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Technology-enabled service delivery: An investigation of reasons affecting customer adoption and rejection

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Abstract *The use of technology to enable or facilitate the delivery of services has the potential to benefit customers and service providers alike. Correspondingly, however, the purposes to which technology is put, and the manner in which it is used, also has the potential to disenfranchise customers. Therefore the operational desirability and gains of any employment of technology to facilitate service provision should be balanced against the perceptions and behavioural response of customers. Our research aims to shed light on the reasons why customers adopt or reject technologically facilitated means of service delivery, and to develop a means by which likely adoption or rejection may be predicted. The research we have undertaken to date suggests that adoption or rejection of technologically facilitated services is moderated by the personal capacity and willingness of individuals.*

Introduction

Across a range of industries, computer and telecommunications technology is being increasingly used to enable and/or to enhance marketplace exchanges in a variety of service settings, and to create new or improved benefits to customers and providers alike. At the same time, however, technology can malfunction or break down, and its manner of use may create "technology-induced hostility" in customers. This might be due to technical faults and failings, but also due to situations in which human interaction is substituted or diminished by a use of technology that is more in a service organisation's interests than in those of its customers. In other words, the adoption of technology to enable service delivery can have both a positive and a negative impact on customers, their attitudes, perceptions and behaviour, and therefore reflect well or badly on a service provider. Thus, a key issue for service providers is to determine how technology should be adopted in such a way as to be acceptable and satisfactory to customers and service organisations alike.

Our research addresses this very issue and has been designed for the express purpose of illuminating reasons why customers adopt or reject technologically facilitated means of service delivery. In this paper we explain and discuss the nature of this research and some of our key findings to date.

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Conceptual background

Technologically facilitated means of service delivery have the potential to benefit customers, employees and management alike (Bitner *et al.*, 2000; Brown, 1997; Dabholkar, 1994, 1991). Customers can be offered additional or extended services, greater convenience and control, potentially more reliable information delivery, access to data and support services that may not have otherwise been available, and the ability to conduct transactions in such a way that does not necessitate the customer visiting the service organisation. Correspondingly, technology can be used by management to permit faster response to customer enquiries and problems, to improve internal efficiency and productivity, to reduce labour costs, and to gain a number of distinctive and differentiating competitive advantages. These potential gains or benefits, however, are accompanied by a number of potential risks: technology-enabled service delivery can impede customer access, frustrate and intimidate users, de-personalise the service encounter and create a distance between customers and service personnel (Walker and Craig-Lees, 2000). Consequently, the impact of technology on services is potentially something of a double-edged sword: it can be both beneficial and detrimental (Mick and Fournier, 1998). Forcing technologies on customers, particularly complex technologies that do not enhance the exchange process, may create hostile customers. Therefore the operational desirability, gains and benefits of any employment of technology to facilitate service provision need to be balanced against the perceptions and behavioural response of customers (Walker and Craig-Lees, 1999).

To determine the most efficient, effective and mutually acceptable use of technology in service delivery, the customer's perspective needs to be known and understood. For service providers, the central issue is essentially that of deciding if a new and available technology, presumably one that would enhance the position of the provider, would be acceptable to customers and not detract from the overall service experience.

Our premises

We submit that, ultimately, a customer's decision to adopt, i.e. use regularly, or reject technologically facilitated means of service delivery will be conditioned by their individual capacity and willingness. Capacity implies a perceived ability to use (Adams *et al.*, 1992; Davis *et al.*, 1989; Tornatzky and Klein, 1982). Even if the technology does not malfunction, customers may experience difficulties, in that they may not have the capacity (actual or perceived) to "manage" the technology (Moore and Benbasat, 1996; Cooper and Zmud, 1990; Tornatzky and Klein, 1982). Consequently we believe that it is reasonable to surmise that a customer's perceived capacity may be likely to have a direct bearing on their willingness.

Willingness, we submit, is likely to be born of a mix of factors including, for example, the relative advantage afforded by, and the perceived complexity and accessibility of, what is being offered (Rogers, 1961, 1976; Marr and Prendergast, 1991, 1993; Rugimbana, 1995; Moore and Benbasat, 1991; Daniel

and Storey, 1997; Loh and Ong, 1998.); and the perceived risks and costs associated with trialling the offering (Rogers, 1961; Taylor, 1974; Ostlund, 1974; Zeithaml, 1981). These, and possibly other, considerations are grounded, on the one hand, in intrinsic personal characteristics of individual customers and concerns and, on the other, in customer-extrinsic operational attributes. By the former we mean, for example, a customer's individual needs and wants, desire for personal interaction, sense of perceived risk in the service encounter, desire for control, behavioural and cultural norms. Examples of the latter include the relative advantage and benefits offered by the technological means of service delivery, its complexity or ease of access and use (and how this is perceived), and its technical or performance reliability. Consequently we believe that any adoption of technology to facilitate service provision needs to be planned and implemented with reference to customer attitudes, perceptions and requirements as well as managerial needs, and in such a way that it complements the perceived capacity and willingness of customers to make use of it.

This, however, raises a number of questions, among them:

- What do different customers want and expect from different means of service delivery?
- What are the attitudes, perceptions and requirements of different customers in relation to different forms of technologically facilitated means of service delivery?
- What are the perceived advantages and disadvantages of technologically facilitated means of service delivery?
- How do these perceptions and expectations affect a customer's decision to adopt or reject technologically facilitated means of service delivery?

It is these questions that our research aims to answer.

Research methodology

Initial exploratory work and conceptual development

An initial review of relevant behavioural and innovation diffusion literature served to identify a range of considerations likely to moderate customers' perceived capacity and willingness. With the aim of defining these more explicitly for the particular purposes of our study, however, we also undertook focus group discussions with people from a broad demographic and socio-economic range. A total of 56 participants were selected and spread across a total of ten group discussions. The age of participants ranged from 14 to 68 and the gender balance was approximately 60 per cent female and 40 per cent male. The discussions were recorded and transcribed, and the data collected were used for three purposes:

(1) to construct a provisional conceptual model of what appeared to moderate the capacity and willingness of customers to adopt technologically facilitated means of service delivery (Figure 1);

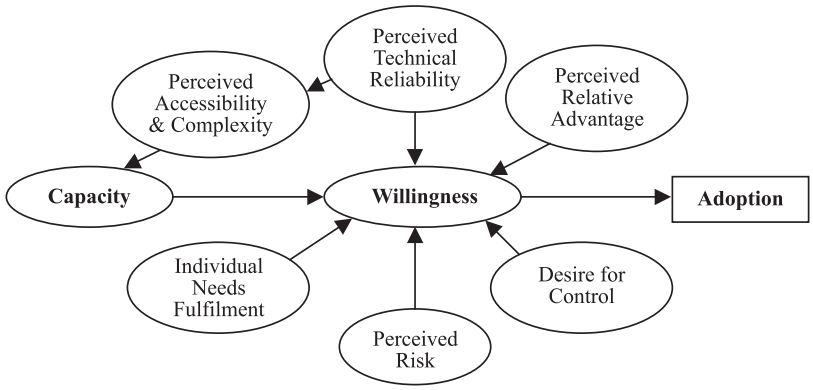

Figure 1.
Capacity and willingness: relationships and determinants

(2) to posit potential relationships between the variables; and

(3) to generate dimensions or elements of each construct by which the model could be operationalised for testing.

Perceived accessibility and complexity accommodates concerns expressed about how easy the service is to access, to learn how to use and to use on successive occasions (Karahanna *et al.*, 1999; Daniel and Storey, 1997; Leblanc, 1990; Rugimbana, 1995; Moore and Benbasat, 1991; Rogers, 1976). Technical reliability accommodates the attitudes and expectations of customers in relation to mechanical dependability (Daniel and Storey, 1997; Tornatzky and Klein, 1982). Relative advantage accommodates the advantages that the service is perceived to offer over more traditional, human means of service delivery, and alternative service providers (Bitner *et al.*, 2000; Marr and Prendergast, 1993; Moore and Benbasat, 1991; Zeithaml and Gilly, 1987). Individual needs fulfilment accommodates the desire or preference of some people for human rather than technologically facilitated means of service provision (Marr and Prendergast, 1991, 1993; Leblanc, 1990; Moutinho and Meidan, 1989; Zeithaml and Gilly, 1987). Perceived risk accommodates concerns about security, system failure and reliability, and other personal, psychological or financial risks associated with using the service (Daniel and Storey, 1997; Taylor, 1974; Rogers, 1961). Desire for control accommodates the extent to which customers feel that contact with human or mechanical means of service provision give them greater or lesser control over the service encounter (Daniel and Storey, 1997; Moore and Benbasat, 1991).

A total of 35 scale items were developed, five for each construct, for the purpose of investigating the nature and inter-relationships of the seven variables thought to moderate the willingness to adopt. Each item was framed in such a way as to invite a response on a five-point Likert-type bipolar scale ranging from strongly disagree to strongly agree. In addition, two further questions were included to explore respondents' present use of technologically facilitated means of service delivery, and their own assessment of their willingness to adopt new things. It was believed that answers to these

questions would provide an indication of "empirical" willingness (i.e. usage), in contrast to the attitudinal willingness reflected in all of the other items. A further five questions were included to capture demographic data in respect of respondents' age, gender, education, occupation and income range. The next step was to undertake a pilot study for the purposes of testing and purifying the instrumentation, and investigating the extent to which what was postulated in the provisional model was confirmed or otherwise.

Pilot study

A local suburban shopping strip was chosen as the location to conduct the pilot study, which comprised of 50 completed interviews with randomly selected passers-by. The sample consisted of 21 males and 29 females from a wide range of occupational categories, and the age of subjects interviewed ranged from 15 to 70 with most, almost 71 per cent, aged between 30 and 60.

Subsequent analysis of the data showed that the Cronbach alpha coefficients of all but three of the seven constructs measured were > 0.652. Desire for control (DC), however, scored 0.465, and technical reliability (TR) 0.407. As well, capacity (C) scored particularly poorly: 0.055. Consequently the scale items for TR and C were reviewed and refined:

(1) *Capacity*:
- C1 – I feel comfortable with technology.
- C2 – I feel I have the ability to make use of mechanical equipment.
- C3 – Experience with technology improves my confidence and willingness to use it.
- C4 – I am comfortable adapting to new systems.
- C5 – I have a well-developed technological ability.

(2) *Desire for control*:
- DC1 – I need face-to-face contact to explain what I want and to answer my questions.
- DC2 – I need to know someone is there to listen to me if I have a question or problem.
- DC3 – I need to know that someone has the power to fix problems if they occur.
- DC4 – I feel like I am more in control when dealing with people than with automated systems.
- DC5 – Service personnel help to give me control over what I want.

(3) *Needs fulfilment*:
- NF1 – With the provision of services I prefer to deal with people.
- NF2 – My particular service needs are better served by people.

- NF3 – With the provision of services I like to have someone to communicate with.
- NF4 – I like to have someone to whom I can complain if I need to.
- NF5 – Interaction with people provides me with greater reassurance.

(4) *Perceived accessibility and complexity*:

- PA1 – New technology is often difficult to use.
- PA2 – Changes to technical systems annoy me.
- PA3 – I expect technical systems to be easy to use.
- PA4 – Automated systems make it harder to access customer service people.
- PA5 – Technical instructions are often confusing or hard to understand.

(5) *Perceived risk*:

- PR1 – I am concerned about the security of services where I have no contact with anyone.
- PR2 – I like to be assured that what I have requested has in fact been done.
- PR3 – I am worried that mechanical systems will not work as I want them to.
- PR4 – I am concerned about the consequences of making a mistake.
- PR5 – I am tentative about trying new things.

(6) *Relative advantage*:

- RA1 – Technology provides faster service.
- RA2 – Technology provides more reliable service.
- RA3 – Technology provides more convenient service.
- RA4 – Technology gives me what I want.
- RA5 – Technology saves me time.

(7) *Technical reliability*:

- TR1 – I feel that mechanical systems are more reliable than people in providing services.
- TR2 – My willingness to use automated systems is not affected by occasional technical breakdowns.
- TR3 – Technical breakdowns are not overly frustrating.
- TR4 – Automated systems must operate reliably to satisfy me.
- TR5 – I am not put off using automated systems when they malfunction.

TR was re-conceptualised in such a way as to measure this with reference only to its affect rather than in terms of both functional performance and affect. The conceptualisation of C was reviewed with the aim of ensuring that the scale items more clearly and consistently reflected the sense of perceived personal capability, i.e. the ability to use, than they were in the pilot study. Because the reliability analysis indicated that the alpha coefficient of DC would be improved to 0.803 by the deletion of one question in particular, the decision was taken to replace this question with another that was more consistent with the meaning conveyed by the remaining four. The refined scale items in respect of each of the seven main constructs are summarised in the above list.

Correlation analysis of the pilot study data indicated that both attitudinal and empirical willingness appeared to be heightened where technical reliability and the sense of personal capacity were perceived to be high. Correspondingly, willingness appeared to be lowered where accessibility and complexity were perceived to be inhibitive; where the risk(s) associated with use, and the desire for control were perceived to be high; and where individual needs were not met by technology. Furthermore, there appeared to be little or no difference in these findings between gender and age categories. Consequently there appeared to be sufficient support for what had been conceptualised in the provisional model to proceed with wider empirical testing.

Main empirical study

Results and analysis

Survey respondents were chosen at random in a variety of inner city locations including the central business district, a shopping mall, a restaurant and tourist precinct, and a suburban shopping strip. A total of 210 respondents were interviewed, of whom 106 were male and 104 female. Slightly more than 55 per cent of the sample reported their income as less than A$40,000 p.a., and slightly more than 44 per cent reported this at >A$40,000 p.a. A similar distribution was found in respect of education, with 55.7 per cent of the sample claiming tertiary education, and 44.3 per cent claiming only secondary education.

Instrument reliability. Reliability analysis showed the Cronbach alpha coefficients to be 0.808 for capacity, 0.778 for relative advantage, 0.772 for individual needs fulfilment, 0.708 for desire for control, 0.666 for perceived risk, 0.590 for perceived accessibility and reliability, and 0.481 for TR. The scale item replaced in TR was again the cause of the relatively low alpha, which rose to 0.647 if deleted.

Correlation analysis. The mean scores for the scale items in respect of each of the main variables thought to moderate adoption or rejection were calculated and subjected to correlation analysis using SPSS. Summarised in Table I, these results show a high correlation between all of these variables, suggesting a high degree of convergent validity in what was posited in the model. Furthermore, the strong correlation between capacity and willingness (0.588)

Table I.
Correlation coefficients of main variables

	TR	PA	RA	NF	PR	DC	C	W
TR	1							
PA	–0.329***	1						
RA	0.496***	–0.262***	1					
NF	–0.336***	0.559***	–0.273***	1				
PR	–0.369***	0.624***	–0.172*	0.594***	1			
DC	–0.414***	0.622***	–0.230***	0.713***	0.664***	1		
C	0.501***	–0.350***	0.609***	–0.354***	–0.362***	–0.272***	1	
W	0.414***	–0.350***	0.347***	–0.222**	–0.341***	0.213**	0.588***	1

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (all two-tailed)

supports our premise that these together play a key role in moderating the decision to adopt or reject technologically facilitated means of service delivery.

The correlations illustrated in Table I generally confirm what was revealed in the pilot study. Willingness and actual usage (i.e. adoption) are highest where there is a strong sense of capacity to use, where TR is perceived to be satisfactory and where the RA of the system, and the perceived C to utilise it, are perceived to be high; and, correspondingly, where the risks (PR) perceived to be associated with use, and the desire or perceived need for, personal contact (NF and DC) are low. By contrast, willingness appears to be lowered where there is a desire or sensed need for personal contact (NF and DC), where the risks (PR) perceived to be associated with accessing and using the system are perceived to be high, and where the sense of capacity (C) to operate the system is perceived to be low. It bears noting that actual reported usage appears to have its strongest correlation with perceived capacity, and where the technical performance of the system is not regarded as problematic. In other words, adoption would appear to be primarily contingent upon a perceived comfort with, and ability to make use of, technologically facilitated systems, despite occasional malfunctions. Furthermore, because RA appears to have its strongest correlation with C, this suggests to us the possibility that the effect of marketed advantages and benefits to be derived by customers may be mitigated in circumstances where perceived capacity is low.

Despite the expressed willingness to try new things, it would seem that actual adoption hinges on one or both of two main considerations: the extent to which personal contact is desired or preferred, and the perceived ease of access and use. The first of these, the desire and preference for personal contact, is supported by the negative correlation between individual NF and TR, and between DC and TR; and by the significant positive correlation between DC and NF. It is given further support by the positive correlation between PR and NF, and DC and PR, suggesting that the sense of risk is higher in situations where there is no personal contact and, conversely, in situations where the sense of risk is high, the desire for personal contact will also be high. The importance of the perceived ease and access of use would appear to be

supported by the positive correlation between NF and PA, PR and PA, DC and PA.

Factor analysis. Because of the high degree of convergence apparent in the correlation analysis, our next step was to undertake a factor analysis for the purpose of better understanding the interdependence of, and differences between, the variables contained in the model, and behavioural implications implicit in the findings. The KMO was 0.862 and Bartlett's Test with df = 595 were 3,024.4 ($p < 0.001$) indicating that the factor analysis was appropriate. The results of this analysis showed that > 64 per cent of the variance was accommodated by nine factors (each with Eigenvalues of > 1.0), and > 50 per cent by five factors. Factor 1 alone accounted for > 24 per cent of the variance. Consequently, because of the high number of variables loading on Factor 1, varimax rotation was undertaken with the aim of clarifying the extent and nature of the variance between the principal factors. The results of this factor rotation are summarised in Table II.

The factor correlation matrix, after oblique rotation, showed only two correlations greater than 0.30 indicting that the varimax rotation was reasonable. The results showed that there were nine factors with Eigenvalues > 1.0 accounting for 63.8 per cent of cumulative variance. The first six variables accounted for 54.3 per cent of the cumulative variance and, from the scree plot, seemed to be those most usefully interpreted.

The results of this factor rotation serve to indicate support for what we posited in our model of adoption (Figure 1), and distinguish a combination of variables that we believe reflect the preferences, attitudes and beliefs underpinning the willingness to adopt or reject technologically facilitated services. These factors may also hold the potential to serve usefully for market segmentation and other marketing purposes. The variables loading on Factor 1 appear to us to reflect the preference for face-to-face human contact in the service encounter: personal communication and interaction that provides assurance, a sense of control over the service encounter and someone to whom complaints can be directed.

Factor 2 appears to capture the advantages offered by technologically facilitated services: the greater convenience and faster response time they afford, and what is perceived by some to be their comparatively greater reliability over services that depend on people for their provision.

Factor 3 clearly reflects what we had conceptualised as technical reliability, but suggests to us that although occasional breakdowns or malfunctions are frustrating, they are not necessarily a deterrent to adoption and regular use.

The variables loading on Factor 4 seem to reflect a range of personal concerns that may inhibit use and adoption. These include concerns about security and system reliability, having to learn new systems, and not having access to customer service personnel.

Factor 5 appears to reflect the personal sense of ability: what we conceptualised as the perceived capacity to use. This ability or capacity clearly moderates the willingness to try new things.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
NF3	*0.747*					
NF5	*0.707*					
NF2	*0.683*					
DC5	*0.595*					
DC4	*0.549*		–0.337			
DC1	*0.489*			0.386		
NF4	*0.411*					
NF1	0.360					
PA4	0.352		–0.320			
RA2		*0.652*				
RA5		*0.643*				
RA4		*0.632*				
RA3		*0.619*				
RA1		*0.599*				
C3		*0.579*				0.351
TR1		*0.482*				
TR5			*0.633*			
TR2			*0.603*			
TR3			0.533			
TR4			*–0.416*			
PR3	0.305		–0.389	0.366		
PR1				*0.563*		
PA2				*0.557*		
PR4				*0.458*		
PR5	0.383			*0.429*	–0.385	
PA1				0.390	–0.333	
PA5	0.339			0.354		
C5					*0.735*	
C5					*0.735*	
C1		*0.485*			*0.593*	
C1		*0.485*			*0.593*	
C2					*0.534*	
C2					*0.534*	
C4		*0.435*			*0.486*	
C4		*0.435*			*0.486*	
DC2						*0.732*
DC2						*0.732*
DC3						*0.614*
DC3						*0.614*
PR2						*0.573*
PR2						*0.573*
PA3						
PA3						

Table II.
Varimax rotated factor analysis of scale items

Note: Principal axis factoring with varimax rotation. For ease of interpretation scale items with loading > 0.4 are shown in italics

Finally, the variables loading on Factor 6 suggest to us that the adoption of technologically facilitated services is likely to be increased where some users know that they have access to customer service personnel should the need arise.

Cluster analysis. Because of the results of the factor analysis, a preliminary *k*-means cluster analysis was undertaken for the purpose of discerning potential market segments. A four-cluster solution appeared to be the most parsimonious and useful for interpretation (Figure 2). The first of these, representing 33.8 per cent of respondents, has an above average preference for dealing with people (Factor 1). Because of the well above average technological capability of these people (Factor 5), however, they do not have difficulties in using technologically facilitated services and do not appear to feel the need for face-to-face contact, save for when problems occur (Factor 6). They could be classified as reasonably willing users of technologically facilitated services although, intriguingly, they see only average benefits from technology (Factor 2). We have labelled them as "People-people Pragmatists".

The second cluster, representing 33.3 per cent of respondents, is also characterised by an above average preference for dealing with people but, because of their concerns and insecurities in using technologically facilitated services (Factor 4), this preference is more deep-rooted than it is with the people who comprise the first cluster. They see benefits in technology (Factor 2) but have concerns about using and learning how to use technological systems. Consequently they appear to us to be largely unwilling users whom we have classified as "Techno-Waries".

The third cluster, representing 15.7 per cent of respondents, is overwhelmingly characterised by a total denial of the need for personal contact and identifies strongly with the marketed benefits of technology (Factor 2). The cluster is comprised of people who are able and willing users of technologically facilitated services (Factor 5), who have no concerns about using these services

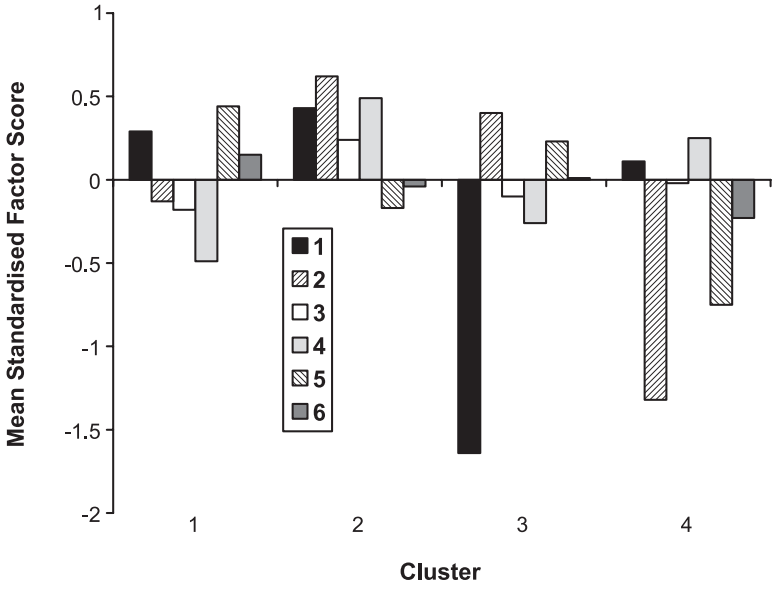

Figure 2.
Mean standardised factor scores for each cluster

(Factors 3 and 4), and who appear to be quite happy not to have contact with customer service personnel. We call them "Techno-Beneficiaries".

The fourth cluster, representing 17.1 per cent of respondents, is comprised of people who see no benefits in technology (Factor 2) and who are most concerned with what they perceive to be the difficulties and risks associated with the use of technologically facilitated services (Factor 4). They are either non-users or highly unwilling, spasmodic and tentative users of technologically facilitated services. We have labelled them "Techno-Phobes".

The results of this analysis suggest to us that a clear distinction exists between those who prefer face-to-face contact in the service encounter and those who do not. At the same time, however, it would appear that the desire for personal interaction varies. There appear to be those who want only this and who are exceedingly unhappy when this is not possible; but there also those for whom contact with customer service personnel is only necessary when they have a problem or complaint. Others appear to have no need of, or desire for, any personal contact at all and are quite happy to avoid it if they can.

Clearly people can also be differentiated with reference to their perceived sense of capacity. This, however, is not a simple "either-or" distinction, i.e. either they have the capacity or they do not. Rather, this sense of capacity would appear to exist on a continuum ranging from virtually non-existent to high and confident. This suggests to us that, for marketing purposes, it is likely to be more meaningful to cluster people with reference to other variables, and then to characterise the relative capacity of each cluster, rather than to attempt to use capacity alone as a clustering differentiator.

Managerial implications

The research undertaken to date serves to reveal shades of difference both in willingness, and in adoption/usage behaviour and the attitudes that accompany this behaviour. Correspondingly, there appear to be shades of willingness moderated by the individually perceived sense of ability or capacity, the perceived complexity and accessibility of the service delivery system, and individual needs and requirements. This raises several questions. For example:

- To what extent is adoption characterised by a sense of "having to" or "compelled to", rather than "wanting to", what implications does this have for marketing?
- Given that the correlation between capacity and use appears to be greater than that between willingness and use, what would it take to increase the confidence and perceived capacity of what would appear to be both voluntary and non-voluntary users so that the willingness to use is heightened?
- What is likely to be required to convert non-voluntary users to more willing and confident users?

- By what means can those who prefer personal interaction best be encouraged to adopt technologically facilitated means of service delivery?

Usage born more of the sense of "having to" rather than "wanting to" may not be grounded in a confident sense of capacity. Consequently, to improve the level of adoption, a distinction may need to be made between those with a high degree of voluntary willingness and capacity, and those with a lower level of perceived capacity and non-voluntary willingness for whom the provision of education and technical support may be necessary.

The observable distinction in attitudes, characteristics and behaviour that we have discussed above suggests that users, actual and potential, are capable of segmentation. This means that different marketing strategies are likely to be required for different segments, to motivate different kinds of people to trial and adopt technologically facilitated services, and to convert non-voluntary usage to voluntary usage. For example, the marketed relative advantages that we conceptualised for the purposes of this study appear not to have the same appeal for all people, especially non-voluntary users who perceive their capacity or ability to be low. Correspondingly, the same marketed advantages of technologically facilitated services appear to be of little consequence to people who prefer dealing with customer service personnel and who, therefore, may be expected to respond to different marketing stimuli.

It appears that an individual's capacity and willingness to use technology in service encounters does have a fundamental relationship with their adoption behaviour. This relationship, however, does not necessarily proceed in the linear direction we originally envisaged (see Figure 1). An individual may perceive that they have an "adequate" capacity to use technology but their willingness to adopt technology for service purposes still may not be high and, as we have highlighted above, their willingness may be tempered in such a way that results in either voluntary or obliged usage. Furthermore, with some people willingness may not necessarily be predicated on, and may in fact precede, capacity considerations. This raises important questions as to whether the marketing focus should be on fostering willingness or developing capacity; and, because of the observable differences between people, which should take precedence over the other.

Clearly, some people are likely to be motivated to adopt voluntarily and non-voluntarily. With each, however, there is a clear preference or desire for personal interaction, at least when they have a particular problem or question. This suggests to us that it may be a mistake to attempt to enforce use of a technologically facilitated service delivery system without any access to customer service personnel. Rather, it would seem that adoption rates are likely to be enhanced if people know that they have access to customer service personnel and technical support in circumstances where this is desired.

Limitations of the study and future research directions

We recognise several limitations in the work we have undertaken to date. First, the findings are limited by the scope of the study. This means that it is premature to speculate on the generalisability of our findings, especially in respect of any one particular service sector as opposed to another. Furthermore, it is too early to judge the extent to which our research and instrumentation may be employed in such a way as to predict adoption. The further work in which we are presently engaged, however, has the aim of arriving at an instrument that can be relied upon to do just this. It is also our intent to widen the scope of our research for the purposes of testing conclusions derived from this initial study; and the validity of the market segments that we have thus far tentatively identified. Correspondingly, we also intend to investigate the extent to which our preliminary findings are consistent or dissimilar across different service sectors.

Second, we believe that the model of adoption and the instrumentation designed to operationalise this study will benefit from refinement, especially in relation to how we have conceptualised technical reliability. This is also work in which we are now presently engaged.

Third, we recognise a limitation in how we have measured attitudinal willingness. A combination of a general question ("How willing are you to adopt new things?") and a scale of "Never/Rarely/Sometimes/Always" may have resulted in problems arising from a restriction of range. Only 5 per cent of respondents indicated "Never" or "Rarely" to this question, which may have to do with the demand characteristics of the interview situation. However, 36 per cent of respondents agreed they were "tentative about trying new things".

Fourth, we have yet to explore more fully the inter-relationships and affect of the variables thought to moderate capacity and willingness. The correlation analysis that we have undertaken thus far indicates strong relationships between several of the variables accommodated in our conceptual model, but the extent to which they moderate capacity and willingness, or both, needs to be better understood.

Fifth, more work needs to be done by way of profiling more fully the nature, characteristics and attitudes of voluntary and non-voluntary adopters, and non-users, to the end of understanding how to improve the willingness of non-voluntary users, and to convert non-users to users. Already our research indicates that different people have different reasons for adopting or rejecting technologically facilitated means of service delivery in different service settings or situations. Therefore the degree of importance placed on the various determinants of willingness may be expected to vary across groups of people with different demographic and psychographic characteristics. This data would enable future research to concentrate on the attitudes and behaviour of discrete segments. In this way the reasons affecting adoption and non-use within particular segments would be better distinguished and understood, and could thereby illumine marketing practice more usefully.

By exploring determinants and dynamics of willingness across a range of different customer types and service settings we aim to:

- ascertain the extent to which willingness and its determinants are a reliable indicator of customers' acceptance of technology in service delivery;
- define situations more or less conducive to the employment and acceptance of technology in the facilitation of service provision; and
- provide insight into what shapes willingness among different groups of people.

In this way it is hoped that the findings of this research will serve to inform beneficially where and in what ways technology may be employed to facilitate service delivery in such a manner as to be acceptable to customers as well as operationally advantageous.

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