

FACTORS INFLUENCING THE ADOPTION AND IMPLEMENTATION OF ORGANIZATIONAL INTRANETS

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ABSTRACT

Intranets or corporate information portals can have tremendous impacts on modern organizations. Today's intranets are not just sources for publishing and posting internal documents and corporate policies, but instead are sources for knowledge management, work group collaboration, and on-line access to a multitude of other applications that support end-user tasks. Despite these impacts, there is a scarcity of research exploring intranet adoption and implementation. In this paper, we propose a framework that identifies several contextual antecedents of intranet adoption and implementation. An initial validation of the framework is provided through a case study that has implications for future research investigations.

Keywords: intranets, intranet development life cycle, intranet adoption and implementation, innovation diffusion

INTRODUCTION

The advent of emerging technologies has had a dramatic impact on how information is shared, how end-users collaborate, and how knowledge is managed in organizations. Intranet is one of the many emerging technologies that provide a platform for an organization to better support end-users in accomplishing their tasks by speeding up access to information, enhancing communications across functions, providing capabilities for collaboration, and facilitating online access to disparate knowledge bases. An intranet is an internal corporate network that utilizes the Internet to share and disseminate information and knowledge using Internet protocols (21).

The greatest advantages of implementing intranets is that they can be developed less expensively than other technologies and they can be adapted to any operating system and hardware platform (21). They also offer environmentally friendly internal communication, increased information and knowledge accessibility, timely and current information availability, easy information publication, distribution, and training (20). Intranets are a critical first step to create an infrastructure for developing extranets for linking suppliers and customers, and to promote a virtual organization arrangement (17).

Intranets are evolving rapidly. Today's intranets are no longer viewed as sources of static data and information but rather sources that provide knowledge to end-users, increasing their productivity, and transforming how work is done. The new generation of intranets will be able to launch end-user applications from a single source and create enterprise collaboration environments. It is predicted that intranets will have the capability to enable organizations to "streamline business processes, saving [them] millions of dollars each year" (15, pg. 313).

Despite their increasing popularity, we know very little about factors that influence the adoption and implementation of corporate intranets. There is some empirical evidence exploring

differences between intranet adopters and non-adopters (19). However, the variables considered are limited. Moreover, intranet implementation amongst adopting organizations has not been addressed. In this paper, we tap innovation diffusion theory and propose a comprehensive framework to identify the antecedents of the intranet adoption and implementation process. Through a case study, we illustrate the influence of the antecedents of intranet adoption and implementation. Our findings suggest that the influence of antecedents varies as organizations proceed from the initial phase to the final phase of the IDLC.

INTRANET ADOPTION AND IMPLEMENTATION

The adoption and implementation of corporate intranets can be viewed as an outcome of the intranet development life cycle (IDLC) which consists of five phases: Non-adoption state (no intranet), initiation, prototype development cycle, production system development, and operation, maintenance, and enhancement (18). Figure 1 illustrates the IDLC. The adoption process usually requires that the organization make resource commitments to investigate the technology under consideration: as a move from phase “0” to phase “1” of the IDLC. Implementation, on the other hand, requires delivery of the technology to the end-user: the process by which organizations move from phase “1” through phase “4.” Given this, the evolution of Intranets can be viewed as a repetition of the IDLC. Thus intranets continue to evolve with iterations of the IDLC.

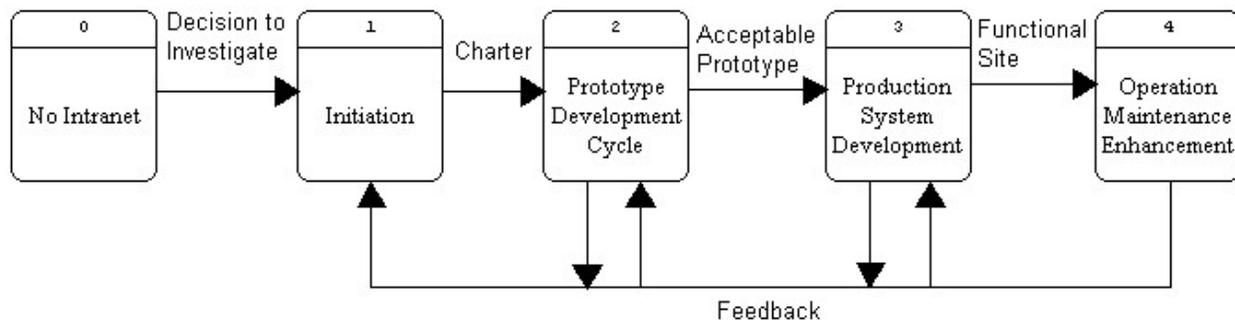


Figure 1: Intranet Development Life Cycle

ANTECEDENTS OF INTRANET ADOPTION AND IMPLEMENTATION: A PROPOSED FRAMEWORK

Organization innovation diffusion can be a useful source to build a theoretical framework for Intranet adoption and implementation. As noted by Fichman: “[It] provides a useful perspective on one of the most persistent challenging topics in the IT field, namely, how to improve technology assessment, adoption, and implementation” (9, pg. 195). Broadly, innovation can be defined as the adoption of an internally generated or purchased device, system, policy, program, process, product, or service, which is new to the adopting organization (6, 7). Five variable classes are believed to have an impact on innovation adoption and implementation. These include external environmental characteristics, organizational characteristics, user characteristics, task characteristics, and technology characteristics (14).

Case Study Background

The discussion that follows is based on observations of an intranet development project within the business school of a university in the northwest. Departments had various static pages, but this project, initiated in January 2001, was undertaken to develop a standard set of pages for all of the departments and centers in the college. The specific objectives of the project were (1) to develop a consistent “look and feel” for all college pages, (2) base the pages on database information maintained by the college and the university, and (3) develop administrative pages for the system that would be easy for department staff to maintain. Iterations of the prototype system were produced throughout 2001 and the initial production version was unveiled in January 2002.

External Environment Characteristics

The importance of exploring the impact of the external environment factors on IT innovation diffusion has been emphasized in the literature (11). These include: uncertainty (dynamism, heterogeneity, and hostility), supplier and customer pressures, and vendor availability. First, organizations operating in more uncertain environments have greater needs to coordinate their activities and are more likely to adopt and implement intranets than their stable counterparts. The fact that competitor university web sites were visually and functionally more appealing affected both the adoption decision and the review of designs during the “prototype development cycle” phase of the IDLC. However, lack of turbulence (dynamism) and less complexity (heterogeneity) in university environments may have lessened the influence of uncertainty on intranet adoption and implementation. Environmental uncertainty is likely to influence intranet adoption and implementation in corporate business contexts, where the environments are not only hostile but also more dynamic and complex.

Second, integrating activities up- and downstream in the value chain can greatly reduce costs associated with purchasing, inventory management, and distribution. Traditional EDI applications provided limited support. To effectively integrate upstream functions, suppliers need to have access to production schedules and other relevant databases. Pressures to develop extranets for supplier support may be a driving force to develop corporate intranets. Similarly the need to extend traditional distribution channels to market products and services directly to customers and provide better customer support may drive organizations to develop intranets. In our intranet, customer support was a key driving force that influenced the adoption decision. Over the years, the university had developed several web sites to improve student (customer) advising. These sites varied considerably in design and information quality. The need to integrate various sites and the desire to improve static sites, with the overall objective of providing better advising support to the students, had a major influence on the intranet adoption decision.

Third, intranets can be expensive and may require vendor software and expertise. In our case, the scope of the project was rather narrow. Therefore the IS skills (MIS faculty) and other resources (hardware, software, IS staff etc.) needed were readily available. As a result, vendor availability did not influence intranet adoption decision. However, when organizations lack the resources and skills to develop intranets, they may seek assistance from external vendors and consultants whose availability may be critical for intranet adoption and implementation.

Organizational Characteristics

Several organizational antecedents of IT innovations have been investigated by researchers (2, 4, 5, 23). However, only a few have been found to be significant because they were not specific to the IT under consideration (9). In the context of intranets, several factors may impact adoption and implementation. These include: management support, presence of a champion, extent of functional integration, physical dispersion, project management skills, and IS skills. First, the significance of top management support in successful adoption of IT is widely accepted (1, 13, 16). In our case, support from both the Dean of the college and the Provost of the university, and the presence of a champion (technology committee chair) were critical during “initiation” phase and also in the negotiations internal to the IS function to move from “prototype development cycle” to “production system development” phase. However, such support did not influence the adoption decision, i.e., to move from “no intranet” to “initiation.”

Second, the recent focus on business process reengineering highlights the importance of functional integration in operations. While a high level of functional integration may promote easy adoption and implementation, lack of such integration may be viewed as a motivation to develop intranets in order to achieve desired integration levels. Functional integration did not influence intranet adoption and implementation in our case. Universities, by design, have colleges and schools that operate somewhat independently catering to students with specializations in different fields. However, functional integration may be an important antecedent of intranet adoption and implementation in corporate business environments.

Third, the extent to which an organization is physically dispersed can be viewed as another critical contextual factor that may influence intranet adoption and implementation. The motivation in this case comes from viewing intranet as a vehicle to close physical distance. In our context, although the university facilities are located on one campus that is completely wired, the intranet allows us to reach out to potential students and faculty.

Finally, although intranet development is different from traditional system development efforts, both project management and IS skills are critical for adoption and implementation, especially in resolving technical problems encountered in development efforts and in maintenance and enhancement activities. In our context, both project management skills and IS skills were important in the “initiation” phase to inspire confidence that the project could be completed, and during the “prototype development cycle” and “production system development” phases to ensure timely progress towards the goals.

User Characteristics

The recipients of IT applications, namely the end-users, have been the focus of many research investigations in the IS literature. It is widely accepted that user characteristics can influence diffusion behavior. In the context of intranets, user characteristics influencing adoption and implementation include: user involvement, user participation, perceived benefits, usefulness, and information access. User involvement refers to psychological state reflecting “the importance and personal relevance that a user attaches to a given system” (3), user participation refers to the assignments and activities that are performed during development efforts. Clearly, both user involvement and participation can be viewed as being critical from intranet development per-

spective. In our study, we found both user (faculty) involvement and participation from different departments to be critical, especially in the “prototype development cycle” to ensure an acceptable prototype and the “operation, maintenance, and enhancement” phase of IDLC.

The notion of perceived benefits and utility of IS to end-users has been the key to measuring IS effectiveness/success (8). In the context of intranets, perceived benefits could very well influence early stages of the development process (adoption) and actual benefits (usefulness) the later stages (implementation). Better and easy access to the desired information and less work to maintain the information were the keys in investigating possible adoption of an intranet. Given the fact that our intranet is still in the early stages of evolution, we cannot comment on the impact of usefulness on intranet operation, maintenance, and enhancement.

Finally, the need to access information for task accomplishment is also likely to influence intranet adoption behavior. In our context, the need to easily access university-wide information significantly influenced the adoption decision.

Task Characteristics

From the end-users’ standpoint, task characteristics have a significant effect on IS success (10). In general, users facing well-defined tasks have easily specified uses for IS, while users facing ill-structured or non-routine tasks “are constantly forced to use IS to address new problems” (10, pg. 226). Thus, in the context of intranets, adoption and implementation may well be driven by the non-routine nature of user tasks. Furthermore, the level of task interdependence could also influence intranet adoption and implementation. The need to share information with others to collaborate to accomplish tasks is likely to drive intranet adoption behavior. When no such need exists, there are limited incentives for/to end-users to adopt intranets.

In our context, interdependency of tasks led the intranet development team to link to information in the university database. During both the “prototype development cycle” and “production systems development” phases, task interdependency influenced database design. As the intranet evolves, the ongoing implementation activities are likely to be influenced by user tasks.

Technology Characteristics

The underlying attributes of the technology itself can have a tremendous impact on propagation of IT innovations (11). In the context of intranets, we focus on extent of networking, ease of use/navigation, security, and server performance. First, the extent of networking in the organization is a relevant variable as it determines the degree to which individual computers have the ability to share information and communicate with other computers (12). From intranet standpoint, creating a networked environment is central to its existence. In organizations that exhibit high level of networking, intranet adoption and implementation is relatively an easy transition. On the other hand, less networked organizations may have greater motivation to adopt and implement intranets. In our context, a highly networked environment provided easy transition to adopt an intranet and also significantly influenced the “initiation” phase of the IDLC. Given the wired context, an intranet was viewed as a viable technology to better support both the faculty and the students.

Second, ease of use has been widely accepted as a criterion for IS success (8). In our case, the ease of use was viewed to be critical for successful implementation. During the “prototype development cycle” phase and the final implementation (i.e. transition from “production system development” to “operation, maintenance, and enhancement” phase) it was deemed necessary to test systems and administration pages for ease of use for both users and data maintainers.

Third, intranets, like any other network, can be attacked by hackers and other unauthorized users. Since vital organizational information and applications may reside on intranets, security is essential. In our context, security requirements were minimal as external users (general public and potential students) are encouraged to visit the site. However, moderate security requirements were enforced for access to site administration to make changes to the data. Such security measures influenced the design of both the “prototype system development cycle” and “production system development” phases of the IDLC. In the context of corporate intranets, security issues are likely to receive greater scrutiny.

Finally, server performance is extremely critical for the evolution and growth of corporate intranets. Several criteria determine server performance. The list includes: scalability, interoperability, configurability, compatibility, manageability, availability, reliability, distributability, serviceability, and stability (22). These criteria must be used to evaluate the suitability and performance of the intranet platform. Server performance was a critical issue during “production system development” phase of the intranet. Final testing during the “prototype system development cycle” phase revealed that the server performance was inadequate. As a result, the production system was implemented using a more robust database management system (we upgraded from Access to SQL server).

CONCLUSIONS

Intranets are popular in a large number of organizations. However, few organizations have been able to deploy them to gain a competitive advantage. While some are attempting to use such corporate information portals to share knowledge, collaborate, reengineer work, most of them continue to have a limited view of intranet as a source to post and publish general information, corporate policies, employee resumes, and possibly to communicate. Furthermore, from research standpoint, we know very little about adoption and implementation of corporate intranets.

In this paper, we have attempted to fill that void by identifying a comprehensive list of factors that may facilitate or limit intranet diffusion patterns. We use a case study to specifically address the impact of contextual factors on different phases of the IDLC. While some of the variables considered in this paper have a significant impact on adoption decision (i.e., movement from “no intranet” state to the “initiation” phase in the IDLC), they may not significantly influence implementation (other phases in IDLC). On the other hand, some of the additional variables considered here may not have a significant impact on adoption decision but are likely to considerably influence the implementation of intranets (progression from the “initiation” phase to “operation, maintenance, and enhancement” phase). Even though our case study provides meaningful insights, the generalizability of our findings are limited to organizations (universities) with similar contexts. As the next step, research should focus on validating the proposed framework so that relationships can be compared across organizations.

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