The chief executive officer and the chief information officer: the strategic partnership

YASH P. GUPTA

Department of Management, University of Louisville, Louisville, KY, USA

Abstract: Information technology (IT) has become a strategic resource for many firms today. Coordination of this resource requires strong leadership and cooperation within the firm. The relationship of the Chief Executive Officer (CEO) and the Chief Information Officer (CIO) is crucial for the effective, successful utilization of IT for competitive advantage.

This paper first explores the CIO position, giving reasons for its development, tracing its evolution, and pinpointing certain responsibilities associated with the position. The paper then highlights the CIO's concerns and identifies the future implications for the CIO. The second portion of the paper takes the CEO's perspective towards IT and the CIO's position. Special attention is directed towards describing the CEO's perspective on the CIO's qualifications, addressing the problem of overblown CEO expectations for the CIO position, and discussing 'old-line' CEOs' attitudes towards IT and the CIO position. Also addressed is the exploration of the common CEO perception of the CIO as an 'empire builder' and an analysis of the CEO's perspective on the future need for a CIO position.

Finally the paper focuses on developing this 'strategic partnership' between the CIO and the CEO. Suggestions are provided for the CIO and the CEO to help achieve this ideal partnership. Although these suggestions are not all conclusive, they are critical to the 'partnership'.

Introduction

Information technology (IT) has evolved from a support function to a critical resource for competitive strategy for many firms. What sort of impact does the IT evolution have on the organization in terms of people, groups, structure and processes? This paper focuses on how executive management and IT management must adapt to this IT evolution.

Historically, information technology was a support mechanism and not a strategic resource. Executive management did not focus on managing IT because IT did not have any impact on competitive strategy. Likewise, IT management did not manage or have expertize in managing a strategic resource so there was no need for IT management to participate in strategic planning. As a result, IT management's perspective towards information technology has evolved independently from executive management's perspective.

The effective use of information technology is now strategically important for many firms. IT management's knowledge, skills and perspective towards managing IT must now be merged with executive management's knowledge and skills in order to develop a perspective of managing not only IT, but the firm as a whole. Cash *et al.* (1988, p. 144) say it succinctly,

'Partnership is necessary. IT experts understand the economies of the technology and know its limits. They can also help move the organization towards the potential of tomorrow's technology... General managers bring insight to the overall business priorities. They have detailed knowledge of the various value chains and their potential in the real world and can help identify the paths of least staff resistance in implementation.'

The purpose of this paper is (1) to analyse the evolution and nature of the IT manager's perspective towards managing information technology, (2) to analyse the evolution and nature of the executive manager's perspective towards managing information technology, and (3) to suggest actions to forge the critical partnership between IT and management and executive management.

CIO's perspective towards IT management and the firm

The influence of information technology in business management has led to the introduction of a new management position, the Chief Information Officer (CIO), whose development has been a slow process with much controversy attached to the title. As Mandell (1988) concludes, 'to some, the CIO represents MIS/DP's rise in status to the corporate inner circle. To others, the CIO is a fairly meaningless exercise in title inflation' (p. 1).

Development of the CIO: a comparison among executive positions

The evolution of the CIO occurred during the information age of the 1980s. The term CIO was coined in 1981 by Synnott (1987). The development of another executive office seemed appropriate to some, while to others it was seen as the influx of more middle management. By 1989, 40% of Business Week top 1000 companies had a CIO (Borbley, 1985). The development of the CIO is much likened to the development of the Chief Financial Officer (CFO). The CFO became responsible for the transition of accounting into a modern competitive weapon for evaluating the economics of new processes, pricing new services, and budgeting the cash flow of potential acquisitions (Wood, 1988). Just as the CFO's position was developed for accounting, the CIO is needed to manage the information technology of the firm. Another analogy to the creation of the CIO goes back to the Great Depression, when companies responded to the growing complexity of manufacturing by creating a vice-president to oversee factory operations (Goldstein, 1987). As business competition changes, consequently, those firms that don't realize the need for key management people become reactive in the way they conduct business.

The CIO and the stages of IT growth

IT development has created the need for the CIO. From applications managers to systems analysts to CIOs, the winds of change are blowing across the IS landscape (Carlyle, 1988). The change in IT from the 1960s, the 1970s and 1980s has led to different positions within the IT department. Using Gibson and Nolan's (1974) four stages of electronic data processing (EDP) growth, we can see the development of the CIO. First come cost-reduction applications, followed by proliferation of applications in all functional areas. This leads to new applications with emphasis on control and finally to data-base applications. As a firm progress into the fourth stage and beyond, a need for the CIO develops.

The role of the CIO has developed with the stages of IT and its development. In 1974, Davis described the IS organization as consisting of an executive with three responsibilities: analysis, programming, and operations (Davis and Olson, 1985; Benjamin *et al.*, 1985) Synnott and Gruber (1981) describe an organization with four responsibilities: data processing, telecommunications, methods, and systems development. Later, Nolan (1982) identified a number of critical IT issues based on interviews with senior managers:

(1) Balancing the supply and demand for computing resources as well as rationalizing the managing of IT as a profit centre;

(2) Measurement of effectiveness, centralization, planning and control, project selection, leadership;

(3) Forecasting and administrative costs (in terms of future opportunities).

From the above research, we can see not only the need for the management of IT, but also how it has evolved.

It is no longer used only for accounting applications but rather as a strategic means of competition. Cash *et al.* (1988) have summed up this situation very succinctly when they point out, 'for some organizations IT activities represent an area of great strategic importance; for other organizations they play (and, appropriately, will continue to play) a cost-effective, useful, but distinctly supportive role' (p 114). Using McFarlan's (1984) strategic grid, companies can position their information systems as support, factory, turnaround or strategic. Thus, firms in the turnaround and strategic positions on the grid would be those which most likely have a CIO or need a CIO. Another example of the development of the CIO is provided by Business Week (Bock *et al.*, 1986, p. 163):

> 'There's a new breed of manager surfacing in the executive suite. As countless chief executives come to grasp the importance of information to their business, they're seeking people . . . and assigning them a high-stake mission: Figuring how to fashion a confusing array of often-incompatible computer and communications equipment into a cudgel that can clobber the competition. Some members of this new information elite sit behind such recognizable nameplates as senior vice-president, vice-president for information services, or information resources manager. Others are beginning to get a higher-sounding title to reflect their status: chief information officer, or CIO.

CIO's organizational responsibilities: management and IT

CIOs must have business knowledge and technical knowledge to lead their firm strategically (Figure 1). As Bock *et al.*, (1986) observe 'although the CIOs have many responsibilities, their main responsibilities can be summarized in three categories: (1) they oversee all the company's technology, including data processing, office systems, and telecommunications; (2) they report directly to a high-ranking executive such as the CEO or chairman; and (3) they concentrate on long-term strategy and planning while leaving the day-to-day operations of the computer room to subordinates. The CIO must have a thorough knowledge of business application and cannot come from the rank and file of data processing' (Bock *et al.*, 1986, p. 160). Too many companies create CIOs simply by promoting their data-processing managers or information systems

Managerial Skills and Expertize
    Strategic Planning
    Financial Planning
    Human Resource Management
    Communications: Written and Oral
    Project Management
    Leadership

Technical Skills and Expertize
    Computer Hardware Acquisition
    Database Design and Management
    Telecommunications
    System Auditing
    Systems Analysis
    Information Service Management
    Application Development

Source: Online May 1985 p. 93

Figure 1 CIO skills, managerial and technical

managers (Keen, 1990). But the CIO must receive support from other areas of the firm's management and must be a part of the firm's total strategic plan. This upward movement in the rank of the IS functional head is attributed to the increasing recognition that information is a strategic resource and that the newly emerging information technologies can be used to gain a competitive edge (Raghunathan and Raghunathan, 1989), which leads us to discuss the CIO's responsibilities in greater detail.

The CIO concentrates on long-term strategy and leaves the running of computer systems to technical experts. To convey his or her ideas on using technology for competitive advantage, the CIO must have access to top management, as he/she has ultimate responsibility for selecting, buying, and deploying all the company's technology, including equipment and staff used in data processing, office automation, and telecommunications (Bock *et al.*, 1986). The CIO's communication skills are important since he or she must communicate with the end-users to find their needs. Thus, the CIO must be able to talk with the CEO in order to develop an IT strategy for the firm and look at the larger picture since the strategic planning of IT for the firm is the responsibility of the CIO. As Watson (1990, p. 21) remarks, 'An IS manager, as a link between IT and an organization's managers, should gather information about new information technology and advise fellow managers on its effective deployment. In order to perform this boundary-spanning role, IS managers must scan the external environment for IT developments and scrutinize the internal environment for opportunities to marry external developments with internal

opportunities'. In the end, the CIO must be constantly aware of IT changes which could create competitive advantages for the firm.

CIO's management issues, critical success factors and future areas of concentration

There have been many studies in IT journals on CIOs and their development into the management circles of the firm. These studies have focused on the key issues with which the CIO must be concerned in order to manage the technological aspects of the firm. As a result, the critical success factors approach to identifying management's information requirements is useful because it focuses attention on areas where 'things must go right' if the organizational unit is to be successful. Critical success factors were used in many of the studies and were developed as more firms were studied. These success factors list the concerns of the CIO and their role in IT and the firm, such as in 'Critical Success Factors for Information Centre Managers' by Magal *et al.*, (1988) (Figure 2). Additional research in articles like 'IS Manager's

A Competent Staff
Communication with users
Top-management support
Reliability of applications developed
End-user training
Understanding of users' business and problems
Training for IC (Information Centre) staff
Organizational acceptance of IC concept
Standardized hardware and software
Liaison functions with end-users departments
Support software packages
Cost effective solutions
Manage end-user expectations
Promote IC services
Atmosphere for users
Commitment of end users to the IC concept
Define IC mission
Career paths for IC staff
Priority criteria for work
Provide services to distributed sites
Control procedures to ensure that standards, policies, etc. are adhered to
System performance
Monitor and coordinate end-user applications development
Users' understanding of data processing
Response to applications requests
Establishing chargeback criteria

Source: MIS Quarterly September 1988, p. 419.

Figure 2 Critical success factors of the CIO

Perceptions of Key Issues' by Watson (1990) lists five key issues that concern the CIO (Figure 3). According to Levis Strauss's CIO, Bill Eaton, there are four challenges a CIO needs to focus on and work with others to achieve (Melymuka, 1990):

(1) Getting the IT platform ready for the future. This includes systems, architecture – traditional CIO functions;
(2) Getting business processes ready to take advantage of the IT platform;
(3) Getting the organizational structure ready for changes in the way people work;
(4) Getting people ready for the future – not just IT people, but all the people, and not just technically ready but physically, ethically and emotionally ready.

These areas of focus stress the managerial skills required of the CIO, the organizational skills, and the technological know-how of the CIO. Management of IT requires skills that have to be developed, since the CIO is, in effect, the CEO of IT. Since people skills are required by the CIO, the CIO must have human resource skills in order to manage IT.

CIO's concentration on scanning current IT issues and the CIO's time allocation

Spending time on scanning current issues and allocating time is important for the CIO to see if his or her goals are being met. According to Watson (1990), IS managers report spending an average of 4.79 hours per week keeping up-to-date on information management issues, with reported hours per week varying from 1 to 10 hours. An average of 2.68 hours is spent on maintaining knowledge of management issues with reported activity varying from 1 to 15 hours. Overall, IS executives report spending about 7.5 hours per week (i.e. about 15% of their total working time) on scanning for information to keep up with the current knowledge in the field. A much earlier study by Kefalas and Schoderbek (1973) found that

• Improving IS strategic planning

• Specifying, recruiting, and developing human resources of IS

• Developing an information architecture

• Aligning the IS organization with that of the enterprise

• Improving the effectiveness of software development

Source: MIS Quarterly June 1990 p. 231

Figure 3 The top five key issues

EDP managers spent an average of 7.5 hours per week scanning for information. Hence, scanning the IT environment has not been an increased issue to the CIO, which is important now that the CIO has become a manager of people, with an emphasis on technology.

According to Watson's study, the most widely used sources of information (cited by 91% of respondents) are hardware vendors' reports and industry seminars (Figure 4). The reported sources for management issues concerning the CIO are financial newspapers like the *Wall Street Journal* and discussions with colleagues. The exhibits are based on Watson's research with Australian IS managers. In his research, Watson found that the IS managers were directly affected by opinion leaders. At seminars or in publications, if the opinionated leader focused on end-user computing, then the IS managers would stress the issue of end-user computing. It concluded that IS managers should look at the benefits to their own firm before incorporating these ideas.

A Coopers and Lybrand/Datamation study of 500 CIOs led to the question: 'How does CIO spend his or her time?'. Those surveyed said they spend 23% of their time – the largest percentage – working with business unit peers, while IT-specific planning consumed 21% of the CIO's time (the second largest time consuming item). The CIO surveyed also spent an average of 16% of their time on administration, 13 % on managing operations, and 10% on corporate strategic planning (Carlyle, 1989).

Future implications for the CIO: communication with the CEO and analysis of management issues

The future of the CIO in the firm depends on how the CIO can keep the IT structure in line with the strategic

Source of Information	Percent Using
Hardware vendor newsletters/reports	91%
Industry seminars or courses	91%
Discussions with other professionals	86%
Industry newspapers (e.g., Computerworld)	84%
Software vendor newsletters/reports	84%
Visiting other organizations	84%
Internal reports prepared by staff	77%
Datamation	70%
Professional books	65%
Local morning newspapers	51%
Consultants	51%
Academic journals	40%
Seminars or courses at a university	28%

Source: MIS Quarterly June 1990, p. 222

Figure 4 Sources of information on information systems management issues.

plan of the firm. The CIO must be a salesman of new technology and of the CIO position. Rothfeder and Driscoll (1990) note that

> 'In the next few years, CIO expertize will be a must for, among other things, forging electronic links for exchanging money and documents with customers and suppliers and building sophisticated data banks for marketing sale, and decision support. Companies ignoring these technologies are going to find themselves playing an expensive game of catch-up. Thus, CIOs must guide the investments of new technologies and must be aware of cost justification. CIOs have been said to be guilty of 'empire building' – measuring their influence by the number of computers and networks they control, not by whether they have helped to improve the company's competitiveness. But CIOs must communicate their position in the management of the firm and not be seen as 'empire builders'.'

Moad (1990, p. 75) says that 'in communicating with the CEO and other executives, the CIO should refrain from using acronyms. . . [and]. . . keep the conversation on technology in business terms'. CIOs need to stay abreast of the current IT issues, their strategic planning is essential and must be in line with the strategic plan of the firm. In addition, they must work on management controls and operational controls of the IT function so that when analysing the strategic plan of the firm, the CIO must establish frameworks to analyse the firm. Porter's five forces and value chain analysis are good frameworks for the CIO to use (Porter and Millar, 1985). Another framework which could be used is Kanter's underlying principles of planning (Raghunathan and Raghunathan, 1989):

(1) The IT must be consistent with the corporate business plan;
(2) Management involvement and commitment are essential;
(3) Planning is everybody's job;
(4) It takes several cycles to institutionalize a planning process.

In sum, the CIO must consistently work toward using IT as a competitive advantage; he/she must be a manager, communicator, and human resource worker before being a technologist.

CEO's perspective on IT and the CIO

The CEO's attitude toward IT and the CIO is best described as difficult for many companies. The CEO has often taken the view that the CIO is serving the interests of the MIS department, rather than the whole company. He or she feels that the IT department, while providing an important service for the company, does not require representation at the executive level. But the CEO needs to know what the CIO can offer the firm and how this contribution can be evaluated in order to ensure effectiveness (Hayley, 1989).

CEO's views on the qualifications of the CIO

Ideally, the CEO wants a CIO who is in touch with both the technical and business aspects of IT, an executive who has experience in applied technology as well as in areas such as mergers and acquisitions (Burger, 1990). The CEO is often faced with pressure from personnel in the management information systems (MIS) department for a CIO position to be established, making the need appear self-serving on the part of the MIS department and not reflecting a true need for this position by upper management (Journal of Accountancy, 1987). While it is often difficult to find such a person who can strike a business-technical balance effectively, the MIS department is the logical place from which to select a CIO candidate. Research by Khosrowpur has found that top executives prefer recruiting MIS people with managerial capabilities for positions such as the CIO (Khosrowpour, 1985). However, the CEO faces many difficulties in trying to select an MIS person who can evaluate objectively IT projects and balance the technical and business aspects of IT.

Problems of overblown CEO expectations with the CIO

The CEO often has unrealistic expectations about the CIO's capabilities within the company, often seeing them as a panacea, as a way to turn the company around. The CEO may expect the CIO to immediately 'take charge' and pull the company out of an existing IT crisis. Sometimes a lengthy period of IT evaluation and audits are required to determine such issues as the amount of current IT expenditures, phase of IT assimilation by the company, and strategic impact, if any, of IT. But a problem may arise if the CEO expects the CIO to solve IT deficiencies swiftly. These deficiencies are often more deeply rooted within the company and are usually the result of IT expenditures being out of control, taken, as Carlyle says, '. . . without any unified vision or plan, and in a purely fragmented manner' (Carlyle, 1988, p. 52).

The CEO expects the projects recommended by the CIO to reflect positively on the 'bottom line' within a somewhat short period. These expectations rarely appear in the short-term. A partial explanation for this could be the CEO's viewing of IT investment as costs, rather than as assets. Information technology, such as computers and telecommunications equipment, account for a large and increasing share of corporate expenses (Keen, 1990). For many firms, IT is a strategic resource which should be managed as a long-term investment. In fact, Goldstein (1987) concludes that '. . . the major obstacle to leveraging computers has been scepticism on the part of top management toward proposals that don't immediately provide a return on investment' (p. 59). Further, investments

which the CIO may feel are necessary for the firm to become competitive are often inherently risky, making the risk-averse CEO more reluctant to approve such projects, despite the competitive advantage which the firm could realize.

The risk-averse CEO also expects the CIO to be able to present sound justification for major IT projects. According to Cash, *et al.*, (1988) there are three important project dimensions which influence implementation risk: project size, company's experience with the technology, and project structure. CIOs should consider these three dimensions when approaching the CEO with project proposals to lessen some of the CEO's concerns over risk exposure.

'Old-line' CEO's attitudes towards IT and the CIO position

Information technology is a somewhat new resource in the CEO's view. There exist many 'old-line' CEOs who are basically sceptical of IT's capabilities for their firm and of the CIO position. Bock *et al.*, (1986) note that 'Many chief executives, having long confined computer technology to the backwaters of the back office, are still not convinced that computers can be used to gain a competitive advantage' (p. 172). While information needs and IT use vary among firms, information is clearly becoming more important for the company desiring to be more competitive. For some firms, it is actually essential for survival.

In some cases, the CEO may feel manipulated by the CIO's command of IT, particularly if the CEO is one of the 'old-liners' and unfamiliar with IT. The CEO's uncomfortable feelings toward IT may put him or her in a position, as Highbarger (1988, p. 53) notes '. . . to be manipulated by internal and external forces when it comes to assessing the quality of information systems operation, which lead directly to the tenure problems of the CIO'. Not surprisingly, the average tenure for a CIO today is about 2.5 years, down from 3 years in the mid-1980s (Nylan, 1990). Further, the dismissal rate has been increasing recently, due largely to conflicts with the CEO. Rothfeder reports that 'Acording to Touche Ross and Co., the CIO dismissal rate doubled in [in 1989] to 13 % . . . compared with 9 % for all top executives' (Rothfeder and Driscoll, 1990, p. 78).

Indeed, the implications for the company for dismissal of a CIO can be significant in the long term. The defeat of IT projects and the loss of executive IT leadership can result in a company losing opportunities for competitive advantage in its market. At the very least, the defeat or loss sets the company back months or years in development and implementation of major IT projects. In addition, the dismissal of a CIO may lead the CEO to shrug off the need for such a position in the future. If the CIO is not dismissed, there will perhaps be increased pressures for the next person who occupies the CIO position.

The successful CEO is the one who undertakes IT investment in a proactive rather than a reactive manner. The CEO sets the overall direction for the company and scans the environment for threats and opportunities. According to McFarlan (1984), company and scans the environment for threats and opportunities. According to McFarlan (1984), companies need to consider five basic questions in determining whether IT could be used as a strategic resource requiring high-level attention. These are as follows:

(1) Can IT build barriers to entry?
(2) Can IT build-in switching costs?
(3) Can the technology change the basis of competition?
(4) Can IS change the balance of power in supplier relationships?
(5) Can IS technology generate new products?

With a CIO's expertize, the CEO could answer these five basic questions by analysing proposed IT investments and by responding to the environment.

Information-dependent companies, i.e. airlines, banks, and insurance companies, are the ones which are most likely to have CIO representation at the executive level (Welter, 1987) (Figure 4). In these industries, information is strategic, and its management requires strong leadership and direction, and CEOs and CIOs work together to carry out IT strategies. For other industries information, while important, occupies more of a support role. As such, its use is directed more towards efficiency-oriented support activities which means that CEOs in companies with non-strategic IT applications, would probably not perceive a need for a CIO.

Often times, for the CIO to be effective, a complete change in attitudes, on the part of the CEO and upper management, towards IT is necessary. Thus, the CIO is likely to meet resistance in obtaining approval for projects which may create drastic change within the firm. Trying to influence corporate culture is difficult i.e. changing attitudes towards viewing IT as a strategic resource when it was previously viewed merely as a convenience. In the end, the CEO must take the lead in implementing the necessary changes which IT often brings.

CEO's perception of the CIO as an 'empire builder'

Chief information officers know that control over corporate information means power. In this vein, CEOs often view the CIO as an 'empire builder' whose only goal is to acquire as much IT as possible to control company information and those who need access to this information. This paternalistic attitude by the

a

Percentage In Which CIO Reports to CEO
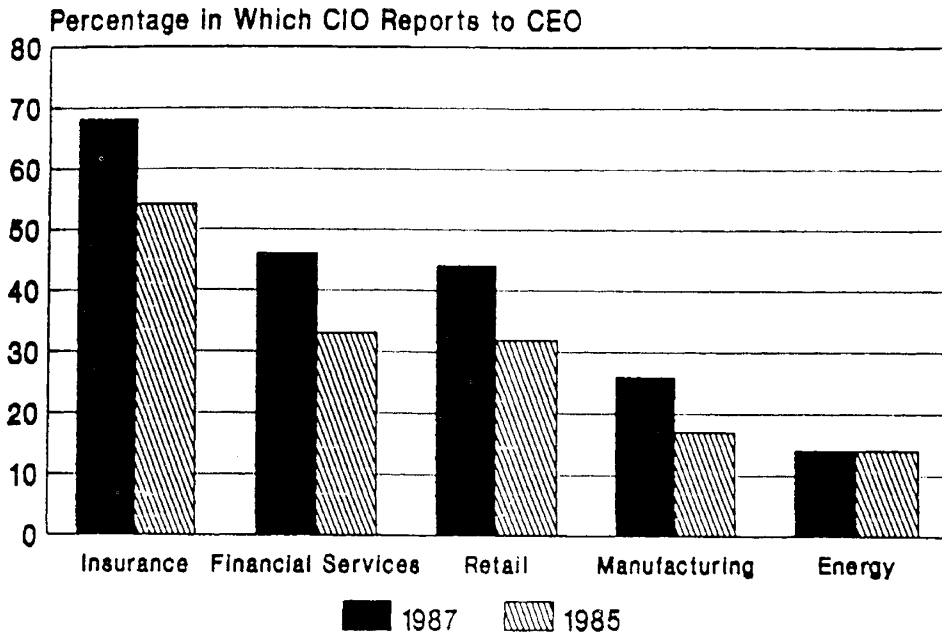
Figure 5 Reporting structure of CIO by industry

CEO reduces credibility with the CIO. The CEO wants the CIO to view IT as a resource that should be distributed within the company, not a resource to be dominated and controlled.

The CEO also perceives the CIO as often being inflexible in deciding on IT projects, unwilling to offer a variety of alternatives, with information technology being acquired just for the sake of having it, rather than out of a true need. As a result, the CIO's IT strategy may run counter to the company's overall strategy, or even parallel but with little coordination. This 're-inventing of the wheel' causes confusion and may cause the CEO to restrict the CIO's powers. One survey reported, for example, that 50% of CIOs thought that they were using their information services as part of their firm's overall plan, but only about 33% of CEOs thought so. This suggests that there is a gap between the CEO's and the CIO's perceptions of IT coordination with corporate strategy (Keen, 1990).

Another problem area that sometimes results in CEO-CIO disagreements is when the CIO tries to implement projects which effectively centralize IT in a company with a decentralized environment. An extension of the 'empire building' idea by the CIO, this centralizing of the IT function creates many difficulties. The 1990 Coopers & Lybrand/ Datamation survey found that very few CIOs '. . . relish the thought of managing in a decentralized environment, since they yearn for something they can control and get their arms around, not for some

amorphous organizational culture that makes control more difficult' (Carlyle, 1990, p. 30). Thus management control of the IT must be within the company's unique culture if it is to be effective. The CEO's job is made more difficult when it is realized that the CIO's own goals for IT do not fit the company.

CEO's perspective on the future need of the CIO position

The ongoing leadership which a CIO can provide is important if companies are to employ IT effectively for the long term. Often times, a CIO is brought into the company to coordinate 'damage control' after a major IT fiasco. If the CIO is successful in turning around the company, then the CEO may feel that this person is no longer needed once the crisis is over. But this could not be further from the truth. As soon as one crisis has passed, another one will soon arise requiring the effective leadership of an experienced CIO.

This discontinuity associated with the CIO's position spells more difficulties for US companies, which need strong IT guidance now and in the future. The CIO can provide such guidence, not only for information-intensive companies but for any company which has such a need. However, it should be noted that the use of IT and thus the need for a CIO depends on several factors, such as '. . . the stage of development of the organization, its competitive position, [and] its use of IT capabilities' (Rhodes, 1986,

p. 8). It will be the CEO's responsibility, along with input from top management, to determine an existing or future need for a CIO position, clearly delineating the responsibilities of the position in order to ensure coordination with corporate strategy.

Fortunately, more top executives are realizing, so Khosrowpour notes that '. . . their information resources comprize not just computers, but a collection of machines, human resources and procedures, which demand planning and managing skills'. Information will be a key corporate resource for the 1990s and beyond. However, it also tends to be difficult to value and manage (Borbley, 1985). As Welter (1987, p. 47) concludes, the CEO wants in a CIO someone '. . . who understands how technology applies to the overall business strategy'. Managing this resource will require top executive vision and effective leadership which the CIO can provide with support from the CEO.

Developing the strategic IT partnership: the CIO and CEO

The CEO alone cannot effectively utilize IT as a strategically competitive resource, nor can the CIO go it alone. However, the partnership of the CEO and the CIO together brings the knowledge, skills and perspectives to effectively use IT as a strategic response. Thus, a manager's success depends on his or her ability to adapt. The CEO and the CIO must both adapt to the evolution of IT and form a critical partnership to harness the strategic power of IT, the subject of the remainder of this paper.

Actions the CEO should take to develop the IT partnership

Continuously scan the organization's environment for key issues (including IT, using a multiple discipline approach
In Hambrick's (1981, p. 256) paper on power in management teams, he quotes, 'Coping with uncertainty. . . is what gives power. . . Scanning – the process of learning about events and trends in the organization's environment – is a form of coping by information'. In the end, the CEO contributes to his or her effectiveness by continuously learning about the organization's environment through reading, listening and networking with colleagues. Therefore, executives should not limit their scanning to areas of their own functional expertize but rather expand their learning to all disciplines, including the IT area to understand the changing environment and the related implications for his or her firm. Without this continuous education the CEO cannot lead the organization in adapting to the constantly changing environment. For example, why would the executive manager from a finance background consider moving the IT manager in the organization structure if he or

she didn't know that IT was changing the way in which firms compete? (McFarlan, 1984). While continuous education may be elementary, it is the very foundation of adapting to change.

Perform a comprehensive industry and firm analysis to determine the strategic importance of IT

The CEO must understand the firm's environment and how the firm competes before he or she can set the direction of the firm through mission statements, goals and critical success factors. The executive manager should use Michael Porter's industry and competitive analysis model (five competitive forces) to analyse the competitive nature of the industry (Cash *et al.*, 1988). The CEO could then use the generic competitive grid to determine how the firm is competing or should be competing. Next, the CEO can use the IT strategic grid to determine if IT serves the firm as support or as a strategic function. The value system and value chain analysis can be used to determine where the firm can add value or utilize IT. After the firm and industry analysis, the executive manager will have the information necessary to determine whether information technology is a strategically competitive resource or a support resource. Although the purpose of this paper is not to discuss in detail the frameworks for situational analysis, this analysis is essential to determine whether a partnership between executive management and IT management is necessary.

If IT is strategically important, position IT in the organizational structure to facilitate two way communication
The reporting level of the CIO is associated with IT's strategic importance to the firm. According to a survey by Raghunathan and Raghunathan the reporting level of the IS executive may be a key variable that management should focus on efforts to increase the effectiveness of their information systems. The CEO should use the contingency approach to determine the position of the IT department within the organization's structure. If IT is used as a support function it may not be necessary to position the CIO so that he is reporting to the chief executive. Based on Raghunathan's survey, if IT is of strategic importance to the firm, the CIO should report directly to the CEO.

Richard Watson (1990, p. 225) in discussing the importance of reporting directly to the CEO concludes that, 'The higher an IS manager is in the organizational hierarchy, the more likely he or she has two-way communication with the CEO. This is not surprising because a major purpose of a reporting hierarchy is to structure the vertical flow of communication between a manager and subordinates'. This partnership between the CIO and the CEO is necessary and beneficial as they need information from each other to utilize IT as a strategic,

competitive resource. The knowledge, skills and perspectives of the CIO complement the knowledge, skills and perspectives of the CEO. Consequently, direct two-way communication is beneficial in both directions. As Watson observes, 'Managers who have two-way conversation with the CEO have a better understanding of the goals, objectives, and direction of the organization. . . .' Likewise, the CIO has specialized information that will benefit the executive manager.

Formulate a clear mission, clear goals and critical success factors and communicate them to the CIO

With the information from the firm and industry analysis the executive manager should now set clear missions, goals and critical success factors. The goals and critical success factors should be specific, formalized, documented and communicated to everyone in the firm, including the IT manager. Deep and Sussman (1990) state that one of the primary methods of avoiding destructive conflict is to 'provide subordinates with clear goals'. James Belasco (1990, p. 4) says 'make the vision clear enough to be used to make decisions'. Consequently, to effectively contribute to the organization goals, the IT manager and other employees must clearly understand where the firm is going and what is important to get it there.

If IT is strategically important use a participative management style to share managing IT with the CIO

Leadership styles form a continuum from an autocratic to a participative style, depending on the amount of participation and power allowed to subordinates by the leader. According to the Vroom-Yetton (1973) model, appropriate leadership style depends on a situation analysis. This model focuses on the importance of the decisions, those who have the knowledge and the potential acceptance of the decision by the followers.

The Vroom-Yetton model has seven questions to determine what leadership style is appropriate to a particular situation. One of the questions fits the description of managing IT as a strategically competitive resource: 'In decisions in which the quality of the decision is important, if the leader lacks the necessary information or expertize to solve the problem by himself and if the problem is unstructured, the method of solving the problem should provide for interaction among subordinates likely to possess relevant information. Accordingly, . . .[autocratic styles] are eliminated from the feasible set [of leadership]' (Ivancevich and Matteson, 1987, p. 422). If different elementary units exist with different preferences or different priorities and all preferred states cannot exist simultaneously then a conflict system exists (March, 1962). This also describes the situation of using IT as a strategic resource. According to March, there are two primary ways to resolve conflict: impose a superordinate goal, or use the

process of forming a political coalition. March says superordinate goals are difficult to define in business so that this political resolution process places the CEO as a broker/politician who organizes a coalition through collaboration, bargaining, and negotiation. Nierenberg (1968, p. 322) states that 'In a successful negotiation everyone wins. . . [therefore] negotiated solutions are likely to be longer-lasting when each party has gained a stake in maintaining the conclusions'.

In addition, the Vroom-Yetton and the March models both recommend a participative leadership style in situations with characteristics similar to a firm using IT as a strategically competitive resource. The CEO must also consider where the firm is in relation to IT assimilation (Gibson and Nolan, 1974). A more participative leadership style would be appropriate during the innovation stages, and a more autocratic style would be appropriate during the control stages. A participativve leadership style would also assist the CIO in the transition from monopoly power over information technology to the free market and regulated free market determination of IT use (Cash and McFarlan, 1989). The IT manager would feel the power in decision-making related to information technology. The CIO's power would then be based on knowledge, an expert power base, rather than the position as manager of a central information services department with complete power of controlling information, a legitimate power base (Ivancevich and Matteson, 1987).

Participation in planning and decision making would help the IT internalize the firms goals and critical success factors, and facilitate motivation. According to Herzberg, 'extrinsic factors', such as salary, don't motivate because employees expect these conditions. Herzberg goes on to say that 'intrinsic factors or job content' such as recognition, responsibility, and meaningful work are conditions that facilitate employee motivation (Ivancevich and Matteson, 1987). In summary, if the firm is innovative and using IT as a strategically competitive resource, a participative leadership style would facilitate the critical partnership between the CEO and CIO.

Actions the CIO should take to develop the IT partnership

Develop the knowledge and skills suited to managing IT as a strategic resource

The critical success factors for the CIO (Rockart, 1979):

(1) To provide acceptable service;
(2) To effectively communicate (two-way communication);
(3) To manage IT human resources;
(4) To re-position the information systems function

'from back-office to a more ubiquitous function involved in all aspects of business'.

Brancheau and Wetherbe conducted surveys in 1980 and again in 1986 to ask CEOs and CIOs about the key issues in information systems management. The writer notes that 'Two major trends were evident. First, management/enterprise issues have increased in importance. Second technological/application issues have steadily declined in importance' (Brancheau and Wetherbe, 1987, p. 33). In general, CIOs and CEOs agreed on what issues were important. Rockart describes the consensus of the new information systems executive: 'Their critical success factors, the key techniques, and processes they use to manage critical areas, and their common individual attributes. . ., taken together. . . provide a profile of an aggressive, proactive, communication-oriented executive who focuses heavily on helping his organization adapt to a changing technical environment. . . . He is assuming the more staff-like role . . .of strategy, planning, standard setting, and management of research. . . he is the disseminator and salesman of ideas and techniques rather than the direct implementer' (Rockart, 1982, p. 12). The drastic change in responsibilities will require not only technological expertize but also broad, multiple discipline knowledge, skills and perspective. The old information systems manager must have or develop the necessary qualifications to successfully make the transition to the position of CIO.

Recognize and accept the change in the IT manager's source of power

As discussed above, since the control of information is being taken from a centralized information systems department and diffused throughout the organization, the CIO's legitimate power is being eliminated. The CIO must recognize and accept this development. From a behavioural context, this must be a discouraging change for the CIO because the CIO must recognize the potential of other power bases. In other words, knowledge is power, the basic message of the expert power base (Ivancevich and Matteson, 1987). The CIO, like the CEO, can also benefit from environmental scanning. Hambrick (1981, p. 256) observes that 'executives who scanned the critical sector of the environment had relatively great power, even aside from whatever power they possessed as a result of their hierarchical level and functional level. Executives who transcend their functional boundaries to scan critical information apparently bolstered their power'.

Adopt and internalize the firm's perspective, goals and critical success factors

The CIO is no longer merely concerned with technical applications of IT, but must broaden his or her perspective and adopt the perspective and goals of the firm as a whole, as set forth by the executive manager. Since the CIO is now participating in strategic planning and decision making, the CIO is part owner of the goals, strategic success factors and decisions of the firm. To be successful the CIO's must be identical with the CEO's goals and the firm's goals, certainly a prerequisite for a successful partnership.

Prioritization and performance based on the needs and expectations of the CEO

Prioritizing the needs and expectations of a superior is the key to having a successful relationship with the superior (Deep and Sussman, 1990). The IT manager can obtain this information most effectively throught two-way commucation. All CEOs will have different levels at which they are comfortable dealing with information technology. The IT manager should evaluate this propensity in order to understand that educational needs of the CEO, for it is critical that the CEO understands the limits of information technology and that the CEO has realistic expectations of the information system's staff. The CIO must also understand what the CEO expects of him or her in terms of contributing to innovation, strategic planning and environmental scanning, since the theoretical 'optimal' strategic partnership between the CIO and the CEO is not necessarily the real world.

Prioritize and perform based on the needs of the firm

The IT needs of the firm depend on how IT strategically impacts the firm and the position of the firm in the process of assimilating IT. The CIO, the CEO and other executives should assess the firm's needs. For example, education may be the primary organizational need during the innovation stage of assimilating a particular IT. Setting standards for fourth generation software may be a more important need at another time. In essence, thinking and acting in terms of 'needs drive' prepares the IT manager for adapting to the inevitable future organizational and environmental changes.

Continuously scan the organization and the IT environment using a multiple discipline approach

Watson notes that 'IS managers tend to be somewhat inward-looking in their use of sources of information to remain abreast of IS management issues. . . .An IS manager who wishes to get ahead of competitors might be advised to take more notice of mass media reports and seek information outside the immediate IS arena. . . IS managers who are seeking to innovate should recognize that they are more likely to find new ideas if they adopt a scanning strategy different from their peers' (Watson, 1990, p. 226). IT managers, like all managers, must continually adapt to change. Therefore, continuous environmental scanning and

learning through reading, listening and networking is mandatory

Conclusion

Partnerships are formed because each partner has different knowledge, skills perspectives and other resources that the other partner needs. Synergy results from forming the partnership – the whole is greater than the parts. Thus, managing information technology as a strategic resource requires both the technically-orientated knowledge, skills and perspectives of the CIO and the broader managerial and operational knowledge, skills and perspective of the CEO. Truly, neither professional can manage the complexity of information technology alone. Managing IT as a strategic resource requires the combination of both the CEO and the CIO – a critical partnership, indeed.

References

Belasco, J.A. (1990) *Teaching the elephant to dance. Sound View Executive Book Summaries,* **12,** November, 1–8.

Benjamin, R.I., Dickinson, C., Jr., and Rockart J.F. (1985) Changing role of the corporate information systems officer. *MIS Quarterly,* **9,** September, 177–188.

Bock, G., Carpenter, K. and Davis J.E. (1986) Management's newest star: meet the chief information officer. *Business Week,* October, **2968,** 160–172.

Borbley, Jack. (1985) Chief information officer: what's in a title? *Online,* May, **9,** 91–93.

Brancheau, J.C. and Wetherbe, J.C. (1987) Key issues in information systems management. *MIS Quarterly,* March, **11,** 23–45.

Burger, K. (1990) The new CIO talks business. *Bank Systems and Technology,* July, **27,** 36–43.

Carlyle, R. (1990) The out of touch CIO. *Datamation,* August, **36,** 30–34.

Carlyle, R. (1988) CIO: misfit or misnomer? *Datamation,* August, **34,** 50–56.

Carlyle, R. (1989) Careers in crisis. *Datamation,* August, **35,** 12–16.

Cash, I. Jr., McFarlan, F.W., McKenney, J.L. and Vitale, M.R. (1988) *Corporate Information Systems Management: Text and Cases,* 2nd Edition. (Irwin Publishing, Homewood, Ill.).

Cash, J.I. and McFarlan, F.W. (1989) Competing through information technology – viewer's guide. *Harvard Business School Video Series,* 1–14.

Davis, G.B. and Olson, M.H. (1985) *Managing Information Systems: Conceptual Foundations, Structure, and Development* (McGraw Hill, New York).

Deep, S. and Sussman, L. (1990) *Smart Moves* (Addison Wesley, Reading, MA).

Gibson, F. and Nolan, R.L. (1974) Managing the four stages of EDP growth. *Harvard Business Review,* January-February, **52,** 76–88.

Goldstein, M.L. (1987) Does the CIO hold the keys? *Industry Week,* January, **232,** 59–63.

Hambrick, D.C. (1981) Environment, strategy, and power within top management. *Administrative Science Quarterly,* **26,** 223–276.

Hayley, K.J. (1989) CIO challenges in the changing MIS environment. *Journal of Information Systems Management,* Summer, **6,** 8–13.

Highbarger, J. (1988) What's the proper role for the CIO? *Management Review,* November, 53–54.

Ivancevich, J.M. and Matteson, M.T. (1987) *Organizational Behavior and Management* (Business Publications, Plano).

(1987) Top companies resist CIO concept. *Journal of Accountancy,* December, **164,** 148.

Kefalas, A. and Schoderbek, P.P. (1973) Scanning the business environment – some empirical results, *Decision Sciences,* **4,** 63–74.

Keen, P.G.W. (1990) What's ailing Mr. fix-it? *Business Month,* January, 60–61.

Khosrowpour, M. (1985) MIS leadership in transition. *Journal of Systems Management,* November, 18–21.

Magal, S.R., Carr, H.H. and Watson, H.J. (1988) Critical success factors for information center managers. *MIS Quarterly,* September, 413–424.

Mandell, M. (1988) The CIO: myth or reality? *Computer Decisions,* March, 66–71.

March, J.G. (1962) The business firm as a political coalition. *Journal of Politics,* November, **24,** 662–678.

McFarlan, W. (1984) Information technology changes the way you compete. *Harvard Business Review,* May-June, **62,** 98–103.

Melymuka, K. (1990) Reinventing the corporate culture. *CIO,* November, **4,** 38.

Porter, M.E. and Millar, V.E. (1985) How information gives you competitive advantage. *Harvard Business Review,* July-August, **63,** 151–153.

Moad, J. (1990) Mike Simmons: a CIO with no apologies. *Datamation,* August, **36,** 73–75.

Nierenberg, G. (1968) *Art of Negotiating* (Hawthorn Books, New York).

Nolan, R. (1982) Managing information systems by committee. *Harvard Business Review,* July-August, **60,** 72–79.

Nylan, P. (1990) Precarious perch for MIS execs. *Bank Systems and Technology,* September, 25–26.

Raghunathan, B. and Raghunathan, T.S. (1989) Relationship of the rank of information systems executive to the organizational role and planning dimensions of information systems. *Journal Management Information Systems,* Summer, **6,** 111–125.

Rhodes, W.L. Jr. (1986) Management's newest star? *Infosystems.* December, **33,** 8.

Rockart, J.F. (1979) Chief executives define their own data needs. *Harvard Business Review,* March-April, **57,** 268–291.

Rockart, J.F. (1982) The changing role of the information systems executive: a critical success factors perspective. *Sloan Management Review*, Autumn, **4,** 3–13.

Rothfeder, J. and Driscoll, L. (1990) CIO is starting to stand for career is over. *Business Week*, February, **3147,** 78–80.

Synnott, W.R. and Gruber, W.H. (1981) *Information Resource Management* (John Wiley, New York).

Synnott, W.R. (1987) *The Information Weapon: Winning Customers and Markets with Technology* (John Wiley, New York).

Vroom, V.H. and Yetton, P.W. (1973) *Leadership and Decision-Making* (University of Pittsburgh Press, Pittsburgh).

Watson, R.T. (1990) Influences on the IS manager's perceptions of key issues: information scanning and the relationship with the CEO. *MIS Quarterly*, June, **14,** 217–231.

Welter, T.R. (1987) The chief information officer: what's behind the hype? *Industry Week*, June, **233,** 45–48.

Wood, D.R. (1988) Do we really need the CIO. *Financial Executive*, November–December, **4,** 35.

Biographical notes

Yash P. Gupta is the Frazier Family Chair in Management at the University of Louisville. He obtained his PhD from the University of Bradford. Prior to this appointment he was Professor and Head, Department of Actuarial and Management Sciences, University of Manitoba, Canada. Professor Gupta's current research interests are in the field of information systems strategies, just-in-time systems, and production scheduling in advance manufacturing systems settings. He has published in various journals such as Decision Sciences, International Journal of Production Research, IEEE Transactions on Reliability, Information and Management, INFOR, European Journal of Operational Research, Long Range Planning, National Productivity Review and Omega. He has consulted with several major international corporations.

Address for correspondence: Yash P. Gupta, Department of Management, School of Business, University of Louisville, Louisville, KY 40292, USA