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Concordia Casting Company

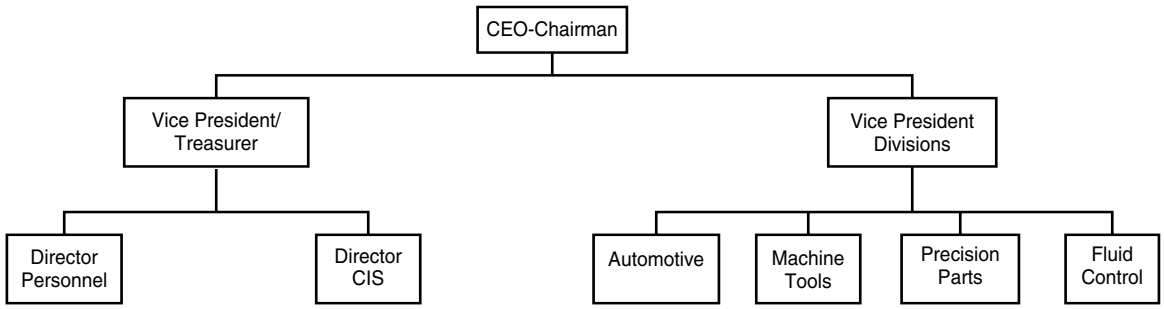
In late October 2002, Stuart McMillen, director of Corporate Information Services (CIS) for Concordia Casting Company, was concerned about a major schedule slippage in his department's most important systems development effort, the CAPS project. After several weeks of intense investigation, some key management changes, and a major rescheduling effort, it was clear that CAPS would come on line almost a year late. This was the latest in a series of missed completion dates for CAPS.

McMillen wanted to make several additional changes within his department, but for the time being, he planned to concentrate on the CAPS project. McMillen also knew that his 2003 operating plan would have to contain longer-term proposals for managing CIS.

Background on Concordia and CIS

Concordia Casting Company, based in Fort Wayne, Indiana, was a large, multidivisional organization with 2001 revenues of more than $2 billion. Originally an automobile parts supplier, Concordia had broadened its operations significantly during the 1990s. By 2002 the company had four business segments. The largest and most profitable division was Automotive (engine blocks and other automobile parts). Machine Tools (lathes, power presses, drills, etc.), Precision Parts (screws, nuts, bolts, and other machined parts), and Fluid Controls (valves and piping for commercial applications) collectively accounted for about half of the company's revenues. Much of Concordia's growth had come through acquisition. Each division, composed of several independent companies, was treated as a separate profit center (see **Figure A**).

Figure A Concordia Casting Company Organization Chart



Professor F. Warren McFarlan prepared this case. All names and figures have been disguised. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

McMillen was hired as director of Corporate Information Services in March 1998. He had previously worked for the consulting firm of Huntington and Wells, Concordia's auditors. His contact with Concordia's Corporate Information Services department began in 1996, when he consulted on systems design for the department. McMillen had an MBA from the University of Virginia and an engineering degree from Purdue. His early experience included six years in systems design for a major retailing company.

McMillen inherited a department in the midst of major organizational transition. An aggressive corporate diversification program had led to acquisition of numerous small specialty manufacturing companies, each with special information technology needs. CIS had previously served only the Automotive Division. In 1995, Jim Butler was hired as CIS director and charged with building a corporatewide information system. Butler devised a plan for a centralized corporate data utility, and recommended the company select a single hardware vendor in order to integrate the various systems.

In 1997, senior management chose Hewlett-Packard as prime vendor and decided to run in a Windows client and centralized UNIX server environment. However, they expressed discomfort with Butler's concept of a centralized data utility. Concordia was highly decentralized. Acquired companies retained their original names and identities, and were explicitly encouraged to operate independently. Said one senior executive: "Concordia is not inclined to get into management's shoes. We bought these companies because it made financial sense, but we repeatedly tell our division presidents that they are autonomous. Our takeovers are friendly; often they come to us and ask if they can become part of the Concordia family."

Butler's centralized information systems proposal was not well received. His boss, Bradley Sherman (former CIS director and now a corporate vice president and treasurer), hired Huntington and Wells to help develop a long-range plan for information systems. The consulting team included McMillen. In early 1998, Butler left Concordia for another job, and McMillen was hired as his replacement.

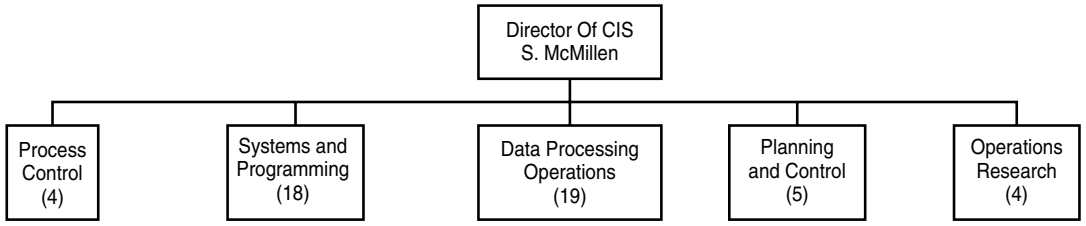
When McMillen took over CIS in 1998, the department had an operating budget of $8 million, and was organized into five functional groups: systems and programming; IT operations; process control; planning and control; and operations research. Of the 52 people in the department, 37 were in operations and systems.

McMillen recognized the need to increase and upgrade the CIS professional staff since converting existing systems to run on HPM equipment with Windows and UNIX putting a severe strain on the department. None of the CIS staff as of 1998 had been trained on Windows and UNIX; indeed, only a few had a solid grasp of the existing systems.

In 1999, McMillen requested a budget allocation of $12 million, and began an aggressive recruiting program that brought Concordia a number of systems engineers and project managers who were well versed in the new equipment, software, and design methodologies.

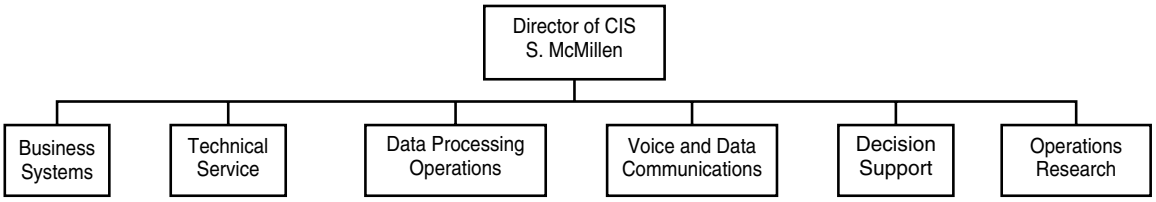
McMillen also worked on strengthening and expanding his management team. He added a business systems manager and a voice/data communications manager to his staff, and he rearranged somewhat the existing CIS groups. By the end of 1999 seven managers reported directly to him (see **Figures B1** and **B2**).

Figure B CIS Organization Structure, Early 1998



Note: Numbers in parentheses indicate number of staff in each area.

CIS Organization Established by McMillen, 1999



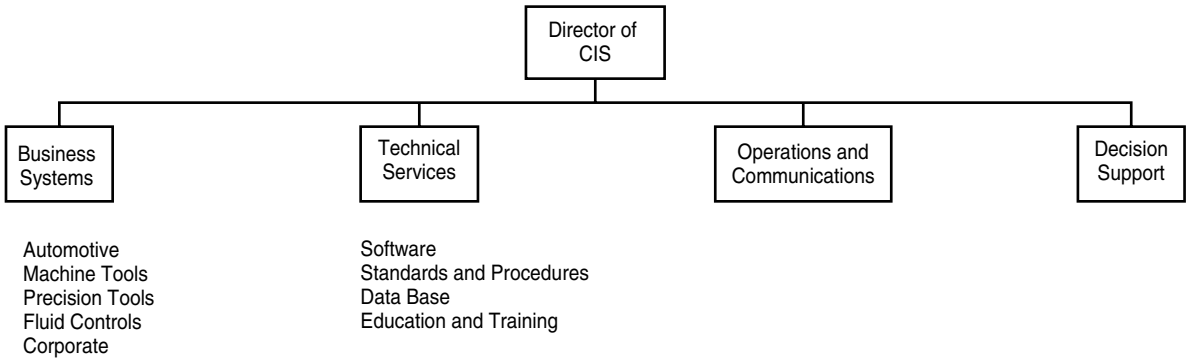
In 2000, the Huntington and Wells consultants proposed a distributed organization for CIS. Corporate data processing functions would be clearly separated from work done for the operating divisions. Several regional servers would be hooked to the central hub and help service clusters of operating divisions, while corporate staff would focus on corporate systems development, decision support, long-range planning, policy-setting, communications, corporate IT standards, database management, and business systems consulting throughout the company. With senior management approval, much of McMillen's time over the next several years was devoted to moving CIS in that direction.

By late 2002, McMillen believed he had a strong, viable Corporate Information Services group. The staff numbered just over 100, including 22 in the Eastern Regional Computer Center in Hagerstown, Maryland. The 2002 operating budget for CIS was in excess of $26 million, and the organization resembled the one the consultants had recommended in 2000 (see **Figure C1** and **C2**, page 4).

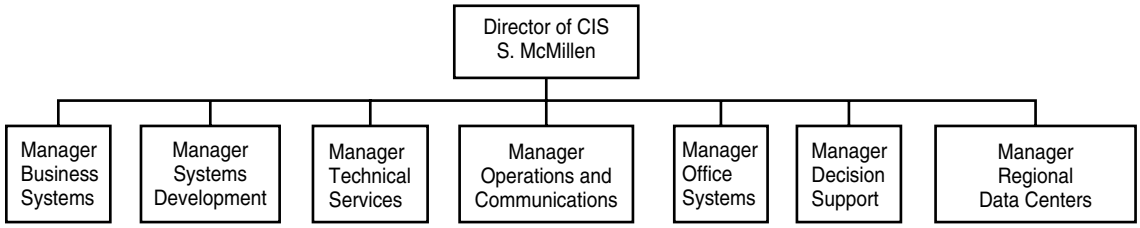
McMillen reflected on the situation he had inherited five years earlier:

> First, I discovered that prior CIS director Butler hadn't done a very good job. CIS had no basic design standards, no formal systems development methodology, and no charge-out system. Moreover, there was tremendous unsatisfied user demand—almost a five-year backlog of projects—with nowhere near the staff to handle it.
>
> To make matters worse, in 1998, the CIS staff in Fort Wayne was spread out on eight different floors in three separate buildings, in old, crowded offices. On top of that, I had a staff of about 50 people and no personnel function. No performance appraisal system, no way to measure individual development, no formal training programs.

Figure C CIS Organization Proposed by Huntington and Wells, 2000



Actual CIS Organization, Fall 2002



McMillen reviewed his major accomplishments:

- Constructing a $10.6 million wing to the headquarters building, bringing the entire CIS staff together for the first time.
- Increasing the CIS staff located in Fort Wayne (from 52 in 1998 to over 80 in 2002).
- Completing several new corporate and divisional applications: two on-line purchasing systems, a payroll-personnel system, and a headquarters local area network. Combined, these projects were as big as the CAPS efforts.
- Replacing the mainframe in the former Eastern Regional Computer Center (in Hagerstown, Maryland) with a LAN. As soon as CAPS was completed, this would become part of an expanded network, serving all divisions, which would maintain their own systems. In addition to the divisional systems, approximately 300 PC terminals would be attached to the new system.
- Developing a formal college-recruiting program to bring qualified systems designers into CIS.
- Improving the operation of the corporate IS steering committee.

Brad Sherman also felt McMillen had succeeded in several areas, especially his development of an IS plan that provided a framework for future development: "Stu is a brilliant conceptual thinker, and he's had a clear vision of where he wants CIS to go. Sometimes he's tenacious to the point of being more aggressive than people around here are used to—you know: damn the torpedoes, full speed ahead. But actually, I don't see how he could have done as much as he has without being a little pushy."

McMillen knew that these impressive accomplishments counted for little in senior management's eyes as long as CAPS was not yet completed. CAPS was the driving force in the department. It consumed the most resources, was highly visible, and had the highest potential for improving operations.

The CAPS Conversion Project

The original CAPS system was developed at Concordia in the late 1970s as a state-of-the-art, on-line system. It operated on two Centronic 275s and comprised 12 systems:

1. Order entry
2. Order maintenance
3. Production scheduling
4. Production maintenance
5. Packed production
6. Packing lists
7. Shipping assembly
8. Shipping maintenance
9. File maintenance
10. Inquiry
11. Invoicing
12. Accounts receivable

In addition, 16 batched systems produced periodic and special status reports:

1. Order file reports
2. Order analysis
3. Customer allocation
4. Delay notices
5. Stock status
6. Stock usage
7. In-process report
8. Shipment report
9. File balance
10. Account receivable
11. Physical inventory
12. Weekly inventory analysis
13. Forecasting
14. Product history
15. Marketing inventory
16. File maintenance

Concordia systems staff wrote the original software programs; the operating system was a proprietary Centronic multi-tasking operating system. Although the system worked adequately in the late 1990s, a major overhaul was clearly required. Software and hardware maintenance was difficult and time-consuming, and finding programmers willing to devote their efforts to learning

and fixing such an archaic system was becoming increasingly difficult. Moreover, since the number of operating divisions had increased due to acquisitions during the 1990s, the need for a coordinated, distributed network was becoming increasingly apparent.

To make matters worse, in late 2000, Concordia's vendor, Centronic Computers, Inc., announced that they were discontinuing Concordia's line of equipment and would no longer support it after December 31, 2003 and had no migration path within their product line. However, Centronic agreed to help its customers transfer their systems to the products of a small company whose equipment was software compatible to Centronics. The long-term viability of this company was in question by many in the industry, and thus this conversion seemed unwise. A speedy conversion to the new HP system was called for.

Converting all of Concordia's systems from a central Centronic computer to a distributed HP using Windows clients, UNIX and Ethernet, was a massive effort. Concordia originally estimated the conversions would require 15 programmer-years. By 1999, it was evident that the initial estimate was wholly inadequate. At that time, Huntington and Wells reviewed the conversion effort, and concluded that it would take a minimum of 27 programmer-years.

By 2002, it was clear that the conversions would actually consume well over 75 programmer-years (of which half would be dedicated to the CAPS system). A Huntington and Wells consultant commented: "The CAPS conversion project was consistently underestimated since Day 1. Although the functions of the system have not changed dramatically, the software and hardware requirements turned out to be significantly greater than we realized. On the other hand, if we had predicted accurately what it would take, no one would have believed us."

McMillen believed several factors had contributed to the poor estimates. First, no one fully appreciated the difficulties of building a complex, interdependent network system virtually from scratch. There were 420 on-line programs (over 750,000 lines of code) and 126 batch programs to be converted, plus over 350 user procedures to be written. Second, many enhancements had been added to the original design. McMillen estimated that the new system had 40% more functions than the old one. Third, the old system itself had evolved during the past four years. Hence, the conversion design was modified several times while the new system was being developed.

Meanwhile, McMillen was under pressure from Ronald Lawton, controller of the Automotive Division, to ensure uninterrupted service. Recently Lawton stopped McMillen in the hallway to remind him of the importance of the CAPS project.

> For a whole variety of reasons, we improved our competitive position dramatically in the late 1990s. Our volume had been fairly stable for several years, but by mid-2000, we had obtained several long-term contracts that meant an upswing of almost 30 percent a year. Needless to say, when we landed those contracts, our shipping requirements increased substantially. We went to a seven-days-a-week schedule, and even had to allocate shipments to some of our customers. We found that by making some major changes in the production schedule, by concentrating our product manufacturing in certain plants, and by working on other productivity improvements, we could substantially increase our shipments without any increases in plant capacity. In fact, in the first half of 2002, we took a strike in the plant and still shipped more than we did in the same period in 2001.
>
> The problem was that just as we were stepping up our business substantially, the CIS people were slacking off their attention to the old Centronic systems. They just were not giving us the service we needed. We were bringing clerks in at 7 a.m. to enter orders through CAPS.

> At one point we had a 40-day backlog of orders, and yet CIS just did not seem to be pushing to get anything done.
>
> What really scared me is how dependent we are on CAPS. If the system goes down for more than a day, we have to start thinking about closing the plant. We simply can't run without it.

Stu McMillen understood Lawton's concern, but he did not believe Lawton recognized how substantially the old system had been modified. Supporting changes in the old system had a double impact on CIS: modifications consumed CIS resources directly and necessitated substantial revisions in already completed portions of the new system.

Staffing Problems

"Our technical problems, horrendous as they were, were nothing compared with our personnel problems," said McMillen. Attracting new employees had been very difficult. When they arrived, management had a new set of problems. The new staff understood the new equipment, software and procedures, but they were not familiar with the old CAPS system, with Concordia's businesses, or with the "Concordia approach" to solving problems. Many of the experienced CIS staff resented the newcomers and were reluctant to share their knowledge. In the words of one long-time CIS manager:

> We do need Windows and UNIX trained people, but we don't have enough Concordia people. We cannot completely describe the system on paper; a programmer needs to know all the file structures, the program linkages, and so on. I offered to introduce the new staff people to the operating people, but they were always too busy. I guess they saw themselves as professional managers and thought that was enough. Around here, it is not. Most of the managers in the plant have been here a long time. I started there and fought my way up, but a lot of these college kids want to be managers overnight.

Managers outside CIS were also concerned about the rapid influx of new technical specialists. Lawton commented:

> These newcomers have really affected the morale of the old-timers, who see new people placed above them in the organization. What's worse, the old-timers worry about losing their jobs when the conversion is complete. What role does a Centronic programmer play when we're 100% networked, using Windows and UNIX?
>
> The newcomers have been pretty insensitive. It's getting better, but not too long ago it was: "Hi, I'm from CIS. Here's the system you're going to use." Our people won't forget being treated like that.

Sherman told a similar story, stressing how radically different the newcomers were:

> In one instance, four people from CIS were visiting a division. Each one rented a separate car, and they acted like "big-shot" representatives of corporate headquarters, making pronouncements about company policies. They don't understand our low-key, people-sensitive organization. We get things done by patient, gentle persuasion. Yet CIS has to impose change on divisions who view themselves as highly autonomous.

Over the past five years McMillen had hired close to 90 people in the Fort Wayne operations, just to achieve a growth in staffing from 50 to 80. McMillen attributed the turnover problem to two primary factors: salary levels and location. A telecommunications analyst making $52,000 a year had

recently left for $74,000 at another company. Qualified technical people had many other options. Salary pressures were also creating internal equity problems. New hires were making almost as much as top managers both in CIS and in other departments.

McMillen believed that Concordia's location in Fort Wayne had hampered his efforts to attract and retain quality IS personnel. He recalled one prime candidate from Philadelphia who drove through town from the airport to Concordia's headquarters, took a quick tour of the facilities and announced he wanted to leave on the next plane. The economic downturn had helped this issue.

As a short-term strategy, McMillen had made extensive use of outside contract programming personnel, budgeting over $4 million in 2002 for the purpose. But contract programmers were not very efficient. They usually traveled to Fort Wayne on Monday mornings and left on Friday afternoons. Although they put in evening hours to make up for travel time, their work pattern irritated many of the internal programmers.

Recent History of the CAPS Project

The CAPS team had had four project managers in three years; one had been fired, and two had resigned. Frank Northrup, the most recent resignee, left Concordia in April 2002. Northrup had predicted the system would be up and running before the end of 2002; the consultants agreed. McMillen wondered whether Northrup had been uneasy about CAPS and left before major problems surfaced.

As McMillen understood it, the testing problems related primarily to the integration of CAPS's separate modules. Since the project team had already tested the individual programs, it assumed the system testing would proceed smoothly. During the summer of 2002, many unexpected modifications had to be made by a short-handed project team. In addition, a test generator package had not worked as expected. The systems tests were taking much longer than expected. In addition, the problem was compounded by a personality clash between two key analysts (a newcomer and an old-timer).

The CAPS plan called for running the new HP system in parallel with the old Centronic system for a day, and assessing the results before a final cutover. In late August, it became apparent that the system was not ready to run in parallel. Lawton (controller for the Automotive Division) recalled his frustration at learning of the delay:

> The stuff hit the fan at a review meeting on September 6. The project leader told me the system wouldn't be ready until late in the fourth quarter. I got pretty excited, but he told me they announced the delay several weeks earlier. That was news to me! He told me to go back and read my mail.
>
> Well, I finally found the one sentence on page 3 of the monthly Executive Summary. Why hadn't they communicated it to me personally? Our manager of Production and manager of Scheduling had not known about it before September 6 either.
>
> When word got to our division vice president, he started asking what was going on, and got Brad Sherman to look into it pretty closely.

McMillen had initiated an intensive review of the CAPS project well before Lawton learned of the problems.

> I called the whole CAPS team into the office on Sunday, August 19. We met from 9 a.m. to 4 p.m., and then I knew it could not be done until April or May 2003 at the earliest. I ordered an exhaustive review of CAPS and the other conversion projects, using new assumptions about machine downtime, program modification, programmer availability, and so on. By mid-September I realized the CAPS conversion couldn't be completed before September 2003.
>
> We purposely kept this information from users until we could give them a reasonable new estimate that we knew we could live with.

McMillen asked Len Creighton, his strongest technical manger, to take over the CAPS projects. Creighton, who had over 10 years at Concordia, had developed the company's operations research effort, and most recently had been in charge of the CIS business systems analysis group. When Creighton stepped into the CAPS project, he found:

> Chaos. The team was too small, the planning was almost nonexistent. The few Gantt charts they had were not detailed enough. The guy who had been managing the project wasn't strong enough. He's good technically, but his planning and control skills are weak. In addition, no one had adequately addressed how to handle the upcoming 'drop dead' date on the old Centronic equipment. We needed a contingency plan, especially since it wasn't just a contingency. It was a certainty.

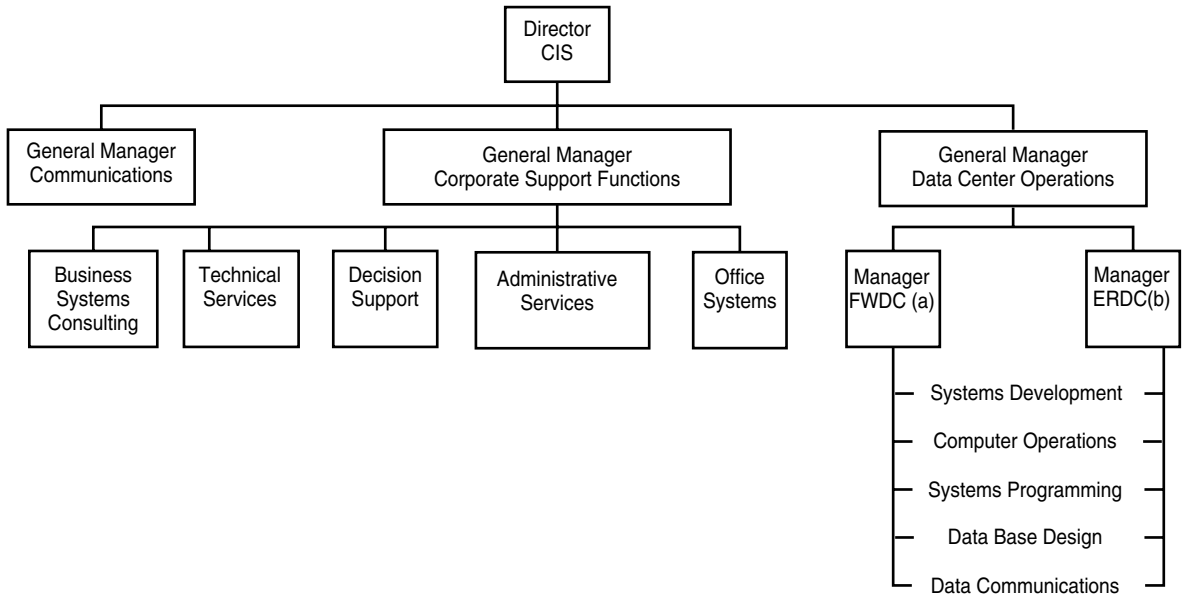
McMillen had shuffled other assignments and added 10 new people to the project, bringing its staff up to 18. Creighton made certain that the team included a project administrator with extensive project planning and control experience and someone to handle the contingency plan. As Creighton put it:

> The project administrator is monitoring progress on a daily basis, and training others to do so. He's put up a huge magnetic board in his office, and now everyone can track their commitments, their progress, and their problems. That alone is helping the team watch interim deadlines, and rearrange activities and schedules on their own.
>
> The testing is already uncovering a can of worms, so there is a lot of need to constantly rearrange people and activities. But we are staying with the basic plan.

Organizational Implications

Although McMillen was confident Creighton would bring CAPS under control, he was concerned about the deeper organizational problems that the CAPS difficulties had revealed. In a memorandum written several months earlier (see **Exhibit 1** and **Figure D**), Huntington and Wells had recommended a narrower structure for CIS. It proposed an additional level of management, with only three people reporting directly to McMillen.

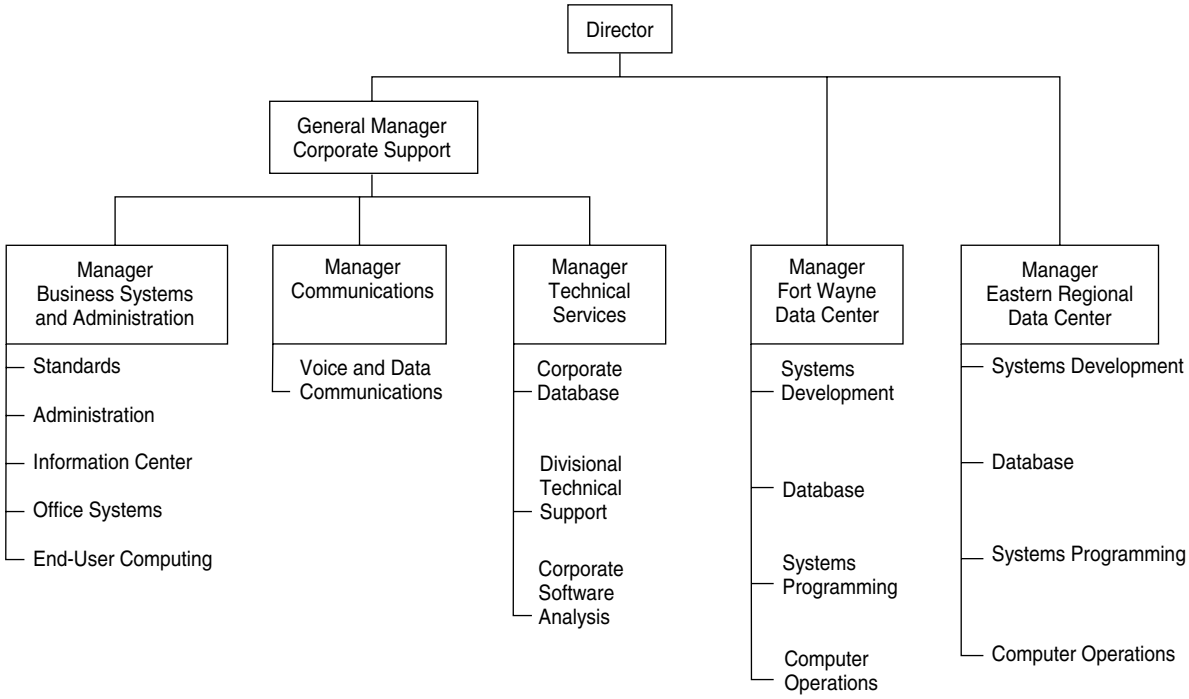
Figure D Consultants' Proposed CIS Organization



[a] Fort Wayne Data Center
[b] Eastern Regional Data Center

McMillen and the consultants subsequently developed a slightly different organizational plan (see **Figure E**). Like the consultant's original proposal, McMillen's current plan proposed a sharper separation between CIS's two primary functions. The data centers in Hagerstown and Fort Wayne were to meet the ongoing data processing and systems development needs of individual operating divisions and would support a more decentralized system with minicomputers in several locations. In contrast, the corporate support function would provide corporatewide systems planning and coordination, and serve corporate headquarters' own data processing needs. McMillen believed the planned organization would help resolve many of the user-relationship problems that had plagued CIS.

Figure E Proposed Organization of CIS, October 1991



McMillen wondered how quickly he could implement the new structure. The situation in Fort Wayne was tenuous, due to an inadequate management team. The conversion projects were soaking up so many people that many other projects were being tabled or delayed: there was no one to work on fundamental problems like recruiting, training, performance evaluation, career planning, project planning and control systems, and user relations. And there was a tremendous backlog of user demand for new applications, including new supply chain systems based on the Internet [replacing Electronic Data Interchange (EDI) systems] and Extensible Markup Language (XML) technologies. McMillen spoke: "The Automotive Division alone has requested 18 major new applications. Our other divisions have literally dozens of programmer-years of work that we need done. Most of the division 2003 plans assume that they will get new systems next year. They can't meet their business plans without those new systems."

As McMillen pondered these operating problems and organizational alternatives, he wondered what goals and priorities he should set for 2003. He also wondered how he should allocate his time and what steps he should take to implement his goals.

Exhibit 1 Excerpts from Consultant's Recommendations for Reorganization of the CIS Department, June 2002

A three-tiered structure (see **Figure D**) has been proposed to replace the existing two-tiered structure based on the following:

1. The director has too many people reporting to him, which limits severely the time he can spend with corporate and divisional management.
2. An increase in the size and scope of the department necessitates an increase in the number of management personnel.
3. Conversion of Centronics to HP computers has revealed problems in the existing organization, which the revised organization should address.

The new organization calls for a greater division between "line" and "staff" activities, in order to concentrate on longer-term issues affecting the company. This division will require a strong coordination effort between the two groups which should be accomplished by the general managers of corporate support and computer center operations; an effective quality assurance function; and establishment of a career path which requires employees to work in both major areas.

Below are brief descriptions of the revised positions:

4. **Director:** The principal role of the Director will not change, but he will have more time to act as a liaison between corporate and divisional senior management.
5. **General Manager-Communications:** This new position would separate communications from computer operations. Presently, 90% to 95% of communications work is associated with voice transmission, although data communications requirements will increase significantly in the next few years.
6. **General Manager-Corporate Support:** Coordinate all "indirect" data processing support management functions:
    a. Coordinate activities within the "corporate group" for consistency.
    b. Ensure coordination between the two major groups by continued contact with the general manager.
    c. Screen information now going to the director and assume some of the decision-making.
    d. Respond to divisional planning needs.
7. **General Manager-Data Center Operations:** Initial responsibility for two computer centers (each with their respective manager). Responsibility may increase through the addition of computer centers or separation from the existing regional computer centers or the divisional support activities. Prime functions are:
    a. Control and coordinate activities of the regional computer centers.
    b. Ensure review by line personnel of proposed policies/procedures developed by corporate group, and ensure adherence to them once they are adopted.
    c. Report to the director on all aspects of computer center operations and systems development.
8. **Manager-Business Systems and Decision Support:** Little change in functions from those currently performed.
9. **Manager-Technical Services:** Combine the current decision-making functions of the existing Techincal Services Department with equipment requirements determination and selections.
10. **Manager-Standards and Quality Assurance:** Combine the existing standard function with a new quality assurance function. Need for the latter will be heightened by the proposed division between line and staff positions.
11. **Manager-Administrative Services:** Responsibility for user billings and associated follow-up, and possible training and other administrative functions.
12. **Manager-Regional Data Center:** Follow closely the role performed now by the Eastern Regional IT Center Manager, but with total unit responsibility for systems development (as indicated on **Figure D**).