

Information Personalization in User Decision Making Model with cognitive experience: An empirical study

Dr. Darshana Desai^{#1}

[#] Indira College of Engineering & Management,
Dept of MCA, Pune, India

Abstract

Information Personalization is frequently used to reduce information overload, retain customers and leverage business by online web portals in recent years. Still, less attention has been paid to the validity of information personalization and its influence on users' decision making. To address this gap, the study draws models based on Stimulus-Organism-Response theory and proposes a personalization model for users information processing and decision making. Personalized information induces cognitive experience during interaction with websites which in turn generates satisfaction and effects on users' decision making to revisit the personalized website. Research identifies quality and relevance of personalized information used in e-commerce websites, proposes research models and validates it empirically. The result validates the proposed model with Exploratory Factor Analysis (EFA) having four factors as information personalization, cognitive experience, satisfaction and intention to revisit personalized websites with 547 valid responses collected through convenience sampling from ecommerce website users. Confirmatory Factor Analysis(CFA) & Structural Equation Modeling result shows interrelation of constructs information personalization on users cognitive experience, satisfaction and intention to revisit. Research shows that relevant and quality personalized information in websites play an important role in forming a user's positive cognitive experience induce perceived ease of use, usefulness, enjoyment to instill higher satisfaction and revisit of e-commerce websites.

Keywords: Web Personalization, Information Personalization, Cognitive experience,, satisfaction, perceived ease of use, perceived usefulness, enjoyment, Stimulus Organism Response

I. Introduction:

Website has an invaluable source for information exchange for users and E-tailers. Today every part of business and social media worldwide are disseminating information to attract users, increase customer interaction and brand promotions. Diversity in users' needs and complexity of web applications leads to information overload and one-size-fits-all issues. Cognitive limitation of user information processing leads to lost users in the world of information and results in inefficiency in decision making. Website personalization has emerged as an effective solution to overcome this problem of information overload in recent years. Personalized services are provided by E-tailers providing personalized information catering users need 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 use information personalization with recommendations, personalized offerings with categories of products and services to attract and retain users. Personalized information or content is generated by explicitly entered users interest based on their demographic information or implicitly done by identifying users' needs based on search history and recent transaction. Information is personalized by modelling users' needs on a regular basis and updating rules in algorithms.

Personalization is the process of catering tailored content, website structure and look & Feel of Website with by identifying users' implicit and explicit needs(Desai 2016). Personalization is offered in dimensions of object(What should be personalized), subject(Who does) and (to what extent)level with respect to customer retention (Kwon et al. 2012). (Wu et al. 2003) scored a 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. (Bunt et al. 2004) 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 representing personalized information to satisfy users implicit needs, quality of information and relevance of information to cater users' needs have impact on users' information processing and decision making. 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 effects on customer satisfaction (Alpert et al.2003). Accordingly, a boom in research on real-world implementation of personalization features has been witnessed recently, and typically focusing on the impact of isolated, personalization features on users. These studies have focussed web personalization adopted in websites and its effect on users with respect to information processing and affective reaction with customer retention (Kwon et al. 2012, Liang et al. 2009, Wang et al. 2010, Desai 2019).

In general, it has been recognized that necessary and well designed, relevant, personalized quality information facilitates the effectiveness, perceived usefulness, perceived ease of use and develop feelings of enjoyment, 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 contemporary literature, his research attempts to show interrelation of personalized quality and relevance of information impacts on users cognitive load and information processing and how they impact the user's intention to revisit or reuse the website. This paper is organized as follows: section II discusses previous studies on information personalization dimensions. Section III represents a Research model derived from previous studies and corresponding hypotheses. Section IV describes research methodology, research design and data collection with analysis. Section V summarizes the results of the data analysis with EFA, CFA, and SEM. Results are discussed with major findings, theoretical and practical contributions, limitations, and possible directions for future work in section VI.

II. Information Personalization:

Personalization is the process of presenting a 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(Desai 2016). Personalization can also be classified based on user involvement i.e. who initiate personalization like user initiated personalization and system initiated personalization. Information Personalization can be done with explicit involvement of users by providing customization choices & demographic information. User initiated personalization provides more privacy and control to the user as users 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 transactions, search history and analyzing demographics based on users' profile(Desai 2019) to provide recommendation to the users.

Information overload affects 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.

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).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.

(Adomavicius, Tuzhilin, 2005) 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 an important role in modeling based on the user's implicit and explicit need. Researchers have studied 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). Websites generate recommendations for adaptive content based on different techniques like rule based filtering, collaborative filtering and hybrid filtering. For example, Amazon.in adapts websites 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.

The success of any website can be measured with various criteria like number of clicks for URL, frequency of use and time spent on e-commerce websites, number of items purchased, ratings and recommendations by users. 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.

III. Research model development:

Research model is derived based on previous literature review and identified constructs information personalization used in websites acts as stimuli, secondly impact of personalization aspects (Web Stimuli) on cognitive experience representing organism state of user, thirdly its effect on user's behavioural response with satisfaction and intention to revisit the website.

The proposed research model is derived from the environmental psychology theory, S-O-R (Stimulus-Organism-Response) theory, TAM3 (Technology Acceptance Model) (Venkatesh, and Bala 2008) and Information System success model. User with positive cognitive experience have more satisfaction and are likely to revisit personalized websites. More specifically, this study focuses on how users perceive information personalization and their influence in decision making to reuse the website. Hypotheses are proposed to address the research questions. Quality of information is one of the parameters to measure information overload, Quality of information measured with relevance of information and validity of information which is included in the questionnaire.

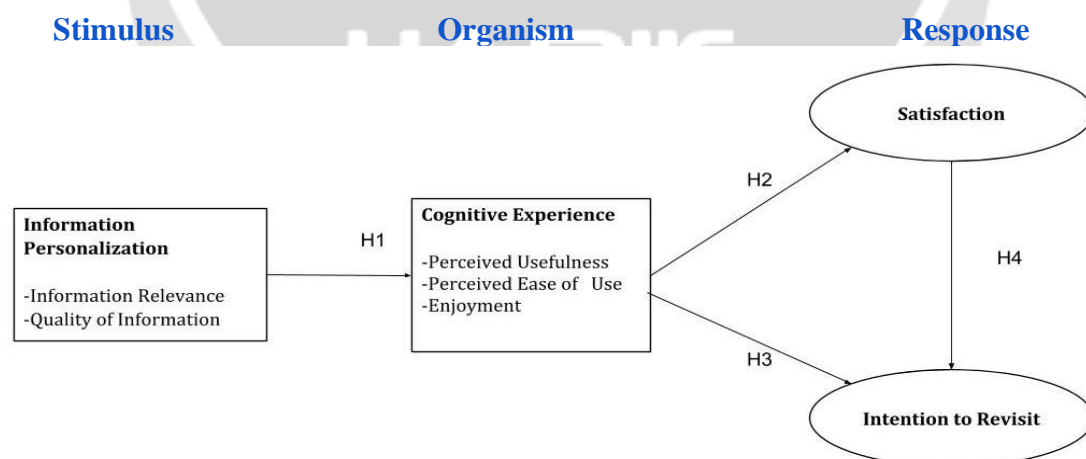


Fig: Information Personalization Model

Hypotheses:

Information Personalization and Cognitive Experience:

Users experiencing perceived usefulness of information and ease of use of a website are more likely to enjoy using an ecommerce website and create a positive shopping experience. So we can say that users'

cognitive/utilitarian experience is associated with perceived usefulness, ease of use and enjoyment with relevant and quality information. 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). Personalized content decreases the cognitive effort needed in order to assess the information. Therefore, we propose hypotheses:

H1: 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 is positively related to user's cognitive state perceived usefulness and ease of use. facilitates users with system initiated personalized structure that reduces users efforts for information search.

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:

H2: Users' satisfaction is positively associated with cognitive experience.

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 of website environmental cues on user during interaction with Web Portal to be similar. If the users enjoy their experience during web site interactions, 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).

H3: Users' intention to revisit is positively associated with cognitive experience.

Research shows that relevant information personalization reduces information overload, increases user involvement with increased efficiency, performance and satisfaction (Liang et al. 2007, Kwon et al. 2012, Thongpapanl et al. 2011, Desai 2016). Users with positive hedonic experience of control with personalization features like user interface, information, and over website with involvement using the website are more satisfied and likely to revisit the personalized website. So we propose hypothesis:

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 a user's intention to reuse the system is highly associated with Satisfaction. So we propose hypothesis as:

H4: Users' intention to revisit the personalized website is positively related to user satisfaction.

IV. Research Methodology:

This research is descriptive research with qualitative nature of study as we investigate the effect of personalization on user's behavioural intentions and satisfaction. Non-Probability sampling method convenience sampling is used for data collection after pilot study of 50 users. The purpose of the pilot study was to check for the reliability of the questionnaire items constructs to finalize for actual study. 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 aspects when using ecommerce websites. Questionnaire for survey had all construct items used as five point likert scale and adopted from previous literature (Wang 2010; Kamis et. al.2008, Mc Lean 2003). Total 600 responses were collected from ecommerce websites users from India. Incomplete and inconsistent data from responses were cleaned with a data screening process. After initial screening of data, further responses were also removed with less standard deviation (i.e. below .30) to get 547 valid responses were used for further analysis. 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 were reliable and appropriate to use in an actual research study.

Constructs	No. of items	Cronbach's Alpha
Information Personalization	6	0.777
Cognitive Experience (Perceived Ease of Use, Perceived Usefulness, Enjoyment)	7	0.892
Satisfaction	2	0.945
Intention to Revisit	3	0.989

V. Results & Findings:

We used factor analysis techniques to summarize data, to interpret the relationships and understand the patterns of variables. This technique is used to regroup the variables in a set of clusters based on their shared variance.

We used exploratory factor analysis(EFA) to identify the number of factors with a group of variables and named those factors or constructs. Confirmatory Factor Analysis (CFA) is used to find interrelationship among constructs. 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 above table of ecommerce websites show fairly desirable factor loadings above 0.32.

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 shown in the table below depicts KMO value 0.906 which is above 0.6 showing good sampling adequacy for our research.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.906
Bartlett's Test of Sphericity	Approx. Chi-Square	8730.003
	Df	190
	Sig.	0.000

In Figure 2 Total Variance Explained for ecommerce websites, 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. **Initial** 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.

Kaiser's criterion suggests retaining all factors that are above the Eigenvalue of 1(Kaiser, 1960) which is a rule of thumb. Exploratory Factor analysis explores a number of factors based on total variance explained table which mentions factors, Eigenvalues, percentage of variance and cumulative percentage with extraction and rotation sum of squared loadings. Table shows 61.434 % of cumulative variance for seven factors.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings*
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	8.325	41.625	41.625	6.447	32.237	32.237	7.185
2	2.751	13.755	55.380	1.517	7.584	39.821	4.177
3	1.273	6.366	61.746	2.944	14.719	54.541	5.798
4	1.081	5.403	67.149	1.379	6.893	61.434	4.429
5	.850	4.252	71.402				
6	.716	3.579	74.981				
7	.628	3.139	78.120				
8	.605	3.027	81.147				
9	.558	2.789	83.936				
10	.541	2.703	86.639				
11	.473	2.364	89.003				
12	.440	2.201	91.204				
13	.389	1.944	93.148				
14	.351	1.756	94.904				
15	.317	1.584	96.488				
16	.295	1.476	97.964				
17	.273	1.367	99.331				
18	.074	.369	99.700				
19	.041	.207	99.907				
20	.019	.093	100.000				

Extraction Method: Maximum Likelihood.

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

Figure 2: Total Variance Explained for ecommerce websites

Table 4 states factor loadings of through pattern matrix generated with maximum likelihood extraction method and promax rotation method. Pattern matrix results give all the factors, their loadings with items with similarity in exploratory factor analysis. Appropriate names of the factors were given based on the nature of the questions and measuring variables falling under each factor. We were able to derive four factors and named factors as information personalization, cognitive experience, satisfaction and intention to revisit. Table 4 below mentions factor loadings of variables with underlying constructs of ecommerce web portals' personalization design aspects and its interrelationship with users' cognitive experience, control, satisfaction and intention to revisit.

Pattern Matrix^a

	Factor			
	1	2	3	4
ECPEU1	.833			
ECPEU4	.782			
ECENJ1	.754			
ECENJ2	.697			
ECPU1	.679			
ECPEU3	.662			
ECPEU2	.634			
ECPU3	.626			
ECPU2	.564			
ECIP2		.794		
ECIP3		.761		
ECIP4		.716		
ECIP6		.643		
ECIP1		.624		
ECIP5		.621		
ECINT1			.969	
ECINT3			.958	
ECINT2			.932	
ECSAT2				.948
ECSAT1				.944

Extraction Method: Maximum Likelihood.
 Rotation Method: Promax with Kaiser Normalization.
 a. Rotation converged in 6 iterations.

Residuals are computed between observed and reproduced correlations in exploratory factor analysis with maximum likelihood extraction method. There are 14 (7.0%) 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.

Factor Correlation Matrix

Factor	1	2	3	4
1	1.000	.446	.673	.570
2	.446	1.000	.251	.245
3	.673	.251	1.000	.535
4	.570	.245	.535	1.000

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

Table 5: Factor Correlation Matrix

Above table 5 shows correlation matrix of all seven identified matrix with good correlations amongst factors. Information, , is highly correlated with cognitive, hedonic experience, satisfaction and intention to revisit.

CFA for Ecommerce website:

A Confirmatory Factor Analysis (CFA) was done with SPSS AMOS 21.0, it used to validate the Measurement model by establishing acceptable levels of goodness-of-fit for the measurement model and finding specific evidence of construct validity. The CFA would also provide evidence that all items are properly aligned with the correct latent variables within the general construct being measured.

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 0.044 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).

Fit statistics	Recommended	Obtained
CMIN	-	336.390
DF	-	162
CMIN Significance	$p \leq 0.05$	0.000
CMIN/DF	< 5.0 (Bentler and Bonnett, 1980)	2.076
GFI	> 0.80 (Joreskog & Sorbom, 1981)	0.942
AGFI	> 0.80 (Joreskog & Sorbom, 1981)	0.925
NFI	> 0.90 (Bentler and Bonnet 1980)	0.962
RFI	> 0.90 (Bollen, 1986)	0.955
CFI	> 0.90 (Hu and Bentler 1999)	0.980
TLI	> 0.90 (Tucker and Lewis, 1973)	0.976
RMSEA	< 0.06 (Browne and Cudeck, 1993)	0.044
RMR	<0.02 (Hu and Bentler 1999)	0.020

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.

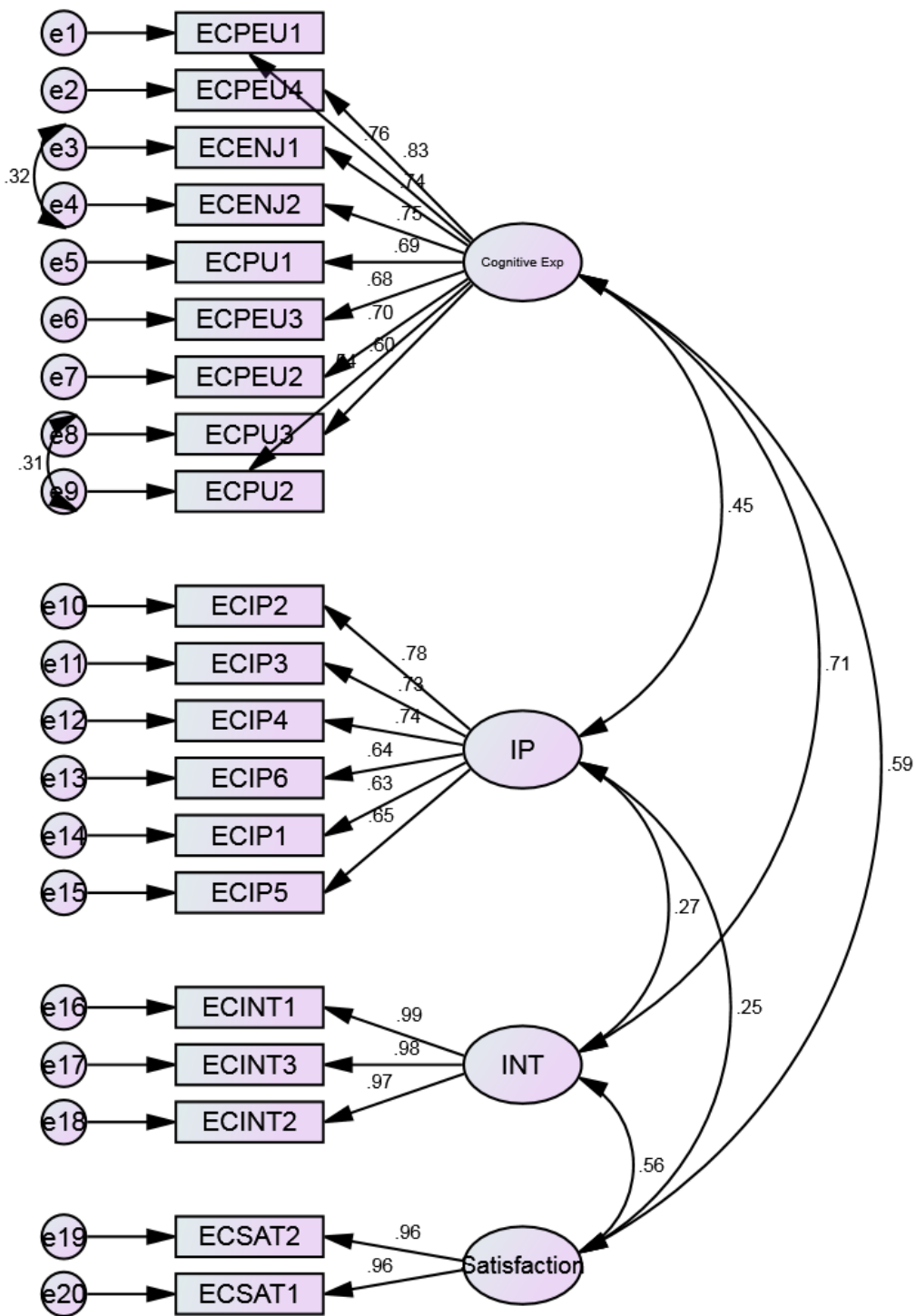


Figure 7: CFA model for ecommerce websites

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 websites have a positive effect on users satisfaction and intention to revisit a website through positive cognitive and hedonic experience .

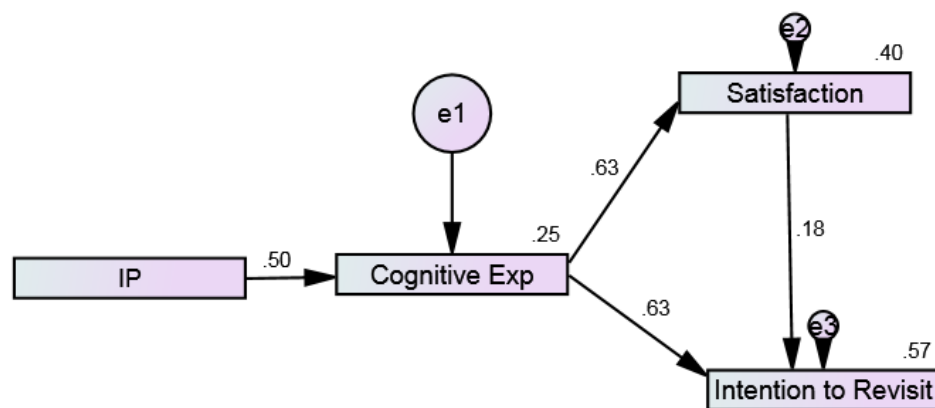


Figure 4: SEM for personalized ecommerce website

SEM Model for ecommerce website personalization shows that different dimensions of personalization plays a different role in the decision making process by placing different impacts on cognitive experience and hedonic experience of control which further lead to satisfaction and intention to revisit. The R^2 values range from 0.25 to 0.57. 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).

VI. Conclusion:

Our results suggest that quality and relevant personalized information play an important role in the users decision making process. Users experience greater enjoyment when the level of is perceived to be higher. Users also appreciate information, and very much since it enhances the perceived usefulness perceived ease of use of a website and enjoyment. 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. Information personalization is high task relevant since they directly improve user effectiveness and efficiency in retrieving information. Result shows that information personalization quality and relevance increases Perceived Usefulness, Perceived Ease of Use and enjoyment inducing positive cognitive experience with ecommerce websites. 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.

Our result supports findings that 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 which is in coherent with the findings by Liang et al 2012; Tam and Ho 2006.

Major findings of our research show that personalization reduces cognitive efforts of users by personalized information provided which, in turn, decreases search time of users 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). In accordance with previous research findings this study finds that users with higher satisfaction are likely to revisit personalized websites (McLean 2013). 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 websites.

Future Scope Research:

Future research can be conducted in several directions. First, different methods can be applied to cross-validate the findings in the current study. Longitudinal study is expected to investigate the changing role of personalization features as users gain more experience. Second, other dimensions of personalization from different perspectives 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.

References:

1. Adomavicius, G., & Tuzhilin, A. (2005). Personalization technologies. *Communications of the ACM*, 48(10), 83–90.
2. Benbasat, Izak;Komiak, S. (2006). The Effects Of Personalization And Familiarity On Trust And Adoption Of Recommendation Agents,1, 30(4), 941–960.
3. Blom, j.o., and monk, a.f. (2003). "Theory of personalization of appearance: why users personalize their pcs and mobile phones," *human-computer interaction* (18:3), pp 193-228
4. Chellappa, R. K., & Sin, R. G. (2005). Personalization versus privacy: An empirical examination of the online consumer's dilemma. *Information Technology and Management*, 6(2–3), 181–202.
5. Dabholkar, P. a., & Sheng, X. (2012). Consumer participation in using online recommendation agents: effects on satisfaction, trust, and purchase intentions. *The Service Industries Journal*, 32(9), 1433–1449. <http://doi.org/10.1080/02642069.2011.624596>
6. DeLone, W. H., & McLean, E. R. (2013). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems / spring*, 8(4), 9–30. <http://doi.org/10.1073/pnas.0914199107>
7. DeLone, W., & McLean, E. (1992). The Quest for the Dependent Variable. *Information Systems Research*, 3(1), 60–95. <http://doi.org/10.1287/isre.3.1.60>
8. Desai D. Kumar S. (2015). "Web Personalization: A perspective of design and implementation strategies in Websites"*Journal of Management Research & Practices* ISSN No: 0976-8262.
9. Desai D.(2016). "A study of personalization effect on users' satisfaction with ecommerce Websites" *Sankalpa- Journal of Management & Research"* Vol. 6, Iss. 2, (Jul-Dec 2016): 51-62
10. Desai D.(2017). " A Study of Design Aspects of Web Personalization for Online Users in India" PhD Thesis, Gujarat Technological University.
11. Desai D. (2019) An Empirical Study of Website Personalization Effect on Users Intention to Revisit E-commerce Website Through Cognitive and Hedonic Experience. In: Balas V., Sharma N., Chakrabarti A. (eds) *Data Management, Analytics and Innovation. Advances in Intelligent Systems and Computing*, vol 839. Springer, Singapore
12. Eroglu, S. a., Machleit, K. a., & Davis, L. M. (2001). Atmospheric qualities of online retailing: A conceptual model and implications. *Journal of Business Research*, 54(2), 177–184. [http://doi.org/10.1016/S0148-2963\(99\)00087-9](http://doi.org/10.1016/S0148-2963(99)00087-9)
13. Eroglu, S. A., Machleit, K. A., & Davis, L. M. (2003). Empirical Testing of a Model of Online Store Atmospherics and Shopper Responses. *Psychology and Marketing*, 20(2), 139–150. <http://doi.org/10.1002/mar.10064>
14. Éthier, J., Hadaya, P., Talbot, J., & Cadieux, J. (2008). Interface design and emotions experienced on B2C Web sites: Empirical testing of a research model. *Computers in Human Behavior*, 24(6), 2771–2791. <http://doi.org/10.1016/j.chb.2008.04.004>
15. Gie Yong, A., & Pearce, S. (2013). A Beginner's Guide to Factor Analysis: Focusing on Exploratory Factor Analysis. *Tutorials in Quantitative Methods for Psychology*, 9(2), 79–94.
16. Hu, L.T. and Bentler, P.M. (1999), "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives," *Structural Equation Modeling*, 6 (1), 1-55.
17. Kamis, arnold;marios, k. S. T. (2008). Using an attribute-based decision support system for user-customized products online: an experimental investigation. *Mis quarterly* pp., 32(March), 159–177.
18. Kobsa, A. (2007). Privacy-Enhanced Web Personalization. *Communications of the ACM*, 50(8), 628–670. Retrieved from <http://portal.acm.org/citation.cfm?id=1768197.1768222>
19. Koufaris, M. (2002). Applying the technology acceptance model and flow theory to online consumer behavior. *Information Systems Research*, 13(2), 205–223
20. Kwon, K., & Kim, C. (2012). How to design personalization in a context of customer retention: Who personalizes what and to what extent? *Electronic Commerce Research and Applications*, 11(2), 101–116. <http://doi.org/10.1016/j.elerap.2011.05.002>

21. Lai, j.-y., wang, c.-t., and chou, c.-y. (2008). "how knowledge map and personalization affect effectiveness of kms in high-tech firms," proceedings of the hawaii international conference on system sciences, mauihi, p. 355
22. Lee, H.-H., Fiore, A. M., & Kim, J. (2006). The role of the technology acceptance model in explaining effects of image interactivity technology on consumer responses. *International Journal of Retail & Distribution Management*, 34(8), 621–644. <http://doi.org/10.1108/09590550610675949>
23. Liang, T. P., Yang, Y. F., Chen, D. N., & Ku, Y. C. (2008). A semantic-expansion approach to personalize knowledge recommendation. *Decision Support Systems*, 45, 401–412. <http://doi.org/10.1016/j.dss.2007.05.004>
24. Liang, T.-P., Li, Y.-W., & Turban, E. (2009). Personalized Services As Empathic Responses: the Role of Intimacy. PACIS 2009 Proceedings. Retrieved from <http://aisel.aisnet.org/pacis2009/73>
25. Liang, T.-P., Chen, H.-Y., Du, T., Turban, E., & Li, Y. (2012). Effect of Personalization on the Perceived Usefulness of Online Customer Services: a Dual-Core Theory. *Journal of Electronic Commerce Research*, 13(4), 275–288. Retrieved from <http://www.ecrc.nsysu.edu.tw/liang/paper/2/79> Effect of Personalization on the Perceived (JECR, 2012).pdf
26. Monk, a. F., & Blom, J. O. (2007). A theory of personalization of appearance: quantitative evaluation of qualitatively derived data. *Behavior & Information Technology*, 26(3), 237–246. <http://doi.org/10.1080/01449290500348168>
27. Montgomery, A. L., & Smith, M. D. (2009). Prospects for Personalization on the Internet. *Journal of Interactive Marketing*, 23(2), 130–137
28. Nunnally, J. C. (1978). *Psychometric theory*, 2nd edition. New York: McGraw-Hill.
29. Oulasvirta, A., & Blom, J. (2008). Motivations in personalization behavior. *Interacting with Computers*, 20(1), 1–16. <http://doi.org/10.1016/j.intcom.2007.06.002>
30. Tam, K. Y. & Ho, S. Y. (2006). Understanding the impact of web personalization on user information processing and decisions. *MIS quarterly*, 30(4), 865–890.
31. Thongpapanl, N., Catharines, & Ashraf, A. R. (2011). Enhance Online Performance Through Website Content and Personalization. *Journal of Computer Information Systems*, 52(1), 3–13.
32. Tsekouras, D., Dellaert, B. G. C., & Li, T. (2011). Content Learning on Websites: The Effects of Information Personalization. SSRN eLibrary.
33. Venkatesh, V., and Bala, H. 2008. "Technology Acceptance Model 3 and a Research Agenda on Interventions," *Decision Sciences* (39:2), pp 273-315.
34. Wang, J.-C., & Lin, J.- P. (2003). Are Personalization Systems Really Personal? 36th Annual Hawaii International Conference on System Sciences, 2003. Proceedings of the.
35. Wang, May;Yen, B. (2010). The effects of website personalization on user intention to return through cognitive beliefs and affective reactions. PACIS 2010 Proceedings., 1610–1617.