

Designing Online Service: From State-of-the-Art to a Unified Framework

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Abstract: Online services are now extensively used all over the world in desktop and mobile applications. These services are driven by technologies that attempt to enhance how people manage their lives in more networked and interconnected ways. The aim of this study is to conduct a systematic review of 103 articles published from year 1998 to 2014 by reviewing the research objectives, research findings, methodologies and research gaps of prior online service studies. Since, there are limited focus on online services research as a whole albeit several researchers concentrated specifically on areas such as e-banking and e-commerce, the authors summarized prior research by developing a unified framework –the Design for Online Service (DOS) framework– that synthesized the findings of success factors – web design, social networking, service provisioning, user involvement and critical success factors- in designing online services. The DOS framework provides a holistic view of determinants for the success of online service design, incorporating range set of factors and its criteria. Overall, these findings provide insights and greater understanding of online service research agenda.

1 INTRODUCTION

The internet is increasingly recognized as an important communication medium and contributes to the ubiquity of digital technologies. Internet World Stats (2014) have projected internet population of 2937 million users for 2014, which is around 40% of the world population, as shown in Figure 1. Over the internet, a wide range of online services and online systems are provided through websites and applications that allow users to perform transactions such as fund transfer and communicate using social networking sites such as Facebook, Twitter, and YouTube (Hong, 2013). According to Parthasarathy and Bhattacharjee (1998), online services can be defined as a combination of proprietary and open internet-based content, with features, functions and assistance provided to customers. These services date as far back as 1979 when CompuServe offered a dial-up service for end-users. Online service examples include the digital provision of news, online magazines, software download, music and movie streams, email and web access. With this in mind, some scholars have argued that the development of the online services

industry and its emergence has mirrored the growth of technology (Buhalis and Law, 2008).

Researchers have conducted several reviews of online services over time. For instance, Chiou et al. (2010) carried out a comprehensive review of 83 articles published between 1995-2006. The review focused on websites that offers services, promote products and generate revenue in business. It investigated the trend of website evaluation conducted by other researchers and developed a strategic evaluation framework that explains the steps to evaluate websites effectively. Their findings reported that commercial websites need to be

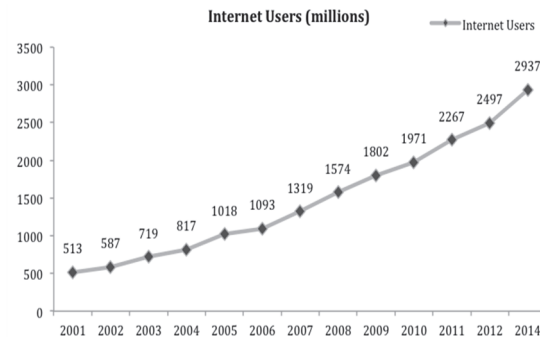


Figure 1: Internet penetration.

evaluated using an effective framework to improve quality, usability and achieve business objectives. A review by Law et al. (2010) analyzed the methodological approaches to website evaluation in tourism research used by prior researchers. They reviewed several papers published from 1996 to July 2009.

Similarly, Buhalis and Law (2008) reviewed the progress of information technology and tourism management. The authors extracted articles from the tourism literature using a comprehensive review technique and pointed that technology and internet facilitates direct interactions of consumer within the tourism industry. Also, a study by Hanafizadeh et al. (2014) focused on internet banking adoption in their systematic review of literatures published between 1999 and 2012. They mentioned that it is foreseeable that the different approaches on adoption studies could be inter-related in some cases and recommended for future studies. From these reviews, we found coverage of a range of specific topics in online services like e-tourism, e-commerce, and e-banking. However, there is a need for a study that provides a unified framework for informing an online service research agenda as a whole. The presence of differing services found emphasizes the need for an integrated unified framework that will represent the success factors of online services – this is the motivation of our research. For that, insight is needed on the state-of-the-art of online services and the factors that can contribute to the success of online service as a whole. This is the gap that this review seeks to address.

This study attempts to provide a systematic review of prior online service literature by reviewing online service studies published between 1998 and 2014. The main objective of this study is to develop a unified framework that synthesizes success factors for online services design. Along these lines, the objectives of this systematic review are as follow: (i) to analyze the methodological approaches, findings and research gaps within the online service literature, (ii) to synthesize the determinants involved in online service literature (iii) to develop a unified research framework of factors for the success and effectiveness of online service designs

2 RESEARCH METHODOLOGY

For this review, we have conducted a systematic review to evaluate the contribution of literature to the body of knowledge in online services. Data gathering for articles involved the use of three large

databases: Web of Science (<http://apps.webofknowledge.com/>), Google Scholar (<http://scholar.google.co.uk/>) and Scopus (<http://www.scopus.com/>). The candidate articles were identified using ‘online service’ or ‘on-line service’ as topics in search. ‘E-commerce’, ‘online banking’ and ‘e-travel’ were also used as keywords. We started the sampling process by scanning potential articles listed by the search engine according to their relevancy. Both authors of this study conducted the scanning and skimming process of the abstracts of the potential articles. The database search from Web of Science identified 477 articles after some customization. For Scopus, there were 476 results yielded and cross-reference were done against Web of Science to remove duplicate articles.

To improve the quality of this review, only articles with at least one citation were included. We identified the number of citations of each articles retrieved from the respected database and all of them were recorded. Then, we filtered the selected articles by reading the abstracts. Full text of the selected articles were then read and evaluated in-line with our review objectives. After this final step, we selected a total of 103 articles from 53 journals in our review list. These articles were determined to be relevant and had made a significant contribution to online service in general and to this study in specific.

3 DATA ANALYSIS

3.1 Descriptive Analysis

We found that majority of the articles were from the ‘Service Industries Journal’, ‘Online Information Review’ and ‘Decision Support System’ journals with 5 articles. ‘Information Management’, ‘Computers in Human Behavior’, ‘International Journal of Bank Marketing’, ‘International Journal of Information Management’, ‘Tourism Management’ and ‘Journal of Services Marketing’ contributed 4 articles each. We classified 30 articles as ‘Others’ since they were derived from numerous journals such as ‘Information Science’, ‘Journal of Internet Commerce’ and ‘Journal of Information Science’. Given that the scope of online service is wide and extensive; numerous articles have been published from diverse industries such as banking, travelling, reservation, and government service.

In Figure 2(a), the graph reveals the number of online services articles that have been published as per Web of Science database from 1995 and the

number has been consistently increasing as of 2013. At the same time, Figure 2(b) depicts the amount of online service articles cited for each year and we found that the most frequently cited paper is written by Bhattacharjee (2001) regarding understanding the information system continuance with 656 citations (46.71 citations per year) in Web of Science and cited by 2257 articles as reported in Google Scholar.

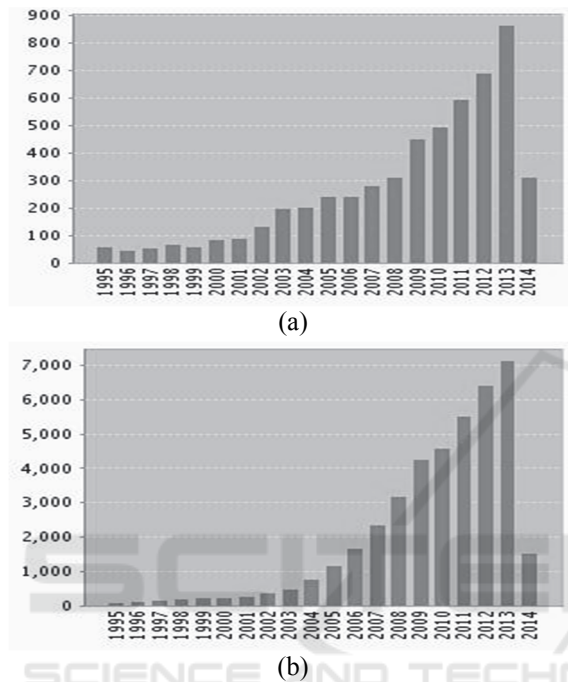


Figure 2: Distribution of online service articles based on (a) published years and (b) yearly citations.

Our data analysis showed a range of research methods and Figure 3 captures the main research methodologies used by prior online services researchers. The figure showed surveys as the most frequently used method with 73 studies followed by mixed method with 6 studies. Experiments, case studies and content analysis occupied with 5 studies each. According to Tan and Teo (2000), researchers mostly choose online or paper-based survey because of several factors such as lower costs, faster responses and also geographically unrestricted sample. As for mixed method, this approach tends to be chosen because of its capability to integrate both quantitative and qualitative research to provide more reliable and presentable results (Seneler et al., 2010). Typically, a range of mixed method approaches are such as a written questionnaire, personal interviews, literature review and field visits as was the case in Younis (2005). In this review, our analysis also includes a summary of research fields involved in

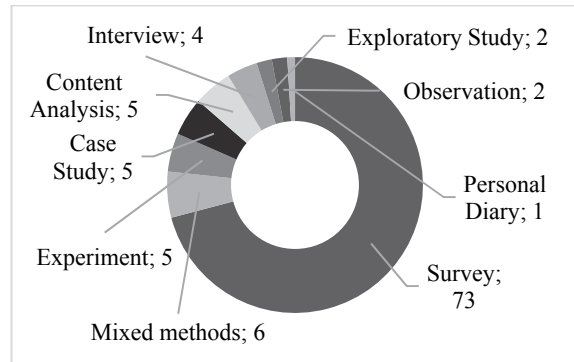


Figure 3: Summary of research methodologies.

literature review and field visits as was the case in Younis (2005). In this review, our analysis also includes a summary of research fields involved in online services. Majority of the articles (39%) focused on online services in general such as its antecedents, influences and factors of user satisfaction and acceptance. The second most studied field is e-commerce (21%) followed by e-banking (19%). E-ticketing/reservation and mobile services shared the same percentage and each occupied 7% of the total sources. 6% of the studies focused on e-government and social media represents the smallest share with 1 percent of all publications in this review.

3.2 Research Theories

Our analysis showed several research theories and models applied by researchers in the study and development of online services. For instance, Lean et al. (2009) implemented Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI) theories to investigate factors that initiate users acceptance of an online service. The researchers used TAM because it is a renowned model to measure users' adoption of computer system. In contrast, Escobar-Rodríguez and Carvajal-Trujillo (2014) applied unified theory of acceptance and use of technology (UTAUT) model to examine the determinants of purchasing flights tickets and found online purchase intentions, habit and ease of use were the most important determinants. UTAUT is a model that attempts to explain the success of new technology and determinants that influence the acceptance of technology or system (Venkatesh et al., 2003). Other theories and models used in the studies include Theory of Planned Behavior (Cho, 2006), Theory of Reasoned Action (Shih, 2004), Innovation Diffusion Theory (IDT) (El-Gohary, 2012), Social Cognitive Theory (Hernández et al.,

2010), and DeLone & McLean IS Success Model (Bhattacharya et al., 2012).

3.3 Research Gaps

Generally, studies have highlighted issues and gaps for the purpose of online service research and generalization. The identified research gaps are:

- To perform longitudinal study for future research because it offers more accurate observation and provides high validity of research (Ahn et al., 2007; Cheng et al., 2006; Yang and Fang, 2004).
- To extend the developed model and framework in prior studies at different online services and in various industries for a valid and reliable analysis (Barrera and Carrión, 2014; El-Gohary, 2012; Klaus, 2013; Ladhari and Leclerc, 2013).
- To expand studies' sample size in a wider spectrum in order to ascertain the developed hypotheses (Laforet and Li, 2005; Lean et al., 2009; Sohail and Shanmugham, 2003).

4 DISCUSSION OF DATA SYNTHESIS

4.1 Determinants of Online Services

The synthesis process enabled us to establish eight common key determinants of online services as shown in Table 1. These determinants are: (i) security/privacy, (ii) loyalty, (ii) quality, (iv) acceptance, (v) trust, (vi) user satisfaction, (vii) user behavior and (viii) functionality. They were synthesized using several steps. First, we identified and extracted the determinants in each reviewed study by recording them in a table to get a summary of factors that allows us to check the frequency of them being mentioned. The rationale of creating this table is as an additional attempt to summarize and validate the determinants. They were then sorted and grouped accordingly. The grouping process were done by both authors and any disagreements were resolved by obtaining mutual consensus between the authors.

As mentioned above, the determinants were identified based on the key determinants mentioned in most studies and we listed them according to concepts and reflections. For instance, perceived risk and perceived credibility was conceptualized and merged with security and tagged under 'Security'. Other examples include willingness to pay and

word-of-mouth which we connected with loyalty as these determinants covered issues related to users' loyalty and continuance of using the system. Other related determinants were also grouped together under a major determinant if they had logical relationships and represented the same concept. There are numerous of determinants founded in the 103 articles and some of them overlapped in the wording and in the meaning as well. Duplicated determinants were found in different studies due to the application of similar theories, frameworks and models.

We also noticed different contexts of determinants where determinants found in an e-banking service are different from e-government service due to the practice of the services. For instance, studies from Kesharwani and Bisht (2012) studied the context of security and privacy in internet banking while El-Gohary (2012) and Lean et al. (2009) chose to measure 'user acceptance' determinant in their e-government studies. We consider these variations in how we synthesize the data obtained and create our framework.

Table 1: Determinants of online service.

Factors	Description	Sample Source
Privacy/Security	Information protection	(Kesharwani and Bisht, 2012)
Loyalty	Being loyal and commit to the system.	(Kim et al., 2011a)
Quality	The accuracy of information provided.	(Barrera and Carrión, 2014)
Acceptance	Willingness to accept and rely on the system	(Hong, 2013)
User satisfaction	The contentment when the system fulfils the needs	(Chang et al., 2012; Harris et al., 2006)
User experience	The way a user reacts towards the service	(Hernández et al., 2010)
Functionality	Providing correct system's functions	(Kim et al., 2011b)

4.2 Framework for Online Services

Using these determinants, a unified framework – the design for online service (DOS) framework – for online services can be formulated, as shown in Figure 4. The framework categorizes and groups the determinants that have been found to be influential in determining the success of online services into five group of factors: (i) web design, (ii), social networking factors, (iii) service provisioning factors, (iv) user involvement factors, and (v) critical success factors. Each factor was condensed and grouped based on our insight and analysis of determinants from the literature that have been identified as

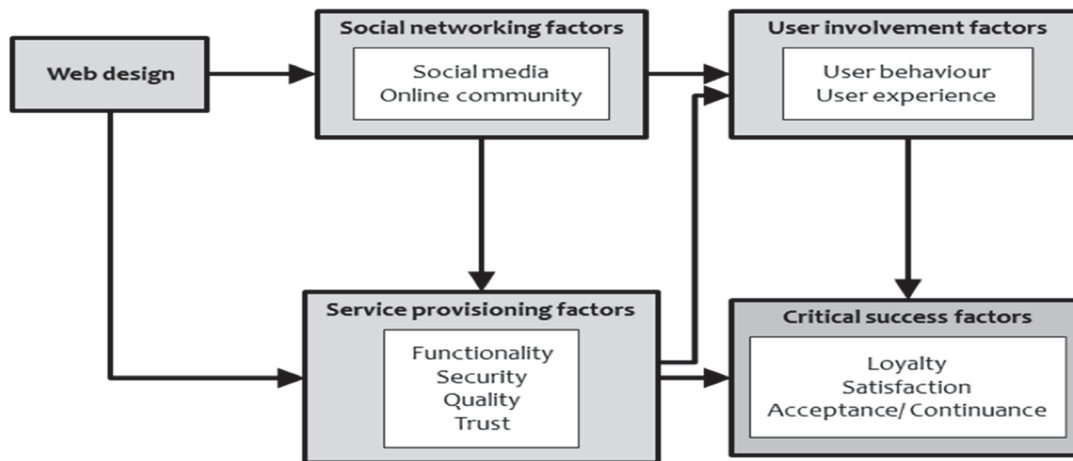


Figure 4: The design for online service (DOS) framework.

contributors to the success of an effective online service. We synthesized the factors by grouping and merging related determinants and amalgamating variables into an established and epitomized factor.

The first factor is **web design**, which represents the features, the accessibility, the navigation, and the user-friendliness of the service that plays an important role in fulfilling customers' needs. This factor was mentioned by several authors in their studies where they suggested web design as a key factor that could influence online service success (Bhattacharya et al., 2012; Klaus, 2013; Liu et al., 2009). Web design is essential in developing a website because it attracts, sustains and retains the interest of customers that visit the websites. With this in mind, authors such as Aladwani and Palvia (2002) and Liu et al. (2009) suggested four important issues to be considered in website design which are proper fonts, proper colors, attractiveness and multimedia features. Also, Preece (2001) introduced dialog and social interaction support, information design, navigation and access as key components to make a good web design and software.

The next set of factors in the DOS framework is **social networking** and this consists of *social media* and *online community* determinants. This aligns with Mangold and Faulds (2009)'s that discussed the provision of networking platforms for online communities to encourage online communities to engage with offered systems. We underscore the importance of *social media* for online services acceptance/penetration and our conceptualization of this factor has emerged from prior studies (Moe and Larsson, 2013; Hong, 2013). Their works highlighted how specific objectives are at the heart of the targeted use of social media such as

networking sites, forums, blogs, wikis, and micro-blogs as channels of communication. Social media sites like Twitter and Facebook are used by governments to gain high volume users. As explained by Preece (2001), *online community* means different things to different people depends on individual's perspectives. Some view online communities as a social phenomenon and others assume communities as people operating in the society to create networks and connection. Therefore, online communities are essential as the driving force of online services success due to connections and communications created when people connect and bump into each other within these communities in cyberspace.

In this framework, we categorized the next factors under **service provisioning factors** consist of *functionality*, *security*, *quality* and *trust*. Service provisioning is a preparatory action that is taken to develop a network that offers services (Low and Varaiya, 1993). *Security (and privacy)* are essential in online service since they may hinder the development of e-commerce (Yousafzai et al., 2003). The authors argued that privacy must be protected during online transactions because these transactions tend to involve confidential information such as customers' details, account number, and credit card details. Besides, consumers need to be assured that the provided privacy protection also includes the protection of not giving data to other entities without their authorization as well as encryption and authentication procedures. In addition, the nature of the *functionality* of online services is one of the factors that could contribute to the success of online service provision. For instance, we found that service recovery is an important example that needs to be included as Chang et al.

(2012) and Harris et al. (2006) reviewed recovery services design in the provision of online services and examined their influences and impact. They found that service recovery potentially influences user satisfaction, repurchase intention and the failure of online services.

Several authors mentioned *quality* as a determinant that can contribute to customer satisfaction and influence repurchase intention (Al-Hawari, 2011; Negash et al., 2003; Yang and Fang, 2004). Negash et al. (2003) argued that quality of system, service and information determine the effectiveness of the system and at the same time is reflected the satisfaction of users. Bhattacharya et al. (2012) in their e-government portal study, found factors such as transaction transparency and usefulness of information were positively significant with e-service quality. Using this insight, we argue that good quality of service could influence the success of online service based on prior studies' findings. *Trust* on the other hand is a factor which researchers have discussed along the lines of trust in online services, the roles of trust and the effect of perceived trust on online services (Cho, 2006; Kesharwani and Bisht, 2012). Relationships have also be found between trust and satisfaction with the influence of functionality and security provided in the system (Kim et al., 2011a). Based on this insight, we argue that trust plays an important role as service provisioning factor to ensure the success of online services.

In our conceptualization of the DOS framework, we highlight the issues of **user involvement** in online service research consist of *user experience/behavior*. Law et al. (2010) in their study of website evaluation in the tourism sector mentioned that experienced computer users able to extract and adopt online service system introduced to them quicker than non-experienced computer users. Along these lines, *user experience* in view of different experiences has also been identified by several researchers such as Hong (2013), Tong et al. (2013), and Lu et al. (2011) in their recommendations for further studies. They have called for studies to include this factor to examine and see the difference between the involvement of experienced and non-experienced users, heavy-users and light-users, and internet and non-internet users. The influence of adoption between experienced and non-experienced users is different because of some distinct characteristics such as level of education or socioeconomic status. Similarly, the involvement of heavy- and light-users is dependent on frequency of software use and familiarity with services and

transactions. We therefore view the level of experience among users as important in determining the success of online services.

The last important factor is **critical success factors** where it contains three types of determinants, which are *loyalty*, *satisfaction* and *acceptance* that significantly affect online services performance and operations. *Loyalty* is important for the success of online services since it translates to the retention and building good relationships among customers of online services (Hsu et al., 2013). Research by Srinivasan et al. (2002) indicates that networking, provisioning and involvement items impact loyalty. *Satisfaction* is the second determinant viewed in success factors because it determines the usage and continuance of online services. In fact, customer satisfaction is considered one of most popular research topic in marketing and e-commerce studies because of its translation to customers' repurchase and 'word-of-mouth' behaviors (McKinney et al., 2002). The third determinant we identified as a contributor to the success of online service is the *acceptance* of the system created. Polatoglu and Ekin (2001) examined the acceptance of internet banking and found consumer behavior has a significant impact on the e-banking acceptance process. Also, Choi et al. (2009) found perceived consequence, satisfaction and social factors have influenced on customers' adoption of online system in Korea. We therefore view acceptance as the important benchmark in online service to measure the success of the system created.

5 CONCLUSIONS

In this study, we have evaluated 103 articles from 53 journals published from 1998 to 2014 on the topic of online services like e-banking, e-commerce, e-government, and social media. We noted less research and limited focus on online services as a whole research albeit several researchers concentrated specifically on areas such as e-banking and e-commerce. Sensing that, we conducted this systematic review research with the objective to develop a unified framework that synthesized the findings of success factors - web design, social networking, service provisioning, user involvement and critical success factors - in designing online services. This is encapsulated in our Design for Online Service (DOS) framework that identifies factors and determinants for the success and effectiveness of online services.

The findings from this study provide practical

guidelines for online service designers, developers and the practitioners. It is significant for system developers to incorporate the identified factors found in this research in designing an online service. From a theoretical standpoint, our DOS framework provides a holistic view of determinants for the success and effectiveness of online service design, incorporating range set of factors and its criteria. Although, the framework is proposed to assist developers during the design of online services by considering the enumerated determinants, this analysis remains at a high level of abstraction.

Further studies are therefore needed to delve into the intricacies of the conceptualized determinants such as investigating the structure of user involvement in online services since most of the theories involved in online services literature concentrates on users' behavior. It is also recommended that future research concentrate on longitudinal analysis of online services and testing/validating the framework across the spectrum of online service types. The findings of our review and these further studies are expected to benefit researchers, practitioners, and developers in understanding the factors that contribute to the design and success of online services.

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