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Managing empowerment and control in an intranet environment

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Abstract. *An intranet increases in sophistication and complexity as it evolves. This evolution leads to an increasing need for control over the intranet. However, this is a contentious issue, as an intranet is deemed to be an empowering technology. Consequently, intranet control systems must balance empowerment and control so as not to negate each other. This paper investigates intranet control activities and their effect on users' perceptions of empowerment throughout the evolution of an intranet in Hewlett Packard (Ireland). The growth of the intranet is charted as a six-stage model that illustrates an evolution of purpose, control and empowerment. The control strategies for managing the intranet implemented at each stage are investigated, and their resultant effects on empowerment are evaluated. The study reveals the importance of balancing control strategies with empowerment initiatives in managing intranet environments. Based on the evidence available, the study recommends the implementation of specific controls at particular stages in the evolution of an intranet in order to achieve control systems that balance empowerment and control.*

Keywords: intranet, stages of growth, control, empowerment, case research

INTRODUCTION

An intranet is an application of internet technology within an organization for the purpose of information dissemination, communication, integration and collaboration (Hills, 1996; Telleen, 1997; Lau, 1999; Curry & Stancich, 2000). It facilitates the empowerment of users, but must also respond to organizational demands for control (Hills, 1996; Telleen, 1997). As an intranet evolves, it increases in sophistication and complexity (Hinrichs, 1997; Scheepers & Damsgaard, 1997; Romm & Wong, 1998) and can be used for advanced applications such as 2
'collaborative design, concurrent engineering, and workflow support' (Scheepers & Damsgaard, 1997). Curry & Stancich (2000) argued that intranets must be well managed and planned, as '*ad hoc* development precludes real value additionality and corporate integration in strategic terms'. According to Phelps & Mok (1999), intranets are positioned for expansive growth once a predictable method for managing them can be devised.

Based on an in-depth case study at Hewlett Packard (Ireland), this paper describes the evolution of the HP intranet using a 'stages of growth' model, and examines the effects of intranet control activities on users' perceptions of empowerment throughout this evolution. The paper concludes that an intranet is a vital system for user empowerment, but timely implementation of intranet control activities is essential to maximize this empowerment.

INTRANET STAGES OF GROWTH MODELS

Stages of growth models contend that an organization moves through a number of distinct stages of maturity with respect to the use and management of IT (Galliers & Sutherland, 1991). Gibson & Nolan (1974) proposed a 'stages of growth' model that emphasizes the need for management strategy to be consistent with the organizational use of technology. The model has been criticized because it has not proved possible to validate its claim to represent reality (King & Kraemer, 1984; Benbasat *et al*., 1987). However, Robson (1997) noted that it still provides a number of valuable contributions.

It has been proposed that an intranet evolves through different stages of growth, from a method of information dissemination to being extended to external entities via an extranet. Hinrichs (1997) identified the evolution of an intranet as consisting of fives stages: basic, publishing, collaboration, transactions and, finally, an extranet. KPMG (1999) suggested that an intranet evolves through several levels (ad hoc, advanced, integrated, highly interactive, extended enterprise) with each level marking a possible staging point. Damsgaard & Scheepers (1999) 'speculated' on a stage model of intranet technology with each stage characterized by seven general characteristics, whereby the pervasiveness of the intranet technology at each stage is used as a measure of success or failure. Damsgaard & Scheepers (1999) proposed that 'progression can be made even though not all elements are strictly in the same phase', and that stages can be skipped. It is important to note that these 'stages of growth' models have not been tested empirically.

CONTROL AND EMPOWERMENT IN AN INTRANET ENVIRONMENT

As an intranet is deemed to be an empowering technology, excessive control may be detrimental to its development (Hills, 1996; Telleen, 1997; Ryan, 1997). Nevertheless, Simons (1995) argued that 'empowerment requires greater control'. The relationship between organization control and information technology becomes more significant as more business processes are mediated by information technology (Orlikowski, 1991). Consequently, Curry & Stancich (2000) argued that 'intranets require a high level of commitment to systems management as their complexity increases'. Uncontrolled development of an intranet by users can lead to an anarchic systems environment, but 'the strategic effectiveness of intranets can often be hampered by the extent of control given to IT departments' (Damsgaard & Scheepers, 1999).

The key to developing and maintaining a high standard of content is the ability of information creators/publishers to retain 'both the ownership and the responsibility for the information they publish' (Mansell-Lewis, 1997). As many managers regard information as power, and thus restrict access to it, a cultural shift to information sharing is also necessary (Curry & Stancich, 2000). Consequently, the control issue is 'one of the biggest impediments to the adoption' of an intranet (Ryan, 1997). As illustrated in Table 1, Nelson & Todd (1999) examined the strategies and tactics that organizations use to co-ordinate and control web development, finding that the majority of organizations had a monopolistic control-oriented approach.

The concept of control has many implied interpretations, but intertwined in all of these meanings are two opposing views: the 'conflict view' and the 'order view' (Oliga, 1996). Control mechanisms are both enabling and constraining: enabling in that they facilitate the co-ordinated action of individuals, and constraining as they restrict the manner and outcomes of

Table 1. Web-related management control activities (Nelson & Todd, 1999)

Standard and role setting	*Technical standards* – the setting of standards for Web-related hardware, software and communications technology purchased by end-users.
	Design standards – the setting of standards for end-user development of Web applications (e.g. page design, navigation aids, etc.).
	Data management – the establishment of policies on data accessibility, reliability, consistency and security related to Web applications in the end-user community.
	Data access – supporting the end-user community's ability to obtain data for use by Web applications.
	Assignment of roles and responsibilities – the establishment of policies for reducing role ambiguities between end-users and information systems personnel with respect to Web-related applications.
Resource allocation	*Acquisitions approval framework* – the setting of procedures and requirements for formal approvals of, as well as economic justification of, Web-related tools and resources for use by end-users.
	Setting priorities – for Web-related applications in the end-user community; e.g. order of development or resource allocation.
	Planning for equipment, capacity, and manpower – to ensure that sufficient resources for Web-related activities exist in the end-user community.
	Financial controls and charge-back systems – for allocation and 'fine-tuning' of financial resources; may involve allocation (charge-back) of Web-related costs to end-user groups.
	Audit and review – systems of checks and balances to ensure that appropriate controls and standards are developed, implemented, and adhered to by end-users.
Applications development	*Scope of Web-related activities* – the development of clear distinctions between the applications that can be developed by end-users and those that should be developed by IT professionals.
	Co-ordination across organizational boundaries – for the management of Web-related activities that cross functional lines (e.g. departments or divisions).
	Systems integration – planning for and facilitation of the technological interdependence between end-user and IT-developed Web applications.
	Training and education – of end-user personnel in the development, management and use of Web-related technologies.
	Consulting – providing ongoing support services to end-users in the area of Web-related technology.
	Development – the design and implementation of Web-related systems by end-users.
	Documentation – of end-user-developed Web applications.
	Operation and maintenance – ongoing operation and maintenance of end-user-developed Web applications.

individuals' actions (Orlikowski, 1991). Boland (1979) referred to these concepts as 'control with' and 'control over'. According to Simons (1995), 'control systems must balance empowerment and control in such a way that empowerment does not lead to a control failure, and correspondingly, control does not lead to an empowerment failure'. Simons identified seven types of controls that need to be in place before employees can be effectively empowered. The implications of these seven controls for intranet management are illustrated in Table 2.

Table 2. Implications of the seven controls for intranet management

Control systems	Implications for intranet management	References
Beliefs systems	Users must clearly understand the basic purpose, goals, objectives, roles and direction of the intranet (intranet statement of purpose) (intranet goals and objectives)	Adapted from: Rader (1994), Simons (1995), Evans (1996), Telleen (1997), Nelson & Todd (1999)
Boundary systems	Users have bounded freedom. intranet boundary systems prescribe what users should not do and rely on individual creativity to seek out opportunities within these boundaries (intranet policy documents)	Adapted from: Simons (1995), Telleen (1997, 1998)
Standardization	Excessive standardization should not limit opportunities for creativity or the intranets responsiveness. intranetstandards and tools are based on support for an incorporation of diversity. It is the standardizing on content (or output) rather than the tools that create the content that matters (intranet standards)	Adapted from: Simons (1995), Sternberg (1995), Telleen, 1997), Nelson & Todd (1999)
Diagnostic control systems	Empowerment does not mean giving up control, but it does change what is controlled. In the absence of control over inputs or process, individuals must be held accountable for outputs or performance. The use of an intranet statement of purpose, goals, objectives, content standards and policy documents provides a basis from which performance can be evaluated and hence introduces an intranet diagnostic control system.	Adapted from: Simons (1995), Telleen (1997), Nelson & Todd (1999)
Incentives	Empowerment means greater responsibility and this means reater risk. Users must be rewarded individually for their contributions, either financially or non-financially (e.g. recognition).	Adapted from: Simons (1995), Markus & Benjamin (1996), Roberts (1996), Phelps & Mok (1999)
Internal controls	Internal controls provide the procedural checks and balances that safeguard assets and assure the integrity of data. These are the systems that protect assets from theft or accidental loss and ensure reliable information systems and the validity of information.	Adapted from: Simons (1995), Nelson & Todd (1999)
Interactive control systems	Interactive control systems provide information conduits to transmit learning horizontally and vertically in the organization and thus capture the benefits of employee knowledge and experience.	Adapted from: Simons (1995), Marino & Schelp (1997), Bunker *et al*. (1996), Hills (1996), Telleen (1997), Nelson & Todd (1999)

Empowerment is a rather diverse concept. Clement (1994) stated that 'the concept of empowerment may be termed functional in the sense that it is oriented to improving performance toward organizational goals that are assumed to be shared unproblematically by all participants'. Fatout (1995) defined empowerment as a process for developing internal locus of control by 'placing boundaries around an area of potentially acceptable behaviour and allowing the individual to test and experiment with a variety of choices'. Rappaport (1987) defined empowerment as conveying 'both a psychological sense of personal control or influence, and a concern with actual social influence, political power, and legal rights'. It is a multilevel construct and suggests 'the study of people in context' (*ibid.*). Townsend & Bennis (1997) suggested three interdependent empowerment concepts: direction, freedom and support. Benjamin & Scott Morton (1992) introduced the concept of incentives and defined empowerment as an individual's perception that 'they can make a difference, that their efforts directly affect the organization's performance, and that they are able to take on as much responsibility and commensurate reward as they are willing to work for'. 9

A more comprehensive measure of empowerment would consider the intrapersonal as well as interactional and behavioural components. Empowerment involves a critical understanding of the socio-political environment, as it is a 'dynamic contextually driven' construct (Zimmerman, 1990). Thomas & Velthouse (1990) and Spreitzer (1995) developed a number of conceptualizations of intrapersonal empowerment including meaning, competence, self-determination and impact. Zimmerman (1995) identified complementary constructs including motivation to control, self-efficacy, perceived competence and domain-specific perceived control.

THE RESEARCH APPROACH

The objective of this research is 'to investigate empirically intranet control activities and their resultant effect on users' perceptions of empowerment throughout the evolution of an intranet'. The single case study method is considered to be a potentially rich and valuable source of data, while suited to exploring relationships between variables in their given context (Benbasat *et al*., 1987; Yin, 1994), and is appropriate where it represents a critical case (Yin, 1994).

To satisfy the research objective, the research environment had to meet a number of requirements. First, the organization must have an established intranet with a significant number of applications, users, contributors and a firm commitment to ongoing development. The HP intranet met this requirement. Secondly, active managerial involvement and support of the intranet's development and management was essential. The HP intranet is based on standards established by management, with partnerships to provide applications support for users. Thirdly, end-user input to intranet evolution was considered important. In HP, every person has access to the intranet, as it is critical to his or her job performance. Finally, the data-gathering processes necessitated access to the organization, management and other intranet users for a period of time sufficient to satisfy the research objective. It was also necessary to have access to relevant documentation and to experience the intranet in operation. The access at HP was sufficient to meet this requirement.

To develop an understanding of how the intranet evolved, 17 management personnel were interviewed over a three-month period. These individuals were able to offer valuable insights from differing perspectives and were selected on the basis of having considerable management experience of the intranet evolution. During this interview process, management personnel were encouraged to identify major staging points during the development of the intranet. After conducting multiple interviews, a working model of the intranet evolution was established. During subsequent interviews with the same managers, the model was refined further and a consistent view of the intranet's evolution established.

Having established a model of the intranet's evolution, the model and a structured quantitative scale based on Simons' (1995) model for balancing empowerment and control, operationalized by Nelson & Todd's (1999) list of web management activities, were used to (a) identify the precise stage at which each control activity was implemented; (b) measure the extent to which each of the control activities was practised; and finally (c) identify a recommended stage of implementation by drawing from the experiences and hindsight of management personnel. The extent to which each of these intranet control activities are performed was measured using a multiple-item scale, which ranged from 1 (not performed) to 5 (performed extensively). The respondents' scores for each of these control activities were then aggregated to obtain a measure of the extent to which each intranet control system is practised in HP. The same 17 management personnel who participated in defining the stages of growth completed this instrument.

Next, the study measured the extent to which users perceive empowerment, and explored the effects that control activities have on users' perceptions of empowerment. The second instrument is based on both established contextual and psychological constructs drawn from a number of previous research studies, as shown in Table 3. The extent to which users agreed or disagreed with empowerment statements was measured using a multiple-item scale, which ranged from 1 (strongly disagree) to 5 (strongly agree). Fifty non-management personnel with an average of 3.56 years' intranet experience completed the instrument. The measurement instrument was administered at a single point in the evolution of the intranet. It is acknowledged that, under ideal circumstances, this instrument should be administered at each stage of the intranet's evolution using a longitudinal case approach. To achieve a more thorough perspective of how the control activities affected users' perceptions of empowerment, the second measurement instrumented was supplemented by semi-structured interviews with 10 of the respondents, chosen on the basis of their varied functional positions and the duration of their intranet experience (average 4.05 years).

THE EVOLUTION OF THE HP (IRELAND) INTRANET

Members of the IT department instigated the intranet at Hewlett Packard (HP) Ireland in May 1995. Table 4 shows six growth stages that illustrate how the intranet evolved. The labels are descriptive and are considered appropriate to describe the function of each stage. Although management personnel quickly identified a consistent view of the first three stages of the HP

Table 3. Contextual and psychological constructs of empowerment

Empowerment construct	Description of empowerment construct as applied to intranet development, management and use	Reference
Direction	One has direction setting and is oriented towards improving performance towards intranet goals and objectives.	Adapted from: Townsend & Bennis (1997), Clement (1994)
Freedom	One has the freedom to operate within predefined boundaries of acceptable behaviour in relation to the development, management and use of the intranet.	Adapted from: Spreitzer (1995), Zimmerman (1995), Thomas & Velthouse (1990), Townsend & Bennis (1997), Pastor (1996), Fatout (1995), Rappaport (1987), Clement (1994)
Influence	One can influence organizational decision making when decisions involve that individual's job function and working conditions by using the intranet.	Adapted from: Spreitzer (1995), Zimmerman (1995), Thomas & Velthouse (1990), Benjamin & Scott Morton (1992)
Meaning	One has fit between the needs of one's intranet role and one's beliefs and values.	Adapted from: Spreitzer (1995), Zimmerman (1995), Thomas & Velthouse (1990)
Competence	One believes in one's ability to perform intranet activities with skill.	Adapted from: Spreitzer (1995), Zimmerman (1995), Thomas & Velthouse (1990), Benjamin & Scott Morton (1992)
Support	One receives adequate support, resources and incentives to fulfil one's intranet responsibilities.	Adapted from: Townsend & Bennis (1997), Benjamin & Scott Morton (1992), Pastor (1996)
Accountability	One is held accountable for one's performance of intranet-related activities.	Adapted from: Pastor (1996), Fatout (1995), Clement (1994)

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intranet evolution, stages 4, 5 and 6 were more difficult to model. Discussion revealed that the difficulties in reaching agreement on these stages resulted from some departments not experiencing the same levels of process and systems integration. Departments such as the HR department did not experience the external value chain integration of stage 5 as it served no functional need, but did experience the effects of institutional absorption of stage 6. This supports the belief that stages can be skipped (Damsgaard & Scheepers, 1999), but only at a departmental level.

Although the main application of the HP intranet was for information publication in the early stages, it evolved rapidly to support mission-critical operations, and it is now considered to be vital for day-to-day operations. This supports suggestions (Hinrichs, 1997; Scheepers & Damsgaard, 1997; Romm & Wong, 1998) that an intranet increases in sophistication and complexity as it evolves. Table 4 also illustrates the rapid timeframe of evolution, which supports the findings of Strom (1995) and Cullen (1997). The model also reveals that the growth of the intranet did not terminate with its extension via an extranet to external entities as speculated by Hinrichs (1997), KPMG (1999) and Damsgaard & Scheepers (1999) but, instead, evolves towards

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Table 4. The evolution of intranet applications at Hewlett Packard Ireland

Stage	Stage 1 Introduction	Stage 2 Customized interaction	Stage 3 Collaborative interaction and communication	Stage 4 Process and systems integration	Stage 5 External value chain integration	Stage 6 Institutiona absorption
Time period	May 1995 to August 1995	September 1995 to February 1996	March 1996 to February 1997	March 1997 to June 1998	July 1998 to July 1999	August 1999 to present
Description of the stage	The intranet is introduced into the organization. The technology is 'localized' and 'intradepartmental'.	The intranet accelerated in growth as a number of other departments and users came online. The technology becomes 'organizational' and 'interdepartmental'. The number of content providers increased but with little co-ordination. A certain amount of personal publication (for example) sports and social club news begins to appear.	A central web page is introduced to provide a focal point for information access on the intranet for the entire organization. Information is very formal and critical. All internal manuals are available only on the intranet. The intranet is more functional and becomes more interactive with the introduction of more sophisticated applications. Use of the intranet is becoming a necessary part of the job. The intranet becomes very important for internal communication.	The intranet is integrated with the existing financial, manufacturing and production systems. The intranet becomes a universal platform and an integral part of business processes. Extensive training is required to educate users on how to use these integrated systems interfaces for maximum productivity and return. Access to information is completely browser based and information is not considered to be 'the latest revision' if it is not on the intranet. The intranet is becoming more mission critical.	Limited access to the intranet is extended to key suppliers, customers and business partners in order to integrate supply and distribution chains. The intranet also provides external access for some internal personnel.	The intranet becomes 'translucent' and 'second-nature' to users. The quest for discovery of more effective and efficient means of managing knowledge becomes the centre of attention. Stages 3, 4 and 5 are revisited with new communication and collaboration technologies being introduced, more modular application design for interfacing with financial, manufacturing and production systems is introduced, while extending the intranet via an extranet to an increasing number of customers and business partners. Ongoing support and consultation is also provided for the fine tuning and maintaining the intranet.

Intranet applications at each stage	Static information publishing is the main application. The publishing is of a 'marketing nature' such as this is 'who we are and this is what we do'. Information is basic and limited to contact names, e-mail addresses and phone numbers.	Publishing is still the main application but it increased significantly in volume with an increasing attention to how the information is being structured and organized due to the increasing formality and organizational relevance of the information. A basic search engine is introduced to allow key word searching but only by department. The existing electronic mail application is adapted with a Web interface. Information retrieval from a number of organizational databases and directories is facilitated. An online phone directory is introduced.	A number of departments begin to use the intranet for audio and video communication and collaboration. A more advanced earch engine is introduced capable of searching the entire intranet by various criteria. Electronic discussion groups and newsgroups begin to appear. Software downloads are now available with the click of a button. Online presentations also begin to appear. There is an increasing use of the intranet to facilitate file transfers. Electronic forms are also introduced and access to existing databases and directories increases dramatically. The intranet is also used to train in new staff members, using published documentation and manuals, and video files of maintenance and operation procedures for certain equipment.	The organization has moved from purpose built application software to Web-based applications in order to integrate the entire organizational supply chain and to support business processes. Mission critical financial systems such as SAP, are now accessed through the intranet. Information such as production line figures, that was once only accessible from certain points in the organization is now accessible from anywhere in the organization.	Secure transaction, encryption and authentication technologies are introduced. Initially only access to the SAP system is extended to the 'channel partners' but access is eventually extended to production systems by inventory management partners in order to facilitate JIT manufacturing. Interorganizational ext, audio and video conferencing is also facilitated.	Specialist search tools and information management applications are introduced in order to facilitate the capture, sharing, storing and management of knowledge. An internal electronic news service is introduced with live video and audio feeds with the latest industry and organizational news and information. 'Information tickers' are introduced so that rapidly changing information so as production figures and share price, is fed directly and constantly to the users' computer screen.
Effect of the stage	The effect of this stage is to explore the use of the intranet and to educate other departments of its potential benefits.	The effect of this stage is to acquire information, to publish it in an organized and structured way, and to provide rapid access to information via a search engine.	The effect of this stage is to centralize access to information while facilitating interactive electronic communication and fostering electronic collaboration.	The effect of this stage is to integrate the intranet with other computer-based systems and network applications in order to integrate work processes.	The effect of this stage is to integrate the external supply and distribution chains in order to maximize the synergistic benefits of strategic alliances and information sharing.	The effect of this stage is to 'institutionalize' the intranet in the organization and to continue to explore ways of capturing, sharing, storing and managing tacit information.

a system for managing knowledge, while facilitating the revisitation of earlier stages as new technologies become available.

All departments did not evolve at the same pace and did not reach the same level of technical sophistication. Although it could be interpreted that all departments are not at the same level of maturity of intranet application, it must be acknowledged that some applications have little practical value for certain departments. For example, although collaborative applications such as electronic video conferencing are beneficial to Engineering as they allow HP engineers worldwide to collaborate on projects, it has little practical value for HR. Therefore, it can be asserted that departments can be at different stages of evolution and that all departments may not require the same level of technical sophistication at each stage. This would seem to discount Damsgaard & Scheepers' (1999) idea that the pervasiveness of the intranet technology at each stage can be used as a measure of success. However, it would support their idea that 'progression can be made even though not all elements are strictly in the same phase'.

CONTROL ACTIVITIES IN THE INTRANET ENVIRONMENT

A measurement instrument and interviews were used to measure and explore the control activities implemented at each stage of the HP intranet. Measures were based on Simons' (1995) model, and operationalized as shown in Table 5. Individual respondents' scores were aggregated to obtain a measure of the extent to which each control system is practised within HP. These are reported out of a maximum score of 5.

Beliefs system

A belief system implies that users clearly understand the basic purpose, goals, objectives, roles and direction of the intranet. Analysis reveals a rating of 4.18, and implies that HP has adequately identified the purpose, values and direction that they want intranet contributors to embrace.

Although HP experienced organic growth with little control over intranet development in the early stages, control activities intensified during the latter stages of evolution. The IT manager explained: 'there was a sense that we needed to get some control over what we use the intranet for. We were getting to a stage where there was a bit of chaos developing'. HP did not implement a mission statement until they began to integrate the intranet with systems and network applications. However, the IT manager recommends: 'you give it some direction from the beginning because if you are putting resources into its development, you had better say what it is to support'. HP did not implement goals and objectives until late in the development, but the IT manager believes that goals and objectives should be introduced from the beginning because by 'concentrating on what you want to achieve in the early stages, you are more likely to get an early success that can then be used to show other departments how the intranet can work'. Twelve months after the intranet's introduction, HP implemented guidelines to reduce the role ambiguities between users and IT personnel with respect to intranet development.

Table 5. Extent to which intranet control activities are performed in Hewlett Packard Ireland

Control system	intranet-related management control activities	Response by category ($n = 17$) – extent to which control activity is performed 1 (not performed) to 5 (performed extensively)					Stage at which management control activity was implemented
		1	2	3	4	5	
Belief system Avg. 4.18	1. Implementation of a clearly stated intranet mission or atement of purpose that denotes the direction of its development.	–	–	–	15	2	4
	2. Implementation of specific intranet goals and objectives.	–	–	–	14	3	4
	3. Implementation of guidelines for reducing the responsibilities and role ambiguities between users and IT personnel with respect to intranet development.	–	–	–	12	5	3
	4. Implementation of guidelines that distinguish between the intranet applications that can be developed by users and those that should be developed by IT professionals.	–	–	–	15	2	3
Standardization Avg. 4.27	5. Implementation of standards for the development of the intranet (e.g. page design, navigation aids)	–	2	10	4	1	3
	6. Implementation of technical standards for intranet hardware, software and communications technology purchased.	–	–	–	1	16	1
	7. Implementation of standards and policies for the technological interdependence of user- and IT-developed intranet applications.	–	–	2	2	13	3
Boundary system Avg. 3.53	8. Implementation of policies for data accessibility on the intranet.	–	–	1	3	13	3
	9. Implementation of policies for information reliability,and currency on the intranet	–	–	3	6	8	4
	10. Implementation of policies for data consistency on the intranet.	NI	NI	NI	NI	NI	NI
	11. Implementation of policies for data security on the intranet.	–	–	–	14	3	1
	12. Implementation of policies for the order of intranet application development.	–	–	2	5	10	4

Table 5. Cont.

Control system	intranet-related management control activities	Response by category ($n = 17$) – extent to which control activity is performed 1 (not performed) to 5 (performed extensively)					Stage at which management control activity was implemented
		1	2	3	4	5	
Incentives	13. Implementation of economic rewards for intranet contributors.	NI	NI	NI	NI	NI	NI
NA	14. Implementation of non-economic rewards for intranet contributors.	NI	NI	NI	NI	NI	NI
Interactive control system Avg. 4.29	15. Implementation of a training and education programme for users in the development, management and use of the intranet.	–	–	2	7	8	4
	16. Implementation of consultation and ongoing support services for users in the development, management and use of the intranet.	–	1	3	3	10	6
	17. Implementation of support for users in their ability to access/obtain data for use in developing the intranet.	–	–	3	7	7	2
Diagnostic control system Avg. 3.11	18. Implementation of a system of checks and balances to ensure that appropriate controls and standards are developed, implemented and adhered to by users of the intranet.	–	4	6	3	2	5
	19. Implementation of procedures to ensure that user-developed intranet applications are properly documented.	–	3	7	4	3	3
Internal controls Avg. 4.81	20. Implementation of financial controls for fine-tuning and allocation of financial resources for the intranet.	–	–	–	2	15	4
	21. Implementation of charge back systems for the costs related to intranet development by user groups or departments.	–	–	–	4	13	4
	22. Implementation of a system of checks and balances that safeguard assets and assure the integrity of data.	–	–	1	3	13	4
	23. Implementation of acquisitions procedures and requirement for formal approvals, as well as economic justification, of intranet-related tools and resources for use by users.	–	–	–	2	15	3
	24. Implementation of planning for intranet-related equipment, capacity and manpower to ensure that sufficient resources for intranet activities exist in the user community.	–	–	–	3	14	4

NA, not applicable; NI, not implemented.

Until this, users had been concentrating 'on the soft end of the Web technology, that is compiling the information and doing the structuring and layout', while the IT department had provided 'the technical Web services' according to the HR manager. Those studied recommend a mission statement, goals, objectives and guidelines for intranet roles and responsibilities from stage 1.

Standardization

Standardization implies that intranet standards should be based on support for an incorporation of diversity. Aggregated analysis revealed a rating of 4.27, which implies that, although technical infrastructural standards are extensively performed, moderately applied standards for intranet development allow for creativity and diversity.

The IT manager explains that it was necessary to implement guidelines for intranet application development when user attention began moving from publishing to creating more interactive sites. There was a risk of a proliferation of poorly designed user-developed applications that would be of little benefit to anyone but the individual. The IT manager comments: 'if you define who should do what at this stage, you spend less time policing mavericks in the latter stages'. Those studied recommend guidelines for intranet applications from stage 3.

When HP Ireland introduced a central web page in mid-1996, they also decided to impose some level of structure over development standards. Although the IT department did not develop templates, they encouraged people to follow a particular line of design in order to keep information presentation and access consistent. The IT manager believes that it is important to 'impose some level of discipline on the whole area at an early stage because if you adopt a laissez-faire attitude then you will end up with broken links and inappropriate content'. Those studied recommend that developmental standards should be introduced from stage 2.

By focusing on a core computing strategy and enforcing strict technical standards for hardware, software and communications technology from the very beginning, HP claim to have reduced cost structures, improved communication and enabled new levels of synergy among departments while allowing for the rapid deployment of common applications. Those studied recommend technical standards for hardware, software and communications technology from stage 1.

When HP was implementing development guidelines, they also implemented standards and policies for technological interdependence of user and IT-developed intranet applications. These standards and policies became necessary to ensure that applications developed by users were compatible with IT-developed applications. Those studied recommend standards and policies for technological interdependence from stage 3.

Boundary system

An intranet boundary system implies that users have bounded freedom. It prescribes what users should not do and relies on individual creativity to seek opportunities within these bound-

aries. Aggregated analysis revealed a rating of 3.53, and implies that HP prescribes what users should not do.

HP policy for data accessibility on the intranet relates to two issues: (1) individual's access rights; and (2) details of the information accessible. The HR manager explains that 'HP have always had a standard classification system for information, and access is controlled in accordance with this classification'. However, the implementation of this control activity is 'dependent on the nature of the information being published and the pervasiveness of the intranet in the organization'. The IT manager believes that policies for information reliability and currency should have been implemented when they were implementing intranet development standards. At that time, the volume of information and links had increased dramatically, and the nature of the information on the intranet was considered to be critical to job performance. Therefore, information reliability and currency was critical to success at that time. HP does not have any policies regarding data consistency because they implemented guidelines to reduce ambiguities in role and responsibilities between users and IT personnel. As the financial controller explains, 'there is unlikely to be too much duplication of information, so consistency of information is not a problem, because each person is responsible for different information and there is no duplication of responsibilities'. However, the IT manager concedes that, if there were a larger volume of contributors to the intranet, then this control activity should be implemented when the information on the intranet becomes critical. Those studied recommend policies for data accessibility, policies for information reliability and currency and policies for data consistency from stage 3.

The IT manager argues that, by implementing policies for data security when you first introduce the intranet, 'you are ensuring the security of information on the intranet, and people will therefore publish more freely'. There are three underlying areas to which the security policy relates: (1) security of internal access; (2) security of access by external partners; and (3) security of access by employees working from home. Those studied recommend the introduction of data security policies from stage 1.

Given that a considerable amount of intranet application development did not occur until HP began to integrate the intranet with the existing financial, manufacturing and production systems, the implementation of policies for the order of intranet application development was not necessary until then. Those studied recommend that policies concerning order of application development are not required until stage 3.

Incentives

Incentives imply that a system of incentives and rewards should be in place to encourage users to contribute to the intranet. The implementation of economic or non-economic rewards for intranet contributors is not practised at HP. The IT manager and HR manager believe that intranet contributors should not be rewarded, either economically or non-economically, as 'so much healthy internal competition makes incentives and rewards unnecessary . . . and it is part of every person's job, and they should not need additional reward for doing their job'. Those studied believe that neither economic nor non-economic incentives should be implemented at any stage.

Interactive control system

An interactive control system helps to focus attention on users' needs and organizational needs while diffusing knowledge, experience and learning via the intranet. Aggregated analysis revealed a rating of 4.29, implying that HP has implemented an extensive interactive control system.

HP did not implement a training and education programme for users until they had begun to integrate the intranet with the existing financial, manufacturing and production systems. The HR manager believes that 'training is important when you are setting up an intranet especially if you want users to contribute and to feel if they have a contribution to make'. Those studied recommend the implementation of a training and education programme from stage 2.

At the time of the study, HP was implementing consultation and ongoing support services for intranet users. In the past, external consultants mainly provided these services. Although the external training, consultancy and support have been relatively successful, the number of places on such a course was limited to 15 per month. The HR manager comments that 'the time has come to have more control over this part of the intranet's development'. Those studied recommend stage 3 for implementing consultancy and support services.

The IT manager believes that, when users have gained a little experience of publishing basic departmental information, providing them with access to corporate information and allowing it to be published is important. The HR manager claims that supporting users in their ability to access data was appropriate in the early stages 'because the data security policy ensured that the intranet was pretty tightly controlled, and this really enabled us to publish information quite freely within the organization'. Those studied recommend stage 2 for implementing data access policies.

Diagnostic control system

The use of an intranet statement of purpose, goals, objectives, content standards and policy documents provides a basis from which performance can be evaluated and, hence, introduces an intranet diagnostic control system. Aggregated analysis revealed a rating of 3.11, and implies that HP have implemented a moderate diagnostic control system, which tracks the performance of users in executing their intranet responsibilities.

When external access to the intranet became an issue, HP implemented a system of checks and balances to ensure that intranet users adhered to controls and standards. The IT manager argues that these checks and balances could not have been implemented until most of the other control activities were in place. Those studied recommend stage 4 for implementation of a system of checks and balances for regulating adherence to controls and standards.

Documentation procedures were extremely beneficial when HP was integrating the intranet with other systems and network applications in order to integrate work processes. When HP began to integrate the intranet with the existing financial, manufacturing and production systems, financial structures had to be introduced to ensure that funding was available. The intranet 'had now become such a critical part of what we do, investment in tools or applica-

tions…had to become better funded. Some sort of support structure had to be implemented to justify these investments', according to the financial controller. Those studied identified stage 3 for implementing documentation procedures and financial controls for the allocation of financial resources to the intranet.

Internal controls

A system of procedural checks and balances as a set of internal controls is designed to protect assets and resources, while ensuring their efficient allocation among intranet participants. Aggregated analysis revealed a rating of 4.81, and implies that HP has implemented an extensive internal control system that protects and allocates assets and resources.

When HP began to integrate the intranet with systems and network applications, it was decided to implement a charge-back system for the cost of intranet development by user groups and departments. According to the production engineering systems manager, 'as more and more multimedia applications began to appear on the intranet, a dramatically higher bandwidth and capacity was required than that required for non-multimedia forms'. The IT manager believes that charge-back systems should be introduced when integrating processes and systems because all the technological investment is department specific. Those studied recommend stage 4 for implementing charge-back systems.

Information violations were a concern for HP even before the intranet came to prominence. However, as the information available on the intranet became mission critical, it was essential that access to highly classified information be monitored for any unauthorized access or distribution. HP believes that the implementation of a system of checks and balances that safeguards assets and assures the integrity of data is essential when access is extended to external sources. The production engineering systems manager explains that as, 'we moved from purpose-built application software, which did our shop-floor analysis and data presentation, to intranet-based tools, planning for equipment, capacity and manpower became important to ensure that you could access those applications from any computer in the organization'. A number of managers believe that planning should have been introduced at an earlier stage. The production manager explains: 'we lost a lot of time integrating manufacturing systems because the infrastructure was a little lacking. We had not given it enough consideration and found that the integration of our existing manufacturing systems and applications required a lot more than the development of a Web-based interface'. Those studied recommend stage 4 for implementing acquisition procedures and planning for equipment, capacity and manpower.

EMPOWERMENT AND THE EFFECTS OF CONTROL ACTIVITIES

A measurement instrument and interviews were used to measure and explore users' perceptions of empowerment and the effects of implementing control activities. The empowerment statements used to operationalize each construct are based on the work of a number of researchers and are shown in Table 6. Aggregated scores are shown out of a maximum of 5.

Table 6. An analysis of users' perceptions of empowerment

Empowerment construct	Empowerment statement	Response by category ($n = 50$)				
		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Direction	1. I understand the organizational purpose of the intranet.	0	0	6	24	20
Avg. 4.16	2. I understand my role in the ongoing development of the intranet.	0	4	17	22	7
	3. The intranet is important for attaining organizational goals.	0	0	1	19	30
Meaning	4. My contribution to the intranet is of value to the organization.	0	2	21	2	25
Avg. 3.64	5. My contribution to the intranet is of value to me.	0	10	25	14	1
	6. The intranet is an important tool in performing my job function.	0	0	4	31	15
Competence	7. I am confident about my ability to contribute to the intranet.	0	2	21	25	2
Avg. 3.33	8. I have mastered the skills necessary to contribute to the intranet.	0	8	29	12	1
Freedom	9. I can publish information freely on the intranet.	0	1	19	22	8
Avg. 3.39	10. I can communicate freely on the intranet (e.g. e-mail, notice boards, discussion group, etc.).	0	0	5	37	8
	11. I can access information freely on the intranet.	0	0	0	21	29
	12. I can develop applications freely for the intranet.	14	21	13	1	1
Influence	13. The intranet has increased my influence over decisions that this organization makes.	4	8	22	16	0
Avg. 3.06	14. The intranet has increased my influence over decisions that involve my job function.	0	12	19	19	0
	15. The intranet has increased my influence over decisions that involve my working conditions.	0	12	23	15	0
Support	16. I receive adequate training and education in the development, management and use of the intranet.	0	1	26	22	1
Avg. 3.18	17. I receive adequate support in the development, management and use of the intranet.	0	0	18	30	2
	18. I receive adequate resources in the development, management and use of the intranet.	0	9	29	12	0
	19. I feel rewarded for my contribution to the intranet (economically, i.e. pay bonus; or non-economically, i.e. recognition, pride, sense of personal achievement).	10	19	17	4	0
	20. My organization encourages me to participate in the intranet's ongoing development.	0	5	23	19	3
Accountability	21. I am responsible for the integrity of information that I communicate on the intranet.	1	0	4	28	17
Avg. 3.82	22. I am responsible for the accuracy of information that I communicate on the intranet.	1	0	0	21	28
	23. I am responsible for the reliability of applications (including documentation) that I develop for the intranet.	6	6	28	3	7
	24. I am responsible for the proper utilization of resources that I use which are allocated to intranet development.	1	4	18	18	9

Direction

Townsend & Bennis (1997) define direction, 'as the charge or mission statement that tells workers what is needed. It includes definitions of desired outcomes, and quality specifications'. This construct implies that one has direction setting, and is oriented towards improving performance towards intranet goals and objectives. Analysis revealed a rating of 4.16, which implies that users receive considerable direction setting, and are oriented towards organizational goals and objectives.

Goals and objectives were not introduced until integration of the intranet with systems and network applications. Although users were relatively knowledgeable regarding intranet purpose, goals and objectives at a departmental level, users were less knowledgeable at an organizational level. The introduction of roles and responsibilities meant that users knew who was responsible for every piece of information and, if it was incorrect or outdated, that person could be notified. One user felt that previously 'information publishers were less accountable and less likely to keep information current'. By implementing guidelines that distinguished between IT and user-developed applications, users had been effectively discouraged from attempting application development as it was 'now recognized as the sole domain of IT personnel'.

Meaning

Spreitzer (1995) states that meaning 'involves a fit between the needs of one's work role and one's beliefs, values and behaviours'. This implies that one has fit between the needs of one's intranet role and one's beliefs and values. Aggregated analysis revealed a rating of 3.64, which implies that users believe that their intranet roles fit with their beliefs and values.

The delegation of roles and responsibilities meant that certain users were not able to publish directly to the intranet. Departments nominated a few key personnel to take full responsibility, and these were the only people trained in publishing skills. Certain users feel unable to contribute to the intranet and believe that their contribution to the intranet is not of value to the organization or to them personally. One engineer comments that 'the intranet is of unquestionable value to the organization and it is obviously vital for my position'. For him, the intranet is pivotal in enhancing work relations with colleagues, which was of definite personal value.

According to one accountant, rapid access to known accurate information from any point in the organization has significantly improved his ability to perform his job, explaining that 'in less than a minute, I could find how much it cost to build a Pen in July 1997, whereas if I had to go to hard copy files it could be a three day process'. HP implemented technical standards for intranet hardware, software and communication technologies when they introduced the intranet to the organization. It is believed that this standard set of desktop applications has enhanced information access, sharing and communication. An accountant explains: 'I don't have to worry about going to a production line and discovering that I can't access important production data because of an unfamiliar computing environment. I don't even have to go to the production line, I can get all the necessary data from my own desktop'.

HP introduced charge-back systems and financial controls for fine-tuning and allocating financial resources when they were integrating the intranet with other systems. Some users believe that more investment and research were required on how the intranet could improve one's ability to do a job. An engineer explains: 'embedded video and audio clips are very useful for repair procedures but we found that the typical computer display will not give us the image quality for visual inspection standards. It would be a significant performance enhancer, if we could improve this'. The engineer believed that the cost factor was a significant impediment to this development as departments were 'unwilling to bear the costs incurred through charge-back systems'.

One systems analyst believes that a failure to introduce standards for online documentation and a lack of training in the early stages had important implications, such as applications being underdeveloped and a certain amount of documentation appearing on the intranet as if it was being published for printing. The user explains that 'even though all manuals and documentation are online, and we have embedded video clips, some of it is still formatted as a print version'.

Competence

Thomas & Velthouse (1990) stated that 'competence or self-efficacy specific to one's work is a belief in one's capability to perform work activities with skill and is analogous to agency beliefs, personal mastery, or effort-performance expectancy'. Aggregated analysis revealed a rating of 3.33, which implies that users only moderately perceive their ability to perform intranet activities with skill.

Two problems seem to have affected the users' level of competence. First, the training and education programme was implemented very late in the evolution. Secondly, the programme was conducted by external consultants with only a limited number of places available on each course. HP intranet users believe that focusing on training and education is the key to empowering users. One business support specialist claims: 'users are more empowered because they now have the tools to create their own reports and generate their own information in a flexible environment'. However, despite the availability of these tools, a lot of users 'are not aware of the existence of some of these tools and most do not use them to their fullest potential'. One engineer claims, 'a lot of the collaborative technologies are only used by our people (engineers) because others are not aware of their capabilities and need to be shown how these tools can improve how they work'.

Freedom

Townsend & Bennis (1997) defined freedom, 'as the ability of the employee to perform the job they have been given. It includes the latitude to make operational decisions within the boundaries of the mission'. Aggregated analysis revealed a rating of 3.39, which implies that users are relatively free to conduct their intranet activities within the predefined boundaries.

HP did not impose developmental standards from the beginning in order to encourage users to contribute to the intranet. One engineer pointed out that 'developmental standards became a critical success factor for exchanging meaningful information across geographies'. One sys-

tems analyst argued that publishing standards and policies for information reliability and currency was important because 'there was a lot of outdated information in the beginning and broken links became a problem. It was difficult to find information and if you did find it, you couldn't be sure it was current'. The introduction of data security policies and standards for intranet hardware, software and communications technology from the beginning ensured that users were aware of their security obligations and the dangers of transmitting sensitive information. An engineer remarks: 'most people are happy to comply with security policies and communications standards, as their jobs are dependent on maintaining secrecy about our production methods'. Extensive support for users in their ability to access data for use in developing the intranet at the beginning made it possible to publish all information, increasing information access immensely. A systems analyst argued that 'users were empowered for the first time to satisfy their own information needs and to do their jobs better, as it was easier to access information and it also lessened certain individuals' control over information'. Users also believed that the introduction of a very open data accessibility policy improved their efficiency as it gave them access to historical data and tests that eliminated repetitive testing. However, charge-back systems and policies for the order of application development effectively removed any opportunity for users to develop intranet applications. One engineer stated that HP has 'tight control over application development' but 'this applies to all application development and not just for the intranet'.

Influence

12 Morton (1991) stated that an individual's perception of empowerment implies that 'they can make a difference, that their efforts directly affect the organization's performance'. Aggregated analysis revealed a rating of 3.06, which implies that users can only influence organizational decision-making moderately by using the intranet, when decisions involve their job function and working conditions.

Users believed that the intranet has made them feel more involved at a higher level because of the large volume of information at their fingertips, especially since the introduction of policies for data accessibility on the intranet. One administrator commented: 'the ability to access the majority of information in the organization certainly makes you feel more involved. This in turn should make you feel more knowledgeable about the organization'. Users agreed that electronic discussion groups have increased their influence over decisions that the organization makes at a lower level in relation to project development, research directions, process re-engineering and production methodologies. One user even felt that having participated in a number of training and education programmes, their experience of the intranet had in some way made their 'job position more secure' and, therefore, had indirectly increased their influence over decisions that involve their job function.

Support

Townsend & Bennis (1997) defined support as 'providing the resources necessary to perform the job'. Aggregated analysis revealed a rating of 3.18, which implies that users perceive moderate intranet support.

The introduction of policies to ensure that users have extensive access to information for publishing on the intranet also encouraged users to participate. One IT specialist believes that 'initially it was important to promote the intranet so that employees knew that anybody could access the intranet at any time. Users were also instructed to search the intranet for the solutions to their problems'. One engineer points out that 'any employee that does not have a PC in front of them can still access the intranet from shared PCs in the production areas or from various points around the site'.

Few users agreed that they had mastered the skills necessary to contribute to the intranet. A lack of training and education in the early stages was identified as the primary cause. However, users believed that they received adequate intranet support, and one administrator believed that the support provided was 'very rapid and efficient'. As an administrator explains: 'the IT department is broken down so that there are clearly identified people to support each operation in HP. Therefore, if I have a problem, I have a designated person that I can contact for support'.

One IT specialist argues that because HP has implemented technical standards for intranet hardware, software and communication technology, 'the tools which users can use for the development of the intranet are limited'. The IT specialist continues that 'there are a lot of excellent software applications free on the internet and in computer magazines but users are not really encouraged to install these applications in case they conflict with our existing environment'. This is interesting because, previously, the common operating environment was considered empowering, in that it enabled users to access information from anywhere in the organization using the same interface and also because it ensured that all users had equal access to technical resources. However, it is now apparent that implementing technical standards restricts users to a recognized tool set, which has the effect of eliminating the use of certain resources for intranet development.

Accountability

Pastor (1996) believed that empowerment 'must integrate key aspects of responsibility, accountability and shared risk taking'. This implies that one is held accountable for one's performance of intranet activities. Aggregated analysis revealed a rating of 3.82 for 'accountability', which implies that users quite readily accept accountability for their intranet activities.

Policies relating to information reliability and currency were implemented when access to information had become completely browser based, and the intranet was being integrated with systems. One user felt that previously 'information publishers were less accountable and less likely to keep information current'. This meant that 'information was now only considered the latest revision if it was on the intranet', according to an accountant. Roles and responsibilities also meant that, for the first time, publishers were now directly accountable for the information they reported, virtually guaranteeing integrity and accuracy. The implementation of documentation procedures is also important. One user states: 'it is important that the user of an application has a clear idea where the information is coming from. If developers didn't have to document the purpose of the applications, this may not happen to the same extent as it does'.

There is also a charge back each time a user uses certain applications on the intranet, which ensures that users utilize resources effectively. One accountant comments that the 'efficient use of intranet resources is essential because it means that funding is there for the applications that are really needed as expenditure has to be justified and all revenues generated by the charge-back system are reinvested in the intranet's development'.

DISCUSSION

Implications for practice

The HP intranet grew organically in the early stages, and only a few control activities were implemented at the beginning. As the intranet progressed through the middle to later stages of its evolution, control activities intensified with a significant number of control activities been implemented. In most instances, the intensity and complement of the control systems greatly facilitated empowerment. Both managers and users of the intranet believe that the implementation of these control activities is the main reason that the intranet experienced such rapid growth. Users also believe that control activities were significant empowering factors in the early stages.

The implementation of some intranet control activities was mistimed, and management recommends more appropriate implementation stages so that each activity is consistent with the organization's stage with respect to the intranet's evolution. These stages are identified in Table 7, but these recommendations are tentative as they emerge from a single case study.

This study found that not all departments evolve at the same pace, and stages may be skipped at departmental level. Some intranet applications have little practical value for certain departments, but the primary reason for the varying degrees of evolution among departments is the wide variations in intranet skill levels among departments. The fact that extensive training was not provided in the early stages affected skill levels.

The implementation of roles and responsibilities also has a deep impact on the speed and extent of the intranet's evolution. Although these controls ensure that users are made accountable for the information, they often determine which personnel participate in training and education programmes. This affects users' abilities to contribute to the intranet and diminishes their organizational influence. Furthermore, although the implementation of technical standards for intranet hardware, software and communications technologies ensured a common operating environment from which all users had equal access to technical resources, a lot of users could not use these resources to their fullest potential because of the absence of any formal training and education in the early stages. A lack of training and education was also seen to affect users' beliefs that their contribution to the intranet was of value to the organization while also affecting their confidence in their ability to contribute to the intranet.

It is necessary to implement controls for technical standards for intranet hardware, software and communications technology and an extensive security policy from the very beginning. Users felt that these controls were significantly empowering, as a secure and reliable intranet

Table 7. The recommended stages for the implementation of each intranet-related management control activity

intranet-related management control activities	Recommended stage of implementation
1. Implementation of a clearly stated intranet mission or statement of purpose that denotes the direction of its development.	1
2. Implementation of specific intranet goals and objectives.	1
3. Implementation of guidelines for reducing the responsibilities and role ambiguities between users and IT personnel with respect to intranet development.	1
4. Implementation of guidelines which distinguish between the intranet applications that can be developed by users and those that should be developed by IT professionals.	3
5. Implementation of standards for the development of the intranet (e.g. page design, avigation aids)	2
6. Implementation of technical standards for intranet hardware, software and communications technology purchased.	1
7. Implementation of standards and policies for the technological interdependence of user- and IT-developed intranet applications.	3
8. Implementation of policies for data accessibility on the intranet.	3
9. Implementation of policies for information reliability and currency on the intranet.	3
10. Implementation of policies for data consistency on the intranet.	3
11. Implementation of policies for data security on the intranet.	1
12. Implementation of policies for the order of intranet application development.	3
13. Implementation of economic rewards for intranet contributors.	Not recommended
14. Implementation of non-economic rewards for intranet contributors.	Not recommended
15. Implementation of a training and education programme for users in the development, management and use of the intranet.	2
16. Implementation of consultation and ongoing support services for users in the development, management and use of the intranet.	3
17. Implementation of support for users in their ability to access/obtain data for use in developing the intranet.	2
18. Implementation of a system of checks and balances to ensure that appropriate controls and standards are developed, implemented and adhered to by users of the intranet.	4
19. Implementation of procedures to ensure that user-developed intranet applications are properly documented.	3
20. Implementation of financial controls for fine-tuning and allocation of financial resources for the intranet.	3
21. Implementation of charge back systems for the costs related to intranet development by user groups or departments.	4
22. Implementation of a system of checks and balances that safeguard assets and assure the integrity of data.	3
23. Implementation of acquisitions procedures and requirement for formal approvals, as well as economic justification, of intranet-related tools and resources for use by users.	4
24. Implementation of planning for intranet-related equipment, capacity and manpower to ensure that sufficient resources for intranet activities exist in the user community.	4

gave them the freedom to publish more information, ensured more open access to data and provided everybody with a common operating environment. Users also felt that, by implementing policies for data security from the beginning, managers were more willing to release information for reporting on the intranet. Support for users to access information for publishing was also a significant empowering factor in the early stages, underlining the need for a cultural shift to information sharing.

The lack of development standards in the beginning had a negative effect on empowerment. The publication of information without any structure or navigational and editorial guidelines led to the undesired effect of broken hyperlinks and, more importantly, information that was poorly presented, unsearchable and often unreliable. By implementing a few development standards and policies for information reliability and currency in the early stages, users will be more empowered to satisfy their own information needs, as more control will ensure an up-to-date and consistent representation of information while enabling easier navigation. The introduction of roles and responsibilities also meant that users knew who was responsible for every piece of information. The person could be notified if the information was incorrect or outdated.

Early implementation of goals and objectives is necessary to provide developmental focus and for combining efforts at department level, while a mission statement is crucial to establish the organization's commitment to, and direction of, the intranet. HP did not implement a mission statement or goals and objectives until they began to integrate the intranet with systems and network applications. Consequently, individual departmental intranet goals and objectives were widely known, as departmental development projects were aimed directly at the achievement of these targets, but users were less knowledgeable at an organizational level.

Implications for future research

The study identifies some stages as being more appropriate than others for the implementation of certain control activities. As these results emerge from a single case study, further research using multiple case studies would be beneficial. Further research should also be conducted using multiple organizations to establish whether stages are skipped. Further research should also be conducted using a longitudinal case study to explore the perception of empowerment as it is experienced at each stage, as it is difficult to recreate and measure empowerment constructs retrospectively. Finally, further research should be conducted with regard to the timing of control activities using multiple case studies.

SUMMARY

The HP intranet evolved rapidly to support mission-critical operations. The HP intranet is also a vital system for user empowerment. However, the timely implementation of intranet-related management control activities is essential to maximize this empowerment. A number of these control activities have more considerable effects. In particular, the implementation of an intranet training and education programme, goals and objectives and support for users to access

information for publishing in the early stages are essential to provide developmental focus and to establish the organization's commitment to, and direction of, the intranet. Technical standards for intranet hardware, software, communications technology and policies for data security must also be implemented from the early stages. Furthermore, although roles and responsibilities are necessary from the beginning, these should not be too restrictive as they can alienate some users from the intranet. HP users believe that these controls are significant empowering factors in the early stages of the intranet. HP management contend that implementation of the control activities are the main reason that the intranet experienced such rapid and effective growth.

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