transactions and may not need a lot of presentation personalization to make the website more attractive or pleasing.

7.7 Summary:

Personalized website design is an effective strategy for web portals to satisfy users need and offering unique user experience. Effective personalized website design is an important issue to be researched to meet the expectation and dynamic need of the users. Different design aspect of personalization impact differently on users' perception, and fulfill different kinds of user requirements. However, in previous literature, studies often focus on only one or more aspects of personalization, and little is researched on effectiveness of the design aspects of personalization. Our research has tried to fill this research gap and identified three design aspects: information, presentation and navigation personalization used in ecommerce and social networking websites. We also found correlation between these personalization aspects and users' satisfaction and intention to revisit through cognitive and hedonic experience. This research has proposed a model of personalization identifying effect of personalization on cognitive and hedonic experience resulting satisfaction and intention to revisit personalized web portals of ecommerce and social networking which also supports S-O-R (Stimulus-Organism-Response) model.

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Invitation to participate in survey of personalized websites

Dear Respondent,

I am working as Asst. Professor with one of the reputed institute and pursuing PhD from Gujarat Technological University, Ahmedabad with specialization in IT under "Management" stream. As a part of my PhD work I have prepared a questionnaire. You are invited to participate in a research study of personalization features available in social media and e-commerce Website Portals and its effectiveness.

You are requested to fill the survey form based on your experience with personalized websites like different Social Networking Web Portals like Facebook.com, google+/gmail.com, msn.com, yahoo.com, and e-commerce websites like amazon.in, ebay.in, firstcry.com,flipkart.com etc.

Please note that all the data provided by you will be used for academic purpose only and shall not be divulged in any one else.

For any query contact @ personalizationresearch@gmail.com

Demographic Details: * Required

Please enter your First Name: _____

Please enter your Last Name: _____

Please enter your Email ID: *_____

Please select your age group: *

☐ 18-25 ☐ 26-35 ☐ 36-50 ☐ 50-65 ☐ 66 & above

Please select your gender: *

☐ Male ☐ Female

Please select your Highest Qualification: *

☐ Doctorate ☐ Post Graduate ☐ Graduate

☐ Under Graduate ☐ if Other (Pls. Specify):_____

Please select your Profession: *

☐ Service ☐ Business/ Self Employed ☐ Housewife

☐ Student ☐ Retired Person

Please select your State Region you belong to: *

☐ North Region ☐ Central Region ☐ South Region

☐ East Region ☐ West Region

How frequently you use internet? *

☐ Daily ☐ Once in a Week ☐ Every Month

☐ Once in Few Month ☐ Occasionally

Are you aware of different personalization features available with different social networking and ecommerce web sites? *

○ Yes ○ No

Do you have account for social networking websites? *

○ Yes ○ No

Select **any one** social networking website that **you like** to use **the most**: *

○ www.facebook.com ○ My Yahoo!/www.my.yahoo.com

○ Google+/www.gmail.com ○ www.msn.com

How many hours do you spend on social networking site daily? *

☐ Less than one hour ☐ 1-3 hours ☐ 3-5 hours

☐ More than 5 hours ☐ occasionally

Have you used or made online purchase with e-commerce websites? *

○ Yes ○ No

Select **any one** website from the following e-commerce websites that **you like** to use **the most**: *

○ www.amazon.in ○ www.ebay.in

○ www.flipkart.com ○ www.firstcry.com

○ Other: _____

What is the frequency of purchasing with e-commerce website? *

☐ Weekly Once ☐ Monthly Once

☐ Once in 3 Months ☐ Occasionally ☐ Never Purchased

Information Personalization

Please rate the website that you have used/selected from above mentioned websites on the following criteria of Information Personalization.

None -1 Low-2 Not Sure -3 Moderate-4 High -5

Social networking website:

1. How many choices do you feel you were offered in terms of information selection (e.g. horoscope, weather forecast, news, friends list etc) to personalize the website? *

	1	2	3	4	5	
None	○	○	○	○	○	High

2. How many choices do you feel you were offered in terms of range of information (e.g. horoscope, weather forecast, news, friends list etc) to personalize the website?*

	1	2	3	4	5	
None	○	○	○	○	○	High

3. How much variety do you think there was in the information selection? *

	1	2	3	4	5	
None	○	○	○	○	○	High

4. How much variety do you think there was in the information group or cluster (e.g. horoscope, weather forecast, news, friends list etc in social networking websites)?*

	1	2	3	4	5	
None	○	○	○	○	○	High

5. How much variety do you think there was in the personalized friends recommendation offered in social networking website.*

	1	2	3	4	5	
None	○	○	○	○	○	High

6. Please rate the website on the following criteria of Information Personalization. The amount of information personalized to my unique needs is very adequate.*

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

E-commerce Website:

7. How many choices do you feel you were offered in terms of information selection to personalize the website?

	1	2	3	4	5	
None	○	○	○	○	○	High

8. How many choices do you feel you were offered in terms of range of information to personalize the website?

	1	2	3	4	5	
None	○	○	○	○	○	High

9. How much variety do you think there was in the information selection?

	1	2	3	4	5	
None	○	○	○	○	○	High

10. How much variety do you think there was in the information group or cluster (e.g. price, categories etc in ecommerce websites)?

	1	2	3	4	5	
None	○	○	○	○	○	High

11. How much variety do you think there was in the personalized product recommendation offered in e- commerce website.

	1	2	3	4	5	
None	○	○	○	○	○	High

12. Please rate the website on the following criteria of Information Personalization. The amount of information personalized to my unique needs is very adequate

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Presentation Personalization

13. How many choices do you feel you were offered in terms of choices offered with different presentation attributes (e.g. colors, font, themes) to personalize the interface of website? *

		1	2	3	4	5	
Social Networking Website	None	○	○	○	○	○	High
E-commerce Website	None	○	○	○	○	○	High

14. How many choices do you feel you were offered in terms of the number of alternatives color (e.g. 256 colors), fonts, and backgrounds to personalize interface?*

		1	2	3	4	5	
Social Networking Website	None	○	○	○	○	○	High
E-commerce Website	None	○	○	○	○	○	High

15. How much variety do you think there was in personalizing the layout? *

		1	2	3	4	5	
Social Networking Website	None	○	○	○	○	○	High
E-commerce Website	None	○	○	○	○	○	High

16. How much variety do you think there was in personalizing the look and feel of the website? *

		1	2	3	4	5	
Social Networking Website	None	○	○	○	○	○	High
E-commerce Website	None	○	○	○	○	○	High

17. How much variety was the presentation personalized by website to my unique needs? *

		1	2	3	4	5	
Social Networking Website	None	○	○	○	○	○	High
E-commerce Website	None	○	○	○	○	○	High

Personalized Navigation

Please rate the website on the following criteria of Navigation Personalization

18. Navigation components (e.g. quick links) can be adjusted to my interest to a large extent. *

		1	2	3	4	5	
Social Networking Website	Strongly Disagree	○	○	○	○	○	Strongly Agree
E-commerce Website	Strongly Disagree	○	○	○	○	○	Strongly Agree

19. The variety of ways to personalize the navigation of different website sections is adequate. *

		1	2	3	4	5	
Social Networking Website	Strongly Disagree	○	○	○	○	○	Strongly Agree
E-commerce Website	Strongly Disagree	○	○	○	○	○	Strongly Agree

20. The link structure can be personalized based on my preferences to a large extent.*

		1	2	3	4	5	
Social Networking Website	Strongly Disagree	○	○	○	○	○	Strongly Agree
E-commerce Website	Strongly Disagree	○	○	○	○	○	Strongly Agree

21. The Personalized Structure of website is adequate. *

		1	2	3	4	5	
Social Networking Website	Strongly Disagree	○	○	○	○	○	Strongly Agree
E-commerce Website	Strongly Disagree	○	○	○	○	○	Strongly Agree

22. Using these selected personalized websites enhance my effectiveness in accomplishing tasks or browsing information. *

		1	2	3	4	5	
Social Networking Website	Strongly Disagree	○	○	○	○	○	Strongly Agree
E-commerce Website	Strongly Disagree	○	○	○	○	○	Strongly Agree

23. Using these selected personalized website reduce time consumption for accomplishing tasks or browsing information. *

		1	2	3	4	5	
Social Networking Website	Strongly Disagree	○	○	○	○	○	Strongly Agree
E-commerce Website	Strongly Disagree	○	○	○	○	○	Strongly Agree

Please write your feedback about experience with the above mentioned sites that you have used.

Statements	Website	Strongly Disagree 1	Disagree 2	Not Sure 3	Agree 4	Strongly Agree 5
1. I find using these personalized websites useful. *	Social Networking					
	E-commerce					
2. Learning to use the personalized website is easy for me. *	Social Networking					
	E-commerce					
3. My interaction with this Web Portal is clear and understandable. *	Social Networking					
	E-commerce					
4. It would be easy for me to become skillful by using the Personalized Web Portal. *	Social Networking					
	E-commerce					
5. I find this personalized website is easy to use. *	Social Networking					
	E-commerce					
6. I enjoy my visit with the personalized website. *	Social Networking					
	E-commerce					
7. I find my visit of personalized website interesting. *	Social Networking					
	E-commerce					
8. I feel in control using the website. *	Social Networking					
	E-commerce					

9. I feel of ownership of my work. *	Social Networking					
	E-commerce					
11. I found personalized features provided in websites satisfactory. *	Social Networking					
	E-commerce					
12. I intent to continue using the Personalized Web Portal in future also. *	Social Networking					
	E-commerce					

Please write your feedback for personalized website.

_____
_____
_____
_____
_____
_____

----------Thank You----------