Healthier for whom? Technological service improvement in the healthcare industry

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This study tackles the dilemma of a technology-based service improvement wherein an organization performs a technology change to improve its service process, while its customers do not necessarily perceive the new service as an improvement. The empirical research follows a healthcare provider that changed its primary care provider appointment scheduling using a new call centre technology. The methodology involves three processes reflecting the entire change: personal interviews, focus groups, and surveys. To facilitate adoption of a technology-based service, it is recommended that there be a focus on customers’ experience with similar service industries’ image, and organizational policies on contracting service representatives.

Keywords: healthcare organization; service improvement; call centres; service process; technology change

Introduction

Integrating technology to increase service quality is quite common. However, in many cases the returns on technology investments have been disappointing and have led to the opposite outcome from that intended (Lee & Allaway, 2002; Moon & Frei, 2000). This paper explores the effect of a technology change on service quality in the healthcare industry.

Healthcare services are ideal for exploring customer perceptions of service quality in the light of technology change for several reasons: first, health services are highly important and relevant to most of the population. Second, a remarkable number of technology innovations have been adopted by healthcare organizations in recent years; and third, the healthcare industry has undergone dramatic changes, becoming much more customer-oriented, with a growing emphasis on customer preferences (Choi, Lee, Kim, & Lee, 2005).

Recently, Timmor and Rymon (2007) proposed the internal, consistency, external (ICE) conceptualization to address the dilemma of technology-based service changes. According to this conceptualization, three factors – internal, consistency, and external – influence customers’ behaviour intentions towards a new service. The ICE model covers some conceptual grounds suggested by the innovation literature and consolidates various aspects of earlier models examining technology acceptance (i.e. technology acceptance model (TAM; Davis, Bagozzi, & Warshaw, 1989); UTAT (Venkatesh, Morris, Davis, & Davis, 2003)). In addition, it examines three distinct dimensions of customer adoption behaviour (preference and usage, extension, and recommendation), and takes into account the compatibility of the organization to the change, as perceived by customers. Hence, we have chosen to base our hypotheses development on the ICE framework.

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The empirical part of this study was done in cooperation with a health maintenance organization (HMO) in a Mediterranean country. This HMO has changed its primary care provider appointment scheduling process, in order to improve its customer service, using a state-of-the-art call centre, featuring services such as self-identification, a queuing management system, and navigation options. The new call centre handles most calls for primary care provider scheduling, including pressing matters that occur on short notice. Hence, appointment scheduling is one of the most frequent and important services used by patients. Our data contains several samples from various time stamps throughout the process, and reflect the entire change, i.e. before, during, and six months after the new call centre launch.

The major objectives of this study are: (1) to identify and analyse major drivers and barriers for customers in adopting service changes; and (2) to provide practical implications for managements considering technology-based service changes.

We commence with an overview of service quality and technology changes in both the service marketing and healthcare literature. Next, we describe the empirical study, its setting, hypotheses, procedures, and data collection. The results section contains findings of a qualitative study based on in-depth interviews, focus groups, and analyses of quantitative surveys, including a repeated measure sample. Finally, we discuss the contribution of this study, its managerial implications, its limitations, and suggestions for future research.

**Literature review**

There is a consensus in the services marketing literature that consumer reaction to services is affected by three main factors: perceived quality, perceived value, and satisfaction (Athanassopoulos, 2000; Cronin, Brady, & Hult, 2000; Garbarino & Johnson, 1999; Zeithaml, Berry, & Parasuraman, 1996). However, views are disparate regarding the relationship between these constructs (Cronin et al., 2000). Most studies have examined customer satisfaction or perceived quality, as well as their implications on behavioural intentions (Bendall-Lyon & Powers, 2004; Bolton & Lemon, 1999; Roest & Pieters, 1997; Taylor, 1997; Zeithaml et al., 1996). Some studies have examined the relationship between service quality and customer satisfaction. Bigne, Moliner, and Sanchez (2003) found that the overall satisfaction with a multi-service organization is determined by its perceived overall quality. They also concluded that the organization’s perceived overall quality is influenced by the perceived quality of both core and peripheral services, while the influence of the core service is higher.

**Technology changes and service quality**

In recent years, billions of dollars have been invested in technologies intended to improve service quality and result in greater customer satisfaction and profitability (Drennan & McColl-Kennedy, 2003; Hackett, 1990; Lee & Allaway, 2002). However, technology changes might discourage new customers and irritate existing ones (Freedman & Sudoyo, 1999; Hackett, 1990). Such manifestations of customers’ resentment and other conflicts raised by technology changes may be explained by the ‘Paradoxes of Technology’ suggested by Mick and Fournier (1998), Fournier and Mick (1999); the sources of dis/satisfaction in technology encounters as suggested by Meuter, Ostrom, Roundtree, and Bitner (2000); and customers’ ‘technology readiness’ (Parasuraman, 2000; Parasuraman & Colby, 2001; Tsikriktsis, 2004). The healthcare industry offers services based on new technologies (i.e. online medical information, drug purchase, and consulting; use of
electronic medical records (Flower, 2004)). Many healthcare studies assess service changes using economic parameters (Gelijns & Rosenberg, 1994; Kirby, Spetz, Maiuro, & Scheffler, 2006), technical measurements of specific medical procedures, or quantitative indicators of service provision and delivery (Monaghan & Murray, 2005). This study assesses a medical service change using measures based on the literature of service quality.

While integration of technology into services has become quite common, limited research has been conducted on its effects. Few studies examine whether information technology affects provider performance (Bitner, Brown, & Meuter, 2000; Drennan & McColl-Kennedy, 2003). Studies in the IT domain offer some explanation for user acceptance and usage behaviour of information systems: The TAM (Davis, 1989; Davis et al., 1989) adapted from the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) posits that user acceptance is determined by two key beliefs: perceived usefulness (U) defined as the extent to which a person believes that using a particular technology will enhance her/his job performance, and perceived ease of use (EOU) defined as the degree to which a person believes that using a technology will free them from effort (Davis, 1989). Venkatesh and Moris (2000) added the subjective norm as a third construct affecting users’ behavioural intentions, they also postulated that gender and experience serve as two intervening variables. Based on the TAM and seven other prominent models, Venkatesh et al. (2003) formulated a unified model called the unified theory of acceptance and use of technology (UTAUT). According to this model, there are four core determinants of intention and usage of user behaviour (performance expectancy, effort expectancy, social influence and facilitating conditions) and up to four moderators of key relationships (gender age experience and voluntaries of use). Venkatesh et al. (2003) proposed a conceptual framework named ICE, to address the dilemma of service changes. They suggested that behavioural intentions regarding a new technology-based encounter can be explained by three factors: internal – the degree to which the new service attributes satisfy the customer’s needs and increase customer utility, consistency – the gap between the attributes of the new service and the old service and customer’s technology orientation, and external – customer perception of the new service as suitable or not suitable for the firm in terms of its image and positioning (hence the acronym ICE).

Several aspects of ICE have made it relevant and noteworthy for use in this study: First, it covers some conceptual ground suggested by various disciplines and consolidates various aspects into one model. For example, the internal factor of ICE relates to similar aspects of those suggested by the TAM (Davis, 1989; Davis et al., 1989) and the UTAUT (Venkatesh et al., 2003) and the consistency factor covers elements characterising innovations as explored in the innovation literature (see Meuter, Bitner, Ostrom, & Brown, 2005). Second, while other frameworks rely mainly on a single type of customer behaviour, i.e. trial (Meuter et al., 2005) or usage (IT models), ICE examines three distinct facets of customer adoption behaviour (preference and usage, extension, and recommendation), each of which may affect potential adopters and increase diffusion rate, respectively. Third, ICE takes into account the compatibility of the organization to the change, as perceived by customers, and relates to the gap between the new and the existing service. These aspects are particularly important for the long-term customer–organization relationship, which specifically encompasses the context of this study.

In studying services, a distinction is commonly drawn between the service’s delivery process and its outcome (Bitner, 1992; Boulding, Klara, Staelin, & Ziethaml, 1993; Brady & Cronin, 2002; DeSarbo, Huff, Rolandeli, & Jungwhan, 1994; Parasuraman, Zeithaml, & Berry, 1988; Rust & Oliver, 1994). In the healthcare case, patients may experience service improvement due to the introduction of a new medical procedure or device, or due to a
change in the service process itself (one-stop emergency room (ER) check-in, 24/7 consulting call centres, online test result access). Our focus is the service process, i.e. how the service is delivered to, or consumed by, the patient.

The study
This study is based on actual data of a healthcare insurance provider in a Mediterranean country. The vast majority of residents of this country, regardless of income, are entitled by regulations to a basic health insurance and can choose a healthcare provider. State funding for healthcare providers in this country is calculated by the number and ages of providers’ customers. Another major source of income to healthcare providers is insured members’ co-payments, which are also affected by the number of insured patients (healthcare providers collect co-pay fees as a token for subsidized services that are included in the basic national health package; they also collect much higher fees for extra services that are not state-subsidized). As switching between healthcare providers is relatively easy, competition in this market has increased, and healthcare providers make intense efforts to gain customers by improving services and increasing customer satisfaction.

This research follows a change in the doctor appointment scheduling process of one of the leading healthcare providers in the country. The main goal of this change, as revealed in the qualitative section, was to improve customer service. Another motivation was enhancement of the healthcare provider’s image as offering state-of-the-art services. Thirdly, this change enabled the provider to match some of its competitors who had adopted or were considering implementing similar services.

Before the change, insured members scheduled their appointments directly through the local clinics by approaching the clinic’s administrative staff either in person or by phone. After the change, patients were instructed to schedule their appointments using the call centre featuring self-identification, several menus, and a queuing management system. While in individual clinics, patients were usually served by familiar personnel, the service in the call centre is less personal, as patients are served by a different unfamiliar representative each time. Other major differences between the two service formats are availability hours (specific clinic opening hours vs. 24/7), EOU (a different telephone number for each clinic vs. a single number), and average waiting time (shorter in the call centre, as it has multiple lines staffed by dedicated personnel).

The research data are restricted to appointments with PCPs only (primary care physicians trained in internal medicine, pediatric medicine, or family medicine). Such appointments are relevant to most patients and constitute the vast majority of doctors’ appointments overall. In addition, analyses of the provider’s head office indicated that most queuing pressure was on PCP appointments, leading to the supposition that improvement of this particular scheduling process would be considered an advantage by the customers.

Hypotheses setting
Figure 1 depicts the ICE conceptualization (original and extended) and the research hypotheses.

As described before, the ICE conceptualization includes three factors: internal – the degree to which the new service attributes satisfy the customer’s needs and increase customer utility; consistency – the gap between the attributes of the new service and the old...
service and customer’s technology orientation; and external – customer perception of the new service as suitable or not suitable for the firm in terms of its image and positioning (for theoretical review, see Timmar & Rymon, 2007). The first four sets of hypotheses examine the three ICE factors in the healthcare context. The first set (H1a–H1c) refers to the internal factor, the second (H2a–H2c) and the third (H3a–H3c) refer to the consistency factor (specifically the second set refers to the delivery gap and the third set to customer technology orientation), and the fourth set (H4a–H4c) refers to the external factor.

H1a: The HMO customers will prefer using the call centres and not the clinics’ secretaries for making appointments with PCPs, as they view the former as having a better outcome than the latter, being easy to use, and delivering reasonable value for cost.

H1b: The HMO customers will opt to extend the use of the call centre to other services provided by the same organization, as they perceive the call centre as having a better outcome, easy to use, and delivering reasonable value for its cost.

H1c: The HMO customers will recommend scheduling PCP appointments through the call centre to their family and friends, as they perceive it as having a better outcome, easy to use, and delivering reasonable value for cost.

H2a: There will be a negative correlation between the HMO customers’ preference to make appointments via the call centre, and their perception of the delivery gap between the two service formats.
H2b: There will be a negative correlation between the HMO customers’ willingness to extend the use of the call centre to other services and their perception of the delivery gap between the two service formats.

H2c: There will be a negative correlation between the HMO customers’ intentions of recommending the new service to family and friends and their perception of the delivery gap between the two service formats.

H3a: The HMO customers will prefer making appointments via the call centre the more technology-oriented/experienced they are with this technology.

H3b: The members will opt to extend the use of the call centre to other services the more technology-oriented/experienced they are.

H3c: The HMO customers will recommend the new service to their family and friends the more technology-oriented/experienced they are.

H4a: There will be a positive correlation between HMO customers’ preference to make appointments via the call centre and their perception of the compatibility level between the organization’s positioning and image and the new service format.

H4b: There will be a positive correlation between the HMO customers’ willingness to extend the use of the call centre to other services and their perception of the compatibility level between the organization’s positioning and image and the new service format.

H4c: There will be a positive correlation between HMO customers’ intentions of recommending the new service to their family and friends and their perception of the compatibility level between the organization’s positioning and image and the new service format.

The next set of hypotheses relates to the extended conceptual framework factors: individual differences and time effect.

Previous studies have suggested that individual differences such as age, education, and gender might affect the adoption of new technologies (Tsikriktsis, 2004; Venkatesh et al., 2003). The first study of the ICE conceptualization was conducted on a relatively homogenous population with regard to age and education; consequently, demographic effects could not be tested. However, in this study, the demographic heterogeneity of the studied population enabled us to test these effects. The following three hypotheses examine possible effects of individual differences as intervening variables on customer behavioural intentions. The next hypothesis is based on evidence pointing to a negative relationship between age and acceptance of technological change (Harrison & Rainer, 1992; Nickell & Pinto, 1986; Raub, 1981; Venkatesh et al., 2003).

H5a: There will be a negative correlation between HMO customers’ age and their willingness to extend the use of the call centre to other services.

It has also been suggested that education leads to a greater propensity for learning in a novel situation (Bower & Hilgard, 1981) and that lack of education and knowledge of technology are likely to generate operational fears about how to use new technology (Howard & Smith, 1986). On these grounds, we test the following hypothesis:

H5b: There will be a positive correlation between HMO customers’ education and their willingness to extend the use of the call centre to other services.

With regard to gender, Tsikriktsis (2004) suggested that men might have an advantage over women in adopting new technologies. Several studies exploring gender and technology have focused on computers: Harrison and Rainer (1992) concluded that the male gender is associated with higher computer skills, and Gutek and Bikson (1985) found that men tend to bring more computer-relevant skills to the workplace than do women. Computer use has been perceived to be a male-oriented activity, and males have also
demonstrated a greater affinity for the computer (Wilder, Mackie, & Cooper, 1985). However, Venkatesh et al. (2003) pointed out that empirical studies outside the information technology (IT) context have shown that while gender roles have a strong psychological basis and are relatively enduring, they are open to change over time. Indeed, Kraut et al. (1998) showed empirically that males and females do not differ substantially in the frequency with which they use new technologies. In addition, in a recent study that focused on attitudes, perceptions, and uses of computers (Bain & Rice, 2006), gender differences were found to be non-significant, and eagerness to learn to use new technology such as the graffiti handwriting of the personal digital assistant (PDA) was evident in both genders. As the use of call centres does not require special knowledge or technological abilities on the part of the user, and most customers have experienced call centres before the change, we believe that in this particular case, there will be no differences between the two genders regarding behavioural intentions towards the new service. Thus:

H5c: There will be no gender differences regarding preferences and willingness to extend the use of the call centre to other services provided by the same healthcare organization.

The intangibility of services makes product offerings difficult and sometimes impossible to evaluate even after purchase (Van Looy, Dierdonck, & Gemmel, 1998). Indeed, Zeithaml (1981) distinguished between search qualities, experience qualities, and credence qualities. Search qualities are attributes that can be determined prior to purchase; experience qualities are attributes that can be discerned after purchase or during consumption; and credence qualities may be impossible to evaluate even after purchase. Timmor and Rymon (2007) suggested that services characterized by credence qualities may be better evaluated over time as the customer becomes more accustomed to a new service’s format and uncertainty decreases. Hypothesis 6 follows this line of thinking:

H6: Over time, the HMO customers will increase their preference for using the call centres over the clinics’ secretaries for making appointments with PCPs.

Methodology

Research procedures and data collection

We were fortunate to have access to a unique and rich dataset that enabled us to track the entire process of the change and hence examine the effects on customer satisfaction and behaviour with a repetitive measure. The research encompasses two main parts – qualitative and quantitative – each consisting of two distinct phases. The qualitative study included in-depth interviews with management and administrative staff of the healthcare provider, and focus groups with customers. The interviews were conducted a month before the new call centre was launched in order to comprehend the motivations of the service provider to change the service format.

After the launch of the new call centre, customers were gradually assigned to its use on a geographical basis. Allocation of all clinics and customers was gradual and took five months. The focus groups were conducted two months after the call centre launch. They were moderated by experts from a marketing research company and observed by the authors through one-way mirrors. There were three types of focus groups: (1) Customers parenting young children who had not yet been assigned to the new service; (2) customers aged 50 and over who had not yet been assigned to the new service; (3) customers of both categories who had already been assigned to the new service.

Based on the interviews and focus groups two questionnaires were drafted and pre-tested for clarity and flow. The final questionnaires were formulated and administered
by a marketing research company. Phone surveys were conducted at various hours of the day to avoid selection bias by time. The interviewers identified themselves as working for a research firm and conducting a survey on healthcare services. The interviewees were asked to state their healthcare insurance provider to ensure the anonymity of the specific company, so as to minimize possible biases due to interviewees’ desires to satisfy their service provider by answering the questionnaire.

The telephone surveys were conducted at two different time stamps of the change: The first took place about a month after the launch and consisted of a random sample of customers who had not yet been assigned to the new service. The second took place half a year later and consisted of customers who had been assigned to the service for at least five months. This survey consisted of two samples: a random sample of all customers and a repeated-measure sample of customers who had filled in the first survey (double records were omitted and re-sampled to avoid overlapping of samples). A total of 500 questionnaires were collected in the first phase, and 700 in the second. The surveys’ response rates were 25% and 32%: relatively high for randomized sampling surveys. Since the healthcare provider had its insured members’ profiles, socioeconomic data and frequency of appointments with physicians could also be checked for those who declined to be interviewed. As their distribution was found similar throughout the sample, refusal was of minor concern.

The second survey was conducted on customers who had had five months’ adaptation time to the new service. The average time between visits to a PCP for a standard patient is three months; hence the waiting period of six months between the two samples enabled us to assume that by the time of the second questionnaire, most interviewees would have experienced the service in its new format. Analysis of changes of attitudes over time could be conducted as both surveys (apart from the repeated-measure sample) were independent, and customer population was normally distributed.

**Measurements**

The measurements were based on earlier studies whenever possible (i.e. Cronin & Taylor, 1992; Cronin et al., 2000; Lee & Allaway, 2002; Timmor & Rymon, 2007). In cases where previous measurements were not available or did not fit the proposed structure, specific measuring tools were developed. Some of the measurements relied on responses and statements made in the focus group (see Measures in the Appendix).

**Behavioural intentions**

Theories of consumer behaviour (Fishbein & Middlestadt, 1995) claim that customers’ preferences are a precondition for actual behaviour (i.e. buying, recommending). Studies of services tend to examine customer behaviour intentions regarding their willingness to adopt or buy a new service (Lee & Allaway, 2002; Parasuraman & Colby, 2001; Tsikriktsis, 2004). Word of mouth is a dominant factor affecting individuals’ decision-making, particularly for services wherein there is difficulty in assessing the expected outcome before experiencing the service. Therefore, customer recommendation becomes an important behaviour for service providers looking to expand the adoption of the service. Hence, behavioural intentions were measured by three aspects: (1) Identifying patients’ preferences for scheduling appointment with their PCP (via call centre or clinic secretaries); (2) patients’ willingness to extend the call centre service to other appointments (e.g. lab samples, physical therapy); and (3) patients’ intentions of recommending the new service to family and friends.
Perceived outcome

In the ICE context, perceived outcome relates to customers’ perceptions of the outcome resulting from using the new service format. Therefore, customers’ perceived outcome was reported in terms of scheduling a doctor’s appointment (note: we refer to the waiting time until the appointment takes place, and not to the time it takes to make the appointment). The perceived outcome was calculated by a standardized average of the following three items: perception of the new service as an improvement/deterioration in service, general satisfaction with the new service, and call centre staff’s willingness to help in urgent cases (Corenbach $\alpha = 0.705$). The latter measurement was added due to the importance of handling urgent cases, as revealed later in the qualitative findings. This can be explained the fact that PCPs handle pediatric care as well as primary care.

Cost

When referring to service cost, one should take into account the service price to the customer and the cost to the organization as perceived by the customer. When customers believe that a change is made mainly to cut costs, they may expect price reduction, or else perceive the service to be of lower value. The launch of a nationwide call centre that replaces permanent clinic employees with outsourced temporary or part-time workers may be perceived by customers as a way for the organization to cut costs rather than a service improvement for customers’ benefit. In this case, the monetary cost to the customer was negligible, so the surveys related to the perceived cost to the organization only. Accordingly, patients were asked to rate their agreement with a statement that healthcare providers are moving to central call centres in order to cut costs.

Ease of use

This refers to the perceived complexity of the new format. In the call centres, customers can make appointments with various physicians at the same time with a single phone call. In addition, the call centre operates 24/7 in contrast to clinics’ limited hours. Consequently, we used three different measures: call centre response time, convenience of call centre operation hours, and importance of using a single number for all doctors.

The delivery gap

In the old service format, patients were served by an individual clinic staff member who was usually familiar to them. In the new service format, appointments are scheduled on a nationwide level by many service representatives working shifts. As a result, a patient is likely to be answered by a different service representative each time, and the chance of acquaintance between the two is low. Hence, we examined the perceived importance of contacting familiar personnel.

Customer technology orientation

Previous experience with technology and positive attitudes thereto are expected to affect customers’ intentions and behaviour (De Jong, De Ruyter, & Lemmink, 2003). In this study, we extended the measurement by adding a new measure for previous experience with call centres. This new measure complements the former, as it relates specifically to
experience with same or similar services and therefore provides a more comprehensive assessment of overall technology orientation.

**External**

To examine the effect of the perceived image of the healthcare provider, two views were examined: a general one referring to the perceived motivation of the healthcare provider for moving over to the new service, and a detailed one referring to the compatibility of the change with the specific healthcare provider’s image as perceived by the customer. The latter view is an extension of the original ICE factor.

**Findings**

The findings are reported separately for each of the methodological approaches. An integrative discussion is presented in the Discussion section.

**Interview results**

We conducted in-depth interviews with the Vice President of Marketing and Customer Service, with the Research and Evaluation Department Director, and with the administrator in charge of customer satisfaction assessment. In general, all three interviewees felt that the call centre provides superior service, while they shared some concerns regarding the initial reaction of insured members and their PCPs. We report the major insights from the interviews regarding the following: (1) Expected benefits for the insured members; (2) expected benefits to the organization; and (3) major concerns of management.

**Expected benefit to the insured members:**

- Flexibility and convenience in making PCP appointments
- Access to all relevant PCPs in the area via a single phone call 24/7
- Better handling of urgent needs given easier access to more PCPs
- Call centre representatives speaking five languages, thereby accommodating members who speak various mother tongues

**Organization benefits:**

- Efficiency: saving labor and time of clinic personnel
- Better utilization of PCPs’ time: ability to fill empty time slots and adjust appointments accordingly (yield management)
- Positioning the organization as a leader in adopting new technologies for the benefit of its customers
- Providing competitive advantage over other healthcare organizations

**Major concerns of management:**

- Resistance of insured members to anonymous call centre representatives replacing interaction with familiar clinic staff
- Difficulties in following the automated system instructions
- Clinic staff feeling threatened by being ‘replaced by technology’
- PCPs not feeling comfortable and hence not fully cooperating, as they perceive this change as being forced on them and compromising their autonomy
Focus groups

The three focus groups were: (1) Customers parenting young children who had not yet been assigned to the new service; (2) customers over the age of 50 who had not yet been assigned to the new service; and (3) customers who had already been assigned to the new service.

In the group discussions, moderators were instructed to encourage spontaneous reactions to, and associations with, the clinics, the call centres, and the organization. We received support for the ICE conceptualization and its related factors in addressing the dilemma of technology-based service change. We report on the main insights and reactions:

Internal factor

Consistent with the internal factor – referring to the degree to which the new service attributes satisfy customer needs and increase customer utility – supporting voices indicated availability and faster service as perceived advantages of the call centres over clinic secretaries, e.g. ‘The secretaries in the clinics usually do several things at the same time, making service slower. In the call centres, they do appointment-setting only, hence service is much faster’; ‘One number for all doctors’ appointments’ was repeatedly mentioned as another advantage over the clinics. This aspect enables checking the availability of a number of doctors with one phone call. Specific comments were: ‘I save money when I make one call instead of several’; ‘I like the fact that I don’t have to reveal my medical issues to the secretary in the clinic; in the call centres they don’t know me’.

Opposing voices stated that they have to wait (some experienced participants) or they are afraid they will need to wait (those who were not yet experienced) until they get a response. They claimed the call centre does not handle urgent cases and special needs well. Particularly parents of young children indicated: ‘All appointments for pediatrics are urgent!’ Another perceived concern was that call centre representatives were not qualified enough and that the information they provided was sometimes inaccurate or not updated. Another drawback mentioned related to the automated system and the process the caller goes through before getting a human response: ‘When you call, you hear many internal promotions...’; ‘You get lost in such a comprehensive call centre’. Consistent with this, previous studies reported on increasing ‘phone rage’ and low customer satisfaction with call centres (Malhotra & Mukherjee, 2004). As for the cost perception, a concern was raised regarding the organization’s motives for cutting costs and reducing the number of secretaries in the clinics, e.g. ‘They cannot cut down the number of secretaries; the secretaries also need to liaison between the call centre and the clinics’.

Consistency factor

This factor consists of two variables: delivery gap and customer technology orientation. With regard to the delivery gap, one major insight emerging from all the focus groups was that the members described a more personal and intimate interaction with their PCP compared with specialists, with whom they reported having a more formal, distant interaction.

Two main shortcomings were raised: The first related to the delivery gap as well, and cited the clinic secretaries as being familiar with the patients and being able to empathize and provide individual service. In the call centres, on the other hand, all callers are anonymous and considered equal, and the personal, human touch is lost, e.g. ‘How can I explain
to the call centre representative that my son needs to see the doctor today? They don’t know me. The secretary in the clinic has known us for years, and will do anything to help; ‘When I call the clinics, I know exactly who I’m talking to; they know me. It’s as simple as that’. The second shortcoming related to customer technology orientation: Among those who opposed the new service, some expressed their concerns regarding interacting with technology, e.g. ‘My mother is not used to call centres and has problems handling them’; ‘I don’t like computerized systems; you press one button and then you’re directed to press another one, then another...’ Other negative associations regarded previous experience with call centres, e.g. ‘I don’t like my bank’s call service; there need to be professionals’; ‘My bank’s is annoying and exhausting’; ‘I called my phone company’s and waited five minutes listening to commercials’; ‘In [another health insurance provider], it works well; my father...’.

Previous experience generally has a positive effect on behaviour intentions of adoption. However, the focus groups revealed some negative attitudes towards the new service format that was based on previous experience with other service providers’ call centres. The focus groups were conducted at the beginning of the process, when customers had hardly experienced the new service format; hence, it is most likely that attitudes changed as customers increased their use.

External factor
With regard to the organizational image and its motivations to make service changes, participants in all three groups believed that this step was taken to improve the service and to better stand up to the competition, e.g. ‘It’s more efficient and an improvement’; ‘There’s competition to be more efficient’; ‘My healthcare provider does not want to lose customers, and needs to be like the others’. These statements imply that with regard to the external factor, it may not be enough to measure the perceived image of the specific service provider alone, but also the perceived image of the industry. Hence we added a new variable – ‘perceived image of the industry’ – to the surveys in order to better assess the external factor (see results in the next section).

Results of surveys
Table 1 summarizes the results of the surveys according to the model factors and their related variables and the research hypotheses.

In order to examine the relations between the ICE factors and the HMO customers’ behaviour we applied three regression analyses (see Table 2).

We applied a logistic regression analysis to examine the differences between those who intend to continue contacting the clinics, and those who intend to use the call centres. The ICE factors and their related variables were used as independent variables. The model is significant and has a relatively high predictive ability (81.5% of the observations were correctly classified). Consistent with the internal factor and supporting H1a, the perceived outcome of the customers who intend to use the call centres is higher than those who prefer to contact the clinics directly. The latter believed more than did the former that the healthcare provider made the change in order to cut costs. However, EOU in this analysis is not significant, and hence cannot support this part of the hypothesis. The consistency factor is significant for the delivery gap, and H2a is significantly supported as customers who prefer to contact the clinics directly, perceived contacting familiar secretaries more important than customers who preferred to use the call centre.
In this analysis, customers’ technology orientation, which was tested by tendency to use technological tools, did not receive a significant result. On the other hand, the effect of customers’ previous experience with call centres is significantly positive for preferring the clinic secretaries over the call centres, hence \( H_3a \) was partially supported. Consistent with the external factor and supporting \( H_4a \), customers who preferred directly calling the clinics over the use of call centres associate this change more positively with the healthcare industry’s image and as being more compatible with their specific healthcare provider’s positioning.

We conducted a second logistic regression analysis to examine the effects of the ICE factors on customers’ willingness to extend the call centres to other services offered by the same provider. In this analysis, the internal and the external factors were found to have significant effects. \( H_1b \) (internal) receives significant support for its outcome and cost-perception effects. This means that customers would like to see the service extended, as they perceive its outcome as being better, and they believe less that the change was made to cut costs and is therefore of less value. \( H_4b \) received significant support for the perceived image effect.

We applied a third regression analysis to examine the correlation between the ICE factors and customers’ intentions of recommending using the call centre to their family and friends. Following the internal factor and supporting \( H_1c \), these findings demonstrate that customers will recommend the use of the call centres as their perceived outcome is better, and as they find the use of one number for all doctors’ appointments to be important. In this analysis we did not find a significant effect for the perceived cost in the internal factor. Other indicators for testing the ease-of-use effect: response time and convenience of operating hours are non-significant as well. In line with the consistency factor and supporting \( H_2c \) (delivery gap) and \( H_3c \) (technology orientation), customers will recommend the use of the call centres as they perceive contacting familiar secretaries to be less important, and as they use technological tools. Previous experience, however, was not found to have a significant effect on recommending behaviour. Following the external factor and supporting \( H_4c \), customers will recommend the use of the call centres as they associate
Table 2. Regressions results.

<table>
<thead>
<tr>
<th>ICE Factor</th>
<th>Predictor</th>
<th>Dependent variable</th>
<th>B Coeff.</th>
<th>B Coeff.</th>
<th>B Coeff.</th>
<th>Std. error</th>
<th>B Coeff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>Perceived outcome</td>
<td>Intended use of scheduling process (call centre or clinics) (categorical)</td>
<td>−0.893*</td>
<td>−0.826*</td>
<td>0.448*</td>
<td>0.07</td>
<td>0.316</td>
</tr>
<tr>
<td></td>
<td>Ease of use: call centre response time</td>
<td></td>
<td>0.130</td>
<td>0.124</td>
<td>−0.038</td>
<td>0.025</td>
<td>−0.066</td>
</tr>
<tr>
<td></td>
<td>Ease of use: convenience of call centre operating hours</td>
<td></td>
<td>−0.084</td>
<td>−0.002</td>
<td>−0.036</td>
<td>0.037</td>
<td>−0.043</td>
</tr>
<tr>
<td></td>
<td>Ease of use: importance of using one number to make all doctors' appointments</td>
<td></td>
<td>0.078</td>
<td>0.076</td>
<td>0.060**</td>
<td>0.024</td>
<td>0.104</td>
</tr>
<tr>
<td></td>
<td>Cost: cutting costs</td>
<td></td>
<td>0.162*</td>
<td>0.137**</td>
<td>−0.017</td>
<td>0.016</td>
<td>−0.041</td>
</tr>
<tr>
<td>Consistency</td>
<td>Delivery gap: importance of contacting familiar secretaries</td>
<td></td>
<td>0.340*</td>
<td>0.076</td>
<td>−0.041**</td>
<td>−0.017</td>
<td>−0.098</td>
</tr>
<tr>
<td></td>
<td>Customer technology orientation</td>
<td></td>
<td>−0.025</td>
<td>−0.032</td>
<td>0.034**</td>
<td>0.015</td>
<td>0.092</td>
</tr>
<tr>
<td></td>
<td>CTO: previous experience</td>
<td></td>
<td>0.213**</td>
<td>−0.051</td>
<td>−0.029</td>
<td>0.028</td>
<td>−0.041</td>
</tr>
<tr>
<td>External</td>
<td>Perceived image</td>
<td></td>
<td>−0.259*</td>
<td>−0.195**</td>
<td>0.136*</td>
<td>0.024</td>
<td>0.284</td>
</tr>
<tr>
<td></td>
<td>Perceived image: perceived suitability to specific service provider</td>
<td></td>
<td>−0.368*</td>
<td>0.135</td>
<td>0.080*</td>
<td>0.023</td>
<td>0.172</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td></td>
<td>−1.08</td>
<td>−1.538</td>
<td>2.890</td>
<td>0.312</td>
<td></td>
</tr>
</tbody>
</table>

Models statistics

- 2 log likelihood: 322.465, 350.655
- Chi square (10 df): 148.347 (P < 0.01), 69.446 (P < 0.01)
- Correct classification: 81.50%, 82.1%

*R = 0.680; R² = 0.463.
*p < 0.01; **p < 0.05.
this change more positively with the healthcare industry’s image and it being more compatible with their specific healthcare provider’s positioning.

Summing up, the three ICE factors (Internal, consistence and external) were found significantly influencing the customers’ behaviour intentions. Of the three variables of the internal factor, the perceived outcome was found to influence preference for, extension to other services, and recommendation of call centres, EOU was found to influence recommendation and cost was found to influence preference for and extension. For the consistency factor, delivery gap was found to influence preference for and recommendation, customer technology orientation was found to influence preference for and recommendation. As for the external factor, the perceived image of the organization was found to be significant in all three cases and the perceived suitability to the specific HMO to the industry’s image was found to be significant for preference for and recommendation.

Tables 3, 4, and 5 show the study’s findings by age, education, and gender and their respective representations among customers’ intention behaviours (use of call centres and willingness to extend them to other services). The findings are reported for two

Table 3. Demographics (interviewees’ ages) and behaviour intentions: Use of call centres vs. clinic secretaries and willingness to extend the service for the two sample phases after one month and after six months of the call centre services operation.

<table>
<thead>
<tr>
<th>Behaviour (raw %)</th>
<th>Sample phase</th>
<th>18–24</th>
<th>25–34</th>
<th>35–44</th>
<th>45–54</th>
<th>55–64</th>
<th>65+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use call centres</td>
<td>1 month</td>
<td>11 (7.2)</td>
<td>27 (17.8)</td>
<td>40 (26.3)</td>
<td>32 (18.1)</td>
<td>23 (15.1)</td>
<td>19 (12.5)</td>
<td>152</td>
</tr>
<tr>
<td></td>
<td>6 months</td>
<td>38 (9.9)</td>
<td>92 (24.1)</td>
<td>93 (24.3)</td>
<td>71 (18.6)</td>
<td>42 (11)</td>
<td>46 (12)</td>
<td>382</td>
</tr>
<tr>
<td>Will call the</td>
<td>1 month</td>
<td>19 (6.9)</td>
<td>53 (19.2)</td>
<td>62 (22.5)</td>
<td>50 (18.1)</td>
<td>52 (18.8)</td>
<td>40 (14.5)</td>
<td>276</td>
</tr>
<tr>
<td>clinics</td>
<td>6 months</td>
<td>20 (7.9)</td>
<td>57 (22.5)</td>
<td>69 (27.3)</td>
<td>54 (21.3)</td>
<td>32 (12.6)</td>
<td>21 (8.3)</td>
<td>253</td>
</tr>
<tr>
<td>Service extension</td>
<td>1 month</td>
<td>23 (6.3)</td>
<td>72 (19.7)</td>
<td>91 (24.9)</td>
<td>65 (17.8)</td>
<td>67 (18.4)</td>
<td>47 (12.9)</td>
<td>365</td>
</tr>
<tr>
<td></td>
<td>6 months</td>
<td>52 (10.4)</td>
<td>117 (23.4)</td>
<td>127 (25.4)</td>
<td>93 (18.6)</td>
<td>61 (12.2)</td>
<td>50 (10.0)</td>
<td>500</td>
</tr>
<tr>
<td>No extension</td>
<td>1 month</td>
<td>6 (6.4)</td>
<td>14 (14.9)</td>
<td>21 (22.3)</td>
<td>23 (24.5)</td>
<td>11 (11.7)</td>
<td>19 (20.2)</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>6 months</td>
<td>9 (5.6)</td>
<td>36 (22.5)</td>
<td>51 (31.9)</td>
<td>33 (20.6)</td>
<td>17 (10.6)</td>
<td>14 (8.8)</td>
<td>160</td>
</tr>
</tbody>
</table>

Chi-square tests revealed no significant levels for the correlation between age and behaviour.

Table 4. Demographics (interviewees’ education) and behaviour intentions: Use of call centres vs. clinic secretaries and willingness to extend the service for the two sample phases after one month and after six months of the call centre services operation.

<table>
<thead>
<tr>
<th>Behaviour (raw %)</th>
<th>Sample phase</th>
<th>Elementary</th>
<th>High school (partial)</th>
<th>Graduated high school</th>
<th>12+ (prof.)</th>
<th>12+ (academic)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use call centres</td>
<td>1 month</td>
<td>5 (3.5)</td>
<td>13 (9.1)</td>
<td>47 (33)</td>
<td>25 (17.6)</td>
<td>52 (36.66)</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>6 months</td>
<td>9 (2.3)</td>
<td>16 (4.2)</td>
<td>138 (36.7)</td>
<td>73 (19.4)</td>
<td>140 (37.2)</td>
<td>376</td>
</tr>
<tr>
<td>Will call the</td>
<td>1 month</td>
<td>16 (6.1)</td>
<td>19 (7.3)</td>
<td>81 (31.1)</td>
<td>41 (15.7)</td>
<td>103 (39.6)</td>
<td>260</td>
</tr>
<tr>
<td>clinics</td>
<td>6 months</td>
<td>2 (.8)</td>
<td>16 (6.5)</td>
<td>89 (36.1)</td>
<td>37 (15.0)</td>
<td>102 (41.4)</td>
<td>246</td>
</tr>
<tr>
<td>Service extension</td>
<td>1 month</td>
<td>20 (5.7)</td>
<td>29 (8.3)</td>
<td>113 (32.3)</td>
<td>58 (16.6)</td>
<td>129 (36.9)</td>
<td>349</td>
</tr>
<tr>
<td></td>
<td>6 months</td>
<td>8 (1.6)</td>
<td>24 (4.9)</td>
<td>175 (35.9)</td>
<td>91 (18.6)</td>
<td>189 (38.8)</td>
<td>487</td>
</tr>
<tr>
<td>No extension</td>
<td>1 month</td>
<td>4 (4.5)</td>
<td>5 (5.7)</td>
<td>26 (27.7)</td>
<td>9 (10.3)</td>
<td>43 (49.4)</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>6 months</td>
<td>5 (3.1)</td>
<td>6 (3.7)</td>
<td>64 (40.5)</td>
<td>27 (17.0)</td>
<td>56 (35.4)</td>
<td>158</td>
</tr>
</tbody>
</table>

Chi-square tests revealed no significant levels for the correlation between education and behaviour.
Table 5. Gender and behaviour intentions: Use of call centres vs. clinic secretaries and willingness to extend the service for the two sample phases after one month and after six months of the call centre’s operation.

<table>
<thead>
<tr>
<th>Behaviour (raw %)</th>
<th>Sample phase</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 month</td>
<td>6 months</td>
<td>1 month</td>
<td>6 months</td>
</tr>
<tr>
<td>Use call centres</td>
<td>51 (33.6)</td>
<td>100 (26.2)</td>
<td>101 (66.4)</td>
<td>282 (73.8)</td>
</tr>
<tr>
<td></td>
<td>90 (32.6)</td>
<td>65 (25.7)</td>
<td>186 (67.4)</td>
<td>188 (74.3)</td>
</tr>
<tr>
<td>Will call the clinics</td>
<td>118 (32.3)</td>
<td>247 (67.7)</td>
<td>365</td>
<td></td>
</tr>
<tr>
<td></td>
<td>138 (27.6)</td>
<td>362 (72.4)</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Service extension</td>
<td>35 (37.2)</td>
<td>59 (62.8)</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td></td>
<td>32 (20.0)</td>
<td>128 (80.0)</td>
<td>160</td>
<td></td>
</tr>
</tbody>
</table>

Chi-square tests revealed no significant levels for the correlation between gender and behaviour.

Table 6. Intentions of using call centre vs. clinic secretaries after one month and after six months of the call centre services operation.

<table>
<thead>
<tr>
<th>Phase of applying the call centre service</th>
<th>Clinic secretaries</th>
<th>Call centre</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>After one month</td>
<td>276</td>
<td>152</td>
<td>428</td>
</tr>
<tr>
<td>Raw %</td>
<td>64.5%</td>
<td>35.40%</td>
<td>100%</td>
</tr>
<tr>
<td>After six months</td>
<td>253</td>
<td>382</td>
<td>635</td>
</tr>
<tr>
<td>Raw %</td>
<td>39.80%</td>
<td>60.20%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Chi square = 6.416, 1df, p < 0.05, Fisher test < 0.05.

time periods: after one and after six months of the call centre’s being in operation. No significant correlations were found, hence $H5a$ and $H5b$ were not supported; yet $H5c$ proposing no difference between genders and behaviour was not rejected.

To examine the direct time effect on customers’ attitudes and behaviour, we tested the percentages of customers who reported that they intend to use the call centres vs. clinic secretaries after one month and after six months of the call centre’s operation (Table 6).

The Chi-square test indicates that there is a significant correlation between time periods and customers’ intended behaviour. After six months, a significantly higher percentage of customers (60.2%) intended to use the call centres than after one month’s use (35.4%); hence $H6$ is supported. Table 7 (see appendix) exhibits the means, standard deviations, and correlations for the various variables. Nearly all of the correlations are very low; none exceeds 0.6. Hence, multicollinearity is of minor concern in this study.

**Discussion**

The major objectives of this study were: (1) to identify and analyse major drivers and barriers for customers in adopting service changes; and (2) to provide practical implications for management considering technology-based service changes. The study drew on the ICE conceptualization, and its three factors (internal, consistency, and external) were verified, as were their effects on behaviour intentions (preference for, recommendation and extension). In addition, the study examined possible extensions for the framework.
The new measurement for handling urgent calls was supported by both qualitative and quantitative analyses. Urgency is of great importance vis-à-vis healthcare services such as ER and ambulances; furthermore, it may be salient in other service industries as well (i.e. travel; banking). EOU was reflected not only in the complexity of operating the new call system, but also in the ability to order several services via a single call.

### Internal factor: perceived outcome

The importance of contacting familiar secretaries was significant and consistent with previous studies, which noted that patients frequently rank communication and interpersonal aspects of the healthcare experience highest in importance (Bendall-Lyon & Powers, 2004). It may be argued that it is not only the human voice or contact that plays an important role in assessing new service encounters but also the continuity and familiarity of the personnel do so.

### Consistency factor: delivery gap

The importance of contacting familiar secretaries was significant and consistent with previous studies, which noted that patients frequently rank communication and interpersonal aspects of the healthcare experience highest in importance (Bendall-Lyon & Powers, 2004). It may be argued that it is not only the human voice or contact that plays an important role in assessing new service encounters but also the continuity and familiarity of the personnel do so.

### Customer technology orientation

Previous experience with call centres affected behaviour intentions regarding the use of the new call centre. One would expect previous experience to facilitate adoption of a similar service format; except however, where previous negative experience might inhibit adoption. This finding may be relevant not only to a health care context but also to other service industries.

---

**Table 7. Means (std) and correlations.**

<table>
<thead>
<tr>
<th></th>
<th>Means (std)</th>
<th>Perceived outcome</th>
<th>Response time</th>
<th>Operation convenience</th>
<th>One # for all PCPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived outcome</td>
<td>5.18 (1.52)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response time</td>
<td>5.72 (1.60)</td>
<td>0.058</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating time</td>
<td>6.57 (1.02)</td>
<td>0.039</td>
<td>0.316*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One # for all PCPs</td>
<td>6.06 (1.68)</td>
<td>-0.008</td>
<td>0.096*</td>
<td>0.249*</td>
<td></td>
</tr>
<tr>
<td>Contacting familiar</td>
<td>5.03 (2.24)</td>
<td>-0.009</td>
<td>-0.119*</td>
<td>-0.068</td>
<td>0.050</td>
</tr>
<tr>
<td>secretaries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutting costs</td>
<td>4.46 (2.33)</td>
<td>-0.031</td>
<td>-0.047</td>
<td>-0.010</td>
<td>0.025</td>
</tr>
<tr>
<td>Industry perceived</td>
<td>5.44 (1.92)</td>
<td>0.012</td>
<td>0.324*</td>
<td>0.186*</td>
<td>0.167*</td>
</tr>
<tr>
<td>image</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived suitability</td>
<td>5.01 (1.98)</td>
<td>0.002</td>
<td>0.356*</td>
<td>0.259*</td>
<td>0.217*</td>
</tr>
<tr>
<td>Previous experience</td>
<td>1.97 (1.34)</td>
<td>-0.012</td>
<td>-0.017</td>
<td>-0.006</td>
<td>-0.001</td>
</tr>
<tr>
<td>Technology orientation</td>
<td>3.87 (2.57)</td>
<td>0.095</td>
<td>0.041</td>
<td>-0.043</td>
<td>0.136*</td>
</tr>
<tr>
<td>Contacting familiar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>secretaries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry perceived</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>image</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived suitability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.01.
**External factor**

The factor was extended with a new variable – *perceived image of the industry*. This variable was found significant and may be relevant in a broader context. Competitors commonly serve as reference groups not only for organizations but also for customers, who often tend to compare service process and offers with other providers. Hence, while a service change can increase customer convenience (e.g. web-based consulting) it may be perceived as incompatible with the industry image as characterized by personal contact. In such cases, the organization’s image and positioning may be damaged.

Two other factors were evaluated to explain technology-based change: *Individual Differences* (represented by the demographics of age, education, and gender); and *Time*. Individual differences did not play major roles in explaining or predicting behaviour intentions. Regarding age, a possible explanation is that for the end user, the technology was simple to operate, so even elderly users were familiar with it. As for gender, this finding is consistent with previous studies that found that gender differences regarding technology acceptance diminish over time (Venkatesh & Morris, 2000; Venkatesh et al., 2003). While high technology may be positively associated with education, it appears that lack of education may be moderated by technology orientation and experience. However, this study did not find any significant direct effect of education on behaviour. This might be explained by the relatively established technology of the particular research setting and the fact that many customers have already had some experience with similar systems. The time factor had a significant influence on customer behaviour intentions. As time passes, people get used to the new service format and uncertainty thereof or fear of the ‘new’ diminishes (Laroche, Bergeron, & Goutaland, 2003). Another explanation is that a customer’s assessment of a service improves over time as s/he gains experience using it (Bolton, 1998; Boulding, Kalra, & Staelin, 1999; Boulding, Kalra, Staelin, & Zeithaml, 1993).

**Managerial implications**

Our second objective was to provide practical implications for management considering technology-based service changes. Improving service with technology has become common practice in many organizations. However, problems arise when managers feel that they know their clients best and consequently ‘what’s good for them’. While managers believe that technological changes take the service miles ahead and contribute to their customers’ welfare, the latter believe that technology-based service improvements are complicated, impersonal, and decrease their benefit dramatically. It is suggested that prior to technological changes in service, managers analyse the intended service change and customers’ perceptions of them utilizing the ICE model. This study suggests to check customers’ past experiences with similar services in addition to their general technology orientation. While previous experience facilitates the adoption of a new service in general, this study found that in some cases, previous *negative* experience with similar services can jeopardize the adoption. Therefore, managers should take such previous experience into consideration.

We also recommend exploring the industry’s image apart from the specific organization’s image. It appears that both the organization’s image and the industry’s perceived image play roles in customers’ behaviour intentions regarding a service change. Hence, it is suggested that managers analyse both images and assess their suitability to the new service format before implementing the change.
Time was another factor introduced in this study. Over time, as uncertainty decreases, the tendency to adopt a new service increases. Managers can further the use of the new service by providing clear instructions and attentive support. Furthermore, less resistance may occur if the new service is provided alongside the old one, and the transition is gradual.

Commonly, service representatives work part time or on a temporary basis. Managers should bear in mind that being served by the same person time after time may play an important role in customers’ perceptions, and hence switching staff or outsourcing customer service may decrease customers’ satisfaction with the service.

Finally, the study provides some specific considerations for managers in the healthcare industry: Because customers find their interaction with a PCP more intimate than that with a specialist physician, they may expect a more personal way of scheduling a PCP appointment. Therefore, direct and personal handling of urgent PCP appointments seems to be of great importance to customers, and might be considered a true service improvement.

**Future research and limitations**

The study focused on a service change in a healthcare context from the patients’ perspective. However, the healthcare setting is more complex than other service provider-customer relationships, as it involves a third party: the doctor. In many cases, doctors work as independent contractors and do not have the same views and interests as does the HMO. Future research may explore the doctors’ role in this triangle, with specific emphasis on doctors’ perceptions and preferences. This study also calls for a comprehensive analysis of the time factor. As implied in the results, aside from its direct effect, the time factor may also serve as a mediator for factors influencing adoption. Such indirect effects of time may be explored by examining customers’ perceptions of these factors over time.

This study was conducted in a Mediterranean country where the vast majority of citizens (more than 90% of the population) have medical insurance by law. The market is competitive and dominated by four HMO organizations. Replicating this study in another country will contribute to further validation of the model and generalization of the findings. Other specific characteristics are innovativeness and high technology orientation that generally characterize the country’s residents. We believe that higher subjects’ heterogeneity in this field will provide further support for the contribution of Customer Technology Orientation to the adoption of technology service changes.

**References**


Appendix. The measures

**Behavioural intentions**

**Choice**
Assuming that you can always choose, how would you like to schedule your doctor appointment the next time you need one?

1. By calling the call centre
2. Through the clinic office

**Extension**
Would you like the new service to be extended beyond scheduling appointments for PCP visits, such as for laboratory tests and physical therapy?

1. Yes
2. No

**Recommendation**
Would you recommend your family and friends using the call centre for scheduling PCP appointments?

1. I would not recommend at all
2. I may not recommend
3. I would probably recommend
4. I would strongly recommend

**Internal factor**

**Perceived outcome**
In your opinion, is the call centre a service improvement, or a deterioration in service for scheduling doctor appointments?

1. Considerable deterioration
2. Deterioration
3. Neither improvement nor deterioration
4. Improvement
5. Significant improvement

Rate the level of your satisfaction on a 7-point scale, where 1 stands for completely unsatisfied and 7 stands for completely satisfied:

a. **General satisfaction with the service** received at the call centre
b. Satisfaction with the service representatives’ willingness to help at the call centre **in urgent cases, even when there is no available appointment**

c. Satisfaction with call centre response time
d. Satisfaction with convenience of call centre operating hours

Rate the importance of the following characteristics of scheduling doctor appointments on a 7-point scale, where 1 stands for ‘not at all important’ and 7 stands for ‘very important’:

Receiving information about all doctors by dialling one phone number

**Cost**
Rate your agreement/disagreement on a 7-point scale, where 1 stands for ‘completely disagree’ and 7 stands for ‘completely agree’:
The health care provider has launched the appointment scheduling call centre in order to cut costs.

**Consistency factor**

**The delivery gap**

Rate the importance of the following characteristics of scheduling doctor appointments on a 7-point scale, where 1 stands for ‘not at all important’ and 7 stands for ‘very important’:

Scheduling appointments with the same secretaries, whom I know and who know me

**Customer technology orientation**

Have you ever used call centres of other service providers?


Rate your agreement\disagreement on a 7-point scale, where 1 stands for ‘completely disagree’ and 7 stands for ‘completely agree.

When there is a possibility of receiving services via technologies like the Web or computerized services, I usually try it.

**External factor**

**Perceived image of the organization and of the industry**

Rate your agreement\disagreement on a 7-point scale, where 1 stands for ‘completely disagree’ and 7 stands for ‘completely agree’:

1. The move to a central call centre for scheduling doctors’ appointments suits this specific healthcare provider.

2. Healthcare providers have shifted to call centres in order to improve their services to the customer.