Leading the development and implementation of collaborative interorganizational systems

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Abstract

Developments in network technology have enabled an increasing variety of interorganizational relationships. While the interorganizational systems (IOSs) that support electronic markets or customer/supplier relations have been discussed in the literature, those which support ‘symbiotic networks’ – those which form horizontal alliances to allow collaboration on the collective production of goods or services – have received little attention. An examination of the systems development literature and the strategic alliance literature suggested a number of issues; these were examined in an exploratory case study. In developing and implementing a collaborative interorganizational system, the traditional combination of an executive sponsor and a project champion appears to be insufficient for providing the necessary leadership. In particular, while some of the management tasks seem to require a sponsor who is external to all the partners, others need the presence of an executive sponsor within each organization. Unfortunately, the establishment of such a team of sponsors is a difficult task. Our case study underlined the importance of the interorganizational teams charged with the development work and the available underlying social and professional networks. It also suggested that the development and implementation process went through various stages during which the major focus and concomitant locus of leadership changed. © 1999 Elsevier Science B.V. All rights reserved

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1. Introduction

Developments in network technology have allowed organizations to develop a greater variety of interorganizational relationships, from electronic markets to value-adding partnerships. Currently, much of the research on interorganizational systems (IOS) that enable and support these new relationships is focused
on the means by which an individual firm can garner strategic advantage [3, 16, 34], or at least improve its own operating efficiency [2]. A common underlying assumption is that a single organization, in pursuit of such benefits, will take the lead in design and development. This organization will then, by virtue of either its dominant position or its persuasiveness, convince appropriate partners to connect to the IOS [7, 8, 26, 28].

One type of IT-enabled interorganizational structure that has received little attention in the IOS literature is the ‘symbiotic network’. As defined by Alter and Hage [1], these systemic networks consist of organizations from different sectors that come together to collaborate on tasks ranging from straight information sharing, through cooperation in performing specific functional activities, to collective production and delivery of goods or services. They observe that the demands of today’s environment favour structures that are smaller, decentralized, and based on strategies of cooperation and horizontal relationships. Inter-sectoral collaboration or ‘relational governance structures’ [17, 36] may be more appropriate than either strong market competition or vertical hierarchies for ensuring maximum flexibility [25]. The exceptional economic performance of clusters of firms, such as those in Silicon Valley or Northern Italy, has called attention to networks as an attractive form for organizing economic activity [30]. These firms often collaborate at one level – such as providing needed infrastructure – while competing in downstream product markets. In the public sector also, where networks of agencies are responsible for providing different services to the same clients, collaboration can improve both efficiency and effectiveness [12, 27].

The IOSs that can enable such networks of organizations to enjoy electronic coordination would not, to use Konsynski’s [19] terminology, be of the more usual co-optive or competitive type, but might instead be better termed collective or collaborative. Examples demonstrating the benefits that can be gained through such systems include Singapore’s TradeNet (a comprehensive trade-related IOS), and various community health information networks. These systems reflect the horizontal interdependence that underlies symbiotic networks.

A similar distinction is made in the typology developed by Kumar and van Dissel [22] which, using Thompson’s [33] categories, distinguishes between different classes of IOSs on the basis of the type of interdependence between the participating organizations. In this typology, networked IOSs that support reciprocal interdependence are differentiated from both pooled information resource IOSs (supporting pooled interdependency) and value/supply-chain IOSs (supporting sequential interdependency). See Fig. 1. A pooled information resource IOS supports the sharing of a common resource, and might involve shared databases and/or shared applications, such as airline reservations systems. A value/supply-chain IOS, such as an EDI-based order and invoice system, supports the sequential activities of supplier–customer relationships. Networked IOSs support communication and collaboration in more complex relationships where exchanges are reciprocal and requirements are less predictable than in either of the other two types. Examples include CAD–CASE systems linking designers and manufacturers, video-conferencing software, and integrated health networks.

Although the enabling technologies for networked IOSs are not yet mature, the pace of development suggests that managerial rather than technological challenges are more likely to constrain future development. In particular, the relative lack of structure in the exchange relationships being supported suggests that managing the development and implementation of such systems is anything but straightforward. In a collaborative IOS – a networked IOS built to support collaboration and cooperation – there is no obvious focal point for leadership, such as that found in a pooled information resource. Indeed, the likelihood of a self-selected initiator attempting to capture strategic advantage, such as is often the case in the value/supply chain IOSs, is low for various reasons. First, since collaborative IOSs are intended to generate collective benefits rather than offering strategic advantage to one of the participants, the free rider problem is likely to discourage independent initiatives. At the same time, overt steps taken by any single participant to assume leadership may be perceived by the others as an
attempt to appropriate an undue share of the benefits, reducing their willingness to participate. Thus, collaborative IOSs are more likely to be built collaboratively, if at all. Even if the partners jointly agree to fund external development, they have to collaborate to provide collective direction to the developer. The question addressed in this paper, then, is:

“"How is the development and implementation of interorganizational systems supporting symbiotic networks managed?""

More specifically, in the absence of a lead organization:

1. How are the strategic objectives of the collaborative IOS articulated?
2. How are they translated into specific project details? and
3. How is the necessary momentum sustained?

2. Designing and building a collaborative IOS

Although not previously explored in an interorganizational context, similar questions have been addressed in the broader IS literature. In particular, the strategic drivers of systems development projects and the leadership imperatives for turning plans into reality have been discussed.

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<th>Pooled Information Resource IOS</th>
<th>Value/Supply-Chain IOS</th>
<th>Networked IOS</th>
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<td>e.g. Shared Databases</td>
<td>EDI Applications: Order, order-tracking, invoice and payment systems</td>
<td>CAD/CASE Systems Video-conferencing Integrated Health Networks</td>
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2.1. Strategic drivers

Two strategic drivers affect choices made with respect to new systems [15]: business strategy, which gives rise to an information systems (IS) infrastructure that can support the appropriate organizational infrastructure, and IS strategy, which focuses on either improving the services provided to the existing business, or transforming the business through new technological capabilities. In other words, strategic drivers may be business opportunities leveraged through technology, or new technology exploited by the business. In fact, both types of initiatives are necessary for full realization of the strategic potential of IT.

A balance is needed, however, between developments driven by an organization’s strategic purpose only and advantages that might be gained from a purely technologically proactive stance. The tension exists, because the end-users that are most familiar with an organization’s needs often have only a limited appreciation of how new technology might open up fresh opportunities, and vice versa.

Congruence between task and technology is not only critical in strategy formulation, but is essential for successful implementation. One requirement for ensuring such a match is an adequate level of technical competence; yet, while technical experience provides the necessary springboard for identifying and exploit-
ing strategic IT opportunities, excessive technological enthusiasm can lead to disaster [9]. A further requirement for successful IT use is absorptive capacity – the IT knowledge of managers and the effectiveness of its management process, together with the overall climate for IT management [5].

In the case of a collaborative IOS, the capabilities offered by network technology may well motivate initiation of design and development, and provide a motivation that all partners share. On the other hand, the various business strategies of the partners are likely to differ, and their translation into an appropriate strategy for the IOS in the absence of a dominant or lead organization will require some mechanism for harmonization. If, in such an IOS, enthusiasm over technological opportunities is shared more easily than the definition of common strategic purpose, the danger of pursuing technology for its own sake poses a distinct threat. At the same time, for a collaborative, cooperative system to be successful, all partners need to feel that they are receiving benefits. Complicating matters further is the requirement for technical competence and absorptive capacity, since the level of technological readiness, managerial IT knowledge, and IT management effectiveness may be unequal across the different partners. Issues that arise in an IOS context are: In the absence of a lead organization, how can an appropriate articulation of the system’s strategic purpose be accomplished? Once defined, how will differences across organizations be bridged?

2.2. Leadership requirements

Even in the absence of a lead organization, leadership of some form is required. Successful design and development needs top management support and championing at every stage of the process [24, 31]. In addition, the set of roles that collectively define the championing function is likely to include a variety of individuals. Maidique [23] identifies three roles – the executive champion, the product champion, and the technological entrepreneur. This group, supported by technical specialists, must perform the tasks of business definition, technical definition, sponsorship, and communication. Once an organization has grown beyond the point where the senior executive is still active in technical definition, the role of sponsorship becomes particularly important, as only at the top levels can high risk be appropriately absorbed.

McKenney et al. focus on three roles that they label the senior executive sponsor, the technological maestro, and the gifted technologist or technical team. The maestro, who may or may not be technical, plays the pivotal integrative role. This requires both a clear vision of the business and the nature of its strategic direction and sufficient technical competence so that the corps of technicians have confidence in his or her technological judgement.

Grover [14] summarizes the observations of various researchers in his description of two types of support role: a top-management sponsor, who must both provide long-term vision and ensure ongoing commitment of resources, and a project champion, who is responsible for communicating the strategic vision and building project team commitment and enthusiasm.

Whatever the labels, and whoever plays these roles, these descriptions imply that various tasks must be performed: definition of business purpose, translation of the purpose into technical requirements, assessment and acceptance of risk, provision of resources, protection from short-term contingencies, communication between those directly involved, communication with other members of the organization, and integration across the various parts of the project.

When considered in the context of a collaborative IOS, these different tasks require quite different forms of leadership. The problem of articulating a coherent strategic vision that fits with individual organizational strategies may well require a locus that is external to all the partners, yet one which has the authority, or at least the credibility, to negotiate a shared vision. Information partnerships need shared vision in order to be successful [20], and successful partnerships need to be facilitated through the leadership of an external intermediary or overarching authority, such as an industry association or a government or quasi-government entity. On the other hand, the type of senior executive sponsorship that can ensure appropriate and ongoing commitment of resources will require an individual within each organization who has the requisite authority. The relationship between this ‘team of internal sponsors’ and the external sponsor is not clear.
3. Creating strategic alliances

Insight into the challenges involved in coordinating the collaboration of a number of partners can be found in the strategic alliance literature. As discussed by Borys and Jemison [4], reconciling different objectives of sovereign organizations into a common purpose is complicated by the fact that various partners are not normally unitary actors, but may well express multiple interpretations or even experience internal dissension over any stated position. This highlights the need for a sponsor or spokesperson within each organization to ensure internal consistency. Furthermore, as several organizations start to function interdependently on any dimension, there is a tendency for boundaries to become blurred and this can lead to an unclear allocation of responsibilities. In a collaborative IOS, for example, while ownership of hardware may be specified, the maintenance, troubleshooting and development tasks may be harder to allocate.

Doz [10] and Kanter [18] recommend that the partners of an alliance establish mechanisms for interorganizational communication at various levels in their hierarchies. Successful interfaces depend on good personal relations, as standard organizational motivation and internal reward systems are not available. Boundary spanning roles must be filled with entrepreneurial risk-takers whose willingness to try something new can provide the necessary flexibility. Boundary spanning individuals can play a key role in broad two-way communication. They both bring their organization’s interests and concerns to the interorganizational team, and take back reports of the group’s progress. The creation of interorganizational technical committees and project teams at all levels was found to be particularly effective in the research consortia studied by Evan and Olk [11], and in an analysis of SEMATECH, a consortium of US semiconductor manufacturers, by Browning et al. [6]. However, one problem created by this type of boundary spanning is the need for individuals at the boundaries to face conflicting obligations due to their dual affiliations.

A thread running through much of the literature on strategic alliances is the importance of trust in cooperative ventures [32]. Ring and Van de Ven [29] define trust as an individual’s confidence in the good-will of the others in a given group, and belief that the others will make efforts consistent with the group’s goals. Browning et al. observed that it was the leadership by an individual who was both charismatic and highly regarded for his professional abilities that helped SEMATECH to build trust. In addition, pre-existing social networks facilitated the process.

Grandori and Soda [13] discuss the importance of pre-existing social relationships also. They observe that some elementary form of social coordination, such as acquaintance and communication, is the basis on which more elaborate inter-firm coordination structures may emerge. In a similar vein, Krackhardt [21], discussing within-firm organizational change, argued that friendship networks constitute a base of trust that can reduce resistance and provide comfort. In the looser structure that a collaborative IOS is intended to support, these relationships may well be even more critical.

4. Management implications for collaborative IOS – summary of the literature

The process of designing and building a collaborative IOS requires at least two different types of leadership: a locus of leadership that is external to all the organizations, possibly a respected neutral ‘statesman’, and leadership within each organization to support understanding of and adherence to the common vision, etc.

To investigate these ideas, a case study was conducted to observe the form that collaborative IOS leadership actually takes, to determine whether different loci of leadership need to coexist, and to see how the different leadership tasks (articulating a strategic vision, translating strategy into action, and maintaining momentum) can be apportioned.

5. Lessons from the field: the case of LARG*net

5.1. Methodology

The research was conducted as an exploratory case study, with an embedded, single-case design. The nature of the basic question together with the relative infrequency of such projects in the past argued for
case-based methodology [35]. As the project selected for study was divided into a number of sub-projects, issues identified in one set of interviews could be compared and contrasted with the experiences of other groups.

As collaboration has generally been encouraged (if not always practised) in the public sector, it offers more examples of collaborative IOSs. To the extent that ‘collaboration between competitors’ is becoming more common, lessons learned at London and Region Global Network (LARG*net) – a public sector initiative with private sector partners – are expected to be generalizable.

LARG*net is a broadband network connecting seven organizations\(^4\) engaged in the healthcare, research, and education sectors in London, Ontario. It started in January 1994 as a three-year trial both of asynchronous transfer mode (ATM)\(^5\) technology and of a variety of specific applications, such as medical image transfer and archiving, and distance education. It was considered a good choice for this study because the time frame of the research coincided with the midpoint of the three-year project. By closely observing events over an eight-month period, the researchers were able to minimize the danger of retrospective bias. Information regarding the early days did, of course, depend on archival and interview data, but the events were fairly recent. Several follow-up interviews were conducted after the project was completed to bring the information up-to-date.

Data collection activities for the case study included interviews, attendance at meetings, and perusal of archival data. Thirty interviews, both unstructured and semi-structured, averaging an hour in length, were conducted with individuals from all organizations and at all levels. In the iterative manner of exploratory case studies, early findings were pursued in greater depth at later interviews, and regular contact enabled informal discussion. Meetings of two of the interorganizational committees (the operational policy committee and the project leaders committee), which met on alternate weeks, were attended from March to December, 1995. In addition, documentation including the original and revised business plans, budgets, minutes of meetings, and year-end reports were examined. A report summarizing the observations and interpretations was prepared and reviewed by the individuals involved to ensure accuracy.

### 5.2. Articulating a strategic vision

LARG*net’s genesis, in the fall of 1993, was the result of a combination of forces. To begin with, the Ontario government, through its Ontario Network Infrastructure Program (ONIP) was looking for ways to accelerate the development and use of an advanced information infrastructure, and was willing to provide some funding for appropriate projects. At the same time, Bell Canada was looking for a test site for its ATM technology. Five organizations in London, Ontario – the university, a community college, and three hospitals – wished to explore the potential for enhanced interconnection. They had previously worked together as the London Education and Medical Share Group (LEMS) to reduce long distance telephone expenses. The director of Information Technology Services at the university, Andy Bjerring, was the catalyst who first recognized the opportunity, and articulated a vision to take advantage of it.

The strategic impulse which motivated the creation of LARG*net was not, then, driven by any one of the partners of the collaboration; nor did it arise as the rational outcome of the strategic plans of an overarching organization. Bjerring, who understood what the technical developments could do for the organizations, saw an opportunity not only for his institution but for all the institutions. He also had the necessary personal contacts within the potential partners to initiate discussions. He was aided in this by the active support of Bell Canada, who saw it in their own competitive interest to become involved in the venture. He was also fortunate in capturing the interest of Trevor Cradduck, Chair of Nuclear Medicine at one of the hospitals. Cradduck soon became the general manager of LARG*net, its champion and chief architect. Thus in the case of LARG*net, the critical initiating factors were the propitious confluence of external circumstances and some prior experience with a joint project plus one individual who recognized and articulated the potential benefits for the community as a whole and another who undertook to turn the concept into reality.

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\(^4\)Since the conclusion of our work, new partners have joined.

\(^5\)ATM technology offers fast cell-based transmission. By combining elements of both packet and circuit-switching, it can support complex multimedia applications.
The fact that no superordinate organization played a lead role was not for lack of potential candidates. In reality they did make contributions, but could not be considered the source of strategic direction. For example, the Ontario government, through the Ministry of Economic Development and Trade, offered an incentive by making start-up funds available. However, members of the LARG*net community felt that, while the funds encouraged participation, the plans would have gone forward even without them. Similarly, while the Ministry of Health was a second potential candidate, particularly since many of the potential benefits would accrue to the health system as a whole rather than to the individual organizations, it deliberately avoided ‘interfering’ with this community initiative.

Although the government ministries elected not to play the role of external strategic driver, the corporate partners, primarily Bell and 3M, were more active, and more effective. Their financial and technical support (largely in the form of donated equipment and software), and the institutional credibility for the project that this support provided, was helpful in maintaining momentum. In return, the specific projects that were developed to fulfill the general mandate of LARG*net served corporate objectives (primarily testing of beta-ware and development of new applications). While the relationships were symbiotic, individuals within LARG*net observed that a different set of corporate partners would have resulted in a different set of priorities and activities. That being said, while they had input, Bell and 3M had no real authority to set overall strategic intent.

How were the original strategic plans made, and who could take responsibility for reviewing and refreshing them? The first move was made by Bjerring, who, in the role of neutral statesman, ignited the process. Part way through the project, Bjerring was attracted away from the university to lead a national infrastructure project based on ATM technology. The old LEMS group, consisting of telecommunications managers from the IT departments of the various institutions, provided an initial forum for collaboration, and certainly helped define the original strategic direction. This existing network of individuals, which had a previously established working relationship and had built up a degree of trust, appears to have been the main facilitator for building a shared strategic purpose after Bjerring’s initial contribution. Led by Cradduck and supported by the vendors, the process was informal, and decisions reflected the team members’ personal views. The initial strategic driver was, then, a technological opportunity rather than a strategic need. Leadership came from an external sponsor or statesman and an interorganizational technical team, supported by an external project champion.

5.3. Translating strategy into action

Once the project took concrete shape, a more formal organization emerged. At its head was a Board of Directors (the CEOs of each partner institution), charged with approving and reviewing strategic plans and performance. While government start-up funds had provided initial encouragement and vendors helped with capital expenditures, the operating partners were responsible for providing the labour and covering all ongoing operating expenses. Reporting to the Board was Cradduck, the general manager, who was responsible for overall leadership, liaison with external bodies and financial accountability. The vice presidents of the institutional partners comprised the VP Policy Committee, which was intended to enable all partners to influence, or at least be informed about, strategic developments. Supporting the general manager was the administrative or operational policy committee, consisting of the IT directors or their equivalents from each institution – an enhanced version of the original LEMS group. This influential committee took active responsibility for making operating decisions. They met often and were well informed on events and progress. Finally, various project teams were charged with acting on the decisions taken. These teams were also made up of representatives from the various partner organizations, joined by a small number of external contract employees. Apart from the director, there were only four individuals with a full-time commitment to LARG*net (project manager, web site administrator, medical imaging coordinator and multi-media coordinator). Fig. 2 shows the LARG*net interorganizational structure.

This layered sandwich of interorganizational committees was designed to address the challenge of integrating purpose across multiple organizations. Difficulties arose on two fronts. First, because the
VP Policy Committee did not play an active planning role but focused instead on ensuring fiscal accountability, there was a policy vacuum. In addition, the demands placed on team members to work on projects and provide broad two-way communication neglected to consider that each of the individuals already had full-time responsibilities in their home organizations. Few rewards, other than personal satisfaction, accrued to those participating, while the demands were many. Although most CEOs were viewed as being in favour of the project, which should have made it easier for team members to devote work time to LARG*net affairs, an individual’s full-time job was expected to come first. At the university, after Bjerring’s departure, a clear sponsor did not emerge, and the willingness of team members to engage in activities that were not seen as directly related to their organization’s mandate fell correspondingly.

To some extent, the financial and personal support offered by vendors provided a degree of sponsorship by raising the perceived legitimacy and importance of the project. However, their lack of real impact was evident in the frustration they voiced regarding the rate of progress, particularly in the later phases of the project. Cradduck played an ongoing role in promoting LARG*net, but he had no control over resources within the various institutions, particularly with respect to people’s time. Maintaining momentum should, perhaps, have been the role of the VP Policy committee. However, while they needed to spend time mobilizing the necessary political will within their own organizations to allocate appropriate resources, they had so many other matters to follow that they could not devote the time required. They met infrequently, and even then often sent alternates.

According to some observers, one reason for Cradduck’s success in attracting substantial institutional resources despite these constraints was his position as a specialist in medical physics. A respected professional and potential user of the system, he not only added credibility to the project proposals but, through the network of similar professionals, had a ready-made entrée to the associated institutions. The quite different experiences of various sub-projects demonstrated the importance of these sorts of networks.

5.4. Maintaining momentum – comparisons across project teams

Four sub-projects, designed to address different parts of LARG*net’s overall objectives, dealt with connectivity, medical imaging, multi-media applica-
tions, and regional outreach. The connectivity team focused on technical enablement, from design and construction to maintenance and support. Its members came from the technical staffs of the larger partner institutions, including the major vendors. While they did not have prior working relations, they did share the same professional background and expertise, and subsequently grew into a mutually supportive group. During the first year of the project, when the overall focus was to get a system up and running, these individuals made substantial contributions of time and effort. As time passed, however, enthusiasm waned. When new, smaller institutions with little or no systems expertise requested connection, members of this team expressed concern over the apparent expectation that they should provide extensive support and maintenance outside their own institutions. In particular, individuals from the university, after Bjerring’s departure, questioned the wisdom of their continued commitment. What some members of this team appeared to be missing was a clear signal from a sponsor within their own institutions to define and support their participation in LARG*net activities.

Although the connectivity team had a technology focus, the other three projects were applications driven. The group that seemed to have the least difficulty in defining its strategic direction and staying on track was the medical imaging team. The core of this team was a number of medical physics and radiology specialists, including Cradduck, who worked with large electronic files that are difficult to share in the absence of broadband capability. These users, who had known and worked with each other for some time, were not deterred by the lack of a senior organizational sponsor. In addition to the personal interest of the general manager, their perception of a real benefit for their work and the advantage of an existing professional network helped to maintain commitment and momentum. Furthermore, this team was one of the first to employ a coordinator who could devote his full time to many of the necessary tasks. According to some team members, the exact direction of the project was driven, to some extent, by the interests of the corporate partners, but the strong pre-existing network appeared to have helped to maintain a clear and consistent vision of their goal.

Within the multi-media team, the vision was not as focused. Unlike medical imaging, which was organized around specific problems needing solutions, the multi-media team set out to find appropriate applications for the multi-media capabilities of the ATM technology. Telemedicine and distance education were identified as general possibilities, and the team engaged in a variety of efforts to interest potential users. The lack of a specific application focus was reinforced by the team’s structure. While the original team membership was a collection of representatives from the various institutions, the individuals who emerged as prime movers were not end-users. In fact, two of them were ‘outsiders’ on contract, and the group did not have the support of a professional network of potential users.

Despite the lack of user-driven applications, and with no more executive sponsorship than enjoyed by any of the other teams, the core members of the multi-media team devoted considerable time and energy to their project. When asked what drove this commitment, they cited strong personal confidence in the potential of the technology, personal satisfaction from the opportunity to learn more about it, and the pleasure of working in a mutually supportive team. From both this and the medical imaging team, it is clear that the social network, whether already in existence or newly formed, can play a vital role in motivating and sustaining collaborative activity across organizational boundaries when no hierarchy exists. The added advantage of a team of professional end-users that is already in existence is that it has a ready-made set of shared tasks and interests that provide clear direction for the effort.

Although regional outreach was a stated objective of the Policy Committee, this fourth project had great difficulty in getting off the ground. The project leader, who assumed that mantle reluctantly, had the general support of his organization’s director, but did not find others who were willing to share the work and responsibilities with him. In this case there was neither a clearly defined organizational need, nor a supportive network to help articulate specific objectives.

5.5. Progress report

At the end of the three-year trial, the technical infrastructure was operating as planned, and new community and private sector partners were invited to participate in the use of this broadband facility.
However, few of the originally envisioned applications had progressed much beyond the trial phase. While some medical images were being shared between the hospitals and the cancer clinic, for example, most organizational activities were still being conducted as they had in the past. In the end, some expensive infrastructure was working, but limited use was being made of its potential. Since the end of the formal project, the teams have been disbanded (with one individual left in charge of managing network operations, and informal collaboration supporting the applications) and Cradduck has moved on.

6. Discussion and conclusions

The leadership roles demonstrated by LARG*net included not only those that are familiar from the traditional systems development literature, but also new ones that seem specific to a collaborative IOS. In addition, the relative importance of these roles appears to vary across the various stages of the development and implementation process.

6.1. Leadership roles

The observations made during the study of LARG*net parallel the lessons delineated by Ferratt et al. in their description of the Greater Dayton Area Community Health Information Network. What both cases suggest is that the traditional view of the leadership required for successful IS development and implementation has to be extended, in the case of a collaborative IOS, beyond the ‘executive sponsor – project champion/maestro’ duo. First, the executive sponsor role in the LARG*net case was broken up between a neutral statesman who initiated the project, and the team of senior executives within each partner organization who, at the beginning at least, provided the necessary human and financial resources. Unfortunately, this latter group never developed the passionate commitment that was needed to keep the project on track. While Bjerring’s departure did not appear to deter progress in the development of the network technology, it is interesting to speculate whether his continued involvement might have spurred greater commitment from the executive team, and so improved the outcome with respect to applications.

In the absence of both a statesman and an overarching authority, it is not clear how the executive team can be motivated to play its role.

One of the elements that appeared to constrain the support of the executive team and, to some extent, the CIO team, may well be endemic to a collaborative IOS of this nature. Organizations choose to participate in such an endeavour, knowing they are expected to contribute various resources, because they anticipate specific benefits. However, many of the benefits of a collaborative IOS are collective, with contribution and reward not perfectly matched. Not only does this require trust and a degree of altruism, it also motivates ‘free rider’ behaviour. In the case of LARG*net, in order to have enough potential applications to support the design, construction, and maintenance of the network technology, it was necessary to involve a variety of partners. However, the differences in their interests (from healthcare to research to education) meant that each proposed application was likely to be of interest to only a subset of the partners. With time and budget pressures, parochial interests superseded commitment to the collective benefits. In fact, the sense of ‘ownership’, which is part of commitment, may be impossible to sustain in a disparate group of this nature. This supports those who argue the need for an overarching authority that mandates the construction of the IOS.

The integrative and motivational champion/maestro role was played by LARG*net’s general manager, who was external to all the partners, with some support from the team of CIOs. Cradduck was a model of commitment and enthusiasm and this helped to maintain momentum and direction of the technical troops. In fact, the various project teams also seemed to derive energy from working together and took responsibility for setting their own direction. The team of CIOs was less responsible for the integration and goal-setting aspects of championing and more responsible for communication within their own organizations; this helped in obtaining necessary resources. In situations where the CIOs were less committed, resources (particularly the time of their subordinates) were not as readily available. In many ways, leadership in both setting strategic direction and maintaining momentum seemed to be more ‘bottom-up’ than ‘top-down’, centred in both the friendship and professional networks of the project teams.
Although these teams were critical in establishing the detailed strategy and executing technical development, they were not in a position to involve the broader organizational community in development or adoption. What seemed to be missing in the later period was leadership from executive sponsors in the organizations.

6.2. Development stages

One of the unanticipated findings from the case study was that the development and implementation of this collaborative IOS moved through various stages, each with different leadership requirements. The proposed stage model is based on the case and combines elements from two existing models, one reflecting the formation of technical alliances, and the other describing the process of technical innovation. As suggested by Browning et al. on SEMATECH, there appear to be three phases in the evolution of the alliance. At the start, there is little structure and much ambiguity, but also optimism, creativity, and goodwill. In the second phase, as patterns of communication develop and a common vision solidifies, structure evolves in the form of a small, shared community. This must move eventually into an implementation and institutionalization third phase, involving the broader organizational community. These stages, through which LARG*net certainly moved, are superimposed, in the case of a collaborative IOS, on different phases of the technical innovation and implementation process. The six-stage model of Zmud and Cox [37] – initiation, strategic design, technical design, development, conversion, and evaluation – is useful for our purposes. While other models have been proposed, they have tended to focus only on parts of this process.

As indicated in Table 1, there appear to have been three broad stages in the evolution of the IOS. While these overlap and the central tasks of articulating a vision, coordinating activities, and managing change are important throughout, the case suggests that the relative importance of these tasks changes. Each phase is characterized by a different central focus and hence different leadership needs. Each stage reflected one of the alliance building phases, and a pair of the technical innovation process phases. In the first, unstructured phase, the project was initiated and a broad statement of the strategic vision was articulated. This stage seems to require an external intermediary (at LARG*net, this took the form of a neutral statesman) working with an existing network of individuals from the partner organization. The main focus was on developing and communicating a vision for the project.

The second phase involved a relatively small, well-structured community that refined the strategic focus and conducted the design and development work. With the focus on technical issues, the key requirement was coordination, effectively provided by the project general manager. He was external to all the organizations, but worked with teams whose members were based in the partner organizations. The absence of active senior executive sponsors, either internal or external, was a hindrance – some resources were constrained and strategic

<table>
<thead>
<tr>
<th>Stages</th>
<th>Focus</th>
<th>Key leadership roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1: Start-up, initial articulation of vision, strategic focus</td>
<td>Vision</td>
<td>External intermediary/sponsor: overarching authority, or neutral statesman, or proactive vendors, Existing social or professional networks</td>
</tr>
<tr>
<td>Stage 2: Refinement of strategic focus, technical design and development</td>
<td>Coordination</td>
<td>External neutral facilitator, coordinator, Interorganizational teams at various levels, Existing or new social networks</td>
</tr>
<tr>
<td>Stage 3: Implementation and organizational change</td>
<td>Change</td>
<td>Executive level sponsorship within each partner, which may in turn require: External intermediary with authority</td>
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</table>
guidance was minimal – but momentum was maintained and progress was made even without executive level leadership. Unfortunately, the lack of strategic guidance at this stage may well have resulted in difficulties later.

The third stage, when the focus should have been on organizational change, is where the absence of internal executive sponsors had greatest effect. To begin with, their limited participation in strategic design meant that technology rather than real strategic need drove the applications. With little or no ownership of the applications outside the project teams, and no top-down pressure to support implementation, LARG*net became a solution looking for a problem. At this point, the general manager’s position outside the partner organizations reduced his effectiveness. Where CIOs were active, some changes were made, but the new technology did not alter many organizational processes. During this stage, it is unlikely that an external sponsor, unless he or she possessed some real leverage over the organizations, would have made a difference.

It seems, then, that while there are many different leadership roles required for the successful development and implementation of a collaborative IOS, and these roles are likely to be filled by a variety of players, one necessary role is an internal executive sponsor within each partner. These individuals play their most prominent part in supporting the institutionalization of organizational change towards the end of the process. At the same time, while progress can be made in their absence during the early stages, their participation is valuable for securing resources and defining direction. Unfortunately, there also appear to be many reasons why a team of committed internal executive sponsors will not arise naturally. An overarching authority might be one alternative. In the absence of such a body, it would appear that the team of CIOs would have to play a far more proactive and persuasive role in educating senior managers.

References


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