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What is the Psychological Needs Profile of Users of Facebook?

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ABSTRACT

Extant Information Systems literature has demonstrated that there are 3 types of software products – Utilitarian, Hedonic and Social. A stream of motivation literature has also shown that there are three salient human psychological needs – the need for autonomy, competence and relationship. In this study we suggest that the user preference for a particular type of software product will vary with the psychological need profile of the user. To test this proposition, we conducted a study with actual users of three types of software products identified in literature – Google Keep (utilitarian), Critical Ops (hedonic) and Facebook (social). The findings of the study confirm that users driven by predominant need for competence preferred utilitarian software products while those driven by need for autonomy preferred hedonic software products and those driven by the need for relationship preferred social software products. These findings highlight the relevance of software product/ projects managers considering users' psychological needs while developing/ upgrading software to maximize usage of their software products.

KEYWORDS

Psychological needs profile, Need for competence, Need for autonomy, Need for relatedness

INTRODUCTION

Due to increasing competition, software development organizations are continually looking for ways to engender enthusiastic adoption of their products and maximize their intended use. However, while there is a lot of research in the area of software adoption and use of utilitarian and hedonic software products, one core aspect – the users' psychological needs profile - has been surprisingly ignored in models predicting Behavioral Intention (BI), and actual use. The underlying assumption in technology adoption research is that all users are a homogeneous category.

However, in this multi-disciplinary research we suggest that all users will not respond to different types of software products in the same way. Depending on their need profile some user may more enthusiastically spend her time having fun by playing computer games while another might prefer to spend time using software to accomplish something practical and useful or still another might feel more inclined to use software for interacting with family and friends.

To test our proposition, we first identify salient human psychological needs and develop a theory gleaning concepts from a multidisciplinary review of literature. We then conduct a study with actual users of three types of software products - utilitarian, hedonic and social. We analyze the data collected to answer the following questions: What are the basic psychological needs of software users? Do these needs vary among the users? If so, how do they vary? How do these user needs impact the BI, and actual use as reflected by the frequency and the time spent in using different types of software products? The findings of the study are then discussed for their relevance to software project/ product managers and future research.

LITERATURE REVIEW

The typology of utilitarian and hedonic products and services is well established in information systems literature as in consumer product marketing literature (Wu and Lu, 2013; Gerow, Ayyagiri, Thatcher and Roth, 2013, Kakar, 2014) While utilitarian goods are "functional and goal oriented and generate cognitive response from the user", the hedonic goods provide "novelty, aesthetics, unexpectedness, pleasure and fun and evoke affective user responses" (Strahilevitz and Myers, 1998). For example, swiss army knives with their versatile applications provide utilitarian value to the user while a perfume provides hedonic value to the user. Similar among software products using personal productivity software will provide utilitarian value to the user while playing computer games provide hedonic value to the user.

However, there is another class of products including software products that provide social value to the user such as social networking software. Social value helps consumers establish self as well as social identity. For example, using Apple product creates the impression of one being "creative" (Aaker, 2009) while membership of an exclusive club enhances social status and prestige. Recognizing the social value of products (and services) can help providers position and develop products that enhance consumers' self and social expression. Yet unlike consumer product literature, information systems literature until recently had largely ignored the social value provided by software (see Kakar and Kakar, 2018a).

There is also a stream of psychological research on fundamental human needs. In a more recent development, Sheldon, Elliot, Kim and Kasser (2001) examined 10 different feelings, each of which has been proposed as a need by prominent psychological theories. Of the 10 basic human needs (autonomy, self-esteem, self-actualization, pleasure-stimulation, money-luxury, popularity-influence competence, relatedness, physical thriving and security) the needs for relatedness, autonomy and competence were found to be most salient and universal across cultures. The three needs of relatedness, autonomy and competence are considered to be an integrative and parsimonious framework of human psychological needs (Ryan and Deci, 2000).

However, the psychological needs may vary among individuals. For example, individuals high in need of competence also have high need for autonomy but are low in need of relatedness (Richer, Blanchard, and Vallerand, 2000). Further, individuals with a high need for relatedness may have a low need for autonomy compared with individuals having a high need for competence. Thus, each user has her own unique needs profile. In this study we argue that the user preference for the aforementioned three types software products will depend on users' needs profile.

THEORY DEVELOPMENT

Hedonic value of products provides the user with emotional (arouse feelings or perpetuate affective states) and epistemic value (generate curiosity or novelty) while utilitarian value provides functional benefits (Sheth, Newman and Gross, 1991). Hedonic products evoke affective user responses and represents product aesthetics novelty, pleasure and fun (Strahilevitz and Myers, 1998). Utilitarian products on the other hand are goal oriented. They evoke cognitive response from the user.

From the perspective of motivation theory, utilitarian and hedonic value motivates users to use or patronize products in different ways. While hedonic value as an end valued for its own sake provides intrinsic motivation to the users, utilitarian value as a means to accomplish instrumental goals provides extrinsic motivation to the user to use the software (Wu and Lu, 2013). Competence is related to accomplishing complex and difficult tasks (Sheldon, Elliot, Kim and Kasser, 2001) We therefore suggest that the users' need for competence can be fulfilled by the utilitarian value provided by software products. Utilitarian value provides the user a means for accomplishing extrinsic goals such as job promotion, career progression, monetary benefits and security as so does competence. We can therefore expect users with a predominant need for competence to be more inclined to use utilitarian software products e.g. personal productivity software such as Google Keeps.

While utilitarian value is associated with work/ task performance and thereby competence, hedonic value is associated with pleasurable experiences. The users' need for autonomy can be fulfilled through non-directed action such as play through use of hedonic software products such as computer games (e.g. Critical Ops) as contrasted with controlled activities such as accomplishment of work through the use of utilitarian software products. Studies show that autonomy is essential for intrinsic motivation. Threats, deadlines and surveillance associated with work related activities undermine intrinsic motivation and autonomy (Ambile, DeJong and Lepper, 1976; Deci and Cascio, 1972; Harackiewicz, Manderlink, and Sansone, 1984; Kakar and Carver, 2012; Kakar, 2017a, b, c, d; Kakar, 2018a). Hedonic value also provides intrinsic motivation to the user. We therefore suggest that the users' need for autonomy can be fulfilled by the hedonic value provided by the software and we can therefore expect them to be more inclined to use hedonic software products such as computer games.

The social value of consumption can to be understood through the symbolic interactionism perspective which emphasizes the role of product consumption in the context of social roles played by people (Belk, 1988). Software products have symbolic value (Kakar and Kakar, 2018b). The symbolic meaning of product is realized outwardly through the construction of social identity in the social world and inwardly in the construction of self-identity (Elliott, 1997). Products and their attributes through their symbolic value often become part of the extended self of the user and reflect his self-identity (Belk, 1988). Further, by expressing their personal values through the

consumption/ use experience, users can establish social standing and relationships and as a way to engage in social activities with family and friends.

Users are known to identify themselves in relation to other users or group of users (Bagozzi, 2007). This social identity includes self-awareness of group membership and feelings of attachment and belongingness to the group. For example, consumers of Volcom products are youth who feel a sense of belonging to those who are against the world of adults. Social networking products such as Facebook provides social value to its users. It helps users to create a self as well as social identity in the desired community of friends and family. The user need relatedness can be thus be fulfilled when the software provides social value to the user and therefore one can expect BI and actual usage of social software products to be higher for users with a predominant need for relatedness.

Thus, the three basic human needs of competence, autonomy and relatedness will selectively impact the BI and actual usage of the tree different type of software products, leading us to the following hypotheses.

Hypothesis 1: Users with predominant need for competence will show a higher BI, frequency and time of use of utilitarian software products than the BI, frequency and time of usage of hedonic and social software products

Hypothesis 2: Users with predominant need for relatedness will show a higher BI, frequency and time of use of social software products than the BI, frequency and time of usage of hedonic and utilitarian software products

Hypothesis 3: Users with predominant need for autonomy will show a higher BI, frequency and time of usage of hedonic software products than the BI, frequency and time of usage of utilitarian and social software products

METHOD

Study Setting and Design

The study was conducted in a university setting with student subjects. Each subject chosen for the study answered a questionnaire-based survey that captured data on demographics and the users' BI for using the three different types of software products - utilitarian (Google Keep), hedonic (Critical Ops) and social (Facebook. The actual usage of software was captured using a tool developed for the purpose.

Subjects

The subjects for the study were recruited from a medium-sized public university in the south. The college of business of this university encourages research exposure by awarding students extra credit for research participation. An email was sent to all 2304 students of the college of business inviting them to participate in the study if they have been using all 3 software products Google Keep, a personal task planning software, Critical Ops, a popular game and Facebook for at least the past six months. We received a total of 240responses. Based on this response we invited all 240 students to participate in the study. Among those invited to participate 222 actually participated in the study. The subjects were 19-23 years old. 51.5% respondents were female, and 49.5 % respondents were male.

Measures Used

The human psychological needs represented by the 3-item autonomy scale A1–A3, the 3-item competence scale represented by items C1–C3 and the 3-tem relatedness scale represented by items R1–R3 was used in the study (Sheldon, Elliot, Kim and Kasser, 2001). A 3-item Behavioral Intention to use the software product was adapted from Moon and Kim, 2001. All measures used a 9-point Likert scale with anchors of 9 (strongly agree) and 1 (strongly disagree). Responses were coded such that high levels of the constructs are re- presented by high values. Some items were reverse coded. The overall value for each construct was created by averaging the user responses. For actual system usage we collected historical data on average frequency of use per day of the three software products over the last 6 months and the average time used per day for the three software products over the last 6 months.

Procedure

All respondents who participated in the study agreed to provide the browsing history of all the computing devices they used. A software tool was provided to the subjects that automatically generated their actual usage information of the three software products. The software was run by the subjects themselves after they answered the survey questionnaire. Three groups of subjects A, C and R were created for analysis of data. The first group A was created

of subjects whose need for autonomy was greater than their need for competence and relationship, The second group C was created of subjects whose need for competence was greater than their need for relationship and autonomy and the third group R was created of subjects whose need for relationship was greater than their need for competence and autonomy.

Method of Analyses

Factor analysis was performed on the data set obtained from the subjects to establish validity and reliability of the measures used in the study. Further, the correlation matrix and internal reliabilities of the measures were also examined. A difference in proportion test was used to compare the sizes of the 3 groups so formed and a paired t-test was performed for within group analysis of data and multiple two sample t-tests were performed for across user group comparison of mean BI and product usage across the 3 software product types.

RESULTS AND ANALYSES

The results of the factor analysis using IBM© SPSS© Statistics Version show that the factors extracted using Varimax rotation represented the scales used in the study - the autonomy scale represented by items A1–A3, the competence scale represented by items C1–C3 and the relatedness scale represented by items R1–R3) and the BI scale represented by items B1 to B3. The high loadings (>.50) within factors demonstrated convergent validity of items within scales, and the no cross loadings (>.40) between factors demonstrated discriminant validity between scales. The internal reliabilities of all the scales used in the study were greater than .70 (see Table 1). Further, none of the inter-correlations between the scales were greater than .65 (Tables 2).

Name of the scale	Cronbach's Alpha	Number of Items
Competence	0.89	3
Autonomy	0.91	3
Relationship	0.87	3
Behavioral Intention (BI)	0.90	3

Table 1. Internal Reliability of Scales

	C	A	R	BI
C	1.00			
A	.19	1.00		
R	.17	.16	1.00	
BI	.23*	.18*	.17*	1.00

*** p < .05**

Table 2. Correlations between variables (A C R)

A difference in proportion test showed that there were significantly more A (42%) than C (32%) and R (36%). We then performed a validity check on the groups A, C and R using paired t -test (Table 3). The within group average of A in group A, was significantly greater than the within group averages of C and R, the within group average of C in group C, was significantly greater than the within group averages of A and R and the within group average of R in group R, was significantly greater than within group averages of C and A (Table 3). Thus, the three groups were formed correctly as desired for further analyses.

Groups	Number of Subjects	Average of A	Average of C	Average of R	A-C	C-R	R-A
A	93	7.66	5.86	6.66	1.8***	-0.8**	-1***
C	58	5.01	7.37	5.72	-2.36***	1.65***	0.71**
R	71	6.76	5.74	7.43	1.02***	-1.69***	0.67**

**** P <.01, *** P< .001**

A=Need for Autonomy, C=Need for Competence, R=Need for Relationship

Table 3. Average need for A, C and R in groups A C and R

	Google Keep	Critical Ops	Facebook
BI	6.52	6.814	6.9
Average Daily Frequency	1.62	0.83	1.37
Average Time/ day	0.31	0.42	0.15

Table 4. Overall BI and usage of different types of software products

	Behavioral Intention (BI)			Frequency (FRQ)			Time of Usage (TIME)		
Need	**Google Keep**	**Critical Ops**	**Face-book**	**Google Keep**	**Critical Ops**	**Face-book**	**Google Keep**	**Critical Ops**	**Face-book**
A	5.71	8.13	6.31	1.22	1.43	1.04	0.22	0.64	0.11
C	7.43	5.14	4.37	1.96	0.58	0.79	0.42	0.31	0.09
R	5.67	6.12	8.2	1.24	0.64	1.92	0.26	0.31	0.30

Table 5. Table of BI and Usage across groups and software products

Table 4 provides the data on overall average BI and usage in terms of frequency and time used for the three software products. Table 5 provides the data on BI and usage for each of the three products for each of the three groups A, C and R. Table 6 provides the data for the difference in BI and usage of the three software products for each of the three groups. As can be seen users with predominant need for competence demonstrated a higher BI, frequency and time of use of utilitarian software product Google Keeps than the BI, frequency and time of usage of hedonic (Critical Ops) and social product (Facebook); users with predominant need for relatedness showed a higher BI, frequency and time of use of social software product Facebook than the BI, frequency and time of use of hedonic (Critical Ops) and utilitarian software product (Google Keeps); and users with predominant need for autonomy showed a higher BI, frequency and time of usage of hedonic software product Critical Ops than the BI, frequency and time of use of utilitarian (Google Keeps) and social software product (Facebook). Thus, all three hypotheses were fully supported.

	A-C			C-R			R-A		
	Google Keep	**Critical Ops**	**Face-book**	**Google Keep**	**Critical Ops**	**Face-book**	**Google Keep**	**Critical Ops**	**Face-book**
BI	-1.59	1.41***	0.88	1.91***	-0.35	-2.68	-0.32	-1.06	1.8***
FRQ	-0.62	0.31***	0.32	0.5***	-0.06	-1.29	0.12	-0.49	0.97***
TIME	-0.29	0.25***	0.02	0.25***	0	-0.16	0.04	-0.25	0.14***

* P < .05, ** P <.01, *** P< .001

Table 6. Difference in usage among the three user groups for the three product types

CONTRIBUTION

This study makes multiple contributions to our understanding of how user characteristics, in the form of their basic psychological needs, impact BI, frequency and time of use for 3 different types of software products. The results of the study have practical implications. Depending on the type of software product product/ project managers can target users of a specific profile to increase usage of their products. They can craft their messaging and introduce new product features to focus on relationship, competence and autonomy aspects respectively depending on whether their software products are social, utilitarian or hedonic. This study also found that users with the predominant need for autonomy was the largest group compared to those with the predominant need for competence and relationship. This finding explains why the gaming industry is growing at such a fast pace and is expected to be the single largest segment in the software industry. Further, brand pages are becoming very popular on social networking sites and in-game advertising is increasingly becoming popular. The effectiveness of these brand pages and in-game advertising can be enhanced with the knowledge of the specific user profile that frequent the use of these software products.

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