

MAKE OR BUY – A TAXONOMY OF INTRANET IMPLEMENTATION STRATEGIES

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ABSTRACT

Most modern organizations have implemented intranets for communication within the organization itself. Recently drastic changes have occurred on the supply side of the technology on three fronts. First, intranet implementation tools have become very accessible. Second, a new breed of intranet tools known as “intranet-in-a-box” enables the implementation of an intranet without much in-house technical expertise. And third, the rise of the use of the World Wide Web has raised general awareness and knowledge about Internet/intranet technologies. In this speculative paper we ask the fundamental question “how should intranets be implemented?” As a possible answer we present a framework describing four different intranet implementation strategies based on who implements the intranet (in-house vs. outsourced project) and the technology used (development tools or shrink-wrapped intranet packages). The four strategies are the amateur, the craftsman, the engineer, and the traveling fitter. Each strategy has advantages as well as disadvantages. We conducted an explorative field study of eight Danish organizations that were implementing intranets. Our analysis suggests that the appropriate strategy must be chosen in accordance with the level of internal technical expertise, core competence, and maturity of the technology.

1. INTRODUCTION

When implementing an intranet it remains a challenge which sourcing strategy to apply, as well as which changes the implementation will imply in the organizational domain. The management of decisions such as software make or buy remains a painful and risky area that frequently produces expensive and poor IT systems in organizations worldwide. Here we present an empirically backed theoretical paper that increases our knowledge on make or buy decisions. For the case of the intranet technology, we present four strategies and the organizational situations in which they are best applied.

Most organizations around the world have implemented intranets, small versions of the Internet, used purely for communication within the organization itself or even within a subset of its departments (Lyytinen, Rose et al., 1998; Damsgaard and Scheepers, 1999; Newell, Swan et al., 1999). Historically, in-house personnel have developed these intranets using quite basic development tools. Correspondingly, large organizations with plenty of in-house IT and development resources were the first to implement successful advanced intranets (Jarvenpaa and Ives, 1991; Moeller, 1996; Bhattacharjee, 1997).

However, for each implementation the intranet had to be developed from scratch and basic knowledge about the technology had to be reinvented by each organization. This sparked innovative activity on the supply side on three fronts (Zmud, 1984; Perez and Soete, 1988; Attewell, 1992). First, tools for intranet development and maintenance have increased in numbers, diversity, strength, and usability, putting intranet implementation well within the reach of even small and medium sized organizations. Second, a new breed of intranet tools known as “intranet-in-a-box” have emerged, enabling – in principle – any corporation to implement an intranet without much in-house expertise at all. Third, the rise of the use of the World Wide Web has raised awareness and knowledge about Internet/intranet technologies with the average company employees, system developers, and management of all modern corporations. In this manner, the knowledge threshold is effectively circumvented (Attewell, 1992), and the question most corporations are facing is no longer “should we implement an intranet?” but rather “which kind of intranet should we implement?” We would like to suggest that an additional question be asked; namely “how should we implement an intranet?”

In this speculative paper, we present a framework describing four different intranet implementation strategies based on who implements the intranet (in-house vs. outsourced project) and the technology used (development tools or shrink-wrapped intranet packages). We use this model to help implementers navigate between different strategies and we extend recommendations for the implementation of an organizational intranet based on the resources, core competences, and capabilities of the organization.

In the following section, we sketch a theoretical background to intranet technology and its implementation. Section three describes our research methods in the analysis of eight case organizations. In section four we describe two choices giving the two dimensions in our model; the choice of whom implements or customizes the intranet in the organization, and the choice between a tailor-made intranet and a ready-made intranet architecture. These two dimensions are combined in our framework of implementation strategies presented in section five. In section six we discuss our findings and extend recommendations to organizations using or producing intranet technology products, and in section seven we conclude the article and suggest promising areas for the application of our model.

2. BACKGROUND THEORY

In the following section we characterize and depict specific traits of intranet technology, because an intranet can be interpreted and integrated in organizations in a number of different ways (Attewell, 1992; Newell, Swan et al., 1999), and there is a need to be specific about the technology (Monteiro and Hanseth, 1995), since its specific traits have significant impact on its implementation (Damsgaard and Scheepers, 1999; Scheepers, 1999).

2.1. Definition of Intranet Technology

When seeking to understand the concept of intranets, it is important to define what is within the scope of the term “intranet”. Many have attempted to pinpoint an accurate definition, but the technology is in a state of flux and therefore fixed definitions may be misleading or even harmful. Here we define an intranet broadly in accordance with our understanding of an evolving technology that is to a large degree socially constructed (Hughes, 1987; Williams and Edge, 1996) while at the same time we include a technical part that describes the necessary protocols and standards.

An intranet is a shared information space that supports sharing of information among members of an organization. The space is comprised of a number of technical standards and platforms interconnected in a network within well-defined boundaries of a group of people or computers. All communication goes through a web-browser using the TCP/IP and HTTP protocols. Thus any application can be a part of the intranet as long as the browser is the primary client interface.

2.2. Characteristics of Intranet Technology

An intranet differs from other traditional information systems in several ways. Here we adapt the most relevant characteristics listed in Damsgaard & Scheepers (1999) and Lyytinen et al. (1998).

When someone formally decides to implement an intranet, an evolving process has often already started at the grass root level (Bhattercherjee, 1998; Lamb and Davidson, 2000). Therefore the implementation does not start at a definite point in time, but emerges through a series of implementation initiatives that combine existing initiatives with novel ones. Likewise the implementation never seems to end, because new functionality and possibilities evolve over time. This is quite different from traditional software implementation processes that are usually described as a rational lifecycle process that proceeds from determining systems requirements, analysis, design, and technical implementation to systems maintenance (Lyytinen, Rose et al., 1998).

Intranets are based on established Internet standards, and are usually preceded in time by the organization's Internet web site. The experiences gained here means that the technical barriers of intranet implementation usually are low (Attewell, 1992). Intranets are sometimes described as "glueware" or "middleware", since they have the potential to interconnect heterogeneous systems through the browser and associated protocols and applications (Lyytinen, Rose et al., 1998).

Intranet functionalities include calendar, employee directory, knowledge bases, news services (from internal or external sources), reservation of shared resources such as conference rooms, communication functionality such as email and instant messaging within the organization, and procurement services where employees can order products from suppliers subject to the approval of the employees' supervisors. Personalized to each employee, and with interfaces to the organization's customer database, product information, etc., the intranet can become an enterprise information portal fulfilling the majority of many employees' information needs (Markus, 2000).

3. RESEARCH METHODS

The multiple case studies that form the basis for the findings in this paper were conducted over a period of six months from the winter of 1998 to the spring of 1999. Eight organizations participated in the case studies and they represent medium-sized to large Danish organizations (between 100 and 15.000 employees) with very different core competences. In each organization a single department or geographical location (between 20 and 700 employees) was the locus. The organizations were selected because they spanned the lines of businesses that were considered to have the potential to be first-movers. Additionally the participating organizations represented both buyers and suppliers of intranet technology.

Table 1 outlines the specifics of the interviews in the eight organizations. In the first two cases we interviewed both managers and practitioners in the IT-departments as well as end-users. In the last six cases we interviewed managers responsible for the organizational intranets. This way we reduced the possibility of anomalies in our empirical data, since we conducted the most thorough interview series at an early stage of our research, but were able to reduce the number of interviews in each organization as we improved our skills of interviewing and fully comprehended the research area (Star and Gerson, 1987).

We devised a questionnaire to capture the intranet implementation process and strategy. As theoretical reference we applied Leavitt's well-known and widely applied diamond (Leavitt, 1964), and the questionnaire was aligned with tested questionnaires for capturing intranet implementation processes. (Scheepers, 1999; Bansler, Damsgaard et al., 2000) All interviews were recorded and transcribed by one of the authors. The interviews resulted in more than 25 hours of tape that turned into 150 pages of transcripts. Subsequently the transcripts were coded in categories based on the theoretical concepts of intranet and organizations. The intranet codes identified statements concerning intranet characteristics and use modes (Damsgaard and Scheepers, 1999) and the technology applied, while the organizational codes identified statements concerning organizational structure (Mintzberg (1983)), organizational culture (Schein (1989)),

and organizational processes (Porter (1985)). The gathering, transcribing, coding, and analysis of the interviews comprised a workload of approximately twenty-four person-hours per interview.

Organization		Line of business	Date of interviews	Number of interviewees
1	User	Software	Dec. 1998	6
2	User	Telecommunication	Dec. 1998	5
3	User	Public administration	Feb. 1999	1
4	User	Software	Feb. 1999	3
5	User	Advertising and web	Feb. 1999	1
6	Supplier	Consulting, web, and intranet	Mar. 1999	2
7	User	Software and facility management of large systems	Mar. 1999	1
8	Supplier	Intranet in-a-box	Apr. 1999	1
Total			Dec. 1998 - Apr. 1999	20

Table 1: The organizations, dates, and the number of interviewees in each organization

During the coding, we continually adapted the coding scheme to the text. New codes were added when new subject matters appeared, or when an existing code turned out to include an array of minor subjects that warranted a splitting of the code into two or more separate codes. After a redefinition of the coding scheme, the text that had already been coded was re-coded according to the new coding scheme to reduce the possibilities of anomalies in our analytical work (Star and Gerson, 1987).

The result of the coding was that each paragraph of the transcripts relating to an essential part of the used theory was marked according to the categories. The marked paragraphs were then placed together in temporary documents describing all the findings for each organization. These documents were the foundation for the final case descriptions our observations in the eight organizations. The case descriptions were given to the individual organizations as feedback and for validation. Any corrections included in the further work.

By using this method of analyzing the interviews, we found all the descriptive parts of the interview related to our background theory. And at the same time we were not reluctant to skip the parts, which did not fit our premature understanding of the research area (Eisenhardt, 1989; Yin, 1989; Walsham, 1995).

4. CHOOSING AN IMPLEMENTATION STRATEGY

Implementation of an intranet is an activity that has both technical and organizational aspects. On the technical side, network protocols, web servers and other server applications must be in place, while on the organizational side users' interest and involvement must be obtained and quality control mechanisms must be established to ensure the value and reliability of the content on the intranet (Markus, 1994; Damsgaard and Scheepers, 1999).

This section discusses two important aspects of the choice of implementation strategy. First we review the choice of whether to outsource the implementation of the intranet or to implement it in-house. Second we review two intranet architecture choices; one tailor-made from scratch to the organization's specifications, the other a customized version of a standard intranet product (known as intranet in-a-box).

These discussions lead us to propose a 2-by-2 matrix consisting of four implementation strategies, and we offer advice to organizations on which model to choose based on their needs, core competences, and available resources.

4.1. Implementation Process: In-House or Outsourced

Intranet technology is relatively simple, and most organizations will have sufficient in-house competences to address the technical challenges in the implementation of an intranet (see e.g. (Jarvenpaa and Ives, 1991; Moeller, 1996; Bhattacharjee, 1997)). Exclusive use of internal resources, however, will not readily allow the organization to benefit from the experience, expertise, and economies of scale inherent to existing intranet products on the market or vendors specializing in intranet development (Attewell, 1992).

Software make or buy decisions need to encompass both the strategic and the tactical level as recommended in the framework suggested by Rands (1993). At the strategic level the organization makes decisions about investment or divestment in capacity, and at the tactical level the organization attempts to optimize the allocation of the current capacity by applying internal resources to the projects where internal expertise is most needed, and by purchasing software projects from the outside sources identified in the strategic level.

From a knowledge management perspective, an important issue is whether the organization itself should take on the burden but also reap the potential benefits of the required learning. Scarbrough (1995) outlines such choices as a continuum of tradeoffs between social control over the technical knowledge and economic exchange with other organizations.

Below we have outlined a number of the factors to be weighed against each other in the choice of whether to conduct an in-house implementation (see Table 2) or to outsource the implementation (see Table 3).

	In-house implementation process
Observations	<ul style="list-style-type: none"> • This is the default choice in most cases. The option of outsourcing the intranet implementation is often not even considered, resulting in a de facto insourcing (Lacity, Willcocks et al., 1996).
Requires	<ul style="list-style-type: none"> • In-house competences in computer networks, web technology, programming languages used to interlink applications to the intranet. • Sufficient resources in the form of person-hours from skilled personnel in order to avoid bottleneck situations. • Project management of all the tasks involved.
Facilitates	<ul style="list-style-type: none"> • Freedom in the structure and content of the intranet. • Organizational learning about intranet technology.

Table 2: Characteristics of in-house implementation process

	Outsourced implementation process
Observations	<ul style="list-style-type: none"> • The technical side of the implementation is often of a very high quality. • Management owned implementation process due to the explicitness of the costs.
Requires	<ul style="list-style-type: none"> • Market research regarding outside contractors. • Contract negotiation and monitoring with the outside contractor.
Facilitates	<ul style="list-style-type: none"> • Access to experience and economies of scale from the outside contractors. • Getting an alternative view of the organizational processes.

Table 3: Characteristics of outsourced implementation process

4.2. Intranet Architecture: Tailor-Made or Ready-Made

In our research we observed two fundamentally different architectures of intranets, differing in the degree to which they are tailored to the adopting organization. An architecture that describes an intranet developed from scratch to suit the organization at hand, we call the tailor-made intranet (see Table 4). The other architecture describes a standard intranet product implemented in – and then customized to – the organization; we call this architecture the ready-made or instant intranet (see Table 5).

Since the work processes supported by the standard functionality of ready-make intranets will be useful to most organizations, the problems of adapting to a standard system will likely be much smaller than the problem experiences by adapters of larger systems such as Enterprise Resource Planning systems (Markus, 2000). For many organizations, however, some level of adaptation and alterations will be required, increasing both the initial cost of implementation as well as subsequent maintenance and upgrade costs.

	Tailor-made intranet architecture
Observations	<ul style="list-style-type: none"> • Implemented using a wide range of tools and technologies. • High costs because development costs are amortized on a single organization.
Requires	<ul style="list-style-type: none"> • A high level of technical knowledge and training. • A considerable level of technical knowledge and training of content providers.
Facilitates	<ul style="list-style-type: none"> • Integration of applications already implemented in the organization. The intranet becomes a gateway to existing technologies.

Table 4: Characteristics of tailor-made intranet architecture

	Ready-made intranet architecture
Observations	<ul style="list-style-type: none"> • The product delivered to customers is a collection of well-tested applications with proven functionality. • The typical price model is a low system purchase price and additional licenses paid per-user, per-month. • The organization acquires skills and experience in a product that is inherently proprietary as opposed to open standards.
Requires	<ul style="list-style-type: none"> • Analysis of technical and organizational requirements for the intranet should be completed before choice of an intranet product is made. • Market research regarding intranet products. • Willingness to tie the organization to a proprietary intranet product.
Facilitates	<ul style="list-style-type: none"> • The technical staff can operate the intranet without a high level of knowledge and training. • Content providers need little technical knowledge and training. Content is typically added or updated in a guided process using application dialogs.

Table 5: Characteristics of the ready-made intranet architecture

4.3. A Taxonomy of Four Types of Intranets

The two choices outlined above can be combined, i.e. for intranets implemented either in-house or outsourced, the organization can choose to implement either a tailor- made or a ready-made intranet. This

leads us to suggest the framework of four archetypes of intranet implementation strategies depicted in Table 6.

	In-house implementation		Outsourced implementation	
Tailor-made architecture	Homemade intranet <i>(The Amateur)</i>	Type I	Type II	Tailor-made intranet implemented by consultants <i>(The Craftsman)</i>
Ready-made architecture	Intranet in-a-box customized by in-house personnel <i>(The Engineer)</i>	Type III	Type IV	Intranet in-a-box customized by outside contractor <i>(The Traveling Fitter)</i>

Table 6: Four different intranet implementation strategies

We chose the four nicknames to indicate analogies to real-world house maintenance tasks such as carpentry or electrical work. The homemade intranet (type I) resembles the amateur do-it-yourself homebuilder who starts from scratch and builds everything herself. The outside contractor tailoring an intranet to the organizations (type II) resembles the craftsman or the professional builder who draws on professional knowledge, experience, and toolkit to solve the problems *in situ*. The intranet in-a-box customized by in-house sources (type III) resembles the engineer who buys a product as an assembly set and carries out the assembling herself. The intranet in-a-box with outsourced customization (type IV) resembles the traveling fitter who installs and adapts prefabricated components at customers’ locations. In the following section we present the four different strategies of implementing an intranet. The characteristics for the models can be seen as a basis for intranet make or buy decisions.

5. THE FOUR INTRANET IMPLEMENTATION STRATEGIES

5.1. Type I - Homemade intranet (a.k.a. The Amateur)

If the organization chooses to develop a “homemade” intranet, the employees must have certain technical skills and expertise on subjects such as web-server technology, web development tools and programming languages. The cost of getting started is opaque or hidden for this strategy due to the lack of an official budget. However, the amount of time spent is hard to estimate, and it increases as new ideas and requirements of functionality emerge. On the other hand the “homemade” intranet provides a good opportunity to tailor the intranet to specific local requirements, and the organization does not have to accept approximations in terms of adapted standard intranet solutions.

A potential problem with this implementation strategy is that the internal implementers and technically skilled employees will focus on their own ideas and perception of the organization’s intranet needs and will lack the overall view of the organization. A countermeasure against this problem is to perform a formalized requirements analysis for the intranet and assemble an interdisciplinary steering committee.

In large organizations, a variant of this problem is seen when the intranet becomes a manifestation of special interest groups in the organization. The result is multiple, often unauthorized intranets used by geographically, professionally or operationally separated groups of employees, but often performing overlapping or indeed identical tasks for their users. The literature has numerous examples of this in for example pharmaceutical companies. (Bansler, Damsgaard et al., 2000; Ciborra, Braa et al., 2000 (pp. 193-211))

Our case studies in Danish organizations show that some of the organizations that had best prerequisites in terms of skills and expertise developed intranets with a poor technical design. This was quite puzzling but we suspect that the main reason for this was a relative low knowledge barrier, which let the implementers to think they were able to develop an intranet solution without analyzing and planning the implementation process.

Advantages:	<ul style="list-style-type: none"> • Inexpensive in the beginning of the implementation process. • Potential high degree of tailoring to the organization.
Disadvantages:	<ul style="list-style-type: none"> • High hidden costs of use of internal competences. • Experience from similar intranets unlikely. • The functionality of the intranet has not been widely tested. • Often results in a poor technical design.
Organizations that can benefit from choosing type I intranet implementation:	<ul style="list-style-type: none"> • Organizations with technical competence, that wish to develop their own intranet technology competence. • Organizations with non-standard requirements and work-processes. • Organizations with high IT-expertise and/or large IT-departments. • First generation implementers who wish to gain first hand experience with the technology before venturing into a large-scale implementation.

Table 7: *Intranet implementation strategy type I*

5.2. Type II - Tailor-Made Intranet Implemented by Consultants (A.K.A. The Craftsman)

This strategy allows the organization to benefit from the consultants' experiences from similar projects aiding in the requirement specification and development of an intranet tailored to the organization's specific needs. The expertise of the craftsman may rub off while she works in the organization, whether organized as formal training sessions or through informal interaction, making knowledge transfer a part of the product transfer process (Attewell, 1992). Organizations that do not have time or in-house skills to develop an in-house solution may turn to the consultant. Another reason for contacting expertise from outside contractors may be low availability or high costs of a knowledgeable workforce on the market (King, Gurbaxani et al., 1994).

Advantages:	<ul style="list-style-type: none"> • Less internal expertise is required. • Benefits from the consultants' experience and expertise. • Likely to be technically well designed. • An opportunity to improve the internal competence through education.
Disadvantages:	<ul style="list-style-type: none"> • A risk of becoming too dependent on one supplier. • Often an expensive solution.
Organizations that can benefit from choosing type II intranet implementation:	<ul style="list-style-type: none"> • Organizations with insufficient technical competence. • Organizations with non-standard requirements. • Organizations with no time to develop internal expertise.

Table 8: *Intranet implementation strategy type II*

A downside to this solution is the potential for lock-in, i.e. becoming too dependent of a single supplier (Shapiro and Varian, 1999). Organizations should be aware of this risk and seek to maintain control of the project through the use of open standards and ownership of the source code of the delivered applications. For large implementation projects, the organization may deliberately apply a dual sourcing principle to keep costs down by having at least two consultant companies compete for implementation and maintenance contracts.

5.3. Type III – Intranet In-A-Box Customized by In-House Personnel (a.k.a. The Engineer)

The high level of functionality in an intranet in-a-box means that the organization’s requirements may be met by the standard functionality or by simple parameter adjustment of an intranet product, requiring little or no application development knowledge of the organization. The organization must estimate the extent of adjustments and alterations necessary before the organization’s requirements are met, and the result must be weighed against the availability of internal resources.

This implementation strategy lends itself both to organizations with organizational processes similar to those supported in the intranet product, as well as to organizations with a high level of IT skills but too few of these skilled personnel available to implement an intranet type I.

By implementing an intranet in-a-box, the organization will to some degree become dependent on the supplier’s proprietary product. This means that the organization is locked-in and if it chooses to switch to another product, costs are involved. A good example of lock-in for a type III intranet implementation is the training of users and system administrators (Shapiro and Varian, 1999). Brand-specific training reduces the knowledge threshold to intranet adoption and increases the likelihood of success, but training also leads to a lock-in to the product’s user interface, functions, and features (David, 1985). This investment in building up skills to use the specific intranet represents sunk costs and it makes a future switch to another intranet in-a-box more expensive. Shapiro and Varian (1999) recommends that this knowledge be used as bargaining power in the contract negotiations with vendors, since the future switching costs of the customer represents a current value to the vendor.

Advantages:	<ul style="list-style-type: none"> • Standard, thoroughly tested functionality. • A chance of sedimentation of knowledge (Scarbrough, 1995) about the product and its implementation.
Disadvantages:	<ul style="list-style-type: none"> • Not tailored to specific requirements. • A risk of becoming too dependent on the suppliers. • Can be a relative expensive solution for large organizations due to licenses. • Some internal expertise is required for the implementation process.
Organizations that can benefit from choosing type II intranet implementation:	<ul style="list-style-type: none"> • Organizations with well defined requirements. • Organizations with enough internal expertise to install and implement the intranet. • Organizations with requirements, which can be supported by standard-functionality.

Table 9: Intranet implementation strategy type III

5.4. Type IV – Intranet In-A-Box Customized by Outside Contractor (a.k.a. Traveling Fitter)

In this implementation strategy the organization purchases both a standard intranet product and outside expertise to perform the installation and implementation into the organization. Not surprisingly, this implementation strategy combines many of the advantages and disadvantages from the “tailor-made intranet” (type II) and “intranet in-a-box” (type III). Due to the architecture choice, the intranet product will be based on thoroughly tested advanced applications, and due to the choice of implementation sourcing, the implementation effort will benefit from the experience of the consultants.

The consultants can deliver services ranging from minor alterations to the standard intranet product to fairly complex development of new functionality for the intranet. By using this implementation strategy, the organization can adjust its intranet to more demanding requirements without bearing the burden of the required learning.

The ultimate consequence of a type IV implementation strategy is to outsource the maintenance and facility management of the resulting intranet as well, thus further reducing the demands on in-house intranet technology competences. The intranet server can physically be placed in the organization or at a vendor’s location (i.e. an Application Service Provider setup).

Though this implementation strategy seems very useful and accessible to many organizations it can be very expensive, and it holds the double danger of lock-in both to the product and to the consultant company (Shapiro and Varian, 1999), that often gang up and provides a whole package.

Advantages:	<ul style="list-style-type: none"> • Advanced standard functionality can be achieved fast. • Thoroughly tested functionality. • A chance to increase the internal competence (professionalism of workers) through education (Scarborough, 1995) • Benefits from the consultants’ experience with similar projects. • Likely to be technically well designed.
Disadvantages:	<ul style="list-style-type: none"> • A risk of becoming locked-in to the product and to the supplier (Shapiro and Varian, 1999). • Can be an expensive solution due to initial purchase costs, product licenses, and consultant fees.
Organizations that can benefit from choosing type IV intranet implementation:	<ul style="list-style-type: none"> • Organizations with high requirements regarding quality and functionality. • Organizations with low levels of technical competence.

Table 10: Intranet implementation strategy type IV

6. DISCUSSION AND RECOMMENDATIONS

In this section we discuss how organizations, consultants and intranet in-a-box suppliers may be affected by the evolution of the intranet technology. We wish to extend recommendations for user organizations, consultants, and suppliers in the intranet market.

6.1. Discussion of Results

The “homemade intranet” is by far the most typical implementation strategy thus far among the Danish organizations in our investigations (see Table 11). We believe this to be a result of several factors. First, the high-tech line of business of most of our case organizations lends itself well to homemade intranets. Second,

standard-intranets have only recently become available while the organizations in our investigation were indeed chosen because they had had intranets for several years. As intranets lose their novelty and the functionality expectations of intranet users increase, we expect that the choice of intranet implementation strategy will become more explicit, leading to more diversity in implementation processes actually applied.

Organization		Line of business	Implementation strategy
1	User	Software	Type I
2	User	Telecommunication	Type I
3	User	Public administration	Type I
4	User	Software	Type I
5	Supplier	Advertising and web	Type I, vendor of Type II
6	Supplier	Consulting, web, and intranet	Type I, vendor of Type II
7	User	Software and facility management of large systems	Type I
8	Supplier	Intranet in-a-box	Type III, vendor of own intranet in-a-box, vendor of Type III and Type IV

Table 11: Overview of implementation strategies in the eight case organizations

6.2. Recommendations

Many consultant companies and software houses have made a business of implementing intranets for others. Technologies offer limited windows of opportunity where different role players can influence the technology and profit from it (Perez and Soete, 1988). For intranets the time of innovation has passed, but the technology has not yet become a commodity and the need for mediating institutions has not yet disappeared (Attewell, 1992). We believe that this time will come, however, as the evolution of the intranet technology continues, resulting in the advent of large, commercial intranet products analogue to the large commercial office suites and Enterprise Resource Planning systems.

Software houses that produce intranet in-a-box solutions have until recently enjoyed a market with only very few participants on the supplier side. This situation has changed, and competition has increased. We believe that conventional market strategies can readily be extended to apply to the intranet market, and accordingly the suppliers should diversify their products with regards to product features and market segments. This way they can seek to avoid commodification and instead achieve customer lock-in (Shapiro and Varian, 1999).

Meanwhile, organizations that purchase intranet in-a-box solutions of course have the opposite goals of avoiding lock-in and favoring standardizing the intranet products in order to raise competition. The intranet technology favors the customers in this respect because intranets can integrate with any browser-based application or system.

7. CONCLUSION

In this paper, we have developed a framework that distinguishes four different intranet implementation strategies. The taxonomy encompasses the architecture of the intranet (standard product or custom built) and the personnel implementing the intranet into the organization (in-house or outsourced). The framework consequently depicts four types of intranet implementation strategies: 1) Homemade intranet, 2) Tailor-made intranet by outside contractor, 3) Do-it-yourself intranet in-a-box, and 4) Intranet in-a-box customized by

outside contractor. In a multiple explorative case study of eight organizations supported by a literature review, we have found the amateur intranet to be by far the most dominant.

On a practical level the four intranet implementation strategies have different qualities that make them suited and attractive for different types of organizations. By using our framework, organizations can readily consider which implementation process or strategy is better suited for their needs. Naturally no choice is final or fixed and organizations can benefit from alternating between the implementation strategies in accordance with available internal technical expertise, core competence, and the maturity of the technology.

We hope to extend the results of this explorative investigation to other areas of emergent Internet technologies. Most modern organizations will be faced with a number of similar choices in the near future as more new communication technologies become available and popular. For example organizations will be faced with sourcing decisions for implementation of the organization's extranet, WAP and/or i-mode services, as well as the question of timing, i.e. if these applications should be bought on the market when the technology is sufficiently mature or if they should be used to achieve a (temporary) competitive advantage over non-adopters.

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