Network Management

Issues in Local Area Network Management

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Abstract

Computer networks are used in different organizations to many purposes. Some use them internally to enable work processes, others may see network as a strategic resource. This paper looks at local area networks, those networks that are the core of the entire information system in organizations today. The are many important management tasks in the area of local area networks, for example expansion planning and security. Outsourcing is seen as a possible solution in organizing network management tasks.

Keywords: LAN, networks, management, outsourcing

BRT Keywords: CA, EL

Introduction

This paper deals with network management. The interest is specifically in local area networks, in those networks that are the backbone of the entire information system in almost any organization today.

Most organizations have already had a local area network (later LAN) installed and running for several years. In fact, there should not be anything new or surprising in a LAN. It may be considered as common and familiar as a microcomputer. As the networks have been serving the organizations, they have evolved from small local networks to larger computing solutions. This development has usually happened with very little planning. In addition, the management procedures may not have been organized from the beginning.

Companies have distant offices and build connections to business partners. Local area networks are expanding from company's internal network to a system that connects different business partners. Consequently, there are many stakeholders, vendors and service providers involved. To plan, develop and implement complex, constantly changing, expensive technology and turn it to working network solutions that serve users on a daily basis puts great demands on those who are involved in the process.

Viewpoints

The purpose of this paper is to give ideas on important issues in network management. This paper deals with a problem in what way should networks be managed. It is argued that the role of local area network can be strategic. It should be seen as a resource that is a management challenge. Local area network is build from several elements, it is a

combination of technology, IT skills and managerial practices. The managerial practices are seen as most important as they can bring advantages that are strategic (Mata et al. 1995).
In this paper we look at local area networks and

- challenges in information system and network management
- network management tasks
- outsourcing as a solution to organize network management

The border between local area networks and other networks is difficult to define as organizations are building networks that connect distant locations and use public networks like Internet to create private networks. In addition, connections to other companies are common. Internet-connection is a route to other organizations, suppliers, customers and users. The result is that a local area network is a information system that primarily benefits the organization that has built it for its own needs, but it is not necessarily the only network that is used. When other networks and partners are involved network management becomes more challenging. Goodhue et al. (1992) argue that if the number of partners rises, system integration and development becomes difficult.

It is common that companies use external companies to provide elements in information system. For example external vendor sells and installs network hardware. External partners can deliver also other elements than software or hardware, as an example training or support might come from outside vendors. Companies should not exclude external services, as in many cases it is better to buy services than do them in-house (Venkatraman 1997). Buying hardware and software is the only solution if they can not be manufactured or programmed in-house. Managers still have to decide which vendors and brands to use. When network related services are discussed managers problem is to define which IS services should be bought from external service markets and which not. What tasks to give away and which external suppliers to use are a critical decision.

Management challenges

Networks and information systems in general can help company to achieve business goals. According to Ross et al. (1996) this is a result of IS capabilities. They emphasize the ability to control costs, deliver systems when needed and effect business objectives through IS implementations. The important capabilities are a strong and competent IS staff, a reusable technology base and a strong partnership between IT and business management. These key capabilities or assets as Ross et al. (1996) call them dictate the quality of IS planning, delivery and support process.

Ross et al. (1996) emphasize the relationship between IS managers and business managers in setting IS targets. Feeny – Willcocks (1998) notice that both business and IT vision are needed to assess what technology can do and how to best use it. Firstly, IS management practices should be developed constantly, but at the same time new opportunities for business growth should be seeked.

Secondly, IS services should be delivered at low cost and with high quality. One possible solution to deliver IS is to outsource it. There are many views on this issue (McFarlan – Nolan 1995, Lacity et al. 1996, Earl 1996, Rockart et al. 1996, Feeny - Willcocks 1998). This issue is will be discussed further in other parts of this paper. If some parts of information system are outsourced, these partnerships have to be managed. This would include continuous monitoring of existing service agreements, rearranging

them as needed and developing new sourcing strategies. This will lead to a continuos need for strategic management and development of IS-sourcing in the company. At the same time IS people are being asked to deliver new solutions faster and to maintain existing systems better (Rockart et al. 1996).

The third challenge is the development of IT architecture (Feeny – Willcocks 1998). Choices that are made in building the technical hardware and software architecture are important in creating the technology asset of the company (Ross et al. 1996). Networks and networking needs may not last decades; their life cycle can be a few years. The challenge is to choose what technology to buy so that IT architecture should remain open to changing business needs (Feeny – Willcocks 1998).

These challenges are all more or less IS management problems. The IS management should understand the weaknesses and strengths that the company's information system has, follow industry trends and understand business needs. IS managers should also develop their management procedures to match current and future needs. As Venkatraman (1997, pp. 51-52) notes

> Most managers are painfully aware of the limitations of their legacy technological infrastructure and plan to migrate … few recognize the potential weaknesses of their legacy administrative architectures. Outmoded IS organizational design and processes, misdirected IS resource allocation criteria, inappropriate IT planning systems, parochial views on outsourcing, and mismatched IS skills with business needs are as critical as obsolete technological platforms.

The results of inappropriate IS administration is less obvious than for example software that does not function properly: if it crashes there has to be something wrong with it. Venkatraman (1997, p. 52) bring up three major shifts that should make IS managers to rethink their management logic:

The technical arena is changing fast, as business processes are connected with suppliers and customers. This not the only rapid change in technical systems, as the importance of standards has moved from hardware to software. Software like Microsoft Netscape Navigator and SAP R/3 dictate the standards operating system platforms and network infrastructure. Internet and Intranets bring up modification needs and important issues like security.

Secondly, business manager's expectations have changed. Managers no longer consider IS as the magical solution to business problems or expect it to bring considerable cost cuts. Business managers are optimistic but cautious about the opportunities IS offers to business. Information technology is expected to enable new ways of doing business, company may for example enter market areas that earlier were not possible to obtain (Venkatraman 1994).

The third change has happened in the market of external IS services and products. Some systems or tasks can be given to a single external partner, but there can also be multiple service providers and other joint ventures. The external IS-market has evolved and a company has plenty of cooperative partnership arrangements to choose.

The role of information systems and networks

Information and its management can be the element that has the most important role in organizational coordination and organizing internal processes. Mata et al. (1995) notice that managerial IS skills are the only resource that can lead to long lasting advantages.

Other IS resources like computers, software and IS skills can be imitated. This emphasizes the role of IT management, as competitors can not easily copy management practices. Keen (1991) writes that although many IT elements can be seen as a commodity IT management is something that is a value added resource. Ross et al. 1996 add that IS-staff skills and technological platform are required, IT management is just one critical competency that is needed.

IS professionals and business people may have different views the role of information systems and network. External partners have other ideas how company should manage and develop its systems. Customers and suppliers may be involved in network related decisions, at least if new connections or existing ones must remain operational even though company makes changes in internal systems. Local area networks are a combination of different hardware and software. Skilled IS staff is needed to develop and maintain them. User skills and needs users can introduce challenges to network management.

Network management involves external stakeholders like hardware and software providers. In this perspective local area network is also a partnership and acquisition issue: IS management needs to work with external companies. The more there are external partners the more cooperation is needed to manage them (Feeny – Willcocks 1998).

Core capabilities open another view to information systems and its role in enhancing competitive positioning (Prahalad – Hamel 1990). The idea is to know the strengths and weaknesses of the IS in the organization. The information systems management should be able to find areas that are vital for organization. At the same time managers must know what are the strengths in IS and what are not. By combining these perspectives, managers can identify core capabilities. Feeny and Willcocks (1998) link the idea of a strong IS staff (Ross et al. 1996) with the concept of core competencies and the potential for IT outsourcing. They emphasize the importance of concentration on core activities in an organization. As Feeny and Willcocks (1998) write

> It is simply not possible for any organization to remain competitive, let alone world class, if it dissipates managers' attention across many diverse markets and activities when each is subject to potential transformation…successful businesses focus on creating advantage through a small number of core activities, while other activities are outsourced…

Management of existing IS-resources and development of new ones takes a lot of time. External service providers and partners makes the management challenging. If the IS-domain is spread too widely, there may not be enough time to master all areas. Outsourcing may be one solution to sharpen the IS-focus. The question is what IS-areas are strategic or core and what are not. Feeny and Willcocks (1998) notice

> Instead of focusing on IS as core or noncore, the debate should really center on which IS capabilities are core to the business's future capacity to exploit IT successfully.

Applegate et al. (1996) emphasize that understanding the role of IS from the business viewpoint is important. This should be remembered in all management decisions.

Local area network as a core resource

Local area network is the core information infrastructure in the organization. Without a well functioning local area network the whole organizations information processing would stop. Network is a technical platform that is one of the key capabilities or assets in a company (Ross et al. 1996). The role of local area network is important. Its impact is

organization-wide and the system has future consequences for a number of years (Galliers 1993). The role of infrastructure is strategic if business goals are to be achieved (Broadbent - Weill 1997). These ideas are emphasized in this paper too.

Local area network is an essential resource for several reasons. They make it possible to share resources like databases, improve or change internal communications and expand the system by giving access to external resources over communications links. Networks provide strategic benefits by improving (Nadig - Hard 1993)

- productivity in the office or factory
- competitive position by enhancing the overall effectiveness
- service by enabling more accurate and better service faster

Managers are able to get more precise and up-to-date information on for example inventories and accounts receivables. The status of project or order delivery can be monitored accurately, if the data of that object is located in the network. The advantages can be further divided into internal and strategic advantages (Nadig - Hard 1993).

The role of local area network as a backbone of company's information system is critical. However, one can still question whether it is a core IS capability that the organization must develop and manage itself or not. The network management tasks have to be examined at a more detailed level. Consequently, some management tasks may be potential for outsourcing (like network support). This arrangement can work well although the role of local area network as a whole is considered core and the management of it remains in-house.

Network management is not a single task

In this section, we look more closely at local area network management tasks. These tasks have to be managed in every network. Some tasks seem more critical to company's operations than others. Consequently, they should be carefully managed in-house. Less critical tasks can be given to outside service providers. There are many tasks in network management. Their role for business operations should be understood.

Management of local area network has been studied in Nadig - Hard (1993). They consider forming a support center, establishing security and backup procedures, training, crisis management procedures, documentation, monitoring network performance and expansion planning as the most important tasks in local area network management. I will here discuss these tasks and give some examples. The case organization here called company HN gives real-life perspective to network management tasks.

Support center

User support has to be organized. The solutions depend on size of the organization, number of departments or offices, information systems etc. Some organizations have organized user support by creating a help desk, some place support staff directly to business functions close to users. Support should be able to take care of different network operating systems, Internet-related issues, application software, backup operators etc. There are many ways to organize support activities - the important thing is that IS-manager organizes support.

> In HN the organization had earlier experiences of networks, so network management and user support were familiar issues. The company tried several support solutions during the last five years. In the beginning, one enthusiastic worker took care of network support and management.

> The network expanded from 20 microcomputers and 1 server to a network of 100 microcomputers and several servers. Network support and IS-department grew as the first full-time support person was hired. At that time user support was actually not organized. Today company's IS-staff is responsible for support, although some outside specialists are used when necessary.

Security and backup

There are constant changes and threads in security (Schatt 1993). It is important to understand what threads there are and what consequences are possible. Some threads can not be totally eliminated. Only proper backup procedures can help if a serious disaster happens (like fire or thunder). Locks, alarms and security services may help keep intruders away (Applegate et al. 1996, p. 203). Staff is also a security thread. Usually training helps to lower staff-related security threads.

When the amount of users increase issues concerning security, integrity and accessibility should be addressed (Bookholdt 1989). Exception reporting and security monitoring are tasks that should be included in security management procedures. IS-staff should check the level of security regularly, even outside specialists can be used to hack the system and find security problems.

> IS-staff thinks that security is one of the most time consuming tasks in HN. Network support has to change user accounts and passwords daily. There are users who do not understand why passwords are used - all users work in the same company so why should something be secured from other users, right?

Security and backup policy are often connected. The most important thing here is to select responsible person to develop and take control of security and backup procedures. Proper backup procedures are necessary to guarantee that operations continue once a disaster strikes (Schatt 1993).

Crisis management

What if something really happens? There are all kinds of threads, and it is almost impossible to be prepared against everything (Applegate et al. 1996, p. 203). The most important precautions are backup procedures and insurance’s that have to be managed and revised continuously (Schatt 1993). In many organizations, there is need for a dedicated person whose responsibility would be crisis related planning and preparation, developing backup procedures, user training and general security issues.

> We realize that we need for extensive crisis management but we do not have enough time to plan security, commented IS-manager in HN.

Security is a very important issue in all networks. When the role of network development and management is discussed the area of security and crisis management should be evaluated and checked.

Training

Training needs depend on how well users know the systems features and how effectively they can use them. Firstly, continuous training is needed because new services are being developed and implemented. Secondly, training is necessary so that new users are able to use the information system. On the other hand users also forget what they have been told if they do not use some features or functions often. This is why training sessions should be organized periodically (Keen 1981, Eriksson 1990).

HN buys all user training from external markets. Is staff can take courses in interesting IS-issues. IS-department does not offer user training; they concentrate on development instead.

Documentation

System documentation is often incomplete. The documentation is should be done by organizations IS-department. Technical specifications or user manuals are part of the documentation. The whole system documentation, the installed network must be documented. The vendor may help but it will be expensive. IS-personnel should also document network-related procedures. The network documentation should include list of the network components, infrastructure and security issues.

Documentation has always been inadequate. Nobody has been interested to document. IS-manager in HN commented that keeping documentation up-to-date would require too much work. IS staff has no time to do it now.

Monitoring network performance

Network needs organized maintenance. Monitoring and measuring are tasks that involve setting criteria and measuring the performance of the network on a regular basis. The criteria could include acceptable levels of traffic, speed and system downtime. Performance measurement should be an organized and planned function of the IS-department. It is a part of the development process, but also a regular and important systems maintenance task. Any deviation from set criteria must be studied. It can indicate a future development area.

We check network performance, but not very systematically. Different things are monitored and checked. Monitoring is more ad hoc, and there are no criteria for performance. The whole issue is not very important in HN.

Expansion

There are many reasons why networks expand. The number of users may have increased and they need workstations. Users may also demand new and more sophisticated applications, which need more bandwidth and processing power from the network. The company may have expanded to other cities or locations. Local area network expands also through communication links. If the network will be connected to other organizations or other public networks issues like data security have to be studied carefully. Users need usually training when networks expand.

Networks expand also when technology changes, as new faster and more reliable devices become available. Old solutions may no longer function properly and they have to be replaced. It is important to plan expansions so that the network is expandable and open for changes in the future. First networks were not always very expandable - a lesson that has been learned.

IS-manager in HN used networks service providers and system vendors as a source of expertise in expansion planning. It is challenging to keep the network open for changes commented the IS manager.

Outsourcing network management tasks

Outsourcing means that company moves some IS tasks to external service providers. Companies can also outsource all information system activities. Usually the main objectives of outsourcing are cost cutting, need to focus on the business and not on IS, or thirdly getting rid of maintaining and operating legacy systems (Earl 1996). It is argued that selective or smart outsourcing can be the key to successful management of IS capabilities (Earl 1996, Lacity - Hirschheim 1993, Lacity et al. 1996).

Outsourcing has become important issue as companies have changed their business strategy: they abandon diversification and moving to new markets and instead focus on core competencies (Prahalad - Hamel 1990). If information systems or parts of it are seen as noncore they may be given to outside service providers: top management does not see the value of company's network as system that connects different departments, functions and applications. Consequently, top management considers networks as a cost that must be minimized. Outside service providers may offer appealing contracts, and the result is that company moves some network management tasks to external partners.

Contracts can be competitive because service providers have economies of scale and specialized IS-people who can do the job more effectively and with less cost than the company's own IS department. Second reason is that IS has not been able to deliver the promised competitive advantage that was expected. This means that IS will be seen as a cost center and the focus will be on operational efficiency and minimizing risks of IS activities (Venkatraman 1997). These ideas are often behind large outsourcing deals where goals are set to better focus on core activities and capabilities, lower costs and better IS-service from experienced service vendor. Outside vendor can promise solutions to many IS tasks that have been difficult to manage in-house.

> The vendor is often heralded as a strategic partner that will provide access to new technologies and technical expertise during the course of the relationship (Lacity et al. 1996).

The outcome of outsourcing seems to depend on how much IS-activities have been given to outside vendors. Most companies that had signed total outsourcing contracts experienced significant difficulties a few years after the decision (Lacity et al. 1996). Increased IS costs, poor service and inflexibility to adapt to technical and business changes were typical problems. On the other hand, companies that do not outsource at all may also experience problems. If outsourcing is not seen as an option IS-costs can increase as everything is being done in-house at whatever the cost (Venkatraman 1997). As Laticy et al. (1996) write

> By ignoring the external services market altogether, senior executives unwittingly created an environment of complacency and erected organizational barriers against continuous improvement in IT costs and services.

Select what tasks to outsource

Network management is not a decision where the problem is should it be outsourced or not. More fruitful is to discuss in which areas and how can the company take advantage of external IS services. Critical business factors, economical and technical issues are important (Laticy et al. 1996). There are also risks that may limit outsourcing (Earl 1996). Earl (1996) writes that outsourcing is a risky and continuously changing relationship. The

whole IS sourcing question could be rephrased to "Why should we not insource IS services?".

Most of the companies that have had success in using external service providers have a selective outsourcing approach (Lacity et al. 1996). The idea is to select which tasks to outsource and which ones to keep in-house. Selective outsourcing is a modular and incremental solution, and it reflects changing business needs. On the other hand selective approach provides managers many options and is therefore confusing. Managers can consider some IS-functions as commodities and outsource them, although they should be in-house. It is also difficult to calculate economical consequences although cutting costs is the major reason for outsourcing in general (in 85 percent of the companies studied by Laticy et al. 1996).

The problems with outsourcing stem from the nature of information systems and information technology (Laticy et al. 1996). Firstly, information technology is not a homogenous entity, as some systems are critical and some are not. Furthermore many IS functions are cross-functional and integrate business processes. Information technology can integrate material purchases, sales, customer service and product design. For example, company's network is typically a cross-functional and integrating platform for all operations. This is why it is not easy to define what network is. Outsourcing network management totally or even partially may be a bad idea if vendors do not understand what the network exactly is and what implications that network has for business processes and functions.

Secondly, information technology changes fast and unpredictably. Outsourcing company's network management may turn out to be a risky move if company's business will move to electronic commerce, where the role of company's internal network is critical. In this case, company gives a strategic resource to outside company. In-house expertise and organizational learning in developing and managing electronic commerce platform would be lacking (Earl 1996).

Thirdly, the changes in economics and cost reductions in IS can happen very rapidly. Next year computing resources may cost 20 or 30 percent less than this year and nobody can predict what happens the year after that one.

> While a 20 percent reduction of current IT costs for the next ten years may appeal to senior executives, after a few years, they may be paying the vendor above-market prices for computer resources (Lacity et al. 1996, p. 17).

Once the outsourcing decision has been made and contracts signed it is not easy to change the partner. There are large switching costs involved in changing the partner to some other vendor in the marketplace. In fact both contract partners face difficulties if large outsourcing partnerships are broken (Lacity et al. 1996).

In some cases external vendors are able to beat internal IS departments. This may be due to superior technical expertise, economies of scale or outstanding management - so excellent that they can not be replicated in company's own IS department. Still many offerings are based on plans to catch customers with long-term, fixed prices that are attractive in the beginning but step up after a few years (Lacity et al. 1996). Bids may contain hidden costs or may exclude initial setup costs. The vendor can also be buying market share, and after competition is eliminated, prices can be raised.

The success can not be explained by economies of scale as they do occur at a size that can achieved by many medium-size and most large companies. Many companies have information systems large enough to achieve economics of scale, so the costs cut that vendors propose have to be done otherwise. Laticy et al. (1996) suggest that vendor

bids are based more on management practice than economies of scale. Vendors manage costs by consolidating data centers into one site or by standardizing software. These methods could also be used by in-house IS department. Users resist changes and so company's IS-manager is not willing to propose then. If IS-managers were empowered to implement more efficient management practices and to standardize software, costs could be cut. As described in Laticy et al. (1996 pp. 20-22) IS managers may have plenty of ideas to reduce costs, but users resist so strongly that IS-manager can not change anything. If users are threatened by outsourcing they understand that if their own IS manager will not be able to implement these practices the outside vendor will. If the company's IS department is large enough for economies of scale and has efficient management practices, it is not likely that outside vendors are able to reduce costs. Company's own IS departments need to cover costs, but outside vendors should also earn some profit.

What network management tasks to do in-house

Outsourcing is not necessarily a solution to network management problems. Using external IS-services is not a solution because it concentrates on the how of IT, not on the what. This means that it focuses on the supply side, not on the demand side (Earl 1996). Loosely defined contracts and inflexibility in adapting business changes can cause increased costs and poor services (Lacity et al. 1996).

How to decide what network management tasks if any should be outsourced? The company could first study the business value and operational performance of the networks (as presented in Earl 1996). The simplest approach is to consider commodity tasks potential for outsourcing and strategic and core activities remain in-house (Lacity et al. 1996, Venkatraman 1997). The company should know why it is outsourcing - the goals of outsourcing should be measurable and obtainable. If cost reductions or need to focus on core activities are reasons behind outsourcing, company's future direction and needs should be clear (Earl 1996). If the business uncertainty is high and needs change rapidly, the company may outsource a future strategic IT asset and fire its most creative and relevant key-people. This may happen with company's internal networks - from current business's perspective a current commodity and unimportant IS-backbone can be the core of the company's future electronic distribution channel. Outsourcing means here that company gives an important resource away. It takes a long time to regain expertise in this area.

Technical issues can also be important in management arrangements. The technological diversity of the system can cause problems. For example if there are all kinds of software and hardware components in the network, the system will become complex and unreliable. At least the cost of developing a well functioning network will rise (Miller 1989 and 1991, Szabat - Meyer 1992, Nadler - Guarnieri 1993). The development work will take longer time and will be more demanding. The size of the network will also affect the development work and the result (Schatt 1993). Complexity has also impact on management and maintenance costs. Company might outsource expensive technology. Furthermore, some technologies may be unique and nobody in IS-department masters them. Legacy systems might also be managed by outside service companies, especially if they are no longer very critical (Earl 1996, Laticy et al. 1996).

Many IT activities that should have remained inside the organization are too easily outsourced. As Earl (1996) argues companies should ask themselves why they should not insource IT services, as there are several risks involved in outsourcing.

Company must manage outsourcing partnerships actively. Whatever the extent of outsourcing that will be chosen there is need for proper management of the partnership.

> If the IT activity has been badly managed in the first place, will the IT managers be any better at managing an external provider? Earl 1996, p. 27

If this is the case the company should either hire better IT managers or rearrange and rethink the task that is to be outsourced before handing the function over to outside companies.

Establishing shared goals could lower outsourcing risks (Earl 1996). In some cases, a jointly owned company that takes care of the selected IS activities might work well. This arrangement creates shared goals to both parties and prevents vendor opportunism, which could for example lead to pressure to raise service prices. All forms of outsourcing arrangements run risks if following capabilities are not in-house (Earl 1996, p. 18):

- the ability to assess, follow and interpret changing IS capabilities and potential, and relate changes and possibilities to organizational needs
- the ability to work closely with business managers and keep up the discussion of IS possibilities and business needs
- the ability to identify effective ways to take use of the outsourcing market
- the competencies to specify and manage sourcing, monitor and take care of outsourcing vendor relations

Information systems are not a single entity (Laticy et al. 1996). First, IS functions should not be categorized to strategic or commodities, as systems have different roles in different companies. In some cases accounting systems, IS support or internal network work so well that they can differentiate the company from its competitors. Applications also change and migrate from commodity to strategic and vice versa.

Second, some companies do keep IS profile low. This can be result of modest or talented (or both) IS people in the company. The IS profile can be low from the senior managers perspective if the IS department does not ask more money, better hardware or if the system is running well and support is not needed all the time. The overall business contribution of IS can be strategic, but what shows is only rising IS costs. The other departments may do better because of IS, but top management notices rising IS cost-level. For example, logistics may function well because of better and more reliable network and system integration. If the view of IS as a cost burden could be abandoned, its contribution could be realized. This could give a more important role to IS-management.

One possible perspective is to examine how close to the core-business the task is. If the task does not directly affect the important business processes, it might be outsourced (for example user training). When the task is vital to all operations, the company should keep in-house (for example security).

It seems that company should keep many network-related management tasks safely in-house. Security, crisis and backup management should be developed and managed by company's own IS-department. If network performance is a trigger for development projects, IS-staff must monitor performance in-house. IS-staff should also manage expansion planning and documentation. It should be noticed that outside consultants, service companies and business partners can give good advice and be helpful in managing and developing these tasks, but the main management responsibility is in company's IS-department.

Training is a possible outsourcing candidate. Companies that specialize in education and training could organize it. In many companies, this is the normal way of

organizing training. Company might also outsource network support and management of expensive or rare technology. External partners can manage legacy systems, especially if their role is no longer critical (Laticy et al. 1996, Earl 1996). The decision on what tasks to outsource depends on

- the role of the task in the organization at that moment
- the amount of outsourcing partners that are available (that meet required service levels at reasonable prices)
- the skills and resources in the IS-department
- the importance of those business processes that are involved or may be affected by the outsourced task

It is important to notice that the decision between outsourcing or keeping the task in-house changes over time. External and internal changes in competition, company's business processes, IS-department, funding and many other forces may lead to rearrangements in outsourcing decisions. Existing outsourcing contracts need monitoring and they depend on earlier experiences. The management of the outsourcing contracts and relationship building is important - outsourcing is not a one-time transaction that managers can afterwards forget.

Conclusions

A well-planned and managed local area network can give many benefits. The benefits can be internal and help the users have their work done faster and more reliably. Strategic benefits can affect company's competitiveness.

Most local area networks are several years old and companies are replacing their networks. Development work gives possibilities to rethink the role of the network and plan the network properly. In some companies, network management tasks like security and user support were poorly planned. Some network management tasks are critical to the success of the company. If for example documentation and backup are inadequate, serious problems arise if disaster strikes.

Many companies use external IS service providers to take care of some tasks. Main objective is to reduce costs. Outsourcing can still be a risky decision because important expertise may be lost when company gives tasks to outside partners. Company's local area network has important role as platform that integrates different functions and departments. A smoothly operating network is the basis for most other operations in the company.

It may not be wise to give network management to outside vendors without looking at different network management tasks and their role in the company. If company uses external service markets, it is important to manage the partnerships and monitor contracts. Some tasks are so critical that they should be managed and planned in-house. If the role of the network changes and network will affect business operations directly (like in the case of electronic commerce), managers must reconsider management arrangements and eventually move some tasks into the company's IS-department.

The need for proper local area network management is clear. This paper gives some views management of this resource. Company can use external IS-markets to manage some tasks, but this should not happen without careful planning.

Suggestions for further research

This paper emphasizes the role of local area network and brings up management related issues. One of the most challenging tasks is to organize network management so that the organization can create value from it and be able to concentrate on core business. This paper gives ideas on what network management tasks there are – there are many other tasks too.

Management of local area network is the basis of all business operations that use company's network. Further research could study the role of network management in a company and how IS management sees managing network vendors and other partners. Researchers should seek best practices in local area network management.

Researchers are further couraged to study the importance of local area network to find out whether companies consider it as a strategic resource or a commodity. It is argued that commodity parts may well be outsourced and only strategic IS will remain in-house (Earl 1996, Lacity & Hirschheim 1993, Lacity et al. 1996). This may be the case in networking issues as well.

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