Descendents of ServQual in Online Services Research: The End of the Line?

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Descendants of ServQual in Online Services Research: The End of the Line?

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ABSTRACT

Service quality, and the ServQual model, with origins in face-to-face marketing before the age of the internet, has been drafted into the role of explaining the perceived outcomes of computer-mediated self-service encounters. These however differ in important ways from face-to-face service encounters. In this conceptual paper, we offer a number of arguments as to why researchers of computer-mediated services should not look back to ServQual for the basis of their theoretical constructs, models and survey items. We suggest by way of alternative that established information systems theory has greater salience and explanatory power for this phenomenon. We also offer some areas of theory that we believe have potential for the study of online service quality that have so far received little attention.

Keywords
ServQual, online services, service quality

INTRODUCTION

Organisations are continually seeking reliable ways to measure the quality of the service delivered through online channels. ServQual, with origins in the marketing literature and developed for face-to-face encounters before the widespread use of the internet, is by far the most popular instrument for measuring service quality (Parasuraman et al., 1988, Parasuraman et al., 1991b). There has been a long “dynasty” of information systems research papers that draw on ServQual and have an IS contextualisation (Sylvestre et al., 2007). Of these, more than half have been published in the last five years. Anecdotally, information systems researchers in the service quality area have been heard to say “You can’t get published unless you cite ServQual”.

The IS community has applied the ServQual concept to both the quality of face-to-face service delivery by the IS staff (e.g. Pitt, Watson and Kavan, 1998), as well as the computer-mediated self-service provision (Lee and Lin, 2005, Wang et al., 2001). It is the latter area that we are concerned with, as the former is a relatively unproblematic application of the original ServQual concepts. Recently, the notion of software-as-a-service has become popular. This however is related more to outsourcing management (from the client firm's perspective) and to software development and provision (from the provider firm's perspective) and is distinct from the IS mediated self-service of individuals that is the focus of this paper.

Research in online service quality has generally looked back to SERVQUAL literature for its provenance; and followed a modernist approach, principally aimed at achieving a degree of paradigmatic unity and a cumulative research tradition. The weakness of this approach is that seminal research, such as the original ServQual-related papers, is not critically re-examined in the context of subsequent research. In this paper, we argue that ServQual is not appropriate for measuring service quality in computer-mediated self-service provision and does not provide a sound foundation for research into online service quality. We cannot, in the space of a single paper, critically examine all research based on ServQual. However, insofar as later work maintains the basic premise of ServQual, that individually varying services are passively consumed by individuals, our critique applies to that research as well. This paper challenges the assumption of a cumulative research tradition based on ServQual, and the appropriateness of continuing to cite ServQual in online service quality research. We suggest that it is time to end the long dynasty of ServQual-related research in online services, and seek alternative models for investigating the service quality delivered by self-service technologies.

The rest of this paper is structured as follows. First we present a brief history of ServQual in information systems research. Next we present three new arguments supporting the “end of the line” of ServQual research: first, the theoretical status of ServQual is suspect; second, the ServQual instrument is probably mis-specified; and third, ServQual-related research has not produced a cohesive body of knowledge. We offer some alternative directions for further research, and finish with some concluding remarks.
SERVQUAL AND ITS CRITICISMS

ServQual, a highly influential instrument for measuring service quality, is based on expectation-disconfirmation theory, applied to customer perceptions of service quality (Parasuraman et al., 1985). Its basic premise is that services are provided in an inconsistent fashion (because they are provided by humans) to passive service consumers. Hence, ServQual focuses on characteristics of the provider, neglecting any role the consumer might play. ServQual research initially identified ten dimensions of quality (Parasuraman et al., 1985). Validation of the ServQual instrument resulted in consolidation into five dimensions of service quality (Parasuraman et al., 1991c): reliability (the ability to perform the promised service dependably and accurately); tangibles (the appearance of the physical facilities, equipment, personnel); responsiveness (the willingness to help customers and provide prompt service); assurance (the knowledge and courtesy of employees and their ability to convey trust and confidence); and empathy (the caring, individualised attention provided to the customer).

Despite its enormous influence, there have been a number of well-founded criticisms. First, many studies have failed to replicate the five ServQual dimensions. Cronin and Taylor (Cronin and Taylor, 1994) found that ServQual was effectively uni-dimensional, and suggested it should only be used as a summed index, because all the items loaded predictably on a single factor. Other studies found support for seven to eight dimensions (Carman, 1990). In particular, the tangibles dimension proved unstable, even in subsequent studies by the originators (Parasuraman et al., 1991b) and was modified or dropped in subsequent studies (Pitt et al., 1995).

The second area of concern relates to the gap concept and the use of difference scores (Carman, 1990, Teas, 1994) and led to a debate in the Journal of Marketing, beginning with (Cronin and Taylor, 1994) who proposed a perceived performance only instrument, SERPERF. They acknowledge the ubiquity of the disconfirmation of expectations paradigm, but argue that the degree of disconfirmation is captured in an overall assessment of satisfaction anyway, “the perceived summary disconfirmation judgement is sufficient as a causal agent for satisfaction” [Pg. 126].

Finally, when ServQual is compared with the “Nordic” model of service quality, which differentiates between functional (or interaction) quality and technical (or outcome) quality (Grönroos, 1984), it fails to consider outcome quality. Functional quality is the quality of experience while the service is received and is equivalent to interaction quality (Brady and Cronin, 2001). Technical quality refers to the outcome of receiving the service – the customer’s perception of the value of what they have received after the production process is finished” (Grönroos, 1984) and is similar to outcome quality (Brady and Cronin, 2001).

ARGUMENTS FOR THE END OF THE LINE

The Theoretical Status of ServQual

The first argument against the applicability of ServQual to computer-mediated self-service provision is the oft forgotten fact that the theory net that originally gave rise to the ServQual instrument is the “gaps” model of service quality (Parasuraman et al., 1985) (Figure 1). There are two problems with the theoretical provenance of ServQual; the validity of the original theory; and its applicability to a self-service environment.

First, ServQual is intended to measure the dependent variable for the gaps model: “We previously developed a multiple-item scale called ServQual to measure service quality as perceived by consumers (Gap 5...)...Therefore, it is possible to recast the conceptual service quality model (the gaps model) as a structural equations model wherein perceived service quality (gap 5) is the unobservable dependent variable, and the four gaps on the marketers side are the unobservable independent variables. This model can be tested by collecting data on the indicators of the five gaps...” (Zeithaml et al., 1988) [pg 44]. The existence of Gap 5 (the gap between perceived and expected service); and the fact that this Gap 5 consists of the five ServQual dimensions; are both frequently assumed to be true. However, a subsequent attempt by the authors to test this model proved unsuccessful (Parasuraman et al., 1991a). The second issue is that the face-to-face environment, for which the gaps model and the ServQual measurement are developed, is significantly different from a computer-mediated self-service environment. In the former, the consumer is the passive element and the service providers are autonomous human beings with diverse behaviours. It is their characteristics that constitute the important determinants of service quality. However, this is not the case when the customer uses a technology-mediated self-service channel. Once designed and implemented, the service channel will behave. While the company makes the service available, the service encounter is initiated and directed by the customer. Since the service performs as programmed, the customer must adapt to improve their service quality. In computer-mediated self-service provision, the customer is the active element, and hence, the customer's characteristics constitute the important determinants of service quality.
Word-of-Mouth Communications  

Personal Needs  

Past Experience  

Expected Service  

Perceived Service  

External Communications to Customers  

Service Delivery  

Service Quality Specifications  

Management Perceptions of Customer Expectations  

Gap 1  

Gap 2  

Gap 3  

Gap 4  

Gap 5  

In a self-service environment, service delivery is controlled by the customer, rather than delivered by the provider.

Figure 1: the “gaps” model

ServQual is Mis-specified

Recent research in psychometrics has devoted considerable attention to the measurement of psychological states, e.g. attitudes and perceptions. A widely used approach for modelling and measuring psychological states is latent variable theory (Borsboom, 2005). Latent variable theory assumes that internal psychological states are unobservable constructs represented as latent variables. These constructs can only be measured indirectly by their effect on indicator variables. A respondent’s position on a survey indicator can be predicted or explained by their internal psychological state. For example, their perception of the usefulness of a specific technology predicts their response on a question such as “I believe that using [this technology] will save me time or money” (Borsboom, 2005).

Psychometric literature to distinguishes between two types of relationships between indicator and latent variables, formative and reflective specification. Observations of reflective indicators are caused by the latent variable. If the value of the underlying latent variable changes, the values of the reflective indicators will also change. Reflective indicators of a construct are all supposed to be “reflective” of the same concept, and thus be interchangeable. This means that to talk of multiple “dimensions” of a single latent construct, and then to measure that construct reflectively makes little sense. Formative specification of indicators instead assumes that the observations of indicators cause the latent variable (Diamontopoulos and
Formative indicators can be independent of one another, and it is sensible to talk about covering the scope (all antecedents) of a construct. Table 1 summarizes these differences.

<table>
<thead>
<tr>
<th>Reflective indicators</th>
<th>Formative indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicators interchangeable and reflect a common theme</td>
<td>Indicators not interchangeable – omitting an indicator is omitting part of the construct. Indicators do not necessarily share a common theme. In fact, to avoid collinearity issues, indicators should be maximally independent.</td>
</tr>
<tr>
<td>The indicators reflect the underlying latent construct and are selected from a large pool of potential indicators (Jarvis et al., 2003)</td>
<td>The indicators are the set of defining characteristics of the construct (Jarvis et al., 2003)</td>
</tr>
<tr>
<td>Items are “chosen randomly from the universe of items relating to the construct of interest” (DeVellis, 1991) pg 55</td>
<td>A complete census of indicators is required. Items must cover the entire scope of the latent variable. (DeVellis, 1991)pg 55</td>
</tr>
<tr>
<td>Eliminating or changing an indicator will not change the meaning of the latent variable (Jarvis et al., 2003)</td>
<td>Eliminating or changing an indicator may change the conceptual domain of the construct (Jarvis et al., 2003)</td>
</tr>
<tr>
<td>Causality is from construct to measure (Jarvis et al., 2003)</td>
<td>Causality is from measure to construct. (Edwards and Bagozzi, 2000)</td>
</tr>
<tr>
<td>A change in the latent construct preceeds changes in the indicators</td>
<td>A change in the indicators precedes changes in the latent construct. (Edwards and Bagozzi, 2000)</td>
</tr>
<tr>
<td>A change in the value of one indicator should be accompanied by a change in the value of all indicators (Jarvis et al., 2003)</td>
<td>Indicators may vary independently (Jarvis et al., 2003)</td>
</tr>
<tr>
<td>Items have the same antecedents and no consequences (Jarvis et al., 2003)</td>
<td>Items do not have antecedents and have the same consequences (Jarvis et al., 2003)</td>
</tr>
<tr>
<td>Logic or common sense (rather than statistical testing) suggests that a change in the latent variable will effect changes in the indicators (Edwards and Bagozzi, 2000)</td>
<td>Logic or common sense (rather than statistical testing) suggests that a change in the latent variable will not necessarily effect changes in the indicators (Edwards and Bagozzi, 2000)</td>
</tr>
</tbody>
</table>

Table 1. The differences between formative and reflective indicators

Examining the constructs (latent variables) of ServQual, and their indicators shows specification problems and lack of clear definition of the five latent variables and their indicators. The items associated with the five constructs are a mixture of formative and reflective indicators, and in some cases, appear interchangeable with indicators for other, supposedly distinct constructs (Table 2). This means that, ontologically, it is hard to defend the existence of concepts such as “responsiveness”, “assurance” etc. If they were clearly defined latent psychological variables with independent existence, they would each be described by a set of interchangeable reflective indicators that were clearly different in meaning to the indicators of each of the other latent constructs (Borsboom, 2005). Subsequent researchers have made many attempts to adapt or incorporate these factors into their research; this appears futile since when they are re-examined in the light of contemporary psychometric research it appears they do not exist. This provides a further argument, well supported by measurement theory, for distrusting the ServQual instrument and dimensions as a basis for further study.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Indicator</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>1. When excellent companies promise to do something by a certain time, they will do so</td>
<td>Reflective of reliability and interchangeable with 4</td>
</tr>
<tr>
<td></td>
<td>2. When customers have a problem, excellent companies will show a sincere interest in solving it</td>
<td>It is not entirely clear that this reflects reliability in a way that has discriminant validity with other constructs. This could also be argued to reflect empathy (understanding the customer) or benevolence towards the customer (a concept related to trust).</td>
</tr>
<tr>
<td></td>
<td>3. Excellent companies will perform the service right first time</td>
<td>This does not encompass all the meanings of reliability and is not fully interchangeable with the other indicators. Should be modelled formatively.</td>
</tr>
<tr>
<td></td>
<td>4. Excellent companies will perform their services at the time they promise to do it</td>
<td>Reflective of reliability and interchangeable with 1</td>
</tr>
<tr>
<td></td>
<td>5. Excellent companies will insist on error free records</td>
<td>This does not encompass all the meanings of reliability and is not fully interchangeable with the other indicators. Should be modelled formatively.</td>
</tr>
<tr>
<td>Assurance</td>
<td>1. The behaviour of employees in excellent companies will instil</td>
<td>Reflective of assurance</td>
</tr>
<tr>
<td>Tangibles</td>
<td>1. Excellent companies will have modern-looking equipment</td>
<td>Can vary independently from other indicators of tangibles, is not interchangeable with them, and does not necessarily have the same antecedents and consequences. Tangibles appears to be a formative construct.</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
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<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>2. Physical facilities at excellent companies will be visually appealing</td>
<td>Can vary independently from other indicators of tangibles, is not interchangeable with them, and does not necessarily have the same antecedents and consequences. Tangibles appears to be a formative construct.</td>
</tr>
<tr>
<td></td>
<td>3. Employees of excellent companies will be neat-appearing</td>
<td>Can vary independently from other indicators of tangibles, is not interchangeable with them, and does not necessarily have the same antecedents and consequences. Tangibles appears to be a formative construct.</td>
</tr>
<tr>
<td></td>
<td>4. Materials associated with the service will be visually appealing in excellent companies</td>
<td>Can vary independently from other indicators of tangibles, is not interchangeable with them, and does not necessarily have the same antecedents and consequences. Tangibles appears to be a formative construct.</td>
</tr>
<tr>
<td>Empathy</td>
<td>1. Excellent companies will give customers individual attention</td>
<td>Reflective of empathy. Interchangeable with 3</td>
</tr>
<tr>
<td></td>
<td>2. Excellent companies will have operating hours convenient to all their customers</td>
<td>Can vary independently from other indicators, not interchangeable, and does not necessarily have the same antecedents and consequences. Should be modelled formatively.</td>
</tr>
<tr>
<td></td>
<td>3. Excellent companies will have employees who give their customers personal attention</td>
<td>Reflective of empathy. Interchangeable with 1</td>
</tr>
<tr>
<td></td>
<td>4. Excellent companies will have the customer’s best interests at heart</td>
<td>Can vary independently from other indicators, not interchangeable, and does not necessarily have the same antecedents and consequences. Should be modelled formatively.</td>
</tr>
<tr>
<td></td>
<td>5. Employees of excellent companies will understand the specific needs of their customers</td>
<td>Can vary independently from other indicators, not interchangeable, and does not necessarily have the same antecedents and consequences. Should be modelled formatively.</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>1. Excellent companies will tell customers exactly when services will be performed</td>
<td>This construct is very unclear. This item appears to be interchangeable with items 1 and 4 for reliability</td>
</tr>
<tr>
<td></td>
<td>2. Employees of excellent companies will give prompt service to customers</td>
<td>This does not encompass the full meaning of responsiveness, and could vary independently with 1 and 3 (it is possible to be prompt but not willing). Should be modelled formatively.</td>
</tr>
<tr>
<td></td>
<td>3. Employees of excellent companies will always be willing to help customers</td>
<td>This construct is very unclear. This item appears interchangeable with 4, but also appears to reflect a similar construct to questions 1 and 3 of empathy</td>
</tr>
<tr>
<td></td>
<td>4. Employees of excellent companies will never be too busy to respond to customer requests</td>
<td>This construct is very unclear. This item appears interchangeable with 4, but also appears to reflect a similar construct to questions 1 and 3 of empathy</td>
</tr>
</tbody>
</table>

Table 2. Mis-specification of ServQual
Lack of Cumulative Body of Knowledge in Information Systems and Self-service Research

New studies in online service quality continue to propose new dimensions, for example (Tate et al., 2007), or new combinations of existing dimensions, for example, (Alzola and Robaina, 2005). It appears that research is merely "piling up" rather than building up a body of knowledge.

There is no consensus about the theory net for online service quality and the relationship of service quality to other constructs of interest is unclear or contradictory. For example, DeLone and McLean included information quality and service quality as separate and independent antecedents to IS use and satisfaction (DeLone and McLean, 2003) while Barnes and Vidgen, suggested that information quality is a sub-dimension of overall online service quality. Both studies found empirical support for their models (Barnes and Vidgen, 2002).

Related to this is the semantic ambiguity found in service quality research, where the same term is used with different meanings, or different terms are defined using the same indicators. For example, the e-Qual instrument posited a dimension called “Design”, which included the items “This site has an attractive appearance” and “This site conveys a sense of competency” (Barnes and Vidgen, 2002). These items are adapted from ServQual, but the first appears to be most reflective of “Tangibles”, while the second is most reflective of “Reliability”. This is an example of the frequent practice where instruments are not confirmatively revalidated (e.g. using SEM modelling), but rather freely reassembled in an exploratory method (e.g. using PCA or factor analysis). When the free re-assembly does not match the original instrument, researchers simply hand-wave the problem under the proverbial rug, often by suggesting that each company or industry demands its own adaptation and increasing the version number of their instrument by one, rather than exploring in-depth why the data do not fulfill the expectations. This practice of adding, subtracting, modifying and recombining indicators makes comparisons between studies impossible.

In summary, service quality research from consumer behaviour, and ServQual in particular, has been afforded the defacto status of a research paradigm that researchers can accept (Kuhn, 1996), and is used as the basis of a “cumulative” research tradition within information systems. Science is assumed objectively progressive, and the outcome of scientific enquiry is to accumulate solutions to scientific puzzles within a given theoretical frame, rather than piling up different and competing theories in an unsorted (and unsortable) heap. Since the ServQual research stream has not succeeded in producing reliable, replicable results, or a consensus of researchers in the field, it may be time to question the underlying assumption of the research paradigm. The following section examines possible alternatives.

ALTERNATIVES

Research into service quality can focus on either or both elements of the provider-customer dyad, keeping in mind that the provider in this case is an information system. The customer, as user of this IS can be explained by theories of adoption and continuance that offer a well supported theory net, and stable constructs, which have all been demonstrated to be salient in contexts that are relevant for users of online services. The service provider is an information system and cognitive affordance theory from the field of Human Computer Interaction (HCI) can be applied to explain phenomena associated with that element of the dyad. Finally, adaptive structuration theory examines the interplay of the provider and customer and can explains adaptation and cooptation of information systems by users.

IS Adoption and Continuance

Customers of online self-service systems are users of information systems. Hence, IS theory is useful for studying online service quality. To understand how IS theory can be applied, we discuss a typical context of use of online services.

We assume that users of online services have already overcome barriers to IS adoption. Almost by definition they have shown a willingness to adopt and use technology. Anyone with any significant experience of an online service is a continuing user. Moreover, while there are a few novel approaches to computer-mediated self-service provision, the majority of existing services are similar. For example, most online-banking or travel booking services offer similar kinds of capabilities and kinds of experiences (i.e. the same properties, not necessarily the same values of these properties). Thus, as the internet is turning 20 years old, the majority of users of computer-mediated self-service provision can safely be characterized as continuing, rather than novel, users.

IS adoption and continuance studies usually capture a snapshot of respondents’ perceptions at a point in time, due to the difficulties of conducting longitudinal studies. However, people’s past experiences have a large influence on their expectations. This has been confirmed even in face to face environments, where, over time, the gap between future expectations and past experience tended to close (Boulding et al., 1993). We also know that people bring their entire past experience to bear when forming an attitude or affect (including an attitude towards using a self-service technology)
(Fishbein and Ajzen, 1975). In an online context, the expectation-perception gap is therefore likely to be negligible for an experienced user, as commercial software behaves consistently and predictably. Thus, we suggest that rather than a gap between expectations and perceptions, which does not exist for experienced users, it is the notions of perceived usefulness (PU), closely related to outcome quality, and perceived ease of use (PEOU), closely related to service quality, that are the relevant determinants to formation of beliefs about quality. Note that this explanation is also closer to the “Nordic” model (Grönroos, 1984) of service quality.

Several studies support the importance of experience and prior use. (Gefen, 2003) found that for experienced on-line shoppers, habits of use explained a large proportion of the variance of continued use, and also predicted a significant proportion of the variance in PU and PEOU. Venkatesh and Davis found that after hands-on use, direct experience had a significant moderating effect on PEOU (Venkatesh and David, 1996). So use predicts use, and, as we established in the previous paragraph, ongoing use diminishes the gap between expectation and perception and increases perceptions of service quality.

In the marketing literature, the importance of continuance is also emphasised. “In planning new strategies to enhance adoption and usage of new self service technologies (SST’S), it is important to be able to address both the factors leading to the trial as well as those impacting repeated use and commitment.” (Bitner et al., 2002) [Pg 103, our emphasis]. These answers may best be sought from the IS field. Continuance theory focuses on experienced, continuing users rather than those in the initial adoption stages (Bhattacherjee, 2001, Hsu et al., 2004). Continuance, rather than adoption, has more synergy with service quality theory, since a meaningful opinion of online service quality requires that the user has experienced the service. The basic concept underlying user continuance models is that actual use updates individual reactions (including confirmation/disconfirmation, or service quality perceptions), which in turn predict further expectations and intentions. There is thus an iterative relationship between past perceptions and future expectations. This iterative relationship is described as “the basic concept underlying user acceptance models (Venkatesh et al., 2003). For continuing users of information systems, both confirmation (an experience with an online service that met or exceeded expectations) and perceived usefulness, contribute to satisfaction (an attitude towards the service) (Bhattacherjee, 2001). Intention to use is caused by perceived usefulness (PU) and a positive attitude (satisfaction). For experienced users, (PEOU) was found to have minimal influence on IS continuance intentions, in contrast to IS adoption models (Davis et al., 1989).

Internet self-efficacy is the belief that one has the capability to interact with the Internet effectively. It has a positive effect on outcome expectations and actual computer use (Compeau and Higgins, 1995). Computer self-efficacy has been found to influence perceived usefulness and perceived ease of use in different ways. The negative relationship between computer self-efficacy and perceived usefulness suggests that more experienced and informed users are harsher critics (Chau, 1996). Chau found an insignificant relationship between computer self-efficacy and perceived ease of use, but noted their study was limited to one software package. Other studies found a positive relationship between computer self-efficacy and perceived ease of use across six different systems (Venkatesh and Brown, 1997).

A subsequent qualitative study found that self-efficacy tended to increase perceptions of service quality, but found evidence for a more complex relationship than had been proposed by previous researchers (Tate et al., 2008). This study supported the notion that more experienced users are harsher critics (Chau, 1996) and found a positive relationship between computer self-efficacy and PEOU. Since the user plays a much greater role in online services than in face to face services, the user’s own contribution is an essential antecedent for the quality of the service they receive. Tate et al’s study suggested that for online services the confidence in one’s ability to make best use of a service is based on a range of knowledge and skills, including specific knowledge and experience with the service itself, Internet self-efficacy, and general knowledge of the business domain.

Although done in the context of e-purchasing, rather than e-service, a study of online shopping found that PU, PEOU and Trust were all important antecedents to attitudes towards online shopping (Gefen et al., 2003):

*Given that a Web site is both an IT and the channel through which consumers interact...technology-based and trust-based antecedents should work together..."* (Gefen et al., 2003) [pg 53]

In conclusion, for experienced users, which includes most users of online services, IS constructs such as PU, PEOU, prior experience, trust, and self-efficacy provide a compelling alternative to ServQual and the gaps model when theorizing about the nature and antecedents of perceived online service quality.

**HCI – Functional Affordances of Software**

An important difference between technology mediated self-service and face-to-face service is that the technology does not exercise any independent judgement and adaptivity (or can only do so to the extent that it has been pre-programmed). While...
people can be constrained by process design and the limits of their authority in a job, they are almost infinitely adaptive. A person can be asked for advice, directions, to call a superior, and so on. Software cannot. The range of possible options available from technology-mediated self-service offerings is finite.

Affordance theory (Garver, 1991, Norman, 1999) is a useful way to frame these differences between software and human agents. An affordance is what is allowed or “afforded” by an object in an environment. For example, something we might normally recognise as a chair (for sitting on) might also afford standing on, or in rare circumstances, being used as a weapon. It would not afford use for a fine motor function such as sewing or tooth cleaning.

HCI research has identified four types of affordance: real or physical; cognitive; perceptual, and functional (Hartson, 2003). A real or physical affordance helps, aids, supports, facilitates, or enables physically doing something. Adequate size and easy-to-access location could be physical affordance features of an interface button design enabling users to click the button easily (Hartson, 2003). A Cognitive affordance enables thinking and/or knowing about something. For example, clear and precise words in a button label enable users to understand the meaning of the button and the consequences of clicking on it (Hartson, 2003). A perceptual affordance enables the user in perception (e.g., seeing, hearing, feeling, sensing). Perceptual affordance includes design features associated with visual, auditory, or haptic/tactile sensations. Cognitive affordance and physical affordance are key concepts in interaction design while perceptual affordances support physical and cognitive affordances. Users must be able to perceive cognitive affordances and physical affordances in order for them to aid the user’s cognitive and physical actions (Hartson, 2003). Finally, a functional affordance is a higher-level enablement (than simply the result of a button-click) - it helps the user to do something in the work domain. This draws on the concept of application functionality usefulness, also called ‘affordances in software’ (McGrenere and Ho, 2000). This takes the discussion of affordances beyond user interfaces to the larger context of overall system design, and the use of software for purposeful actions.

Here, we are mainly interested in functional affordances. Software has a finite number of functions embedded in it. For example, if the software delivering an online service does not include code and business rules to allow online fee payments, no user action, knowledge, or skill will ever induce it to carry out this function. Functional affordances also work at the technology level. Until functions such as hyperlinking became available, no-one expected software applications to use them. Current industry trends such as integrated portals, and the integration of SMS (short message system) functionality with online services, can be regarded as providing new functional affordances – they support functions such as push notifications that were not previously available. User’s knowledge of advances in technology affordances will affect their expectations of the quality features of specific services.

This concept of functional affordances allowing purposeful user action combines the concepts of usability and usefulness (Landauer, 1995). Usefulness is created by the utility of functional outcomes. Usability stems from the effectiveness of cognitive affordances for understanding how to use physical affordances, from the physical ease of using the physical affordances, and from the perception of these via perceptual affordances (Hartson, 2003). Hence, functional affordances are in important antecedent to beliefs about service quality, mediated by beliefs about usability and usefulness.

**Adaptive Structuration Theory**

Defining functional affordances is complex, and requires a degree of negotiation and adaptation between the user and the software (DeSanctis and Poole, 1994). People use, or attempt to use online services without receiving any training; and many services and software packages offer a smorgasbord of functions in the hope that a reasonably wide base of users will find something to meet their needs. The user has a major role in selecting and creating their own experience, and needs to carry a large part of the burden of adaptivity in order to achieve their goals. This means that there is an adaptation process as users become familiar with the service (DeSanctis and Poole, 1994). For example, many people report using Amazon.com as a research database, since the list of titles it supports is so extensive, while the software was designed as a virtual shop-front for book-selling. The site affords searching book titles for research purposes as well as for book buying. Hence, perceived functional affordances are not simply a subset of designed functional affordances, although there is clearly a relationship.

We suggest that the perceived affordances of an online self-service system as adapted by the user can inform our understanding of what constitutes online service quality. Both the designed affordances of the service, and the user’s perceptions of the adapted affordances are relevant. Adaptive structuration theory provides a way of studying the interplay of the both elements of the provider-consumer dyad and is complementary to IS use and continuance theories, which focus primarily on the consumer, and the affordance theories, which focus primarily on the provider. We suggest that the affordances provided by the service are mediated by the adaptation process, which is individual and unique to each user, and only then become antecedents to beliefs about usability and usefulness, which in turn cause beliefs about quality. Hence, an understanding of the adaptation process is critical to understanding quality beliefs.
DISCUSSION

One thing that becomes apparent from the previous section is that the degree of difference between online and face-to-face services may be much greater than is usually acknowledged, and many of these differences are omitted or mis-represented where ServQual and the gaps model is adopted without due care.

Online services generally behave consistently and do not vary greatly from encounter to encounter; past experience is therefore a good predictor of future experience. As a result, the gap between expectation and perception is generally small, which contradicts one of the main assumptions of ServQual.

Online consumers have a general awareness of current affordances of technologies. When a technology (for example portals or SMS) becomes available, consumers will expect that it will be used to enhance online service levels. This is not represented as a major determinant of expectations in the gaps model, except at the most general level as part of “personal experience”.

The user has a critical role in creating their own quality of experience. It is their own knowledge of computing technologies generally, the business domain of the service, and their experience with the tool that determines the quality of the service they receive; not the competence of the organisation or its agents (beyond the initial design and implementation of the software). Since the user’s own knowledge and experience are so important, one of the most important determinants of ongoing use and satisfaction is simply previous successful use. Users of online services need to adapt, as the software will not adapt. Many users of online services receive better service quality over time without the organisation needing to do anything, as they become more familiar with online service tools and use them more effectively. This is mis-represented in the gaps model, which assumes that the organisation “delivers” each service encounter.

CONCLUSION

We opened with the controversial suggestion that researchers in online service quality should stop looking to ServQual as a basis for future research. In support of this, we offered a number of arguments, some relating to the status of ServQual itself, and some relating to its applicability to an online context. By way of an alternative we examined the explanatory power of IS theories for the study of online service quality.

First, ServQual does not offer a reliable foundation for subsequent researchers. With the benefit of hindsight, the theory net for which ServQual was originally developed was not strongly supported. The instrument itself has a number of deficiencies when considered in the light of more recent research in psychometrics. To be fair to the ServQual authors, much of that debate had not yet occurred at the time ServQual was developed, but it behoves later researchers to be aware of more recent developments and critically assess extant research. ServQual based research, although it continues to be very popular, does not appear to be creating a coherent body of knowledge about online service quality.

Second, ServQual and the gaps model are a poor fit for an online context, when the user takes a much greater role in creating the quality of their own experience. Users of online services need to be conceptualised as users of information technology, as much as, or more than, as customers of an organisation.

Third, existing, well established IS theories, particularly theories of IS adoption, use and continuance, and web-site use have strong explanatory power for users of online services. Once the two analogies are made, between “perceived ease of use” (from information systems) and “functional”, or “interaction quality (from marketing); and between “technical” or “outcome” quality (from marketing), and “perceived usefulness” (from information systems), many existing IS studies become important for users of online services. We also suggest some potential areas for future research, including affordance theory and adaptive structuration theory.

Finally, we hope that our discussion will stimulate debate, and perhaps open the way for some new conceptualisations of online service quality, which can only increase in importance as a phenomenon that is a daily part of our lives.

REFERENCES