Customer satisfaction in Web 2.0 and information technology development

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Abstract

Purpose – The purpose of this paper is to investigate how the individual and organizations best use Web 2.0 social networking technologies to improve its relationships with customers.

Design/methodology/approach – The theoretical background used in the paper was the familiarity-liking theory and prospect theory to understand the extent of user satisfaction with the services. Online survey from Second Life users was conducted to investigate customer satisfaction in Web 2.0 social networks and recent development on information technologies.

Findings – The findings suggested that IT development is the inseparable part of Web 2.0 and enables to understand customer satisfaction as well as their perception on online technology. Both customer satisfaction and IT development has positive influence on consumer's service enjoyment and experience.

Research limitations/implications – The generalizability of the paper is limited. The survey data in this study have some common method bias. The possibility of the existence of the common method bias cannot be completely eliminated.

Practical implications – The paper provides the significance of customer satisfaction for organizations, researchers, managers, and policy makers. The paper provides validated measurements to facilitate evaluation of several major user satisfaction constructs.

Originality/value – The recent development of information and communication technology (ICT), especially the internet and its related technologies has become the main force of the development of online social network. The number of Web 2.0 users has been growing so rapidly that it has become an important channel for marketers to reach their customers.

Keywords Web 2.0, Information sharing, User satisfaction, Social networking (e.g. Facebook, Second Life)

Paper type Research paper

1. Introduction

A good relationship between Web 2.0 technologies and its users does not only improve user satisfaction, but also helps in fostering effective communications between them (Arora, 2003). Failure in managing the relationship will create dissatisfaction of users or customers, which may lead to disbelieve toward the system. A good relationship between technology provider and its customers is vital and the relationship must be managed efficiently to prolong the business. With the recent development in information and communication technology (ICT), particularly the emerging Web 2.0 technology such as social networks (e.g. Facebook, Twitter), blogs, wikis, and video sharing (Youtube), the capability of customer relationship management (CRM) technology can be enhanced further. Greenberg (2009) offers the new CRM with the Web 2.0 technology as Social CRM or CRM 2.0. Web 2.0 technologies can be a powerful tool for an organization; their interactivity promises to bring employees into daily contact at lower cost. When used

effectively, they also persuade participation in projects and idea sharing, thus deepening a company's pool of information. They will bring better scope and measure to organizations as well, strengthening relationships with customers and improving communications with suppliers and outside partners.

Web 2.0 technologies are pivotal to share ideas, improved access to knowledge experts and reduced costs of communications, travel, as well as operations. Many respondents mention that Web 2.0 tools have decreased the time to market for products and had the effect of increasing user satisfaction (McKinsey Global Survey Results, 2009). Web 2.0 provides benefits by delivering the opportunities for collaboration and by allowing information to spread more efficiently. A number of cite blogs, Really Simple Syndication (RSS), and social networks are significant means of sharing information. These networks assist companies to combine together. Apart from of industry, executives at companies that use Web 2.0 technologies also contain larger benefits. High-technology companies are likely to achieve measurable benefits from Web 2.0, followed by other companies offering business, legal, and professional services.

Web 2.0, can facilitate the company and its supply chain enabling effective information sharing and establish collaboration in the form of virtual group. Web 2.0 and other technological developments have facilitated development in e-service provision by enabling a seamless connection between customers and the organization. Consequently, customer engagement online can increasingly be observed as the equivalent to offline experience marketing. Organizations are progressively facilitating customers in uploading and distributing content online (Strauss and Frost, 2009). Consumer opinion platforms enable consumers to share opinions with other customers. Organizations have to examine this as they are important sources of electronic word-of-mouth which may positively or negatively influence existing and prospective customers (Sen and Lerman, 2007). Such social networking sites based on Web 2.0 offer organizations a massive networking opportunities and an online marketplace.

The purpose of this paper is to investigate how do individual and organizations best use Web 2.0 social networking technologies to improve its relationships with users or customers. The customer satisfaction is a key factor for business success and an element of multiple items evaluated as a satisfaction measurement, which can differ from business to business (Tsai *et al.*, 2010; Ostrom and Iacobucci, 1995). Thus, customer satisfaction is an expression of enjoyment or displeasure resulting from an evaluation between quality awareness and expectation of a product or service. The concept of customer satisfaction is a combination of feelings before and after use of the service or product. Online businesses have been improving customer satisfaction and giving them direction for new product development and marketing decisions (Aberdeen, 2008).

Organizations can facilitate interaction with customers or using social networking sites such as Facebook, Myspace, and Twitter. Online 3D virtual worlds, such as Second Life (SL) are increasingly being used by organizations to communicate with existing and potential customers in virtual words (Berman *et al.*, 2007). Toyota has a virtual dealership in SL, while Starwood hotels have launched a hotel chain there. Internet communications such as Skype offers customers the ability to video call with an organization free of cost. Several companies consider blogs as a business intelligence tool and regularly browse the blogosphere and bulletin boards to find out how the companies or its products are viewed in the marketplace. To understand how customers interact with the organization online and through the use of Web 2.0

technologies, service organizations need to identify the various online intermediaries that influence customer's perceived value in relation to online services.

2. Related works

Web 2.0 is an IT platform. Its services facilitate people and organizations to create customer values and to establish customer relationship through collaboration and social networking (Sigala, 2008). Wikipedia defines social media as "web-based technologies to transform and broadcast media monologues into social media dialogues. They support the democratization of knowledge and information and transform people from content consumers to content producers". Web 2.0 is usually associated with technologies such as web logs (blogs), social bookmarking, wikis, podcasts, RSS feeds, social software, and web application programming interfaces. Companies have monitored the move of major web players such as Amazon, e-Bay, Live, Google, and Yahoo to comprise social and community elements, and the interest and demand. In the meantime, they are excitedly considering and constructing gateways in communities and businesses for their own organizations. Web 2.0 is moving to organizations and they are using Web 2.0 technology mostly to communicate with customers, business partners, and potential employees, allowing them to achieve the goal of true real-time collaboration. This can increase output and provides companies with a mechanism to easily promote their products.

The formation of online communities, blogs, and wikis that initiate conversations and promote the sharing of information is beneficial to organizations. Companies have been using the Web 2.0 technologies inside the organization for communication with employees and customers as well as for marketing. It enables analysts, decision makers, and consumers to control their user experiences through the use of IT and thus provide them insightful and competent work environment. The benefits of this involve enhanced worker productivity, confidence, and user satisfaction. Web 2.0 tools promote people to meet virtually, share opinions and interests. It is also enabling content to be produced and shared in real time, with end-users usually able to add content to applications themselves (O'Reilly, 2007). This indicates that Web 2.0 technologies support open communications and deliver users the freedom to share their opinions and suggestions. Web 2.0 tools such as Twitter allows people to share short textual messages with others, can be an enabler for immediate information sharing on the inventory management processes.

Web 2.0 tools have brought companies new ways to attain their target audience and build brand image. Weber (2007, p. 22) mentions that a marketer's role has changed from a broadcaster pushing out messages to an aggregator who pulls together content, collaborates with its customers and participates in communities. Sheth and Sharma (2005) state that reducing costs and enhancing reach are most important advantages of online marketing. However, B2B companies spend more on their online marketing budgets than B2C companies. The reason for this is a less specialized approach of B2B companies when planning internet marketing activities in comparison with B2C companies. Therefore, more holistic online marketing planning and prioritization methods are essential. Trust is the vital goal for global companies since it creates the foundation for the company's function. A company's trustworthiness can be improved by being transparent and engaging multiple stakeholders into a conversation via different communication channels. Web 2.0 technologies bring new opportunities for this interaction. At the core of Web 2.0 is collective intelligence and wisdom of crowds where users have the key role. User-generated content is the basis of the success of

Web 2.0 (Constantinides and Fountain, 2008; Frampton, 2009). It is argued that some contents generated by users such as anonymous amateur videos and music remixes posted to YouTube and other shared-content sites violate intellectual property rights and thus harm professional artists and the entertainment industry (Constantinides and Fountain, 2008). So, copyright problems are one of the major issues when discussing the future of Web 2.0 and the vital role of user-generated content.

Due to the ease of use and inexpensive nature of Web 2.0 marketing, companies have introduced Web 2.0 tools for their marketing mix without a strict plan or goals for these efforts. Although signing up for most Web 2.0 applications is free, keeping up with them needs time and resources (Frampton, 2009). Boyd and Ellison (2008) make remark that networking with strangers is not the primary practice on many of the social networking sites. Instead, users most communicate with people who are already a part of their extended social network. The online users' contributions to the community consist of the information content they create such as comments, feedback, attitudes, and beliefs as well as informative needs. Users also generate other sorts of content to communities like photos, music, and videos. Sharma *et al.* describes virtual worlds as a medium in which users communicate and interact in real time. Users communicate via avatars, which distinguishes virtual worlds from other social media and networking platforms, making them a separate type of social media.

Gartner Inc (2009) defined CRM as a widely implemented strategy for managing interactions with customers which includes using technology to organize, automate, and synchronize business processes such as customer service, marketing, and sales activities. The overall goals are to find, attract, and win new customers, nurture and retain those the company already has, attract former customers back into the fold, and reduce the costs of marketing and customer service. The main reasons for high rate of failure when implementing CRM are related to people's behavior and culture (Greenberg, 2004), and CRM is considered as a technology, not as a long-term strategy (Payne and Frow, 2005). Batista (2010) studied about the internet in becoming a key medium in supporting CRM. The web technology is a powerful channel available for organizations to enhance interactions and strengthen relationship with customers. The Web 2.0 could be used as enablers in creating close and long-term relationships between an organization with its customers.

Customer satisfaction depends on a product's performance in delivering value associated with a buyer's expectations. If the product's performance falls short of the customer's expectations, the buyer is dissatisfied. If performance matches expectations, the buyer is satisfied. If performance exceeds expectations, the buyer is delighted. The excellent marketing companies go out of their way to keep their customers satisfied. Satisfied customers make repeat purchases, and they tell others about their good experiences with the product. The important point is to match customer expectations with company performance. Well developed companies aim to delight customers by promising only what they can deliver, then delivering more than they promise (Kotler *et al.*, 2011). Customer satisfaction is largely specified by how much the customer's expectations differ from the product's or service's actual performance and what traditional marketers refer to as the degree of inconsistency resulting from a customer's disconfirmation of expectations (Tse and Wilton, 1988). Online customer dissatisfaction results from expectations about a product, technology issue, web assessment factors such as information content, customized product information, convenient after sales support, privacy issues, and prompt delivery.

Online customer satisfaction depends on lead-time, delivery speed, product or service introduction, and convenience. In traditional markets, customer complaints are considered a main source of information (Tse and Wilton, 1988). Since complaint management is recognized as being vital to customer satisfaction, any measure of complaint behavior should regard as the degree and quality of the underlying customer satisfaction in online social platform (Cho *et al.*, 2001).

A number of studies have explored the relationship between customer satisfaction and retention on behavioral loyalty in the offline environment (Gronholdt *et al.*, 2000; Reicheld, 1996;). These studies have found qualified support for the positive impact of satisfaction on maintenance, although, satisfied customers may desert to competing products and services (Reicheld, 1996). Research by Bain and Company has highlighted that the returns to loyalty-building initiatives are in the double-digits, and Rust *et al.* demonstrate that under certain conditions, it may be better to focus directly on loyalty-building initiatives, rather than work on satisfaction-enhancing efforts. Customer satisfaction and customer retention have emerged as key measurement for measuring the effectiveness of IT systems and the competitive success of companies. Previous studies show that the higher levels of customer satisfaction have the possibility to double or triple organization profits. In order to improve customer satisfaction, companies are making greater use of IT tools in their internal business processes (Srinivasan *et al.*, 2002). Managers consistently rank improvement in customer satisfaction as one of the prime motivations for making IT development.

3. Theoretical background: familiarity-liking theory

The familiarity-liking theory suggests that an individual's loyalty to a service provider can influence his or her extent of satisfaction with the service. According to this theory, a faithful customer is more satisfied with a service than a disloyal customer due to exposure to the service, information availability about the service, and its social prestige. For example, a customer who is loyal to an organization is expected to be more exposed to its services, have greater access of information about that company, and want to conform to the expectations of other users of that company known to that customer. Hence, this customer could be more favorably disposed to the company's services, and be more satisfied with his/her service experiences at that company and with the overall relationship.

Prospect theory also supports this argument (Mittal *et al.*, 1998). According to this theory, losses loom larger than gains. In the perpective of the relationship between loyalty and satisfaction, this theory applies as follows. If loyal customers comprise a negative experience and become dissatisfied with a service provider, then they might gain by switching to a new service provider but also, simultaneously, lose some loyalty benefits. Compared to non-loyal customers, loyal customers may identify the loss to be larger than the short-term gain of moving to a new service provider. Thus, loyal customers are more forgiving than non-loyal customers of temporary setbacks in service encounters. Loyal customers have a wider level of tolerance, thereby experiencing higher levels of satisfaction than non-loyal customers. Therefore, the greater the loyalty to a service provider, the larger the level of both service encounter and overall satisfaction with that provider. The overall satisfaction is likely to be lower when customers put in more effort than they expected to expend in choosing the service (Anderson and Sullivan, 1993). The online environment normally allows customers to choose faster, therefore, customers may expect to spend less time and effort on shopping relative to the amount they would spend offline. If they actually

spend less time relative to their expectations, then a higher level of satisfaction can be observed.

4. Conceptual model and hypothesis development

Figure 1 shows the logical framework or research model on customer satisfaction in Web 2.0. The conceptual model has been developed based on extensive literature review. The first part of the block is relating to the motivating factors for people with the use of Web 2.0. The variables are ease of use, service quality, interactivity, and trust. In this case these variables act as dependent variables and customer satisfaction acts as independent variable. The variable of second block is IT development which acts as independent variable and customer satisfaction as dependant variable. Web 2.0-based communication technology is popular in computer-based communication. Thus the model facilitates to understand extent of user satisfaction in online social environment. The contribution of research model is that the IT development plays pivotal role in online environment to establish online social network and to perform different activities. IT is becoming an important platform both online and offline users. The web-based technologies are also useful to create new e-commerce for income generation and consumer participation. Due to this, Web 2.0 is becoming new frontier performing online transactions.

The contribution of mediating variable "customer satisfaction" is to link motivating constructs and influencing constructs, i.e. IT development. Web 2.0 is the internet-based simulated environments. The users have impression of being immersed in this platform. In this connection the purpose of communication through Web 2.0 technologies is to get a feeling of enjoyment, telepresence, participation from a distance and information sharing. The impact of communication technology has direct impact on society. Communication allows social interaction. Web 2.0 in this connection has technical, behavioral, and social strengths. Due to the growth of new ITs, Web 2.0 is becoming popular communication medium (Figure 1).

Ease of use
A favorable insight of online interaction is influenced by ease of use of a web site (Merrilees and Fry, 2002). Navigability is a major feature that provides the ability of the user to find their way around a site and keep track of where they are (Richard and Chandra, 2005). Ease of use, delivers the concept that web sites that are easy to understand and easy to use are a pleasure for the user. Ease of use enables how users can locate what they are searching, and can bring about their objective of visiting to the web site. This translates, for the web site owner or company, into sales, subscriptions,
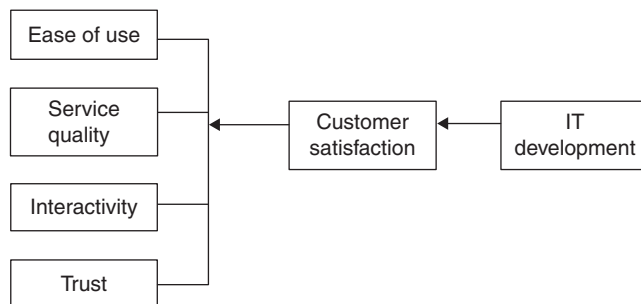

Figure 1.
Conceptual model

and everything else the web site is intended to achieve. Parasuraman *et al.* (2005) specify that the sites contain functions that assists customers to find what they are looking for without difficulty, and allows the customer to move easily and quickly through the web pages. Bandura (1982) and Hill *et al.* (1987) introduce a concept about ease of use, combining selt-efficiency, and outcome to provide an adequate customer satisfaction. Majority of the researchers believe that ease of use is related to the final satisfaction of the users and agree in ranking this variable as a critical factor in web site design (Benbunan-Fich, 2001; Davis, 1989; Elliot and Speck, 1998). According to Davis (1989) perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance". Perceived ease of use is "the degree to which a person believes that using a particular system would be free of effort". The End User Computing Satisfaction Instrument (EUCS) developed by Doll and Torkzadeh (1988), defined five factors that influence user satisfaction: content, accuracy, format, ease of use, and timeliness. User satisfaction is more broadly defined as the extent to which users perceive that the information system available to them fulfills their information requirements:

H1. Ease of use of Web 2.0 technologies has positive influence on customer satisfaction.

Service quality
In online platform such as Web 2.0 social networks there is an increasing emphasis on service quality. A customer's intention to maintain a relationship with a company is dependent on his or her perception of the benefits of high-quality service that provides a continuous flow of value (Patterson *et al.*, 2006). Service quality is one of the most important and widely investigated topics in services literature (Fassnacht and Koese, 2006; Zeithaml, 2000). A consent view among scholars is that service quality results from a customer's expectations about a service encounter with their perceptions of the service provider. The satisfaction and delivery quality may play a pivotal role in the consumer's cognitive appraisal including interest, joy, pride, dislike, enjoyment, and frustration (Parboteeah *et al.*, 2009). Service quality has been shown to be significant for organizations attempting to differentiate their service offerings by enhancing and establishing customer value and fulfilling customer needs. Findings suggest that service quality enhances customer loyalty as well as retention, which are increasingly important in today's competitive environment.

Grönroos (1998), defined service quality as "the outcome of an evaluation process, where the consumer compares his expectations with the service he perceives he has received" (p. 37). According to the prior service quality theories and electronic commerce studies, Tan *et al.* (2007) claimed that the conceptualization of service quality should include considerations of both service satisfaction and delivery. Web sites with a more visually acceptable interface often result in greater service quality and can influence a user's experience and ultimately his or her long-term service provider relationship. Service delivery quality pertains to the consumer-web site interaction during the process when the consumer is searching for information, selecting from available options or carrying out a transaction. Customer satisfaction is a predecessor of service quality. Some studies, mentioned that it is service quality that provides customer satisfaction and behavioral intentions (Chia *et al.*, 2008); Molinari *et al.*, 2008). In this connection service quality and customer satisfaction are directly

associated. Customer satisfaction results from high perceived service quality and this makes customers loyal:

> *H2.* Service quality is directly associated with customer satisfaction in Web 2.0 web sites.

Interactivity

Interactivity is defined as the extent to which users can participate in modifying the form and contents of a computer environment in a real time (Laurel, 1986). The interaction is needed during sharing information, online game playing and learning. Interaction is required to establish social environment. If the person has well-built relationship with Web 2.0 technologies then there will have less possibility of declining (Bruckmen and Jensen, 2002). Online Web 2.0 services provide several dimensions and attributes, such as customization, interactivity, service delivery processes, responsiveness of answering customer inquiries, and web site security. Interactivity is the mutual mediated interaction and considered an important influence in developing online consumer relationships and business experiences (Ha and James, 1998; Merrilees, 2002). Most useful measures largely refer to web sites' technological capability for user satisfaction. Ha and James (1998) include connectedness and information collection as important extents of interactivity. Connectedness refers to the feeling of being able to connect to the material world and to widen individual's experience whereas information collection refers to a web site's capability to provide and collect essential information for consumer transaction. Interactivity enables user satisfaction and is a direct force of repeated web site visits (Lii *et al.*, 2004). A well-designed web site could create higher satisfaction by enabling larger control to customers to personalize the information search. Higher customer control of the shopping experience enhances the pleasure and convenience of shopping, a significant factor of customer satisfaction (Marmorstein *et al.*, 1992):

> *H3.* Interactivity features of Web 2.0 have positive effect on user satisfaction.

Trust

Trust is an important component during online communications to create confidence to the users. Security and privacy issues are strongly related to trust (Goode and Harris, 2007; Lee and Turban, 2001). Trust is an encouraging factor to achieve more confidence among internet users by providing prompt and information rich services. Previous studies have empirically found a constructive relationship between users' agreeableness to employ the e-communication channel and trust as an important and effective factor on the use of all internet activities. According to Aladwani (2001), trust is one of the critical and important elements in the online activities environment. Trust is the foundation of a strategic partnership for an effective relational exchange between provider and user. The trust measurement is necessary and important to consider both for individual and institutional integration for complete user satisfaction (Rousseau *et al.*, 1998). Customer satisfaction is directly related to trust, if the service is reliable, customers believe in the service and purchase repeatedly (Chiung-Ju and Hui-Ju, 2009). In general, it is a common belief that trust is connected with the capability to protect personal information. Thus, trust is always considered as the most important component of an e-commerce web site. Some empirical studies further report trust is greatly improved by security (Kim *et al.*, 2010):

> *H4.* Trust is positively associated with customer satisfaction.

Customer satisfaction
The introduction and understanding of the satisfaction determinants is vital to the success of business on the web (Mckinney *et al.*, 2002). According to the conceptual model developed by Schaupp and Bélanger (2005), it is important to highlight the following components as standard steps of e-satisfaction: technological factors (i.e. IT development) that ensure web site functionality, such as security, privacy and usability and web site design; factors that influence consumer perceptions during and after the purchase, such as convenience, confidence in the virtual establishment, and the delivery of the purchased items; and factors associated with the quality of the product and service being offered, such as the presentation of the selection of products, product worth, and the adaptation of the same to the actual needs of the user. Different studies (e.g. Reynolds, 2000; Rowley, 2000) have focussed that, due to the special features of web transactions, companies with a web presence believe the need to create confidence and brand image in such a way that consumers confirm a tendency toward purchasing processes on their sites. Urban *et al.* (2000) define confidence in the web as a medium for purchases, in terms of consumers' opinions regarding safety, evident transparency in the transaction entered into with companies on the web. The companies' should have commitment to respect what has been transacted with the consumer and should focus on IT development.

IT development
Rathnam *et al.* (1995) show the significance of IT on customer satisfaction. Similarly, Karimi *et al.* (2001) report that companies with better IT development are effective to improve customer service and customer relationships. The role of IT on customer satisfaction has attracted the attention of marketing researchers. In number of studies, researchers have acknowledged the potential impact of IT on the customer satisfaction performance of organizations and highlighted the relationship between IT investments and customer satisfaction. The nature of the service business is such that consumers may experience the effect of IT-enabled business processes flexibility and convenience directly. For instance, IT applications can be used in the hospitality industry to locate the preferences of each customer based on prior experiences and modify new service features that will satisfy customers.

ICT needs to be managed to assist core business of an organization in achieving the mission and vision of the particular company. Business-driven IT Management is defined as "the application of a set of models, practices, techniques and tools to map and to quantitatively evaluate dependencies between IT solutions and business performance and using the quantified evaluation to improve the IT solutions' quality of service and related business results" (Sauve, 2006). Therefore, to deliver quality of ICT services to a particular organization, the proper model, related technology, and processes are needed. Significant investments in IT applications in recent years indicate that IT applications can reorganize both internal and customer-interfacing business processes (Chopra and Meindl, 2003; Karimi *et al.*, 2001). Since customer satisfaction is a foremost indicator of firm performance, it is important to understand the function of IT investments in enhancing customer satisfaction:

  H5. IT development has significant influences on customer satisfaction on online
     environment.

Table I provides the name of variables, their acronym, and description. There are altogether six construct variables and 24 items to be measured for data analysis.

All scales consisted of five-point Likert questions, ranging from "1 as strongly disagrees" to "5 as strongly agree". As shown in the research model (Figure 1) the variables in left block are ease of use, service quality, interactivity and trust. Customer satisfaction acts as a mediating variable. The variable in the right block is IT development. In the table acronym of each variable, their description and indicator items were presented. Each construct contains four indicator items and altogether there are 24 indicators. The item in each variable was selected from literature review and upon suggestion from SL users during pretest and pilot test of online survey.

5. Methodology: online survey and data collection
This study was conducted in SL from September to November 2012. SL is an online virtual world online environment, developed by US-based Linden Lab in 2003. Virtual worlds are creation of mind and place of people's imagination. SL is the computer mediated, shared place for interacting people. SL is also called a Massively Multiplayer Online Role Playing Game (MMORPG) where people have fun and entertainment and play games and perform business activities. Residents in the form of 3D graphical representation can move from one place to another, communicate with each other, design and create new products and services, sell and buy products and perform a number of social activities. The survey questionnaires were prepared from literature review. Pretest of the questionnaires was conducted with 20 users to check the reliability and clarity of questionnaires. Pretest was performed for screening of questions, i.e. select those which have clear meaning and understandable. The pilot test was performed with 25 SL experienced users. Some questions were modified as per the suggestion of users to avoid confusions and to make reliable survey. Altogether 1,478 users were requested for survey participation. The responses were received from 492 users. Thus the response rate is 33.28 percent. Out of them 32 responses were discarded due to incomplete and invalid answers. Consequently, remaining 460 responses were used for data analysis. The survey contains 20 questionnaires and it takes 10 minutes to answer. Each participant received 50 L$ for answering survey questionnaires. SL participants were contacted through IM, local chat and note card message. Most of the participants were selected who have more than one month experience in SL by checking their profile. Based on personal conversation, the survey link was sent after getting permission from users. The anonymity of participants was maintained in this study.

Table II shows the demographic information of participants in SL. High number of responses (34.7 percent) was received from high school level user group. Each item of a questionnaire was rated on a five-point Likert scale from "strongly agree" to "strongly

Construct variable	Acronym	Description	Items
Ease of use	EU	Variables indicating convenient use of Web 2.0	4 items
Service quality	SQ	Includes variables related to quality of online Web 2.0	4 items
Interactivity	INT	Includes variables relating to interactive features of Web 2.0	4 items
Trust	TR	Variable indicating trust on Web 2.0	4 items
Customer satisfaction	CS	Variables indicating customer satisfaction features	4 items
IT development	ITD	Includes variables indicating development of IT on customer satisfaction	4 items

Table I.
Variables of research model

Measure	Value	Response	%	Mean	Variance	SD
Gender	Male	237	51.5	1.31	0.40	0.62
	Female	218	47.4			
	Do not want to indicate	5	1			
Age	Below 13	1	0.3	1.71	0.28	0.62
	13-17	2	0.4			
	18-24	144	31.4			
	25-34	140	30.4			
	35-44	152	33			
	45 and above	15	3.2			
	Do not want to indicate	6	1.3			
Education	Doctoral	15	3.3	3.28	1.36	1.62
	Masters	62	13.5			
	Bachelor	140	30.5			
	High School	160	34.7			
	Others	83	18			
Income	Below $1,000	64	13.9	2.31	2.02	3.51
	$1,000-$5,000	59	12.8			
	$5,000-$10,000	47	10.2			
	$10,000-$20,000	63	13.7			
	$20,000-$50,000	107	23.3			
	$50,000-$100,000	101	22			
	$100,000 and above	19	4.1			

Note: $n = 460$

Table II.
Demographics
of participants
in Second Life

disagree". Neutral was given the score of 3. Of all respondents, 51.5 percent were male, 47.4 percent were female, and 1 percent did not want to indicate their gender. The age varies from 18 to 65. The average age is 32. The respondents come from more than 70 nations. Majority of them are from North America (52 percent), Europe (27 percent), Asia (7 percent), South America (5 percent), Australia (4 percent), and others.

6. Results and discussion
6.1 Measurement model
Structural equation modeling (SEM) using Smart PLS 2.0 was applied to analyze measurement and structural models. Unlike covariance-based SEM tools such as LISREL, PLS has the flexibility to represent both formative and reflective latent constructs, and places minimal demands on measurement scales, sample size, and distribution assumptions (Fornell and Bookstein, 1982). This is because the component-based PLS uses a least square estimation procedure to obtain parameter estimates while LISREL uses a maximum likelihood function. Convergent and discriminant validity and internal consistency reliability (ICR) was used to evaluate the psychometric properties of the measure for constructs. SEM is used for testing hypothesis, multiple variables including latent variables and multiple samples. After a refinement of the survey instrument utilized in our initial tests, all constructs reported high reliability (composite reliability > 0.8, AVE > 0.7). Thus, the measurements fulfill convergent validity requirements. Based on the above described tests our measurement model (Table III) is validated and we have demonstrated that all measures in this study have adequate convergent and discriminant validity.

In order to access the construct validity and reliability, a test on Cronbach's α was conducted for each construct variables and underlying measurement variable. Table IV shows the overall results of research model. Internal consistency is an indication of how well the items for a construct are correlated. Internal consistency can be measured in terms of Cronbach's α, that provides a lower bound of internal consistency and composite reliability, which is a more accurate measure of internal consistency. The overall Cronbach's α is 0.84 and varies in between 0.74 and 0.95. Hair *et al.* (1998) stated that the threshold value of Cronbach's α should be 0.60. If the reliability coefficients are all within generally accepted thresholds, the results suggest a high level of reliability of the construct variable and underlying measurement items. The squared loadings (also called communalities) are used in calculating the variance extracted for each construct. Communality is the sum of the squared factor loadings for all factors for a given variable. Communalities report the percentage of variance within each variable that is explained by the resulting factors. The value is above 70 percent which shows the adequate fit. Variance extracted of 0.5 or higher indicates adequate convergent validity. The value of AVE was obtained above 0.5 in our result. The value of construct reliability 0.7 or higher suggests good reliability. The ICR should be above 0.707. Coefficient of determination (R^2) is received from F-statistics. R^2 in PLS for dependent construct represents how much variances in each of the dependant variables are explained by the model. Internal reliability was evaluated by the composite reliability of each latent variable. Composite reliabilities of all constructs should be above 0.70 threshold (Barclay *et al.*, 1995). In our result the value of composite reliability is above 0.70. The redundancy has no official value for analysis but higher value is preferred.

6.2 Confirmatory factor analysis model
Out of 16 items, two items were deleted due to lower factor loading <0.6. In interactivity construct (INT) the fourth item (INT4) was removed. In IT development construct (ITD) second item (ITD2) was deleted which was related to IT enhancement

	1	2	3	4	5	6
1. EU	1.00					
2. SQ	0.83	1.00				
3. INT	0.68	0.67	1.00			
4. TR	0.75	0.71	0.73	1.00		
5. CS	0.78	0.73	0.74	0.7	1.00	
6. ITD	0.59	0.57	0.63	0.68	0.78	1.00

Table III.
Inter-variable correlation matrix

	AVE	Composite reliability	R^2	Cronbach's α	Communality	Redundancy
EU	0.932	0.892		0.952	0.932	
SQ	0.718	0.803	0.125	0.742	0.754	0.146
INT	0.887	0.953	0.052	0.912	0.843	0.039
TR	0.699	0.85		0.881	0.729	
CS	0.789	0.901	0.219	0.834	0.788	0.165
ITD	0.812	0.912	0.312	0.914	0.787	0.049

Table IV.
Overview of the results

in Web 2.0. Some questions are similar and repetitive as per the comments of the users, so they provided less priority in this matter. The result of CFA is provided in Table V. Reliability of construct is how individuals respond and validity means what is supposed to measure. Individual item reliability can be checked by examining the factor loading of each item on its corresponding latent variable. The loading of all items should be higher than 0.707 (Barclay *et al.*, 1995). However, survey data highly depends upon the opinion of participants, so some fluctuation in result may take place. According to Manly (1994) loading above 0.6 is usually considered high and below 0.4 is low. If all measurement items are strongly significant with a value of over 0.60, then it will be a good model fit and all construct variables are valid. The proposed research model shows a good construct fit as all factor loadings are above 0.6. The model seems statistically significant and well constructed. However, the analysis may have several limitations. Online surveys can suffer from selection bias, the people who fill out survey questionnaires may not be an average player. The age of the users varies between 18 and 70 in SL. The mean age of participants (32 years) may not reflect the entire population.

Table VI provides the result of path coefficient to test the research model. Path coefficients are standardized versions of linear regression weights which can be used in evaluating the possible causal linkage between statistical variables in the SEM approach. The standardization involves multiplying the ordinary regression coefficient by the standard deviations of the corresponding explanatory variable. Higher the coefficient, greater the relationship with variables. The values of path coefficients in the table are satisfactory. Thus the research model was well constructed. It provides validity and reliability of research model in this study.

Items used for principal construct	Factor loading
EU1	0.97
EU2	0.98
EU 3	0.95
EU4	0.96
SQ1	0.89
SQ2	0.86
SQ3	0.87
SQ4	0.89
INT1	0.96
INT2	0.89
INT 3	0.87
TR1	0.87
TR2	0.86
TR3	0.9
TR 4	0.88
CS1	0.91
CS 2	0.9
CS 3	0.89
CS4	0.88
ITD1	0.87
ITD3	0.86
ITD4	0.88

Table V.
Results of confirmatory
factor analysis

Table VII outlines the value of latent variable correlations and Square root of AVE. An AVE is used to assess the convergent and discriminant validity of the constructs. The AVE helps to measure the amount of variance that a construct captures from its indicators relative to the amount due to measurement error. So as to assess the convergent validity, AVE of the stipulated construct should be > 0.50 and the value of square root of the AVE should be > 0.707 (Fornell and Larcker, 1981).

The factor loadings are in acceptable range and the t-values are significant at the 0.01 level. If the square root of the AVE is greater than all of the inter-construct correlations, it is an evidence of sufficient discriminant validity (Chin, 1998). In order to further access validity of measurement instruments, a cross-loading table was constructed. It can be observed that each item loading in the table is much higher on its assigned construct than on the other constructs, supporting adequate convergent, and discriminant validity. Chin (1998) suggests that, covariance-based estimates such as reliability and AVE are not applicable for evaluating formative constructs. Instead, the path weights of indicators need to be examined to check if they significantly contribute to the emergent construct.

Table VIII presents the summary of hypothesis result results of research model. All t-statistics will be significant at $p < 0.001$. If the probability value (p-value) is less than the significance level, the null hypothesis is rejected. If the t-value is > 2.63,

	EU	SQ	INT	TR	CS	ITD
EU						
SQ						
INT						
TR						
CS	0.28	0.31	0.52	0.46		
ITD					0.274	

Table VI.
Path coefficients

	EU	SQ	INT	TR	CS	ITD
EU	*0.961*					
SQ	0.451	*0.778*				
INT	0.332	0.351	*0.923*			
TR	0.364	0.258	0.404	*0.845*		
CS	0.284	0.441	0.321	0.368	*0.833*	
ITD	0.327	0.348	0.218	0.201	0.443	*0.882*

Table VII.
Latent variable correlations and square root of AVE

Hypothesis	t-statistic	Support
H1: CS→EU	7.92**	Yes
H2: CS→SQ	12.49**	Yes
H3: CS→INT	8.37**	Yes
H4: CS→TR	5.96**	Yes
H5: ITD→CS	6.12**	Yes

Notes: t-value significant. **$p < 0.01$

Table VIII.
Summary of hypothesis test results

then the path is significant at $p < 0.01$. t-value in between 2.63 and 1.96 is significant at $p < 0.05$. Likewise, t-value below 1.96 is not significant ($p < 0.01$).

6.3 Discussion
6.3.1 Summary of the results. The key objective of this study is to provide a more comprehensive understanding of the role of Web 2.0 technologies on user satisfaction. The empirical results indicate that all the five hypotheses are supported. Analysis of data from 460 SL users shows that service ease of use (*H1*), service quality (*H2*), interactivity (*H3*), and Trust (*H4*) is found to have a positive and significant relationship with customer satisfaction. IT development (*H5*) is found to have a positive and significant relationship with customer satisfaction. These are significant findings in that these backgrounds are able to explain a large part of the variance of user satisfaction. We also found significant support that service quality and interactivity affect service enjoyment in Web 2.0. We further investigated that ease of use of Web 2.0 has significant effect on trust that trust in turn has significant effects on IT development. In short, we are able to statistically demonstrate that the antecedents of customer satisfaction had significant impact on Web 2.0 implication and IT development had direct influence on user satisfaction.

Vila and Kuster (2011) investigated the effect of well-designed Web 2.0 web sites in terms of constructs such as ease of use, service quality, trust, satisfaction, and interactivity. Their principal contribution related to instrument development using the Rasch method and in developing a mechanism to assess Web 2.0 web site characteristics. However, they did not conceptualize these web sites providing any type of service or their service characteristics. Although this is a latest study, it does not progress our knowledge regarding service quality in Web 2.0 even though scholars have already recognized that customer satisfaction is a central construct within the Web 2.0 literatures(Carrillat *et al.*, 2009). Our study fills the gap in the literature by identifying and empirically validating antecedents of customer satisfaction and their impact on IT development. Palmer (2002), found Web 2.0 web site usability, design, and performance metrics, including download delay, site content, interactivity, ease of use, and responsiveness. Additionally, Chang and Chen (2009), studied customer interface quality, perceived security and customer loyalty and discovered empirical support that unites quality and trust affected satisfaction and loyalty. However, their conceptualization of interface quality is limited in that this conceptualization did not reflect on the larger role of services in the contemporary ITs.

6.3.2 Contributions and implications. During online survey from SL users, it was found that a majority of people have satisfaction with the Web 2.0 technologies, its communication system, social networking behavior, and e-commerce environment to create real business value. SL itself is a latest innovation of Web 2.0. It was further discovered that online events such as conference, training and lecture are highly effective for real-world companies to promote business. The communication through SL has privacy and security. The virtual identity of people helps to protect their personal information. Quality of products, customer relationship and after sales service in SL was found equally important as in real life for e-commerce promotion. Besides this, advertising and consumer traffic has significant effect for online marketing promotion. Thus SL plays pivotal role on user satisfaction.

This study has presented a research model to assess user satisfaction perception in Web 2.0. The proposed research model and relationship between variables were tested by means of survey data. The model is statistically significant and well constructed.

The research result shows IT development is the influencing factor on Web 2.0 and plays a significant role on user satisfaction. There are a number of opportunities for innovation and profit making in Web 2.0 platform. This study tests the familiarity-liking theory in Web 2.0 online environment. The users are satisfied with SL due to high-quality services, information availability, and its social reputation. The research model and empirical results provides the significance of customer satisfaction for organizations, managers and policy makers.

The results of our study have key implications for IT researchers and practitioners as well. For researchers this study provides validated measurements to facilitate evaluation of several major user satisfaction constructs. Our findings are in line with previous research that suggests that enjoyment plays a significant role in achieving customer satisfaction and the overall user experience. For practitioners, this study shows the crucial role that both customer satisfaction and IT development has positive impact on consumer's service enjoyment as well as experience. This study highlights the role of service pleasure to develop effective strategies and management practices. A high-quality and friendly service system will reduce the time and effort in a user's entire social network practice as well as shopping skill in Web 2.0.

6.3.3 Limitations. The limitations of this study are concerned with type of sample, validity and reliability, confidentiality, level of experiment control, and time considerations. First, the study was conducted with a fixed number of samples, with SL participants and thus may not well cover the perceptions of the entire population. The second limitation is associated with reliability and validity issues. Reliability refers to the extent to which the research results are dependable over time and an accurate representation of the population and if the results can be reproduced under similar circumstances using a similar methodology (Hardy and Bryman, 2004). Validity refers to the state or quality of being valid. To achieve a high degree of reliability and validity, it is important to be aware of the conditions and circumstances under which the study is carried out and the factors that may influence the results of the study. Third limitations may arise from SL respondents' anonymity that may create method bias.

7. Conclusion
Web 2.0 technologies enhance interactions with users and suppliers in terms of social networking and business performance. They can increase the competitiveness for a company with customer satisfaction. The implication of Web 2.0 tools could play a major role in keeping organization updated about the incidents on the inventory without them being physically there. Moreover, it helps them to make decisions, and to be acquainted with urgent matters which may need their immediate attention. Bringing Web 2.0 capabilities and services to the organization is to changing the traditional business and tapping into the creativity, intellect, and passion. It is much more important for companies to understand the altering trends in business than to implement the latest technology product. Companies need to cultivate the development of new ideas and enable the synergy to revolutionize existing business models and achieve success. This study developed theoretical models to understand the effect of development on customer satisfaction by synthesizing the existing literature in the information systems and e-commerce. We empirically examined our theoretical models by data analysis. It was found that IT applications influence customer satisfaction through their impact on quality and value. This study will encourage researchers to explore linkages between IT and other measures such as service quality, navigability, and trust. The main strength of this study is its contribution to the literature on

customer satisfaction and development of IT in Web 2.0 technologies. Further research is required on user behavior in Web 2.0 tools such as virtual worlds and social networking web sites.

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