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An Empirical Examination of User Satisfaction With an Information System Implementation

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Abstract

As information technology becomes more and more ubiquitous in modern service organizations, decision makers in these organizations need guidance in determining which service offerings should or can be automated, and which should not. This project seeks to provide such guidance, by empirically examining user reactions to both traditional, human-staffed service offerings and newer, automated service offerings. Specifically, five components of user satisfaction which have been established in the literature are measured both before and after an automated telephone information system is installed to replace a human-staffed customer service center. The field site is a large national financial services company, and two sets of 500 surveys each were mailed to users of the system. Results indicate that the longer the length of usage of a service prior to automation, the more satisfied the user. However, both the age of the user, and the user's previous experience with similar types of automation had no effect on satisfaction.

Introduction

Information Technology is providing the opportunity to automate all varieties of business tasks and functions. The choice to capitalize on this opportunity is obvious for certain efficiency-based processes, but much less obvious for functions which have a human element. Will customers be displeased if the smiling face or reassuring voice that previously answered their questions is replaced by a machine? Are dissatisfied customers consistently coming from a certain demographic group? Do certain groups need to be targeted (or avoided)? Service managers are being forced to confront questions like these almost daily.

Theory And Research Hypotheses

Heskett (1987) and Heskett et al (1990) provide a useful framework for managers to handle such questions, which they call the "Strategic Service Vision". This framework explains service delivery decisions as having four basic elements: Target Market Segments, Service Concept, Operating Strategy, and Service Delivery System. The goal of this research is to empirically examine the interplay between these elements in an Information System (IS) implementation. In particular, the Target Market Segment element will be analyzed given a Service Concept, Operating Strategy, and Service Delivery System which has moved from human-based to near complete automation. What "market segments" reacted favorably to an automated service delivery system? Which did not?

Studies by Rust & Oliver (1994), Kerschner & Chelsvig (1981), Zeithaml & Gilly (1987), Millman & Hartwick (1987), and others have shown that paying careful attention to the demographics of users is critical to implementation success. These studies suggest the following research hypotheses concerning the Target Market Segment for an IS implementation:

H1: As the age of the user increases, satisfaction with a newly implemented IS, as compared to satisfaction with the "old method" of transferring information, decreases.

H1a: User age does not affect user satisfaction with an IS implementation.

H2: As the length of time which a user has used the "old method" of obtaining information increases, satisfaction with the newly implemented IS increases.

H2a: Time of previous system usage does not affect user satisfaction with an IS implementation.

H3: If users have already experienced the type of system to be implemented in another context, they are more likely to be satisfied with the newly implemented system.

H3a: Previous experience with the type of system to be implemented does not affect user satisfaction with an IS implementation.

Research Methodology

A method of measuring user satisfaction is necessary to test these hypotheses. The traditional means of determining user satisfaction is through the use of a survey. The literature reveals many successful vehicles for measuring user satisfaction (Ives, et al., 1983; Bailey & Pearson, 1983), but in the realm of end user computing the work of Doll & Torkzadeh (1988) remains the standard. Their instrument was carefully developed and tested for both reliability and validity. Methodological and conceptual issues about their instrument have been raised (Etezadi-Amoli & Farhoomand, 1991), but test-retest studies have further demonstrated the reliability and stability of the instrument (Doll & Torkzadeh, 1991; Hendrickson, et al., 1994). As such, the Doll & Torkzadeh measure of user satisfaction was chosen as the model for the instrument in this study.

The Doll & Torkzadeh instrument measures end user satisfaction across five components - content, accuracy, format, ease of use, and timeliness - using twelve questions with Likert-type scales. The instrument developed for this study followed these specifications, with the exception of number of questions. Due to practical constraints associated with the company-sponsored survey, six questions were used to address the five components of satisfaction, as opposed to the Doll & Torkzadeh guideline of 12. However, issues of reliability and validity arising from the difference in number of questions have been successfully addressed (Downing, 1997). All questions relating to satisfaction on the survey used a 5-point Likert scale, with "1" being extremely satisfied, and "5" being extremely dissatisfied.

The Information System

This research applied this instrument to an actual service environment both before and after the installation of an automated service offering. In this case, the service offering was a computerized information system. The system is a 12-line telephone interactive voice response system (IVRS) responsible for providing 401(k) retirement plan information to 10,000 internal employees of a large national financial services firm. These employees are the customers who have the opportunity to use the system. As is the case with other IVRSs in this field, customers can use their touch-tone telephones to access personal account or general plan information, request forms and plan brochures, and make various personal account changes (transfer account balances, initiate withdrawals and loans, change contribution amounts, etc.). Additionally, the IVRS allows customers to model unlimited "what if" scenarios of potential loans and projected plan account balances. All of these inquiries were previously handled by human customer service representatives.

Data Collection and Analysis

The research design was to mail the written surveys to 1,000 employees who had experienced both the non-automated and the automated methods of information retrieval. On two occasions, 500 surveys were mailed to employees who had called both a human representative and the automated system. In addition to the satisfaction data, the survey also asked users their age, the length of time they had been in the plan (length of time using the service / needing the information), and whether they had used an automated voice response system before. The first survey distribution generated 263 returns (52.6%), and the second distribution 280 (56%).

Results And Discussion

An immediate and verifiable (t-tests at the =.05 level) result was that the users were more satisfied after the implementation of the information system than they were using human-based information transfer. More important to this study, however, were the questions relating to the three research hypotheses. Table 1 summarizes the ANOVA results (=.05) for H1-H3.

Table 1. ANOVA Results for H1-H3.

	Mean of Satisfaction - Before IS	**Mean of Satisfaction - After IS**
H1- Age:		
25 or under	2.91	1.77
26-35	2.62	1.51
36-45	2.60	1.38
46-55	2.46	1.42
56 or older	2.43	1.41
ANOVA p-Value	0.464	0.075
Conclusion	No difference	No difference
H2-Time Using Old Service:		
0-1 yrs.	2.45	1.81
1-2 yrs.	2.49	1.34
2-3 yrs.	2.59	1.49
3-5 yrs.	2.74	1.52
More than 5 yrs.	2.58	1.41
ANOVA p-Value	0.677	0.008
Conclusion	No difference	At least two means are different
H3- Previous Experience:		
Yes	2.61	1.46
No	2.39	1.37
ANOVA p-Value	0.169	0.309
Conclusion	No difference	No difference

Due to space limitations, only the "Overall Satisfaction" means are shown. Note that means were calculated for each of the five components of satisfaction, with similar results. Further, note that the ANOVA comparisons are being made in a columnar direction in Table 1. In other words, for H1, ANOVA is being done first on the five different *before IS installation* satisfaction means associated with the different age groups, and then a separate ANOVA is being done on the five different *after IS installation* satisfaction

means associated with the different age groups. The goal is to determine whether the relationships of the means in these three demographic categories are different after the implementation of the IS.

H1 is not supported by the data, but it is interesting that the satisfaction means get larger (less satisfied) as age gets smaller, and in fact at the =.10 level this would be supported in the "After" category. This fact is in direct contradiction to the research hypothesis. In testing H2, it was shown that at least two of the means were different. Tukey's multiple comparison procedure was then applied to demonstrate that the users with the least amount of time using the service (0-1 years) were in fact less satisfied with the IS implementation. H3 is not supported by the data.

Only one of the three hypotheses was supported, yet the results are useful. First, the IS implementation did not affect the satisfaction of different aged users in different ways. This fact can alleviate some managers' concerns about whether to implement IS over an older user base, and can check some managers' confidences about implementing IS over a younger user base. The hypothesis that was supported, that those who have used a particular service for a longer period of time are more likely to appreciate an automation of that service, should also prove helpful to managers attempting to decide when to implement an IS. Mangers can have increased confidence that efforts directed toward automation will be well received by those who fully understand and have used the non-automated version of the service. Finally, the rejection of H3, while non-intuitive, informs managers that a user base which has previous experience with the particular type of IS being implemented does not produce additional satisfaction.

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