Information Technology

Information Technology
For Management
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1st Lecture

Information Technology
In The Digital Economy

BRISTOL-MYERS SQUIBB TRANSFORMED IT SELF TO THE DIGITAL ECONOMY

- **THE PROBLEM**

  Bristol-Myers Squibb (BMS) is a world leader in the manufacture of pharmaceutical drugs as well as beauty and infant-food products. Its thousands of products are sold all over the globe. It sells to individuals and to businesses such as pharmacies, hospitals, large retailers, and more. It has many thousands of business partners, including suppliers from which its 30,000 purchasing agents world-wide buy raw materials and supplies. BMS operates in an extremely competitive environment. It has hundreds of direct competitors. With so many competitors, small and large, it is very difficult to keep all the business partners and customers happy, and to make money, and at the same time to move into the digital economy. However, this is exactly what BMS did.

BRISTOL-MYERS SQUIBB TRANSFORMED IT SELF TO THE DIGITAL ECONOMY

- **THE SOLUTION**

  Bristol-Myers was collaborating with research institutions and universities through the Internet's precursor, the ARPNet. So it was natural for the company to embrace the Internet when it was commercialized. BMS is involved in many Web-based initiatives, all designed to transform the company into one that can maintain a competitive position in the digital economy. To do so, BMS is not only using Web-based systems but also overhauling its management structure, re-vamping its procurement and supply chain processes, and expanding its myriad Web sites. The goal is to reduce the company's reliance on costly and error-prone paper processing, banish expensive electronic data interchange (EDI) services by moving to the Internet, and forge tighter relationships with the wholesalers and retailers. The following are the company's major Internet-based activities.

- An Internet infrastructure for data communication replaces the current, ex-pensive electronic data interchange (EDI) that used private networks.
- The company has established for both health-care professionals and patients an Internet-based health education database regarding diseases and available drugs.
- An e-procurement system makes possible purchases of equipment, PCs, and office supplies online. With this system, 30,000 purchasing agents now use standard procedures, and inexperienced employees can be guided through the now-standardized acquisition process. The system enables BMS to track end-user spending in the company, and in turn, lets IT managers channel users to preferred suppliers.
- BMS's human resources *portal* is a gateway to the organization's Web-site content. It makes human resources information easily available. Employees can view personnel information, administrative rules, and performance appraisals, and can enter changes in address, telephone number, and other such data.
- BMS business customers can buy goods and track orders online. Also, extensive customer service is provided online.

- BMS can use different sites to advertise its different products. For example, XtremeFX is a hair-color aimed at young adults. Using a new technology, BMS set up a vivid Web site, with great publicity, to advertise this product. Visitors were encouraged to submit their own MP3 music files for possible inclusion as the background piece to the opening sequence at the XtremeFX Web site.
- Bristol-Myers Squibb's *supply chain* — all the activities related to the flow of materials from suppliers through manufacturing, distribution, and sales — is being automated. This enables BMS to reduce paper flow and better track the flow of information.
- The e-commerce system is integrated with an enterprise resource planning system that integrates all major business processes of the company.

BRISTOL-MYERS SQUIBB TRANSFORMED IT SELF TO THE DIGITAL ECONOMY

- **THE RESULTS**
  It is difficult to estimate results at this early stage, but BMS's chief information officer (CIO) estimates $100 million annual savings just from e-procurement. Also, the move to a paperless transaction system has cut down on errors. For ex-ample, using electronic invoicing forms enables automated editing against catalog and reference material, resulting in significantly fewer errors.

LESSONS LEARNED FROM THIS CASE

- This case illustrates that fierce global competition drives even large corporations to find ways to reduce costs, increase productivity, and improve customer ser-vice. These efforts are best achieved by using Web-based systems, which are the major ingredient in the transformation to the digital economy. The major initia-tives that the company embarked upon were:
  - Reduce costs by introducing an electronic procurement system and by smoothing the supply chain.
  - Increase sales by utilizing the Web, using many portals to better connect with retailers and end-customers.
  - Improve relationships with employees and customers. The company employs various e-commerce models, which were combined with restructuring of management processes.
- In this chapter we describe the characteristics and concepts of the digital econ-omy and how it is changing several business processes. In addition, we will ex-plain the extremely competitive business environment in which companies op-erate today, the business pressures to which they are subject, and what companies are doing to counter these pressures. Futhermore, you will learn what makes in-formation technology a necessity in supporting organizations and why any man-ager in the twenty-first century should know about it.

WEB TECHNOLOGY IS SHORTENING THE TIME TO MARKET OF NEW DRUGS

- The Food and Drug Administration (FDA) must be extremely careful in approving new drugs. At the same time, there is public pressure on the FDA to approve new drugs quickly, especially for high-profile diseases such as cancer and AIDS. The problem is that in order to assure quality, and minimize risk, the FDA requires companies to conduct extensive research and clinical testing. The development programs of such research and testing cover 300,000 to 500,000 pages of documentation for each drug. The subsequent results and analysis are reported in an ad-ditional 100,000 to 200,000 pages. These pages must then be reviewed by the FDA prior to approval of new drugs. Manual processing of this information significantly delays the work of the FDA, so the total process can take as long as 6 to 10 years.

- Several software companies provide software that solves the problems. A pharmaceutical company that uses the software scans all its related documents into a database. The documents are indexed, and full-text-search-and-retrieval software is attached to the system. Using key words, corporate employees can search the database via the com-pany's intranet. The database is also accessible, via an extranet, to the FDA employees, who no longer have to spend hours looking for a specific piece of data. It takes only a few seconds to access an image in the database. Any viewed information can be processed or printed at the user's desktop computer.
- The system not only helps the PDA but also the companies' researchers, who now can have any required information at their fingertips. Remote corporate and business partners can also access the system. The overall results: The time to market of a new drug has been re-duced by up to a year. Each week saved can be translated into the saving of many lives. It can also yield up to $1,000,000 profit for the pharmaceutical company that gets FDA approval for a new drug. The system also reduces the time it takes to patent a new drug, thus protecting re-search and development efforts.

- Recently, companies have been finding ways to further expedite the process. An example is ISIS Pharmaceuticals, a company that develops drugs for treating cancer. The company submits its reports to the FDA electronically, on a CD-ROM. This cuts the FDA's review time by several months. Furthermore, by using an intranet the company can expedite the internal preparation of the report. Smithkline Beecham quickens the process further by us-ing an electronic publishing solution.
- For Further Exploration: It is said that these system help communication, collaboration, and discovery. Explain.

THE MOTHER OF ALL FAILURES, THE 2000 U.S PRESIDENTIAL ELECTION

- Vote-counting machines have been used in the United States for decades in order to expedite the counting of votes and to ensure election integrity. Using information technologies, such as optical readers, these machines counted millions of votes in many elections, without any major problem. All of this changed in November when it was found that the 20- to 30-year-old-machines and the accompanying information procedures generated the greatest election confusion ever encountered, followed by a lengthy and expensive legal and political battle.
- What happened? When it became clear that now-President George W. Bush's victory margin in Florida, as counted by the machines, was slim. Vice President Gore attempted to prove that the machine count was inaccurate. Gore claimed that the count of the old machines, and their supporting information-processing procedures, did not reflect the *intention* of the voters. That is, the technology failed to do its job. So Gore wanted a manual recount of votes in specified counties in the state. The problem was that a manual count might bring the voting process back to the preautomation period, namely to the possibility of human errors, fraud, and ballot tampering.

- What's the solution for the future? Introduce *digital-age voting machines,* which are in use in several countries. How do these machines work? Voting is done directly on a com-puter screen, or by using old-style punch card machines. The innovation of the digital age is that while the voter is still in the polling booth, and regardless of what type of machine he or she is voting on, a computer screen displays
- the vote, as recorded. Before leaving the booth, the voter is asked to verify the record shown on the screen. This is a simple procedure that we all use in other online set-tings—such as in conducting stock trading, banking, or shopping. It is called nonrepudiation, which means ver-ifying the *intention* of the users and making sure that the user will not later deny the choice. With such a system, voters will not be able to later complain that the machine made a mistake. Once verified, the votes can be tabulated by computers very quickly.

- As a matter of fact, in November 2000 the U.S. National Science Foundation was in the middle of a study about *digital voting.* One of the major problems in voting online is security, especially if voting is done from home. Other issues in online voting are privacy protection, and the possibility of fraud. In addition, there is the possibility that online elections could change the nature of politics and the power distribution between the federal government and the states. It is interesting to note that according to a senior expert at the prestigious Brookings Institution *(brookings.org),* the members of the U.S. Congress are too used to the old system and don't want to change to a new system, no matter what it is. This opinion was rendered in early 2000, well before the November election. It may be a different story today.
- For *Further Exploration:* Why may politics become personal if done online? Will more people vote if they can do it from home?

Can Information Systems and the Internet Help a Small Business in Distress?

- Sports for All, one of the most successful stores in Middletown, Illinois, is privately owned by Nancy Knowland. It employs 12 people and has sales of about $3 million per year. Nancy's family started the sporting goods store over 60 years ago. The store grew slowly over the years, attracting customers from several communities around Middletown. The store's strategy was to provide a large variety of products at low prices. Because of low expenses in Middletown (labor, taxes, rent), the store was able to compete successfully against both K-Mart's and Wal-Man's sporting goods departments'.
- Lately, however, the situation has changed. Sports for All was losing customers to Wal-Mart because Wal-Mart was importing extremely inexpensive goods from sources that were not available to Sports for All. Furthermore, several customers opted to travel as much as 150 miles to St. Louis and pay higher prices for special products that were customized for them by a new and fashionable sporting goods store there.

- Nancy became concerned last summer when total sales showed a clear trend of decline for four consecutive quarters. Yesterday, the monthly sales data was compiled and showed the lowest monthly sales level in 10 years. Nancy called in all the key people of the store for an emergency meeting.
- Nancy's son, David, an MBA student at the University of Illinois, has been urging his mother for years to install a modern computerized information system in the store. Last summer, he purchased several computers and an accounting package and transferred most of the manual accounting transactions (billing, purchasing, and inventory) to the computer. The store also handles all of its correspondence on word processors. Nancy objected to further investment in computer systems, especially since profits were declining.

- During the meeting, David proposed the installation of a sophisticated information system that would improve purchasing, inventory management, and customer service. "Some major manufacturers will not sell products to us because we are not on their electronic data interchange (EDI) system. We need to expedite the receipts of shipments and buy directly from manufacturers so we can be more responsive to customers. We also need to control costs and inventories," he explained. He also said that it is not enough to have Internet presence, but that it is necessary to build an e-commerce site. He urged the company to move the existing internal systems to an intranet, and to explore mobile commerce applications. Furthermore, he said, "we should explore the feasibility of joining group purchasing and an e-procurement marketplace."
- Jim Park, who helps Nancy with finance and marketing, was not too enthusiastic. 'David's proposal will cost more than $160,000, to begin with. Then we will have to infuse cash into the system every month, and it will not reduce our labor force by even one employee. We are just too small for these fancy machines. We will be better off applying this money toward advertising and providing spe-cial sales to attract customers," he said.

Questions

1. Explain to management the changing business environment and why traditional actions such as an increase in advertising may not be effective.
2. Use the trends described in this chapter and the capa-bilities of IT to demonstrate to Nancy and Jim why the company may have to use IT in order to survive.
3. Why was David pushing the use of the Web?
4. What specific factors need to be considered in order to make a decision on whether or not to accept David's proposal?
5. Can a small business survive in the digital economy?

Qantas Airways Responds with E-commerce

- Rising fuel costs during 1999 and 2000 created a pressure on the airline industry. The fuel price increase came quickly, and was unanticipated. For Qantas Airways, Australia's largest airline, this was just the beginning of difficulties. The airline also had to deal with two new domestic competitors. Impulse and Virgin Blue, and with higher user fees at Sydney Airport. On top of this the airline faced the need to upgrade its fleet, replacing aging aircraft and buying new 500-seat planes. Also, the economy in Australia slowed down in 2000, and the Australian dollar was sinking. Finally, corporate clients managed to find or ne-gotiate low ticket prices by using computerized planning models and the Internet. The problem was this: Could Qan-tas, the world's second-oldest airline, survive?
- Qantas decided its salvation lay partially in IT. In addition to traditional responses such as buying fuel contracts for fu-ture dates, Qantas took major steps to get into e-commerce:

business-to-business initiatives

- Joined a purchasing business-to-business e-market-place (called Airnew Co.), which links a dozen major airlines with suppliers of direct supplies: fuel, fuel ser-vices, general maintenance services, catering and so on. The marketplace operates with electronic catalogs and conducts different types of auctions.
- Joined another e-marketplace, called *corprocure.com.* together with thirteen other large corporations in Australia, for the purpose of buying indirect goods and services, such as office supplies, light bulbs, and air-line maintenance services.
- Formed a Pan-Pacific e-selling marketplace that in-cludes a full spectrum of travel services (air, hotels, cars, etc). It provides a chance for Qantas's business partners, such as travel agencies, to provide special and personalized services to their customers, at competi-tive prices. This e-marketplace will also sell direct to individual customers.

business-to-consumer initiatives

- Sent an e-mail to 2.4 million Qantas frequent flyers, inviting them to book direct online and rewarding them with bonuses and an opportunity to win $ 10,000 (Australian).
- Began providing information, including personalized information such as flight delays, to travelers via mo-bile phones and other wireless devices.
- other initiatives
- Set up a portal for Qantas travel agents that provides in-formation and online training *(gdstraining.qantas. com.au).*
- Established Qantas College Online, which offers dozens of courses online to help train 30,000 Qantas employees in 32 countries *(qfcollege.edu.au).* This is part of the airline's business-to-employees (B2E) initiative.
- Another B2E project is online banking services. The company operates a credit union with 50,000 members worldwide, and members make over 100,000 transac-tions a month at *qantascu.com.au.* Services are compa-rable with those of other commercial online banks.

strategic alliances

- Initiated several nontravel projects with Telstra (Australia's largest telecommunications company). Co-branding of credit cards and mobile phones are two examples of joint ventures undertaken.

  Leading an old-economy company into the digital econ-omy is not easy. It means interfering with power structures and fitting new-economy strategy with old-economy ways. But Qantas knew that this must be done, and did not ex-pect results overnight. To implement all EC initiatives will take years and hundreds of millions of dollars. Yet, as early as 2003, Qantas expects to reap an estimated savings of $85 million (Australian) per year in reduced communica-tions and advertising costs. Also, it expects to increase rev-enue by $700 million (Australian) annually from nontravel sales. Many airlines, including United Airlines *(united.com)* and CathayPacific *(cathaypacific.com).* are involved in simi-lar projects

Questions

1. Identify all the business pressures cited in the case and additional business pressures you think might apply (see *fonune.com,* and *theeconomist.com).*
2. Identify the responses taken by Qantas. Look for addi-tional responses at *qantos.com* (press releases) and in the Australia financial review *(afr.com.au).*
3. Relate Qantas's responses to the critical responses sug-gested in the chapter.
4. Which of the responses are supported by information systems?
5. Notice that Qantas has e-commerce buying and e-commerce selling projects. Find the benefits of such

BUILDING AN E-BUSINESS AT FEDEX CORPORATION

- FedEx corporation was founded in 1973 by Fred Smith. During 27 years of operation, FedEx earned myriad accolades and won over 194 awards for opera-tional exellence. With a fully integrated physical and virtual infrastructure, FedEx's business model supports 24-48 hour delivery to anywhere in the world. As of 2000, FedEx operates one of the world's busiest data-processing centers, handling over 83 million information requests per day from more than 3,000 databases and more than 500,000 archive files. It operates one of the largest real-time, online client/server networks in the world. The core competencies of FedEx are now in express transportation and in e-solutions.

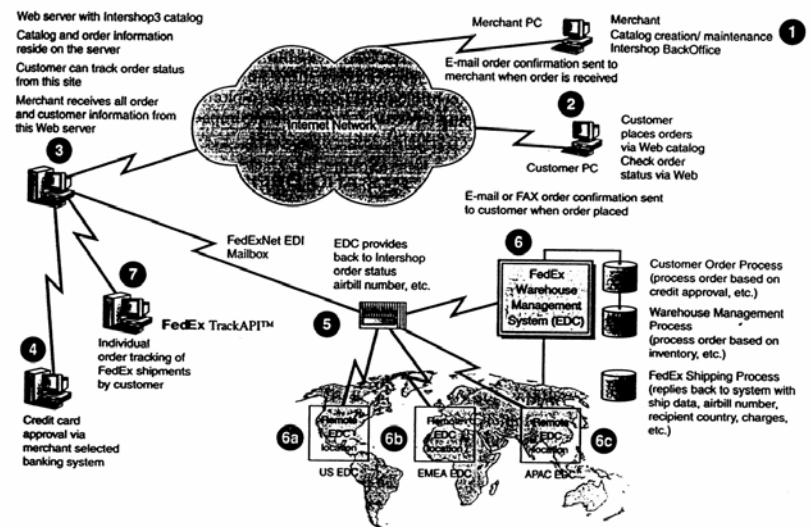
THE PROBLEM

- Initially, FedEx grew out of pressures from mounting inflation and global compe-tition. These pressures gave rise to greater demands on businesses to minimize costs of operation and to improve customer service. FedEx didn't have a business prob-lem per se, but rather, has kept looking ahead at every stage for opportunities to meet customers' needs for fast, reliable, and affordable overnight deliveries, to stay ahead of the competition. Lately, the Internet has provided an inexpensive and ac-cessible platform upon which FedEx has seen further opportunities to expand its business scope, both geographically and in terms of service offerings.

THE SOLUTION

- In addition to e-Shipping Tools (which is a Web-based shipping application that allows its customers to check the status of shipments through the postal com-pany's Web page), FedEx is now also providing integrated solutions to address the entire selling and supply chain needs of its customers. Its eCommerce Solu-tions provides a full suite of services that allow businesses to integrate FedEx's transportation and information systems seamlessly into their own operations. These solutions have taken FedEx well beyond a delivery company.
- FedEx markets four eCommerce Solutions: FedEx PowerShipMC (a multicarrier hardware/software system), FedEx Ship Manager Server (a hardware/ software system providing high-speed transactions and superior reliability, al-lowing an average of eight transactions per second), FedEx ShipAPI™ (an Inter-net-based application that allows customization, eliminating redundant pro-gramming), and FedEx Net-Return® (an Internet-based returns management system). This systems and technology infrastructure is now known as FedEx Di-rect Link. It enables business-to-business electronic commerce through combi-nations of global virtual private network (VPN) connectivity, Internet connec-tivity, leased-line connectivity, and VAN (value-added network) connectivity.

- Figure 2.1 gives one simple example of a FedEx eCommerce solution. It shows how customers can tap into a whole network of systems through the Internet. When a customer places an order through a Web catalog, the order is sent to the FedEx Web server. Information about the order and the customer is sent to the merchant's PC, and a message is sent to the customer to confirm receipt of the order. From that point up to the point of delivery of the goods, both merchant and customer may check the status of the order via the Web. After the order is received and acknowledged, the FedEx Web server sends a message to the mer-chant's bank to obtain credit approval. At the same time, the order is sent via electronic data interchange (EDI) to a FedEx mainframe that activates the ware-house management system. The order is processed (goods are picked and packed), the warehouse inventory system is updated, and the shipping process is syn-chronized. Information regarding the processing of the order is accessible at the three remote electronic data centers (EDC) located in the United States, the Eu-rope/Mediterranean (EMEA) region, and the Asia Pacific (APAC) region.



THE RESULTS

- FedEx's e-business model creates value for its customers in a number of ways: It facilitates better communication and collaboration between the various parties along the selling and supply chains. It promotes efficiency gains by reducing costs and speeding up the order cycle. And it transforms organizations into high-performance e-businesses.
- **LESSONS LEARNED FROM THIS CASE**

  In the network economy, how well companies transform themselves from tradi-tional modes of operation to e-businesses will depend upon how well they can adapt their structure and processes to take advantage of emerging technologies. FedEx has transformed itself into an e-business by integrating physical and virtual infrastructures across information systems, business processes, and organizational bounds. As more companies resolve to expand business online, FedEx's experi-ence in building an e-business serves to show how a company can successfully apply its information technology (IT) expertise to pioneer "customercentric" in-novations with sweeping structural annd strategic impact for an entire industry.

GLAXO WELLCOME SAVES LIVES WITH DSS

- Glaxo Wellcome of the United Kingdom is one of the largest pharmaceutical companies in the world. In 1996, the copmpany found that a combination of two of its existing drugs, Epirir and Retrovir, were effective in treating some case of AIDS. Doctors worldwide began writing prescriptions en masse almost overnight. Such a tidal wave of demand depleted the inventories of the two drugs in the pharmacies.
- Glaxo needed to produce and ship Expirir and Rerovir quickly. But the increased demand, which is used to de-termine production, shipping schedules, and inventory lev-els, was too difficult to forecast.

- To solve the problem, Glaxo developed a special enterprisewide networked information system based on relational online analytical processing technology. Essentially, this system processes data as soon as transactions occur. The system works with a vast amount of internal and external data stored in a data warehouse. Using these data and DSS mod-els, market analysts at Glaxo were able to track and size
- the sources of demand, generating summary reports and projections in minutes. The projected demand was in-putted into DSS models to figure appropriate production plans, delivery schedules, and inventory levels along the supply chain.

- As a result, Glaxo streamlined its distribution process so wholesalers and retailers around the world never ran out of the drugs. An added benefit was that operational costs were reduced. Also, the system provided Glaxo's employ-ees with a tool that allows them to quickly and easily ac-cess information from different sources that is now stored in one place. In addition, the network allows for efficient internal and external collaboration and communication. Finally, the IT solution enabled the company to maximize the business opportunity and to save lives in the process.
- ***For Further Exploration:*** Why was a DSS needed in this case, and why is quick data consolidation so important?

EMBEDDED LOGIC

- Since the early 1990s, expert systems have become so integrated that they have turned into parts of processes. .Vendors sell them embedded in various products but seldom mention their presence. Programs are sold based on their functionality for a given application, not on whether they are "expert.' The new "robot mind* becomes just part of the plumbing.
- This self-effacement may have deliveredexpert systems to their true role, that of Web-based interfaces to corporate data resources. "Expert systems can personalize inquiries to the *n*th degree," says Tod Loofborrow, president and CEO of Authoira, an expert systems development company specializing in human resources and health-care information, whose systems let employees explore their benefits policies on the Web.

- Akeel Al-Attar, of Attar Systems, thinks expert systems are a natural support system for e-commerce, since con-sumer "interviews" are rule bound and require much back-and-forth communication with corporate databases. He gives as an example a Japanese pump manufacturer and Attar Systems customer, Ebara Manufacturing, that produces several thousand kinds of pumps for many industries. Traditionally, customers would just ask for a pump. Sales personnel had to figure out what kind wasn eeded. As products got more numerous and sophisticated, this manual system started to break down. Ebara fixed this problem with an online expert system. The system brings customers through a series of questions that connect their needs to specific products, often in less than a minute.
- Al-Attar points out a subtle edge enjoyed by this new generation of "outward-facing" expert systems (systems that connect an organization to external entities). One rea-son why the programs of 10 years ago did not enjoy the success they expected, he suggests, was that they were internal systems; all they did was reduce costs. E-commerce applications, on the other hand, connect to the outside world and bring in revenue. While it might be true that a saved dollar contains the same number of pennies as an earned dollar, technologies that *make money* tend to get front-office attention. In the end, this may prove to be an even better marketing story than capturing the wisdom of experts.
- *For Further Exploration:* What impacts have expert systems brought to industry? Will expert systems still play an important role in the e-commerce era?

Web-based Information Systems in a Singaporean Hotel

- Raffles Hotel, Singapore's colonial-era landmark and now a national monument, is the flagship of the Raffles Ltd., which manages 16 luxury hotels worldwide, including 2 in Singapore as well as 36 restaurants. Raffles Hotel is op-erating in a very competitive environment. To maintain its worldwide reputation, the hotel spent lavishly on every facet of its operation. For example, the hotel once stocked 12 different kinds of butter, at a high cost.
- All this changed in 2001, when Raffles moved its pur-chasing and sales to the Web by creating a private online marketplace. Here is how it works:
- To do business with Raffles, each of 5,000 potential ven-dors must log on to Raffle's electronic exchange. As for the purchasing. Raffles conducts reverse auctions (see Chapter 5) among qualified suppliers. This reduces the number of suppliers while increasing the quantity purchased, en-abling lower purchasing prices. For example, butter is pur-chased now from only two suppliers. Also, negotiations can take place online.

- The private exchange is strategically advantageous to Raffles in forcing suppliers to disclose their prices on the exchange, thus increasing competition among suppliers. To convince the purchasing agents at Raffles that their jobs were secure, they are encouraged to collaborate on the sys-tem. The company is saving about $1 million a year on
- procurement from eight high-volume suppliers for items such as toilet paper and butter alone.
- The exchange is also used as a sell-side, allowing other hotels to buy Raffles-branded products like tiny shampoo bottles and bathrobes. Raffles-branded products are con-sidered luxury products making the hotels purchasing the products look upscale.
- Since each of Raffles hotels has its own information sys-tem as do all their trading partners, it is necessary to cre-ate a global, secured system that will connect all the par-ties. This is done via an extranet.

Questions

1. Why is an extranet needed?
2. Which Web-based systems are likely to support this venture?
3. Is this an operational, managerial, or strategic system? Why?
4. Identify TPs and any functional systems that are in-volved in this venture.

ROSENBLUTH INTERNATIONAL: COMPETING IN THE DIGITAL ECONOMY

- **THE PROBLEM**

  Rosenbluth International *(rosenbluth.com)* is a major global player in the extremely travel agent industry. The digital revolution has introduced the following threats to Rosenbluth and other agencies in the industry:

- Airlines, hotels, and other service providers are attempting to displace travel agents by moving aggressively to electronic distribution systems (e.g., airlines are issuing electronic tickets, and groups of airlines are sponsoring selling portals for direct sale of tickets and packages).
- Some travel service providers have reduced commissions caps (from $50 to $10) and have cut the commission percentage for travel agents (from 10 per-cent to 8 and then to 5 percent).
- A large number of new online companies (such as *expedia.com)* are provid-ing diversified travel services as well as bargain prices, mostly to attract in-dividual travelers. These services are penetrating to the corporate travel area, which has been the "bread and butter" of the travel agents' business.
- The competition among the major players is rebate based. The travel agen-cies basically give back to their customers part of the commission they get from travel service providers.
- Innovative business models that were introduced by e-commerce, such as auctions and reverse auctions, were embraced by the providers in the in-dustry, adding to competitive pressures on travel agencies (see Turban et al., 2002, Chapter 10).

THE SOLUTION

- *DACODA (Discount Analysis Containing Optimal Decision Algorithms).* This is a patented yield-management system that enables travel managers to de-cipher complex airline pricing and identify the most favorable airline con-tracts. Use of this system optimizes a client corporation's travel savings.
- *Electronic Messaging Services.* Electronic messaging enables clients to man-age their travel requests via e-mail. Its main feature utilizes a Web-based tem-plate that permits clients to submit reservation requests, any time, without the need to pick up the phone. Additionally, a structured itinerary is returned to the traveler via e-mail.
- *E-Ticket Tracking Solution.* This system tracks, monitors, reports on, and col-lects the appropriate refund or exchange for unused e-tickets. As e-ticket us-age grows, so do the number of unused e-tickets that need to be refunded or exchanged.
- *Res-Monitor.* This patented low-fare search system tracks a reservation up until departure time and finds additional savings for one out of every four reservations.

- • *A Global Distribution Network.* This network electronically links the corpo-rate locations and enables instant access to any traveler's itinerary, personal travel preferences, or corporate travel policy.
- • *Custom-Res.* This global reservation system ensures compliance with client travel policies, consistent service, and accurate reservations.
- • *IntelliCenters.* These advanced reservations centers use innovative telecom-munications technology to manage calls from multiple accounts, resulting in cost savings and personal service for the corporate clients.
- • *Network Operations Center (NOC).* This center monitors the many factors impacting travel, including weather, current events, and air traffic. This in-formation is disseminated to the company's front-line associates so that they can keep clients aware of potential changes to their travel plans. The NOC also tracks call volume at all offices and enables the swift rerouting of calls if needed.

- **THE RESULTS**

  Using its IT innovations, Rosenbluth grew from sales of $40 million in 1979 in air sales, primarily leisure-oriented, in the Philadelphia, Pennsylvania area, to sales of over $3 billion in 1997. Today, the company has physical offices in 24 countries and employs about 4,500 employees. Since the introduction of the Web-based solution in 1997, sales increased to about $5 billion in 3 years (60 per-cent). The company not only survived the threats of elimination but also in-creased its market share and profitability.

FRITO-LAY CHIPS AWAY AT ITS COMPETITIONS

- Frito-Lay, a subsidiary of PepsiCo, is the world's largest snack food producer and distributor. Frito-Lay is known for its extensive use of IT. Its strategic information system gives its managers the ability to visualize nearly every element of the company's value chain as part of an integrated whole, The, SIS is a central nervous system that integrates marketing'; sales, manufacturing, logistic and finance. It also provides managers with information about suppliers, customers, and competitors.
- Frito-Lay's employees in the field collect sales informa-tion daily, store by store, across the United States and in some other countries. They feed this information electron-ically to the company. By combining this vast amount of field data with information from each stage of the value chain, Frito's managers can better determine levels ot inbound supplies of raw materials, allocate the company's manufacturing activity across available production capaci-ty, and plan truck routing for the most efficient coverage of market areas. By checking what competitors do, Frito-Lay can make better pricing and inventory decisions.

- Frito-Lay employees also collect information about the sales and promotions of competing products or about new products launched by competitors at selected locations. This infor-mation enables the company to target local demand pat-terns with just the right sales promotion. This ability means that Frito-Lay can continuously optimize profit margins and reduce inventory costs. It can also use this information to identify and to react to environmental pressures and competitive forces. Wegmans, a large food retailer, collaborates with Frito-Lay in supply chain pro-jects, which result in significant sales increases of Frito-Lay product at Wegmans' stores.
- *For Further Exploration:* Why does Frito-Lay pay such close attention to the value chain? Who are the customers? Could smaller competitors use such a system? Is the strat-egy of collecting data on the competition ethical?

New Entrants to the Dutch Flower Market: Electronic Auctions

- The Dutch auction flower market in the Netherlands is the largest in the world, attracting sellers from dozens of coun-tries such as Thailand, Israel, and East African states. Some 3,500 varieties of flowers are sold in 120 auction groups. The auctions are semiautomated; buyers and sellers must come to one location where the flowers are shown to the buyers. The auctioneer of each variety of flower uses a clock with a large hand which he starts at a high price and drops until a buyer stops the clock by pushing an order-ing button. Via an intercom, the quantity is clarified, and the clock hand is reset, at the high price, for the next batch of flowers. The process continues until all flowers are sold.
- In September 1994, the Dutch growers who own the auction organization, called the Dutch Flower Auctions (DFA), decided to ban foreign growers from participating during the summer months in order to protect the Dutch growers from low prices from abroad. By March 1995 some foreign growers, together with several local buyers, cre-ated a competing auction called the Tele Flower Auction (TFA), limited to the Netherlands and a few neighboring countries. TFA is an *electronic auction* that enables its ini-tiators to penetrate the Dutch flower market. Here is how it works:

- In the TFA, buyers can bid on flowers via their PCs from any location connected to the network. The process is sim-ilar to the traditional one, and the auction clock is shown on the PC screen. The buyers can stop the clock by push-ing the space bar. The auctioneer then converses with the buyers by telephone, a sale is concluded, and the clock is reset. The flowers are not physically visible to the buyers. However, a large amount of relevant information is avail-able, for example, the time flowers are picked up, quality, and arrival time to the Netherlands. The buyers are alerted to a specific auction, in real time, when their item of interest is auctioned.
- Initial results indicated that buyers and growers are en-thusiastic about TFA. While prices are about the same as
- in the regular auctions, the process is much quicker, and the after-sale delivery is much faster than in other mar-kets. Delivery starts within 30 minutes after the sale; nearby buyers can receive their purchases within a half hour; for buyers in other European countries, delivery takes longer. A major issue with the online auction could be the quality of the flowers, since the buyers cannot see them; but the quality is actually better since there is less handling (no need to bring the flowers to an auction site), and the growers stand behind their products. As a result, there is enough trust so that everyone is happy.

- The TFA has gained considerable market share at the expense of existing organizations—a real new-entrant suc-cess story. Using IT, the new entrant quickly built a com-petitive advantage. While some minor competitors decided to install a similar system in order to compete immediately, it took the major Dutch Growers Association more than a year to cancel the import restrictions and implement their own electronic clearinghouse for flowers.
- ***Questions***
  1. 1. Why was the TFA successful?
  2. 2. How can the TFA sustain its success while competitors are copying its new concept?
  3. 3. The cancellation of the import restrictions is not work-ing too well for the Dutch Growers Association. Advise the CEO of the association what to do.
  4. 4. Can this concept be extended to the Internet? If so, how can real-time flower auctions be implemented?