92年度碩士在職專班入學資訊管理個案分析試題

April 12th, 2003

Instructions: You MUST answer all the questions in both Part I (50%) and Part II (50%).

Part I: Please refer to the ERP implementation case of *Hershey's Enterprise System Creates Halloween Tricks* to answer the following questions.

Note:

1. You may answer the questions in either English or Chinese.

2. Please mark your answer with appropriate reference. For example, enterprise systems are adopted to solve the Y2K problem [P.363, PR.2, L.4-7], which means the relevant information can be found in page 363, paragraph 2, and lines 4 through 7. Please use this reference format as much as possible. Y

Questions:

(1) What e-business solutions were implemented at Hershey?

(2) What are the (i) technical and (ii) business reasons for Hershey to adopt these e-business solutions?　Was an ERP system and related software a good solution to Hershey's problems? Briefly explain your answer.

(3) Please identify the problems or errors in each phase of the implementation process.　What management, technology, and organization factors caused these problems?　Please explain. [Hint: distinguish your problems and causes carefully.]

(4) Who should be responsible for this fiasco, and why?　Kenneth L. Wolfe (CEO) and/or Rick Bentz (CIO) or vendors?

CASE STUDY　*Hershey's Enterprise System Creates Halloween Tricks*

Hershey Foods Corp. of Hershey, Pennsylvania, was founded in 1894 and recorded $4.4 billion in sales in 1998, including its chocolate candies and other brands such as Reese's Peanut Butter Cups, Milk Duds, and Good and Plenty. Altogether the company sells approximately 3,300 candy products including variations in sizes and shapes. Candy is a very seasonal product, with Halloween and Christmas accounting for about 40 percent of annual candy sales, making the fourth quarter crucial to Hershey's profitability. Hershey's largest continuous challenge may be its ability to rack up its multibillion dollars in sales 50 cents or one dollar at a time, requiring huge numbers of its products to be sold. Such quantities means Hershey must have very reliable logistics systems.

Traditionally, the food and beverage industry has had a very low ratio of information technology (IT) spending to total revenue, ranging between 1.1 and 1.5 percent and a very low profit margin. As the year 2000 approached, many companies chose to solve their year 2000 (Y2K) problems by replacing their legacy systems rather than spending a lot of money to retain them by fixing the Y2K problems within them.

According to Hershey vice president of information systems, Rick Bentz, Hershey began to modernize its software and hardware in early 1996. The project, dubbed Enterprise 21, was scheduled to take four years (until early 2000). Enterprise 21 had several goals, including upgrading and standardizing the company's hardware and moving from a mainframe-based network to a client/server environment. The company replaced 5,000 desktop computers and also moved to TCP/IP networking based on newly installed network hardware. Bentz noted that benchmark studies by the Grocery Manufacturers of America showed that Hershey needed to be able to use and share its data much more efficiently. More and more retailers were demanding that suppliers such as Hershey fine-tune their deliveries so that they could lower their inventory costs.

Hershey's information systems management set as a goal a move to an ERP system using software from SAP AG of Walldorf, Germany. SAP was to be complemented with software from Manugistics Group Inc. of Rockville, Maryland. Manugistics would support production forecasting and scheduling, as well as transportation management. In addition the company decided to install software from Siebel Systems Inc. of San Mateo, California. Siebel's software would aid Hershey in managing customer relations and in tracking the effectiveness of its marketing activities. Management believed that the project would help Hershey better execute its business strategy of emphasizing its core mass-market candy business.

A necessary piece of Enterprise 21 was the installation of bar coding systems at all six U.S. production plants in 1999. Bar coding was necessary so the company could track all incoming and outgoing materials to improve logistics management while controlling production costs. Enterprise 21 required Hershey to switch to the new SAP system and its associated software in April of 1999, an annual period of low sales. This new target meant the company had 39 months to complete the project instead of the original 48 months. Although some SAP modules were actually put into production in January, the project ran behind the aggressive schedule, and the full system did not come on-line until mid-July. Included in the delayed conversion were SAP's critical order processing and billing systems, along with the Siebel and Manugistics systems. The timing meant that Hershey would be facing a major problem because Halloween orders were already arriving by mid-July. The information systems staff chose to convert all these new systems using the direct cutover strategy in which the whole system goes live all at once to enable Hershey to fill its Halloween orders on schedule. By the time of the conversion the whole project had cost Hershey $112 million.

Problems arose for Hershey when the cutover strategy did not work, because serious problems emerged immediately. As a result many Hershey customers found their shelves empty as Halloween approached. Bruce Steinke, the candy buyer for Great North Foods, a regional distributor in Alpena, Michigan, had placed an order for 20,000 pounds of Hershey's candy and found his warehouse short just prior to Halloween. As a result 100 of Great North's 700 customers had no Hershey candy when Halloween arrived. The shortage meant not only a drop in Hershey's sales but Great North (and other Hershey distributors) also lost credibility as its retail customers.

The shortages also meant the loss of precious, highly contested shelf space. Randall King, the candy buyer for the Winston–Salem, North Carolina-based Lowes Foods chain, had to deal with the shortage problem. He told his 81 supermarkets to fill their empty Hershey candies shelves with other candies, and he even suggested that they turn to Mars brand candies. Retailers predicted that Hershey's lost shelf space would be hard to win back. So Hershey's long-range sales were also being placed at risk by the logistics failures.

Hershey itself did not publicly acknowledge the problem until mid-September when it announced that something was wrong with its new computer systems. It did indicate that Hershey employees were having trouble entering new orders

into the system. In addition, once the system was up, the company stated that order details were not being properly transmitted to the warehouses where they could be filled. Hershey did announce that it expected the problem to be solved in time for Christmas shipments. However, industry analysts, such as William Leach of Donaldson, Lufkin & Jenrette, were quick to note that should the company fail to make that deadline, the problems would likely seriously cut into not only Christmas sales but also Valentine's Day and perhaps Easter shipments, two other crucial candy sales holidays.

As soon as the admission of problems was announced, questions immediately arose as to the causes of those problems. Kevin McKay, the CEO of SAP in the United States, denied any problems with SAP's systems, saying, "If it was a system issue, I'd point directly to a system issue." He also made it clear that SAP was operating smoothly for Hershey's much smaller Canadian unit. Tom Crawford, the general manager of SAP America's consumer products business unit, verified that his consultants were at Hershey sites to help resolve the problems. But, he made it clear, "There are really no software issues per se." Crawford explained that his consultants "are just making sure they [Hershey employees] are using the business processes [built into the software] correctly." Manugistics also said it was working with Hershey on "business process improvements." Brian Doyle, an IBM spokesperson, pointed to "the business process transformation under way at Hershey" as a possible cause, which, he said, "is an enormously complex undertaking." He noted major changes in the way Hershey employees were doing their job, which implied the need for more and different training than Hershey's staff had originally received.

It was obvious that the problem was not in candy production. At the time of the cutover Hershey had an eight-day supply of products in its warehouses, a higher-than-usual supply in anticipation of possible minor problems with the new systems. However, within three weeks of turning on the new systems, shipments were more than two weeks late. Hershey began telling its customers to allow 12 days for delivery (the usual turnaround time was 6 days). Even that schedule proved to be too aggressive, because Hershey could not deliver goods so quickly. Company spokespersons told financial analysts in late October that computer system problems had already reduced sales by $100 million in the third quarter.

When word of these problems became public, Hershey's stock price went into a sharp slide. By late October, its price had fallen to $47.50, down 35 percent from $74 one year earlier. During the same period the Dow Jones Industrial Average had risen by 25 percent. Third-quarter earnings dropped from $.74 to $.62. Hershey Chairman and CEO Kenneth L. Wolfe admitted that "third-quarter sales and earnings declined primarily as a result of problems encountered since the July start-up of new business processes in the areas of customer service, warehousing and order fulfillment." He added, "These problems resulted in lost sales and significantly increased freight and warehousing costs." Hershey Senior Vice President Michael Pasquale pointed out that, "Clearly, our customer relations have been strained." Although Wolfe admitted the problems were taking longer to fix than expected, he did state his expectation that fourth-quarter

sales and earnings would bounce back. In late October key individuals within Hershey held a two-day meeting to review the new system and produce a list of changes needed. Wolfe demanded that the changes involved "need to be tested before we put them in.", possibly implying a lack of adequate testing prior to the original cutover.

In early February 2000 Hershey reported an 11 percent decline in sales and profits for its fourth quarter 1999. Wolfe again pointed to order processing, which, this time around, had caused many retailers to not even place orders. He said that although system changes and increased personnel experience with the new software had reduced the problems, Hershey's has "not yet fully returned to historical customer service levels."

Although Hershey has released very little information on the troubled implementation, observers continue to speculate on the key question: What went wrong? Some point to the pushing forward of the target date—trying to accomplish too much in the allotted time frame. Others believe that inadequate time and attention were allocated to testing prior to Hershey's new systems going live in July. Still other analysts point to the use of the direct cutover method. "These systems tie together in very intricate ways," stated AMR Research Inc. analyst Jim Shepherd, "and things that work fine in testing can turn out to be a disaster (when you go live)." Finally, some analysts point their finger at training. A. Blanton Godfrey, CEO of the Juran Institute, a consulting firm based in Wilton, Connecticut, says that only 10 to 15 percent of ERP implementations go smoothly. He claims that the difference for them is better training. Some observers believe that lack of education on the whys of the system and how the many pieces of the full system fit together are possibly the reason order entry difficulties created warehouse problems.

Sources: Jennifer DiSabatino, "Hershey Hires Outsider to Fill New CEO Job," Computerworld, December 15, 2000; Charles Waltner, "New Recipe for IT Implementation," Information Week, September 27, 2000; Craig Stedman, "IT Woes Contribute to Hershey, Profits Decline," Computerworld, February 2, 2000 and "Failed ERP Gamble Haunts Hershey," Computerworld, November 1, 1999; Polly Schneider, "Another Trip to Hell," CIO Magazine, February 15, 2000; Malcolm Wheatley, "ERP Training Stinks," CIO Magazine, June 1, 2000; Emily Nelson and Evan Ramstad, "Hershey's Biggest Dud Has Turned Out to Be Its New Technology," The Wall Street Journal, October 29, 1999; Hershey Foods Corporate Investor Relations, "Hershey Foods Announces Third Quarter Results," www.corporate-ir.net/, October 25, 1999; and Stacy Collett, "Hershey Earnings Drop as New Warehouse, Order Systems Falter," Computerworld, October 27, 1999.

Part II: Answer all the three questions at the end of the Ginormous Life Insurance Company Case according to the following case description.

Ginormous Life Insurance Company

Ginormous Life is an insurance company with a long tradition. The company has four divisions that each operate their own computers. The IS group provides analysis, design, and programming services to all of the divisions. The divisions are actuarial, marketing, operations, and investment. All divisions are located at the corporate headquarters building. Marketing also has field offices in 20 cities across the country.

O The Actuarial Division is responsible for the design and pricing of new kinds of policies. They use purchased industry data and weekly summaries of data obtained from the Operations Division. They have their own DEC VAX minicomputer, running the UNIX operating system, to store data files. They do most of their analysis on PCs and Sun workstations, either on spreadsheets or with a specialized interactive language called APL.

O The Marketing Division is responsible for selling policies to new customers and for follow-up of existing customers in case they need changes to their current insurance. All sales orders are sent to the Operations Division for data entry and billing. They use purchased external data for market research and weekly copies of data from operations for follow-ups. They have their own IBM AS/400 minicomputer with dumb terminals for clerks to enter sales data. There are also many PCs used to analyze market data using statistical packages like SAS.

O The Operations Division is responsible for processing all mission-critical financial transactions including payroll. They record all new policies, send regular bills to customers, evaluate and pay all claims, and cancel lapsed policies. They have all their data and programs on two IBM ES/9000 mainframes running under the OS/390 operating system. The programs are often large and complex because they must service not only the 15 products currently being sold but also the 75 old kinds of policies that are no longer being sold but still have existing policy holders. Clerks use dumb terminals to enter and update

data. Applications written in the last five years have used an SQL relational database to store data, but most programs are still written in COBOL. The average age of the transaction processing programs is about ten years.

O The Investment Division is responsible for investing premiums until they are needed to pay claims. Their data consist primarily of internal portfolio data and research data obtained by direct links to data services. They have a DEC minicomputer to store their data. The internal data are received by a weekly download of cash flows from the Operations Division. External data are obtained as needed. They use PCs to analyze data obtained either from the mini or from commercial data services.

A controlling interest in Ginormous Life has recently been purchased by Financial Behemoth Corp. The management of Financial Behemoth has decided that the firm's efficiency and profitability must be improved. Their first move has been to put Dan D. Mann, a hotshot information systems specialist from Financial Behemoth, in charge of the Information Systems Division. He has been given the objective of modernizing and streamlining the computer facilities without any increase in budget.

In the first week on the job, Dan discovered that only seven junior members of the staff of 200 information systems specialists know anything about CASE tools, End-User Computing, or LANs. They have no experience in implementing PC systems. There is no evidence of any formal decision-support systems or executive information systems in the organization. New applications in the last five years have been implemented in COBOL on DB2, a relational database product purchased from IBM. Over two-thirds of applications are still based on COBOL flat files. One of the benefits of using DB2 is that it is now possible to deliver reports quickly based on ad hoc queries. This is creating a snowballing demand for conversion of more systems to a relational database so that other managers can get similar service.

There have been some problems with the older systems. Maintenance is difficult and costly because almost every change to the data structure of applications in opera-

tions requires corresponding changes to applications in the other divisions. There has been a growing demand in other divisions for faster access to operations data. For instance the Investment Division claims that they could make more profitable investments if they had continuous access to the cash position in operations. Marketing complains that they get calls from clients about claims and cannot answer them because they do not have current access to the status of the claim. Management wants current access to a wide variety of data in summary form so they can get a better understanding of the business. The IS group says that it would be difficult to provide access to data in operations because of security considerations. It is difficult to ensure that users do not make unauthorized changes to the COBOL files.

The IS group complains that they cannot deliver all the applications that users want because they are short-staffed. They spend 90 percent of their time maintaining the existing systems. The programmers are mostly old and experienced and employee turnover is unusually low, so there is not likely to be much room for improvement by further training in programming. Employees often remark that the company is a very pleasant and benevolent place to work. At least they did until rumors of deregulation and foreign competition started to sweep the industry.

Dan foresees that there will be an increasing need for computer capacity as more and more applications are converted to on-line transaction processing and more users begin to make ad hoc queries. Dan is also wondering if intranets or the Internet should become part of any new software.

Dan began to look for ways to solve the many problems of the Information Systems Division. He solicited proposals from various vendors and consultants in the computer industry. After a preliminary review of the proposals, Dan was left with three broad options suggested by IBM, Oracle Corp., and Datamotion, a local consulting firm. The proposals are briefly described below.

IBM proposes an integrated solution using IBM hardware and software. The main elements of the proposal are:

O Data and applications will remain on a mainframe. The IBM ES/9000 se-

ries of hardware running their OS/390 operating system will provide mainframe services. Mainframe hardware capacity will have to be approximately doubled by adding two more ES/9000 series machines. The four machines will run under OS/390 with Parallel Sysplex clustering technology that allows for future growth. The Parallel Sysplex system can be scaled by connecting up to 32 servers to work in parallel and be treated as a single system for scheduling and system management. The OS/390 operating system can also run UNIX applications.

- ○ AS/400 minicomputers running under the OS/400 operating system will replace DEC minicomputers.
- ○ RS/6000 workstations running AIX— a flavor of the UNIX operating system—can be used for actuarial computations. All hardware will be interconnected with IBM's proprietary SNA network architecture. PCs will run under the OS/2 operating system and the IBM LAN Server to support both Microsoft Windows applications and locally designed applications that communicate with mainframe databases.
- ○ A DB2 relational database will store all data on-line. Users will be able to access any data they need through their terminals or through PCs that communicate with the mainframe.
- ○ Legacy systems will be converted using reengineering tools, like Design Recovery and Maintenance Workbench from Intersolv, Inc. These will have the advantage that they will continue to use the COBOL code that the existing programmers are familiar with. New work will be done using CASE tools with code generators that produce COBOL code.
- ○ Proven technology. The IBM systems are widely used by many customers and vendors. Many mission-critical application programs are available on the market that address a wide variety of business needs.

Oracle Corp. proposed that all systems be converted to use their Oracle database product and its associated screen and report generators. They said that such a conversion would have the following advantages:

- ○ Over 90 hardware platforms are supported. This means that the company is no longer bound to stay with a single hardware vendor. Oracle databases

and application programs can be easily moved from one manufacturer's machine to another manufacturer's machine by a relatively simple export and import operation as long as applications are created with Oracle tools. Thus the most economical hardware platform can be used for the application. Oracle will also access data stored in an IBM DB2 database.
- ○ Integrated CASE tools and application generators. Oracle has its own design and development tools called Designer/2000 and Developer/2000. Applications designed with Designer/2000 can be automatically created for a wide variety of terminals or for the World Wide Web. The same design can be implemented in Windows, on a Macintosh, or on X-Windows in UNIX. Applications are created using graphic tools that eliminate the need for a language like COBOL. The designer works entirely with visual prototyping specifications.
- ○ Vertically integrated applications. Oracle sells a number of common applications, like accounting programs, that can be used as building blocks in developing a complete system. These applications could eliminate the need to redevelop some applications.
- ○ Distributed network support. A wide variety of common network protocols like SNA, DecNet, Novell, and TCP/IP are supported. Different parts of the database can be distributed to different machines on the network and accessed or updated by any application. All data are stored on-line for instant access. The data can be stored on one machine and the applications can be run on a different machine, including a PC or workstation, to provide a client/server environment. The ability to distribute a database allows a large database on an expensive mainframe to be distributed to a number of cheaper minicomputers.

Datamotion proposed a data warehouse approach using software tools from Information Builders Inc. Existing applications would be linked using EDA, a middleware data warehouse server that acts as a bridge between the existing data files and the users performing enquiries. New applications would be developed using an application tool called Cactus. The advantages of this approach are:

- ○ Data Location Transparency. EDA Hub Server provides a single connection point from which applications can

access multiple data sources anywhere in the enterprise. In addition, users can join data between any supported EDA databases—locally, cross-server, or cross-platform. Users can easily access remote data sources for enhanced decision-making capabilities.
- ○ The EDA server can reach most nonrelational databases and file systems through its SQL translation engine. EDA also supports 3GL, 4GL, static SQL, CICS, IMS/TM, and proprietary database stored procedure processing.
- ○ Extensive network and operating system support. EDA supports 14 major network protocols and provides protocol translation between dissimilar networks. EDA also runs on 35 different processing platforms. EDA servers support optimized SQL against any RDBMS. And the EDA server can automatically generate the dialect of SQL optimal for the targeted data source. It is available on Windows 3.x, Windows 95/98, Windows NT, OS/2, MVS, UNIX, CICS, VM, OpenVMS, Tandem, and AS/400.
- ○ Comprehensive Internet Support. With EDA's Internet services, users can issue requests from a standard Web browser to any EDA-supported data source and receive answer sets formatted as HTML pages.
- ○ Cactus promotes modern development methods. Cactus allows the developer to partition an application, keeping presentation logic, business logic, and data access logic separate. This partitioning of functionality can occur across a large number of enterprise platforms to allow greater flexibility in achieving scalability, performance, and maintenance. Cactus provides all the tools needed to deal with every aspect of developing, testing, packaging, and deploying client/server traditional applications or Web-based applications.

Dan is not sure which approach to take for the future of Ginormous Life. Whichever route he follows, the technology will have an enormous impact on the kinds of applications his staff will be able to produce in the future and the way in which they will produce them. While industry trends toward downsizing and distribution of systems may eventually prove to be more efficient, Dan's staff does not have much experience with the new technologies that would be required. He is uncertain about whether there will be a sufficient payoff to justify the organizational

turmoil that will result from a major change in direction. Ideally he would like to move quickly to a modern client/sever system with minimal disturbance to existing staff and development methods, but he fears that both of these are not simultaneously possible.

Questions:

1. Write an English abstract for this case within 200 words. (15%)
2. What seems to be the reasons for the IS group not to deliver all the IS applications that users want? (15%)
3. What factors or issues should be considered in selecting a technology platform for the Ginormous Life Insurance Company? What will you suggest to the Ginormous Life Insurance Company about the proposal under consideration? (20%)