The Chief Information Officer: A Study of Managerial Roles

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The Chief Information Officer:  
A Study of Managerial Roles

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ABSTRACT: This study investigates the managerial roles of the chief information officer (CIO) based on Mintzberg's classic managerial role model. Our findings indicate that CIOs differ from manufacturing and sales executives in the relative importance they place on managerial roles. This difference does not exist between CIOs and finance executives or between CIOs and information systems (IS) middle managers. As IS management matures, the spokesman and liaison role of the CIO becomes more important. Surprisingly, as IS matures, the strategic responsibilities entitled in the monitor and entrepreneur roles of the CIO do not become more important. However, it was found that the more centralized the IS resource, the greater the CIO's role in acting as a spokesman, environmental monitor, and resource allocator. The results of this study have implications for management development, training, and the career planning of IS management.

KEY WORDS AND PHRASES: chief information officer, information system managerial roles, information system maturity, information system middle managers, information system personnel.

IN THE EARLY 1980s, THE CHIEF INFORMATION OFFICER (CIO) was often portrayed as the corporate savior who was to align the worlds of business and technology. Synnott [43] described CIOs as "the new breed of information managers, CIOs are businessmen first, managers second, and technologists third" (p. 24). It was even postulated that in the 1990s, as information becomes a firm's critical resource, the CIO may become the logical choice for the CEO position [43]. As early as 1984, some surveys suggested that one-third of the nation's major corporations had a CIO in function, if not in title [13]. While the exact percentages differ (ranging from 40 percent to 70 percent), the number of senior-level information systems (IS) executive positions created over the past ten years has grown tremendously [9, 41].

In vernacular, the term CIO has been somewhat loosely defined and is often used interchangeably with various titles such as Information Technology (IT) Director, Vice President of IS, Director of Information Resources, and Director of IS, to describe a senior executive responsible for establishing policy and controlling information resources. Studies relating to the CIO have focused on the evolution of the position [40, 43] and the similarities between the CIO and other senior-level executives [6, 18]. Rockart [39] and Applegate and Joyce [3] indicate that the CIO is becoming a member of the top management team and participates in organizational strategy development. Similarly, Earl [15] states that CIOs see themselves as corporate officers and general business managers. He suggests that they must be politically savvy and that their high profile places them in contention for top line management jobs [15]. The results of these studies indicate that today's CIO is more a managerially oriented executive than a technical manager. Feeny, Edwards, and Simpson [18] provide a profile of the "ideal" CIO as an open communicator with a business perspective, capable of leading and motivating staff, and as an innovative corporate team player. In this study, we define the CIO as the highest-ranking IS executive who typically exhibits managerial roles requiring effective communication with top management, a broad corporate
Although it was originally expected that the CIO would have high levels of influence within the firm, as the definition of the job responsibilities would suggest, recent surveys indicate that this may not be the case. CIOs may not actually possess strategic influence with top management and they may lack operational and tactical influence with users [9, 46]. Some specific problems include higher-than-average corporate dismissal rates compared with other top executives, diminished power with belt tightening and budget cuts, high expectations for new strategic systems that CIOs may not be able to deliver, lack of secure power bases due to the fact that CIOs are viewed as outsiders by other top executives, and the fact that only 10 percent of CIOs take part in strategic planning and even fewer report to the CEO [41]. These problems seem to indicate that, when compared with other senior executives, CIOs do not have the authority or ability to achieve the kind of changes that were promised when the position was initially proposed. A second and possibly related explanation is that CIOs are experiencing managerial role conflicts that prevent them from meeting those expectations as originally envisioned in the CIO position.

As an initial step toward understanding CIO managerial roles, this research will compare the roles of CIO with the roles of other managers at different functional and hierarchical levels based upon Mintzberg’s [32] classic framework of managerial roles. This study investigates the roles of CIOs in terms of: (1) the extent to which the managerial roles of CIOs differ from those of senior managers in the other functional specialties, (2) the extent to which CIOs differ regarding managerial roles from lower-level IS managers, and (3) the extent to which CIO roles change at varied levels of IS maturity and IS centralization.

An empirical investigation of this nature should offer a better understanding of the managerial role priorities of IS managers and why role conflicts may occur. Assessment of the relationship between the managerial roles and levels of IS maturity and IS centralization should also provide a more contingent perspective concerning the CIO’s roles. It is possible that by avoiding one relatively ubiquitous CIO model for varied IS organizational situations, more realistic expectations concerning the position in different organizational contexts may be established. Finally, the study should provide implications for management development programs, training, and the career planning of IS managers.

This paper is organized as follows. First, Mintzberg’s framework is discussed and research propositions are developed based on the literature. This is followed by a description of methodology employed and a presentation of the study’s findings. The final section is comprised of implications and limitations. Throughout this study the term “IS manager” is used as a generic term to refer to both the CIO and the IS middle manager.

The Mintzberg Roles

As categorized by Fayol, the classic view of management depicts planning, organizing, coordinating, commanding, and controlling functions. However, based on
an observational study of five chief executives, Mintzberg [30] concluded that a manager's work could be described in terms of ten job roles. As managers take on these roles, they perform the above functions [47]. These ten roles consist of three interpersonal roles (figurehead, leader, and liaison), three informational roles (monitor, disseminator, and spokesman), and four decisional roles (entrepreneur, disturbance handler, resource allocator, and negotiator). See Table 1 for a full description of each role. According to Mintzberg [30], these ten roles are common in all managerial jobs regardless of the functional or hierarchical level. However, differences do exist in the importance and effort dedicated to each managerial role based on job content, different skill levels, and expertise. Mintzberg [30] states that managers are in fact specialists, required to perform a particular set of specialized managerial roles that are dependent upon the functional area and hierarchical level in which they work.

Mintzberg's managerial roles have been extensively studied in many academic disciplines. The findings confirm that the managerial roles defined by Mintzberg are exhibited across functional areas and hierarchical levels [23, 27, 42]. However, it has been pointed out that Mintzberg's structured observation methodology, which was used to derive the roles, has some limitations such as sample size, reliability checks, coding method, and external validity [24, 27]. To reduce these limitations, a number of studies were conducted, modifying and extending Mintzberg's work using heterogeneous samples of senior-level executives and different methodologies [24, 34, 35].

McCall and Segrist [28] developed a survey instrument based upon the Mintzberg framework which investigated the influences of functional specialty and hierarchical level on the managerial roles. This empirical study uses multiple item measures to operationalize six of the ten Mintzberg roles: leader, liaison, monitor, spokesman, entrepreneur, and resource allocator. The four other roles (figurehead, disseminator, disturbance handler, and negotiator) were not operationalized because the activities constituting these roles were correlated with the activities of the other six roles and because the activities that comprised those four roles were consistently important only for certain functions and levels of management [28]. This study adapts the McCall and Segrist [28] instrument for use within the context of IS management.

Study Propositions

Role of the CIO

A NUMBER OF EMPIRICAL STUDIES HAVE FOUND THAT MANAGERS within different functional areas will place different importance on their managerial roles [28, 34, 35]. Although previous research has studied the relative importance of managerial roles in sales/marketing, production/engineering, and accounting/finance, virtually no research has focused on the perceived importance of managerial roles of the CIO. The following discussion presents the managerial roles as applied to the IS function.

Leader: As the leader, the IS manager is responsible for supervising, hiring, training, and motivating a cadre of specialized personnel. Literature has emphasized the impact of this role on IS personnel [4, 20].
Table 1 Mitzberg’s Managerial Roles

**Interpersonal roles**

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figurehead</td>
<td>Performs some duties of a ceremonial nature. Examples: greeting visitors; attending the wedding of a subordinate.</td>
</tr>
<tr>
<td>Leader</td>
<td>Responsible for motivation of subordinates and for staffing and training. Example: most activities involving subordinates.</td>
</tr>
<tr>
<td>Liaison</td>
<td>Establishes his/her web of external relationships. Example: attending conferences.</td>
</tr>
</tbody>
</table>

**Informational roles**

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor</td>
<td>Seeks and receives information to understand organization and environment. Example: reading periodicals and reports.</td>
</tr>
<tr>
<td>Disseminator</td>
<td>Transmits information to other organization members. Examples: Forwarding reports and memos; making phone calls to relay information; holding informational meetings.</td>
</tr>
<tr>
<td>Spokesman</td>
<td>Involves the communication of information or ideas. Examples: speaking to the board of directors and top management.</td>
</tr>
</tbody>
</table>

**Decisional roles**

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneur</td>
<td>Acts as initiator and designer of much of the controlled change in his/her organization. Example: developing an improvement project.</td>
</tr>
<tr>
<td>Disturbance handler</td>
<td>Responsible for corrective action when the organization faces unexpected crises. Example: settling disagreements between subordinates.</td>
</tr>
<tr>
<td>Resource allocator</td>
<td>Responsible for allocation of human, financial, material, and other resources. Examples: working on budget; deploying staff.</td>
</tr>
<tr>
<td>Negotiator</td>
<td>Responsible for representing the organization in negotiations. Example: negotiating a new stock issue with the financial community.</td>
</tr>
</tbody>
</table>

**Spokesman:** This role incorporates activities that require the IS manager to extend organizational contacts outside the department to other areas of the organization. Frequently, he or she must cross traditional departmental boundaries and become involved in affairs of production, distribution, marketing, and finance. It has been shown that “keeping in touch” with top executives as well as with key users is critical [39]. The spokesman role demands that the IS manager act as an information disseminator and politician, ensuring that the IS department is properly “connected” to the top level of the organization and to key decision makers in other departments [8, 12]. Mintzberg [32] found that both sales and finance executives have a similarly important spokesman role.

*Source: Adapted from [30, p. 98]*
Monitor: The IS manager must scan the external environment to keep up with technical changes and competition. In acting as the firm’s technical innovator, the IS manager identifies new ideas from sources outside of the organization. To accomplish this, the IS manager uses many sources including vendor contacts, professional relationships, and a network of personal contacts. Synnott and Gruber [44], and Earl [15] in describing the CIOs “impresario” responsibilities, describe the proactive CIO as someone who is knowledgeable about opportunities for use of information technology in his or her respective industry. Coulson-Thomas [12] also states a similar view that emphasizes the CIO’s capability to support environmental monitoring and protection.

Liaison: The IS manager must communicate with the external environment including exchanging information with IS suppliers, customers, buyers, market analysts, and the media. To meet a distinct set of IS requirements and work in joint supplier–customer teams, the CIO should communicate IS capabilities to meet the requirements of suppliers and customers [12]. In order to maintain the compatibility of interorganizational networks, CIOs also may find themselves spending more time working with their equivalent in other organizations.

Entrepreneur: As an entrepreneur, the IS manager identifies business needs and develops solutions that change business situations. A major responsibility of the IS manager is to ensure that rapidly evolving technical opportunities are understood, planned, implemented, and strategically exploited in the organization [39]. A proactive CIO not only sets MIS planning objectives consistent with the firm’s overall objectives, but as an organizational change agent, is also able to influence the future strategic direction and opportunities of the firm [44].

Resource allocator: The IS manager must decide how to allocate human, financial, and information resources. The litany of past discussion on charge-back systems and the importance of “fairness” in IS resource allocation decisions speak to the importance of this role [21]. In addition to financial and human resource decisions, as IS moves away from being the main custodian of corporate data, “information” resource allocation decisions are taking on increased importance. These include decisions concerning departmental data management, standards, and control.

Adapting Lederer and Mendelow’s [25] division of intra- and interorganizational environments as a classification scheme, figure 1 illustrates the roles of IS managers in terms of the communication and information flows between the IS organization and the two outside environments with which it must interact to survive. Mintzberg [32] characterizes the manager as a nerve center and explains roles pertaining to the location of decisions and the direction of information and communication flows. Based upon this view, our model extends this approach by placing all six managerial roles in the context of decision locations, communication, and information flows.

With the exception of the two roles internal to IS (leader and resource allocator), the remaining four external roles are established through interaction between the intra- and interorganizational environments. For example, in the monitor role, the IS
manager is continually seeking external information from the business environment to detect changes and to identify problems and opportunities. It should be noted that arrows in this model may not depict causal relationships, but are used merely to illustrate direction of communication and information flows.

In addition to observing differences in managerial roles based on functional areas, Mintzberg [32] suggests that managers may be more effective when they focus their time on the set of managerial roles deemed most appropriate for their functional specialty. Given the unique nature of the IS environment and the increasing emphasis on IS as a core function, one could argue that the importance of managerial roles in the IS function might be different than in other functional areas. Therefore, we suggest the first proposition:

*Proposition 1: There is a significant perceptual difference regarding the relative importance of managerial roles between CIOs and other senior level executives.*
Hierarchical Level

The hierarchical level of management is another dimension that influences roles. Mintzberg [32] expected that the relative importance of the roles across hierarchical levels would vary due to the different characteristics of jobs at the different hierarchical levels. Higher-level managers focus more on external roles (e.g., liaison, monitor, figurehead) that bridge the organization with the external environment. At lower managerial levels, the focus on internal responsibilities mandates decisional (e.g., resource allocator) and interpersonal roles (e.g., leader) [35]. These differences occur because lower-level managers are mainly concerned with supervising staff and overseeing daily operating work flows and maintenance. Their job assignments tend to be more focused and of a shorter, fixed duration.

Pavett and Lau [35] found that lower-level managers perceived the internal roles of disturbance handler, negotiator, and leader as more important than upper-level managers. Given that the CIO should be increasingly focused on strategies and planning, it is expected that the CIO cannot maintain as much direct line management control over computer operations, and thus, must give away some of these responsibilities to lower IS managerial levels. In this way, it is expected that the CIO is less involved in the actual creation of new products or services, but instead acts as a catalyst who encourages departments to use information technology in innovative ways. Ives and Olson [20] pointed out: "the information systems manager’s job will evolve from a fairly low level, relatively unimportant service function to an important instrument of organizational change and profit making." Bock, Carpenter, and Davis [7] also argue that CIOs concentrate on long-term strategy and planning while leaving the day-to-day operations of the computer room to subordinates. In other words, the CIOs should view information technology as a means to enhance organizational effectiveness rather than as an end in itself. Given the different job expectations between the CIO and lower level IS managers, we propose:

Proposition 2: There is a significant perceptual difference between CIOs and IS middle managers regarding the relative importance of managerial roles. (The ranking of the relative importance of managerial roles for the CIO will be different from that of IS middle managers.)

Factors Influencing Importance of CIO Roles

Two factors are proposed that could influence the nature of IS executive roles: IS maturity and the degree of IS centralization. IS maturity can be defined as the formalization level of IS control mechanisms, level of user awareness and involvement, availability of strategic IS planning, and the degree to which the setting of IS
objectives is rational and compatible with organizational objectives [5, 16]. It has been suggested that the degree of IS maturity is related with the roles of the CIO [6, 46]. Rockart [39] suggests that differences in CIO role importance are based upon his or her critical success factors which are influenced by the maturity of the IS organization. Brown, Karwan, and Weitzel [8] concur, stating that IS maturity is one of many factors affecting the managerial roles of the CIO. Similarly, Bartol and Martin [4] advocate that the CIO must change with the organization, and as the IS department matures, he or she must possess the ability to integrate the diverse elements of information resources into the organization (p. 59).

Organizations that include IT in their corporate planning tend to be relatively mature in their use of IT and view IT as a proactive means to achieve their objectives and gain competitive advantage [5, 10]. Nolan [33] suggests that IS maturity changes the managerial roles of a CIO. He implies that the entrepreneur role becomes more evident as the IS organization moves into the later stages of IS maturity. Benbasat, Dexter, and Mantha [5] indicate that as the IS department matures, its emphasis changes from one of efficiency to one of organizational effectiveness, thus supporting the strategic mission of the firm. Therefore, through entrepreneurship, the CIO plays a greater role in influencing overall strategy and planning in the organization and translates these organizational strategies and plans into definitive IS actions.

In accomplishing this change agent or entrepreneur role, the CIO must help the organization identify and adopt new IT. As Mintzberg [32] points out, entrepreneurial work begins with scanning activity. In the CIO’s search for opportunities and problems, it becomes increasingly critical to monitor the technological and competitive environment so that informed change can be effectively instigated. Thus, in mature IS organizations that recognize the strategic contribution of information technology, it becomes important for the CIO to monitor the technological and competitive environment [17].

Organizational influence requires communication with influential departmental decision makers. Emphasizing the increasing importance of the spokesman role as IS matures, Rockart [39] outlines “a strong need to understand the world of key users and top line executives, as well as to have these individuals understand the IS environment” (p. 8). This is especially true in mature IS environments where IT is diffused in user departments and needs to be coordinated. Donovan [14] also implies that the role of CIO as a “network manager” in the later stages of IS maturity should be similar to a traffic controller, in essence serving as a spokesman linking IS to functional areas. This leads to the third proposition:

Proposition 3: The managerial role importance of CIOs is related to the level of IS maturity.

3a: As IS matures, the entrepreneur role becomes more important.
3b: As IS matures, the monitor role becomes more important.
3c: As IS matures, the spokesman role becomes more important.

Researchers have also stated that the centralization of IS activities may also affect the managerial roles of the CIO [6, 8]. Rockart, Ball, and Bullen [40] argue that a
technology-dominated environment helps determine the degree of centralization of IS activities. Cash, McFarlan, and McKenney [10] suggest that for all but the most decentralized IS, some central control over standards and operating procedures is needed. To expand or maintain one's overall control over organizational interest groups, self-serving behaviors such as enhancing one's position, building a power base, and establishing the right political connections is required [35]. Through the spokesman role the CIO may attempt to use political "muscle" with end-user departments. Typically, accompanying this political role is greater budgetary responsibility for resource allocation of the corporate information resources. As Joshi [21] points out, the more centralized the control of IS, the greater the importance of perceived fairness in IS resource allocation.

In a centralized IS environment the CIO, representing the overall IS operation of the firm, is responsible for maintaining contacts with the outside world. When IS is centralized, the CIO's role as interorganizational liaison concerning IS matters should be greater. For example, the CIO will most likely be the focal point of contact concerning IS related supplier and buyer relationships with key outside groups. This leads to the fourth proposition:

Proposition 4: The managerial role importance of CIOs is related to the degree of IS centralization.
4a: As IS centralizes, the spokesman role becomes more important.
4b: As IS centralizes, the resource allocator role becomes more important.
4c: As IS centralizes, the liaison role becomes more important.

Methodology

Questionnaire Development

THE MCCALL AND SEGRIST [28] INSTRUMENT, which operationalized the managerial roles identified by Mintzberg, was used as a basis to investigate the role of IS managers. The rationale for choosing this instrument was based upon the high validity and reliability they obtained within each of the managerial roles [28]. The survey instrument, which contained forty-six Likert seven-point scales, was adapted to the IS context. The survey asked IS managers to rate the importance of each item as it related to their job. The complete survey instrument is presented in the appendix.

For IS maturity and centralization, fifteen items were used to capture both constructs. The eight items for IS maturity were adapted from the Benbasat, et al. [5] study. The last seven items, representing IS centralization, were adapted from previous surveys by Tavakolian [45] and Ein-Dor and Segev [16]. The first stage of the study involved a pretest of the questionnaire with sixteen senior and middle-level IS managers (e.g., CIO, vice president of IS, managers of computer operations, etc.) in eleven organizations. All sixteen people were chosen on a convenience basis from large companies in a large metropolitan area. The responses were collected and modifications in the
wording of questions, appearance of the survey, and general flow of the questionnaire were made in accordance with the respondent’s suggestions.

Sample

A study sample of 500 companies was randomly selected from the 1991 listing of Fortune 1000 companies. It was assumed that these larger and more progressive firms would tend to have IS executives with job attributes consistent with our CIO definition. Based on this sample, CIOs and IS middle managers were selected using the ACR Directory of Top Computer Executives [1,2]. This resulted in a sample of IS managers who were from relatively large organizations and who were well dispersed throughout the United States. Based on the availability of addresses, a total of 477 surveys were finally sent to these CIOs and IS middle managers. Surveys with incomplete responses were deleted, resulting in a total sample of 111 respondents or 71 usable responses for CIOs and 40 for IS middle managers (overall response rate equaled 23.3 percent). The study’s demographics revealed that a CIO is on average 49 years of age with an average of 23.9 years of IS experience, seven years of which were in a CIO position.

Reliability and Construct Validity

A reliability test of the McCall and Segrist [28] items used showed coefficient alphas ranged from 0.6598 for the entrepreneur role to 0.8402 for the leader role. According to Price and Mueller [37], a standard coefficient alpha of 0.60 or higher is generally viewed as the acceptance level for using a measure. Our items maintained an acceptable reliability level for each role construct.

To measure convergent and discriminant validity of the adapted IS maturity and centralization items, a principal factor analysis was conducted with an oblique rotation. An oblique rotation was used because the two constructs were interrelated and were not considered to be independent entities [5,16,45]. The Eigenvalue greater than one rule was used as the criterion to extract the factors [19].

The result of factor analysis did not produce support for a “unidimension” assumption for each construct. The factor analysis resulted in four factors explaining 65.9 percent of the overall variance. Hence, these results point out that two different dimensions of IS centralization and two different kinds of IS maturity exist. From the observations in Table 2, factors 1 and 2 can be explained as two subdimensions for IS centralization. Similar to those dimensions of centralization identified by Donovan [14], we named the first factor IS resource centralization, which reflects the degree of centralization in physical IS resources such as equipment, IS personnel, and the IS development capability. The second factor, IS management centralization, denotes the location of responsibility and decision-making authority over IS resources and services. The third factor was named end-user computing maturity, which focuses on the maturity level of end users in terms of end users’ involvement in IS projects, information technology awareness, and their expertise and capabilities in information system development. The fourth factor was named IS management maturity and
Table 2  Factor Analysis for IS Maturity and Centralization

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalue</th>
<th>% of variance accounted for</th>
<th>Cronbach's alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS resource centralization</td>
<td>1.6055</td>
<td>12.4</td>
<td>0.8285</td>
</tr>
<tr>
<td>IS management centralization</td>
<td>3.5381</td>
<td>27.2</td>
<td>0.8681</td>
</tr>
<tr>
<td>End-user computing maturity</td>
<td>2.7785</td>
<td>21.4</td>
<td>0.7331</td>
</tr>
<tr>
<td>IS management maturity</td>
<td>1.3277</td>
<td>10.2</td>
<td>0.7054</td>
</tr>
</tbody>
</table>

reflects the maturity level of overall IS management including control mechanisms as well as strategic IS use.

The coefficient alphas for the two IS maturity subdimensions were found to be 0.73 (end-user computing maturity) and 0.71 (IS management maturity) while the standard coefficient alphas for the two IS centralization constructs were 0.83 (IS resource centralization) and 0.87 (IS management centralization). Hence, all constructs had adequate reliability.

Analysis and Results

IN ORDER TO TEST PROPOSITIONS 1 AND 2, the Spearman's rank correlation coefficient was used to measure the accordance level between each group compared [22]. The following results were found:

Proposition 1: Relative Role Importance with Respect to Other Functional Areas

A mean ranking of each role was developed by averaging each item and then computing the mean within each managerial role. Table 3 shows the mean for each managerial role from the McCall and Segrist [28] study and a comparison table with CIOs tested in this study. The McCall and Segrist [28] study provided the relative importance of senior executive roles in three functional areas: manufacturing, sales, and finance departments; and across different hierarchical levels. Proposition 1 was tested as a pairwise comparison between the ranking of the CIO and that of the other three functional areas. The Spearman’s rank correlation coefficients between rankings of CIOs and senior executives in manufacturing and sales departments are not significant. This finding generally supports proposition 1. Specifically, the results indicate that the uniqueness of the IS specialty influences the role requirements of CIOs.

Senior executives in the finance department, however, showed significant ($p < 0.05$) similarity with the IS department in terms of the relative importance of managerial roles. According to Mintzberg’s [31] findings, production managerial jobs require decisional roles (e.g., entrepreneur, resource allocator) to a greater extent than the other roles, sales managerial jobs require interpersonal roles (e.g., liaison, leader).
more, and staff specialists in accounting and finance emphasize informational roles (e.g., monitor and spokesman). The role similarity of the CIO and the senior executive in the finance department points to the importance of informational roles in both jobs. As Rockart et al. suggested, "the CIO will become not simply the 'custodian' of the data, but more importantly, the corporate officer who truly understands the interconnection between the information flow and the business. . . . Ultimately . . . the CIO will fill a role similar to that of the Chief Financial Officer (CFO)" [40, p. 5].

One possible reason for the similarity between IS and finance may be their common history as organizational information support functions. In fact, IS typically resided in the realm of the accounting or finance departments; therefore, managers may have evolved roles similar to their former bosses. A second possible explanation may be based upon the Porter and Millar [36] value chain concept. Porter and Millar describe manufacturing and sales department as core functions, while they describe the accounting, finance, and IS department as support functions. The CIO's role similarity with that of the finance department may imply that the roles of the CIO and IS still have vestiges of a "back-room" support function.

Although there is a nonconformity in rankings, the CIOs, like the other three functional departments, rated the entrepreneur role as the most important. This result seems to match the thinking in the IS literature which emphasizes the entrepreneur role as the most important role of the CIO. The CIO, unlike the other functional executives, ranked spokesman second in importance. This finding confirms the importance of the spokesman role of the CIO as discussed in IS literature [6, 8]. The spokesman role incorporates all the activities that require the CIO to extend contacts within the organization. As a general service provider to the entire firm, one might expect there would be a high interaction level between the IS and other functional departments [10].

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### Table 3: Spearman's Rank Coefficient

<table>
<thead>
<tr>
<th>Division:</th>
<th>Present study</th>
<th>McCall and Segrist</th>
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<tbody>
<tr>
<td></td>
<td>IS middle manager</td>
<td>Manufacturing</td>
</tr>
<tr>
<td>Leader</td>
<td>5.20 3</td>
<td>5.29 2</td>
</tr>
<tr>
<td>Liaison</td>
<td>4.30 6</td>
<td>4.27 6</td>
</tr>
<tr>
<td>Monitor</td>
<td>5.15 5</td>
<td>4.99 5</td>
</tr>
<tr>
<td>Spokesman</td>
<td>5.22 2</td>
<td>5.05 4</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>6.08 1</td>
<td>5.75 1</td>
</tr>
<tr>
<td>Resource allocator</td>
<td>5.19 4</td>
<td>5.08 3</td>
</tr>
</tbody>
</table>

Significance of Spearman's rank coefficient with CIO: significant at $p < 0.05$, not significant, significant at $p < 0.05$. 

---

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Proposition 2: Relative Role Importance with Respect to IS Middle Managers

The findings in Table 3 show that perceptions of managerial role importance for IS middle managers are significantly similar to those of CIOs. The entrepreneur, monitor, and liaison roles were ranked first, fifth, and last at both levels. Despite the fact that this result conflicts with past studies which show differences in Mintzberg’s roles at different hierarchical levels, the findings seem to match some of the discussion in IS literature which emphasizes the importance of the entrepreneur role at all levels of IS management. One explanation for the equally high ranking of the entrepreneur role may be related to the nature of the close link between the CIO’s job and the IS middle manager. As a middleman between the CIO’s strategic orientation and a company’s day-to-day IS operations, the IS middle manager may support the CIO’s key entrepreneurial role by providing the technical insight necessary to formulate a strategic application of IS resources. It was also found that the liaison role is not as important as was discussed in previous literature [6, 40]. The low ranks for the liaison and monitor roles by both CIOs and IS middle managers lead us to suspect that IS managers have not yet placed high priority on environmental scanning responsibilities and are less involved in interorganizational business relationships than has been suggested in the literature.

However, there are some important dissimilarities between the two IS hierarchical levels. The most noticeable difference was in the spokesman role (see Table 3). That is, CIOs ranked the spokesman role as more important than did IS middle managers. Paolillo [34] and Pavett and Lau [35] also reported similar results, placing the spokesman role as more important at higher managerial levels than at the lower levels. We also found that IS middle managers rated the role of leader and resource allocator higher than that of CIOs. The leader role involves supervising, hiring, training, and motivating personnel. Since IS middle managers have direct day-to-day responsibilities for the supervision of IS personnel, these behaviors should be more important at this level. The heavier emphasis by IS middle managers on resource allocator and leader roles demonstrates that they must place greater importance on internal IS functions while the CIO must focus on the “bigger (external) picture.”

Proposition 3: The Impact of Maturity on Role Importance

Table 4 displays the correlation matrix between each of the managerial roles and the two IS maturity factors. The proposed positive relationship between the entrepreneur and monitor roles and IS maturity were not significant for either derived subdimension of IS maturity. In fact, end-user computing maturity was not significantly related with any of the managerial roles. However, the relationships between the liaison and the spokesman role and IS management maturity were significant with correlations of 0.2648 ($p < 0.05$) and 0.2398 ($p < 0.05$), respectively. Therefore, proposition 3c is partially supported.

Based on the information and communication flow model outlined in figure 1, this
Table 4 Correlation Matrix among the CIO Managerial Roles

<table>
<thead>
<tr>
<th>Managerial roles</th>
<th>End-user computing maturity</th>
<th>IS management maturity</th>
<th>IS resource centralization</th>
<th>IS management centralization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader</td>
<td>-0.0305</td>
<td>0.0751</td>
<td>0.2209</td>
<td>0.1286</td>
</tr>
<tr>
<td>Liaison</td>
<td>0.0394</td>
<td>0.2648</td>
<td>0.0768</td>
<td>0.1235</td>
</tr>
<tr>
<td>Monitor</td>
<td>0.1704</td>
<td>0.0985</td>
<td>0.3035</td>
<td>0.2101</td>
</tr>
<tr>
<td>Spokesman</td>
<td>0.1254</td>
<td>0.2398</td>
<td>0.2352</td>
<td>0.3253</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>-0.0501</td>
<td>0.0552</td>
<td>-0.0158</td>
<td>0.1563</td>
</tr>
<tr>
<td>Resource allocator</td>
<td>-0.0326</td>
<td>0.2053</td>
<td>0.3125</td>
<td>0.1151</td>
</tr>
</tbody>
</table>

* Significant at $p < 0.05$.
** Significant at $p < 0.01$.

finding implies that as IS management becomes more formalized and closely linked with overall organizational planning, the CIO is more involved in out-flowing communications to establish a web of intra- and interorganizational contacts through the liaison and spokesman roles. However, since neither of the in-flowing communication roles of monitor or entrepreneur was significantly related with IS management or end-user computing maturity, an imbalance in communication flow may result in the CIO’s inability to act fully on the derived information and ideas from these intra- and interorganizational contacts. Considering the significant correlation between IS management and end-user computing maturity ($r = 0.3299$, $p < 0.01$), an explanation of this finding may be that as IS management matures, end users assume traditional IS development and operational functions and the CIO’s entrepreneur and monitor roles are transferred in part to those users and their departments. With the loss of direct development and operational responsibilities, the CIO may be pressured to establish a more visible presence by means of intraorganizational contact through the spokesman role, but may not be establishing a more strategic presence through entrepreneurship or environmental monitoring.

Proposition 4: The Impact of Centralization on Role Importance

Table 4 shows that the IS resource centralization factor is correlated with three of the hypothesized managerial roles: spokesman ($p < 0.05$), monitor ($p < 0.05$), and resource allocator ($p < 0.01$). IS management centralization also shows significant relationship with the spokesman role ($p < 0.01$). Thus, proposition 4a was supported and 4b was partially supported. This result confirms that as IS management and resources are centralized and become more visible, the role of spokesman becomes more important for a CIO. In essence, the CIO is asked to represent the IS organization to top management and maintain close contact with departmental functional areas.

One obvious explanation for the positive correlation between IS resource centralization and the resource allocator role appears to be that as decision making over IS
Budgets and resources centralizes, the impact of resource allocation decisions become more significant. Previous studies on IS managerial political behavior [26] and equity [21] all reflect the importance and sensitivity to fairness in IS resource allocation decisions. Since CIOs managing centralized IS may be judged based on the fairness of their IS resource distribution decisions, they would be justified in giving the resource allocator role greater emphasis.

One unexpected result was the significant relationship between the monitor role and IS resource centralization. The monitor role for a CIO is the proactive informational role of identifying and extracting information from the external environment. A possible explanation for this positive relationship may be that as IS resources are centralized, the CIO's accountability for effectively utilizing IS resources increases, thus emphasizing the need for environmental scanning to achieve technological improvement.

Implications for Research

This study raises a number of interesting research questions. First, the findings indicate that CIOs rated the entrepreneur role (creating and managing change) as the most important. However, much of IS research on CIOs has focused on the leader role (those activities involving motivation and activation of subordinates), which was rated at a lower level of relative importance by the CIOs in our study. A stronger research emphasis is needed on topics concerning entrepreneurship of the CIO. Questions might include such topics as how IS managers recognize opportunities or how they structure and monitor change.

Second, this study investigated the impact of only two IS factors (maturity and centralization) on the roles of CIOs. Clearly other contingent factors need to be further investigated as to their effect on CIO role importance. For example, Rockart et al. [40] suggest that company size, industry, personal characteristics, and the economy will influence CIO roles. Watson [46] suggests that IS managers in more dynamic, competitive industries will spend more time scanning because they need to be prepared to handle environmental contingencies. Similarly, a firm in the "strategic" quadrant of McFarlan, McKenney, and Pyburn's [29] classification of IS environments might emphasize the entrepreneur and monitor roles, as opposed to firms in the "factory" environment that are more concerned with allocating scarce resources—and have little time to scan. Such a contingent perspective provides an exciting avenue for better understanding the CIO position.

The organizational rank of the CIO may also influence CIO roles. That is, as Raghunathan and Raghunathan [38] point out, the reporting level or political power of the CIO in the organization is related to the extent of strategic orientation and planning success of IS. By operationalizing factors such as organizational rank and those variables outlined by Rockart et al., one could develop additional insights concerning the relative importance of CIO managerial roles in different contexts. In addition, future research might compare such performance measures as IS success or IS strategic impact with varying IS management role orientations. Finally, while this
study mainly focuses on the CIO's perceived roles, the degree and direction of discrepancy between CIO's perceptions and expectations may provide additional clarity concerning managerial roles. This area of research may demonstrate that what CIOs expect as their job responsibilities may not be the same as what they really do in their everyday job. Factors that may cause this expectation–perception gap include such contingent variables as top manager support, the CIO's organization ranking or power, or IS resource munificence level.

Implications for Practice

This study has several implications for practitioners. Management theory has evolved from an early process view of managerial work, which focused on the structuring of management functions (e.g., planning, organizing, etc.), to an action-oriented view emphasizing the skills needed or roles adopted by management for effectively handling the challenges and problems of the modern organization. The role approach in this study may thus provide an alternative method in CIO selection procedures. For example, in companies where IS management is mature, a CIO who is suitable for liaison and spokesman roles may be a good choice for the position. Likewise, as a company's IS resource allocation centralizes, greater emphasis may be placed on a candidate with expertise in monitoring, spokesman, and resource allocation roles. In this vein, executive development programs might also be differentiated by emphasizing the entrepreneur, spokesman, and leader roles which were ranked most important. Finally, mimicking the managerial style of exemplary functional managers from other disciplines is not a guarantee of CIO managerial success. Rather, understanding the relative importance of managerial roles pertinent to the IS function may be critical in successful management of the IS enterprise.

Limitations

While this study has produced some interesting results, they should be interpreted with some caution. Although the IS managers surveyed represent a wide diversity of organizations, the sample total of 111 respondents may not be large enough to generalize to the population of IS managers. The disproportionate sample size between CIOs and IS middle managers could also lower the power of test significance. In addition, because relatively large organizations were used in the sample, IS managerial roles may be different from those of smaller organizations where the CIO or IS middle managers may have a broader array of responsibilities.

This article compared role rankings using nonparametric statistics. An ANOVA test confirms that the mean values of the six roles are statistically different at the $p < 0.05$ level. Even though this assignment of rankings is statistically valid as suggested by this ANOVA result, nonparametric statistics inherently tend to
produce weak significance of findings in terms of statistical power. In this study, a nonparametric statistical approach had to be used because the researchers lacked the needed data to conduct parametric tests. However, since the focus of this study was to identify the relative rank differences of roles rather than to compare absolute means, nonparametric statistics appear to be robust enough to address this study's research questions [11].

Our findings are based on the use of only six of Mintzberg's original ten roles. These six roles were derived from past studies of managerial role importance. While these six roles were validated in these past studies, future researchers' results may differ if additional roles are included. Future study might include all ten of Mintzberg's roles.

Due to the time interval between the McCall and Segrist study [28] and this study's data collection, the generalizability of the findings from the comparison of the CIO roles with those of other functional executives may also be limited. It would be preferable for future researchers to survey other functional executives and CIOs at the same time to validate this study's findings. Finally, this study used perceived measures of organizational variables. By relying solely on a perceptual survey method, findings related to the IS centralization and maturity may be biased if there is a wide variance in IS manager's perceptions. This concern can be overcome in future study by incorporating objective measures such as IS organizational charts or IS budget distribution patterns.

Conclusion

*This study provides some empirical insight into the importance of CIO managerial roles and their comparison with other functional areas as well as hierarchical levels within IS departments. The managerial role importance of the CIO is significantly different from those of the manufacturing and sales departments, but is not significantly different from the finance area. One explanation for this result may be that, like the finance department, CIOs still view their managerial roles as being more structured and more support-oriented.*

There appears to be no significant difference in the role importance between CIOs and IS middle managers. However, the CIO places heavier emphasis on informational responsibilities through the spokesman role and the IS middle manager places more weight on IS internal and supervisory activities through the leader and resource allocator roles. It appears that the burdens of centralized IS resource control require the CIO to be alert to changes in the technical environment through a monitor function as well as to play a greater role as a spokesman and resource allocator. As IS management matures, the spokesman and liaison roles of the CIO become more important as the CIO communicates with sophisticated end users and influential external contacts. Interestingly, we found that as IS matures, the monitor and entrepreneur roles of the CIO, with the strategic responsibilities contained in them, do not become more important. In general, this research suggests that the roles of the CIO are contingent on organizational and environmental
variables and that more realistic expectations concerning the position in varying organizational contexts needs to be established.

NOTES
1. Throughout this paper the term "spokesman" is used in keeping with Mintzberg's terminology. If it were for the sake of research "accuracy," we would prefer the term "spokesperson."
2. To reduce the possible overlap between the spokesman and liaison roles, and to differentiate between intraorganizational and interorganizational communication and information dissemination, the items for spokesman were slightly altered to reflect only intraorganizational information flow.
3. The Coefficient of Concordance, which was used by McCall and Segrist [39], was not appropriate to test our proposition since a function of variance is influenced from the sums of ranks in other functional areas [11].

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APPENDIX: Survey Instrument

A—Please rate the importance of the following tasks as they are related to your job. (Circle the appropriate number)

<table>
<thead>
<tr>
<th>Task</th>
<th>not important</th>
<th>very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintaining your personal network of contacts through visits or phone calls.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Attending social functions which allow you to keep up your contacts.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Evaluating the quality of subordinate job performance.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Integrating subordinates' goals (e.g., career goals, work preferences) with the company's work requirements.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Keeping in touch with and helping subordinates with personal problems (maintaining their trust and confidence).</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Assessing political events as they may affect your work.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Planning and implementing change.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Keeping up with market changes and trends that might have an impact on your department.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Distributing budgeted resources.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Making decisions about time parameters for upcoming projects.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Preventing the loss or threat of loss of resources valued by your department.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Resolving conflicts between subordinates.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Allocating monies within your unit.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Keeping up with information on the progress of operations in the company.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Attending conferences or meetings to maintain your contacts.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Initiating controlled change in your unit.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Keeping up with technological developments related to your work or to the company.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Deciding for which programs to provide resources (manpower, material, etc.).</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Keeping track of subordinates' training and special skills as they relate to job assignments so as to facilitate their personal growth and development.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Allocating manpower to specific jobs or tasks</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Presiding at meetings as a representative of your department.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Providing new employees with adequate training for the introduction to the job at hand.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Gathering information about trends outside your department.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Attending social functions as a representative of your department.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Allocating equipment or materials.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
Gathering information about customers, competitors, associates, etc. 1 2 3 4 5 6 7
Touring facilities for observational purposes. 1 2 3 4 5 6 7
Seeing to it that subordinates are alert to problems that need attention. 1 2 3 4 5 6 7
Serving as an expert to people outside of your immediate department. 1 2 3 4 5 6 7
Learning about new ideas originating outside of your department. 1 2 3 4 5 6 7
Reading reports on activities in your own or others' Information System departments. 1 2 3 4 5 6 7
Using your authority to ensure that your subordinates accomplish important tasks. 1 2 3 4 5 6 7
Maintaining supervision over changes in your department. 1 2 3 4 5 6 7
Providing guidance to your subordinates on the basis of your understanding of the organization. 1 2 3 4 5 6 7
Joining boards, organizations, clubs, etc., which might provide useful work-related contacts. 1 2 3 4 5 6 7
Solving problems by instituting needed changes in your department. 1 2 3 4 5 6 7
Informing others of your department's future plans. 1 2 3 4 5 6 7
Giving negative feedback (criticizing subordinates' actions when appropriate). 1 2 3 4 5 6 7
Directing the work of your subordinates. 1 2 3 4 5 6 7
Staying attuned to the grapevine. 1 2 3 4 5 6 7
Developing new contacts by answering requests for information. 1 2 3 4 5 6 7
Developing personal relationships with people outside your unit who feed you work or services (e.g., purchasing, suppliers, consultants, inspectors, etc.). 1 2 3 4 5 6 7
Answering letters of inquiries on behalf of your department. 1 2 3 4 5 6 7
Forwarding important information to your subordinates. 1 2 3 4 5 6 7
Keeping other people informed about your department's activities and plans. 1 2 3 4 5 6 7
Developing contacts with important people outside your immediate department. 1 2 3 4 5 6 7

B—To what extent:

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>To some extent</th>
<th>To a great extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the information system user aware of system projects?</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the user capable of participation in various aspects of system projects?</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the user capable of leadership in various aspects of system projects?</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Are rules, procedures, and organizational activities documented with formal paperwork with respect to information systems?  
Is information system planning linked with organizational planning?  
Does your organization employ rules and procedures in application development and use?  
Does your organization use any information systems for creating competitive advantage?  
Is information technology dispersed in your organization?  
Does each organizational unit or function have its own information systems?  
Does each organizational unit or function create and develop its own systems?  
Are information systems support personnel centralized in one place within your organization?  
Is the information system department responsible for performing systems analysis?  
Is your information system department responsible for performing systems design?  
Is your information system department responsible for making policies with regard to hardware?  
Is your information system department responsible for performing systems planning?  

C—Please indicate the total number of employees in your overall organization.  
- under 250  
- 251 to 1000  
- 1001 to 2500  
- 2501 to 10,000  
- 10,000 or more  

D—How many years have you worked in your present position?  
- (years)  

E—How many years have you worked in the IS field?  
- (years)  

F—Which of the following categories include your age?  
- under 15  
- 26 to 29  
- 30 to 39  
- 40 to 49  
- 50 to 59  
- over 60
G—How many personnel work or are employed within the MIS functional area?

H—What is your job title in your organization?