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Americas Conference on Information Systems (AMCIS)

December 2002

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Abstract

This work in progress proposes a methodology to assess the implementation of Intranets. This study proposes a measure of Intranet implementations in terms of organizational effectiveness and to identify the effect, if any, of the organization's management infrastructure. The results will guide future research and it will provide practitioners with useful guidelines for future Intranet implementations.

Introduction

As we enter the twenty-first century, Internet-based applications are becoming very prevalent in today's computing environment. Even though some IT organizations continue to support mainframe and client/server applications, Internet-based applications tend to be the platform of choice for new application development. For example, Internet host systems, with a growth rate of almost one hundred percent annually, have grown from 28,000 in 1988 to 150 million in 2001 (Cerf, 2001). The number of Internet users has also grown exponentially from 61 million in 1996 to 147 million in 2000 (Adamic & Huberman, 2000).

The Internet explosion and the user familiarity of Web browsers have led to the proliferation of Intranets. Intranets are very attractive because they offer cost-effective and flexible solutions for organizations. Intranets are used for a wide range of applications, from department document posting to real-time sharing of cross-functional organizations (Lai, 2001). Similar to Intranets, other non-mainframe architectures (e.g., Client/Server) have also brought similar benefits to organizations (Schultheis and Bock, 1994).

Given the importance and popularity of Intranet applications, it is important to develop a methodology to measure the success of their implementations. A review of the current literature shows that most studies related to Intranet implementations are either anecdotal or conceptual in nature (Lai, 2001).

Research Objectives

The main objective of this study is to propose a measure of Intranet implementations in terms of organizational effectiveness and to identify the effect, if any, of the organization's management infrastructure. In this study, organizational effectiveness will be measured in terms of service quality. Management infrastructure refers to whether the organization has centralized or decentralized decision-making.

Evaluation Criteria

One method used in assessing the effectiveness of an IS implementations is to measure its effectiveness in the organization (Adams et al, 1992; Belcher and Watson, 1993; Gill, 1995; Pitt et al., 1995). DeLone and McLean (1992) showed that IS effectiveness is a multidimensional construct, therefore requiring multiple measures. DeLone and McLean's taxonomy includes the following measures:

1. Quality of the System: the match between expected and actual system performance.
2. Quality of information: the accuracy of system output.

3. Actual use: the actual consumption/utilization of system products.
4. User satisfaction: the degree to which users enjoy using the system.
5. Individual impact: the degree to which the system influences users' behavior.
6. Organizational impact: the degree to which the system influences the organization as a whole.

It is important to note that DeLone and McLean's taxonomy implies that IS effectiveness can be measured in qualitative terms such as user satisfaction or their perception of system quality.

Pitt et al. (1995) acknowledged that IS effectiveness is a multi-construct measure and that the current methodology ignored service quality. Pitt et al. extended the model of measuring IS effectiveness by introducing an instrument called SERVQUAL. The modified instrument measures IS effectiveness in terms of service quality (see Appendix).

Since Information Service (IS) departments not only provide products but also include services, service quality is important in the measurement of IS effectiveness. The service quality of the IS department is a key indicator of IS success (Moad, 1989; Rockart, 1982). Service quality is the degree of congruence between customers' perceptions and expectations (Gronroos, 1982; Sasser, et al., 1978). Originally developed by the marketing area, SERVQUAL uses perceptions and expectations to measure service quality. Pitt et al. (1995) argue that qualitative factors such as service quality need to be included in the measurement of IS success. Furthermore, Pitt et al. (1995) argued that the instrument can be used as a measure of IS service quality. Even though their position has been challenged by Van Dyke et al.(1997), other studies have confirmed the validity of the instrument (Pitt, Watson, & Kavan, 1997; Watson, Pitt, & Kavan, 1998).

Effect of Management Infrastructure

Brown and Bostrom (1994) conducted a study that analyzed the organizational designs for the management of end-user computing (EUC).[1] Their study categorized organizational infrastructures in terms of organic or mechanistic characteristics.

The Organic Design

The organic design is expressed as "decentralized, highly participatory form of decision making with loose controls" (Brown and Bostrom, 1994, p. 183), which means that the organization does not have central control of decision-making. The organic management infrastructure, as it applies to Intranet implementations, means that there are no central policies for the selection and implementation of Intranet applications.

Organizations that utilize this type of management style are usually identified by the "islands of automation" that they create. These "islands of automation" refer to the condition where there is no consistent approach or methodology for application development from one department to the next. The lack of standards and/or methodologies often leads to unique and different Intranet implementations, where departments throughout the organization employ different approaches toward the technology to be used, such as different computer brands, programming languages, database management servers, Web servers, etc. The main disadvantage of the organic design is the lack of standards and control decisions. Uncontrolled acquisition of software and/or hardware platforms presents threats to data integrity and security. Decentralized application development may also be redundant and inefficient (Alavi and Weiss, 1985).

An organization that has an organic management infrastructure is likely to experience difficulties with Intranet implementations. In a study of end user computing, Brown and Bostrom (1994) found no support for the effectiveness of the organic design. This leads to the first hypothesis:

H1: Organizations with an organic management infrastructure will have unsuccessful implementations of Intranet systems.

[1]Even though the original literature on EUC dealt primarily with Client/Server implementations (Alavi, Nelson, & Weiss, 1987-88; Olfman & Bostrom, 1991; Trauth & Cole, 1992), EUC can also be applied to Intranet applications.

The Mechanistic Design

The mechanistic design represents "centralized decision making with a more tightly controlled form of management" (Brown and Bostrom, 1994, p. 183). This approach centralizes decision-making and it brings the formation of central methodologies for the development and deployment of Intranet applications. Under a mechanistic approach, the organization has control on the number and/or type of hardware components, programming languages, Web servers, and the database management servers that it wants to implement in the organization.

The Contingency Model of EUC Management Effectiveness by Brown and Bostrom (1989) posits that the benefits of the organic design are high growth at the departmental level at the expense of lack of integration at the organizational level. On the contrary, the mechanistic design provides interdepartmental integration through its centralized methodologies and controls. One drawback of the mechanistic design is that it does not promote high growth but rather a more systematic growth in the implementation of new technologies (e.g. Intranet applications).

Brown and Bostrom (1994) found that the mechanistic design was the effective design for managing EUC. This leads to the second hypothesis:

H2: Organizations with a mechanistic management infrastructure will have successful implementations of Intranet applications.

Proposed Research Methodology

The proposed research methodology is a survey instrument based on the SERVQUAL instrument developed by Pitt et al. The revised instrument will include the constructs of SERVQUAL along with the construct of Brown and Bostrom (1994) which identifies the degree of IS centralization of the management infrastructure. A preliminary version of the instrument will be reviewed by a group of IS researchers and practitioners familiar with Intranet implementations. Once the preliminary version has been conducted and feedback incorporated into the survey, the instrument will be administered in its final form to approximately 200 participants. Assuming a medium effect size (0.5), this sample size should be large enough to assess statistical significance.

Instrument Administration

The suggested methodology to evaluate Intranet success in terms of IS effectiveness is to conduct pre-test and post-test evaluations of the quality of service received by the users. This instrument will be administered to groups that are going to migrate their application from client/server to Intranet environments. Once the Intranet application has been fully implemented, six months should be allowed for the organization to adapt to the new technology and to develop the background necessary to evaluate the IS department in terms of service quality.

The instrument will measure the success of Intranet implementations in terms of organizational effectiveness from a service quality perspective. The instrument also includes one construct that identifies the degree of centralization of the firm. This construct will be used to assess if the management infrastructure has any effect on the success of the Intranet application.

Statistical Techniques

Based on the ordinal nature of the instrument, a non-parametric statistical technique will be used. The two-way analysis of variance can be used when the same objects are observed more than once (Kerlinger, 1986). The two-way analysis of variance will be used to identify any improvement in service quality from the pre-test and the post-test.

The second portion of the analysis is to identify any effect of the management infrastructure on the success of the Intranet implementation. A correlation analysis between the last two items (S1 and S2 in appendix) will be performed. This analysis will identify if there is a correlation between the management infrastructure (mechanistic or organic) and the success level of the Intranet implementation.

Independent Variables

Management infrastructure: measured by EUC Structure (Brown and Bostrom, 1994).

Dependent Variable

Intranet success: measured by SERVQUAL (Pitt et al., 1995)

Conclusion

Intranet applications are commonplace in today's IT environment. Given their popularity, it is important to develop measures to assess their implementations. This research proposes a measure of Intranet implementations in terms of organizational effectiveness. The proposal also questions the effect that the management infrastructure (organic or mechanistic) may have on the success of an Intranet implementation. Specifically, this study proposes to examine the relationship between management infrastructure and Intranet effectiveness.

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Appendix

SERVQUAL (Pitt, et al., 1995)

SERVICE QUALITY EXPECTATIONS

Directions: This survey deals with your opinion of the Information Systems Department (IS). Based on your experiences as a user, please think about the kind of IS unit that would deliver excellent quality of service. Think about the kind of IS unit with which you would be pleased to do business. Please show the extent to which you think such a unit would possess the feature described by each statement. If you strongly agree that these units should possess a feature, circle 7. If you strongly disagree that these units should possess a feature, circle 1. If your feeling is less strong, circle one of the numbers in the middle. There are no right or wrong answers—all we are interested in is a number that truly reflects your expectations about IS.

Please respond to all statements

SCALE:
Strongly disagree Strongly agree
1 ---------- 2 ---------- 3 ---------- 4 ---------- 5 ---------- 6 ---------- 7

E1. They will have up-to-date hardware and software
E2. Their physical facilities will be visually appealing
E3. Their employees will be well dressed and neat in appearance
E4. The appearance of the physical facilities of these IS units will be in keeping with the kind of services provided.
E5. When these IS units promise to do something by a certain time, they will do so.
E6. When users have a problem, these IS units will show a sincere interest in solving it.
E7. These IS units will be dependable
E8. They will provide their services at the times they promise to do so.
E9. They will insist on error-free records.
E10. They will tell users exactly when services will be performed.
E11. Employees will give prompt service to users.
E12. Employees will always be willing to help users.
E13. Employees will never be too busy to respond to users' requests.
E14. The behavior of employees will instill confidence in users.
E15. Users will feel safe in their transactions with these IS units employees.
E16. Employees will be consistently courteous with users.
E17. Employees will have the knowledge to do their job well.
E18. These IS units will give users individual attention.
E19. These IS units will have operating hours convenient to all their users.
E20. These IS units will have employees who give users personal attention.
E21. These IS units will have the users' best interest at heart.
E22. The employees of these IS units will understand the specific needs of their users.

SERVICE QUALITY PERCEPTIONS

Directions: The following set of statements relate to your feelings about ABC Corporation's IS unit. For each statement, please show the extent to which you believe ABC Corporation's IS has the feature described by the statement. Once again, circling a 7 means that you strongly agree that ABC Corporation's IS has that feature, and circling 1 means that you strongly disagree. You may circle any of the numbers in the middle that show how strong your feelings are. There are no right or wrong answers--all we are interested in is a number that best shows your perceptions about ABC Corporation's IS unit.

Please respond to all statements

SCALE:
Strongly disagree Strongly agree
1 ---------- 2 ---------- 3 ---------- 4 ---------- 5 ---------- 6 ---------- 7

P1. IS has up-to-date hardware and software
P2. IS's physical facilities are visually appealing
P3. IS's employees are well dressed and neat in appearance
P4. The appearance of the physical facilities of IS is in keeping with the kind of services provided.
P5. When IS promises to do something by a certain time, it does so.
P6. When users have a problem, IS shows a sincere interest in solving it.
P7. IS is dependable
P8. IS provides its services at the times it promises to do so
P9. IS insists on error-free records
P10. IS tell users exactly when services will be performed
P11. IS employees give prompt service to users
P12. IS employees are always willing to help users
P13. IS employees are never be too busy to respond to users' requests
P14. The behavior of IS employees instills confidence in users
P15. Users will feel safe in their transactions with IS's employees
P16. IS employees are consistently courteous with users
P17. IS employees have the knowledge to do their job well
P18. IS gives users individual attention
P19. IS has operating hours convenient to all its users
P20. IS has employees who give users personal attention
P21. IS has the users' best interests at heart.
P22. Employees of IS understand the specific needs of its users

Now please complete the following:

S1. Overall, how would you rate the quality of service provided by IS? Please indicate your assessment by circling one of the points on the scale below:

Poor Excellent
1 ---------- 2 ---------- 3 ---------- 4 ---------- 5 ---------- 6 ---------- 7

EUC Structure (Brown and Bostrom, 1994)

Informants were instructed to identify the IS vs. User Department Location and hierarchical location for the decision-making authority for five decision areas, as well as to identify in a box the position levels of the people who participate in each decision area.

IS Department Vs. User Department Location

For the items below, please indicate (by circling one option only) where does decision-making take place for any project related to development of a new Intranet application:

1 IS department alone
2 IS department but with user department Input
3 IS department but with considerable user department influence
4 Equally between the IS department and user departments
5 User departments but with considerable IS department Influence
6 User departments but with IS department Input
7 User departments Alone
O Other _____ (please fill in if used)
N/A Decision area not being formally addressed

For the items below, please indicate which members of your organization are involved for each task:

	Top mgr of IS and/or user departments	Middle mgr of IS and/or user departments	First line supervisor of IS and/or user departments	Individual employees of IS and/or user departments	Other (please fill in if used)
Goal setting: e.g. number of end users trained, levels of support for given range of tools.					
Allocations of resources: e.g., establishing priorities between training; software purchases vs. in-house development.					
Development of policies and procedures: e.g., whether support personnel will answer questions only about certain software products.					
Assignment of roles and responsibilities: e.g., organizing personnel support around product knowledge vs. functional knowledge					
Assessment of task performance: e.g., whether user input will be part of performance appraisal for support personnel located in IS department					