

# The PRISM System: A Key to Organizational Effectiveness at Federal Express Corporation

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## *Abstract*

*This paper examines a new type of information system rarely described in the MIS literature, probably because very few such systems exist today. The system, which we have labelled as an organizational effectiveness system (OES), is designed to ensure the health and well-being of an organization in an increasingly complex and turbulent world. Its purpose and net effect are to allow the organization to be flexible and responsive. PRISM, a system developed at Federal Express Corporation, is an imitable example of such a system. As an advanced multi-technology system, it includes core personnel functions, expanded personnel and organizational functions,*

*and extensive external interface features. The PRISM system permits significant and constant interactions with all managers and all employees. This paper describes PRISM in considerable detail, as well as its impact and benefits. By extrapolating from the Federal Express experience, critical success factors are derived for the development and implementation of organizational effectiveness systems in other organizations.*

Keywords: Organizational effectiveness, organizational flexibility, information system, management of information systems

ACM Categories: H.1.1, H.1.2, H.4.2, J.1, K.6.1

## **Introduction**

The focus of information technology in the 1980s was *competitive* advantage (Keen, 1989). In the late 1980s, the focus of information technology began emerging as strategic use for *organizational* advantage (Keen, 1989). Such advantage can be achieved through the design of adaptive, responsive, and flexible organizations (Keen, 1989). As an organization becomes increasingly complex, managing change becomes more important, but also more difficult. At Federal Express Corporation,<sup>1</sup> PRISM provides organizational advantage through managed change.

PRISM was first implemented in the early 1980s<sup>1</sup> to support personnel functions; today it has evolved into an advanced, multi-technology program management system that is at the heart of Federal Express Corporation's organizational effectiveness. PRISM enhances organizational effectiveness by providing managers with the ability to directly input and access online all data pertaining to their subordinates. Similarly, all employees can examine pertinent personnel data in real-time. The system provides efficiencies through better time management and through a paperless environment. PRISM includes many in-

<sup>1</sup> Federal Express Corporation, headquartered in Memphis, Tennessee, is in the business of picking up and delivering high priority documents, packages, and air freight throughout the U.S. and the international market. The company, founded over 20 years ago, revolutionized the quick-delivery business.

novative applications such as job posting and bidding, training and testing, safety and security, and a computer-based management by objectives (MBO) implementation. These features have increased employee commitment and morale, as indicated through internal surveys. Further, the self-management features of PRISM have allowed the personnel department to concentrate on developing, not just tracking, corporate human resources. The PRISM system provides a foundation with which to support the vast, very dispersed Federal Express organization worldwide.

## System Overview

The Federal Express PRISM system is one of the most advanced human resource systems in use today. As illustrative of its scope, PRISM can provide over 300 different screens to its users, and it uses an IMS database that contains 35 segments (records) for each employee. Figure 1 illustrates the comprehensiveness of this system. As the figure indicates, PRISM is driven by the system core. The core functions are identified as white circles. Specific functions of the PRISM core are discussed in the next section of this article. The non-core PRISM functions include expanded internal personnel/organizational functions (which are identified in Figure 1 as cross-hatched circles) and external system interfaces (which are identified as single-hatched circles). In subsequent sections of this article, several expanded internal personnel/organizational functions are described. (A comprehensive examination of PRISM would be impossible within the confines of one article; a description of some of the more important features is provided in this one.)

PRISM has dramatically affected and re-engineered all internal human resource processes and many business processes within Federal Express Corporation. These include application for employment; hiring employees; processing employee benefits; processing salary changes; affirmative action; verification of employment; employee assessment, training, and development; leave time; employee safety; employee input to management; and retirement. PRISM has also had a significant impact on most of the company's external human resource processes including affirmative action reporting, data

exchange with benefits providers, data exchange with retirement plan providers, and OSHA reporting.

PRISM has many interesting and unique characteristics that differentiate it from other human resource systems. Almost all PRISM input is provided directly by end users at the source of the data, thus saving time and errors associated with clerical or data-entry personnel. The users of PRISM include almost all Federal Express employees. The most common users of PRISM are managers who implement personnel-related decisions through direct use of the system. Yet PRISM is much more than an operational management information system. What makes PRISM unique and vital for Federal Express are elements that are more typically found in advanced reporting systems, executive information systems, and strategic systems. These strategic elements unfold as PRISM's various components, characteristics, and impacts are described in subsequent sections.

## The PRISM Core

The PRISM core provides all Federal Express employees worldwide with online access to PRISM through the corporation's vast telecommunications network. The PRISM core is responsible for several of the processes discussed in the previous section. This section discusses the specific core functions of processing newly hired employees, the maintenance of employee data, and the posting and processing of job changes.

### *Processing newly hired employees*

Every job application to Federal Express is entered via a scanner or online terminal into the PRISM applicant tracking database. This vast database allows PRISM users to track applicants' histories worldwide. A hiring manager knows if an applicant has applied at other Federal Express offices, if that applicant has been identified as unsuitable for hire, and, if so, why.

Once a manager decides to hire an applicant, PRISM verifies that the position has budget authorization; if the position has been approved, PRISM accesses its position control database to automatically assign a unique employee number and an organization code based upon the new

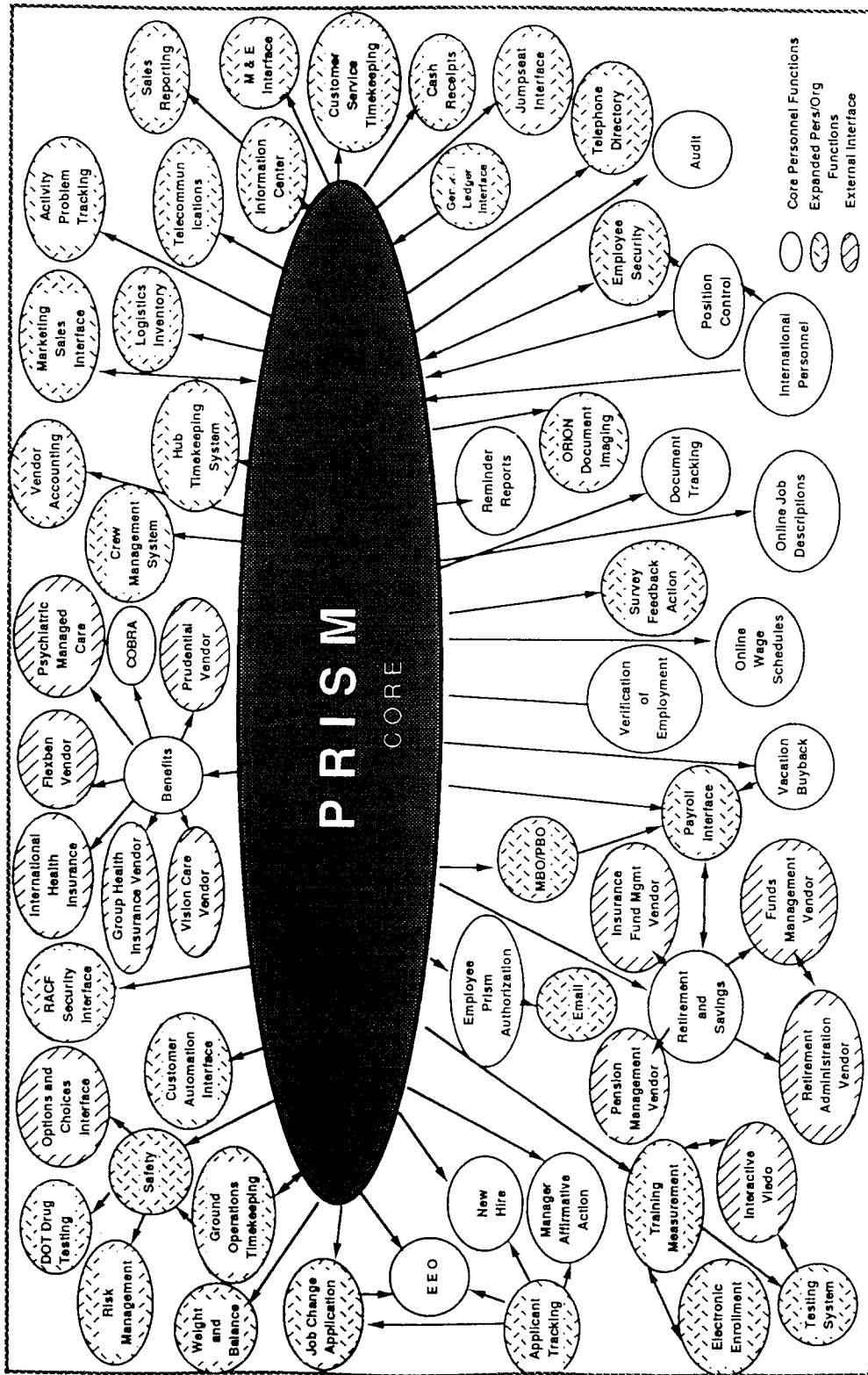


Figure 1. An Overview of the PRISM System

employee's position (see Figure 2). PRISM then creates an employee record for entry into its employee database, transferring appropriate data directly from its applicant tracking database. This process is completed with minimal effort by the hiring manager, not by the personnel department. No paper is required other than the original application, which was completed by the applicant on his/her own time.

### ***Maintaining employee databases***

Just as managers are empowered to hire new employees, each Federal Express employee is empowered to maintain his/her own personal data. Each employee is responsible for updating personal data such as address, telephone number, and benefit options. Supervisory employees are also empowered to maintain management data (as well as selected personal data) pertaining to employees who report directly or indirectly to them. Salary increases are keyed directly into PRISM by supervisors and line managers. Most PRISM transactions require no paper forms, no mail, no document storage, and no additional data entry. On a typical day, PRISM processes tens of thousands of transactions for employees.

Employees can select and change all desired benefits options directly through PRISM. The system walks an employee through the large selection of benefit options, records any additions, deletions, or changes, notifies benefit providers through the benefits interface, and passes the appropriate data onto the payroll system through the payroll interface. The benefit process is conducted at the employee's work location, not the personnel office. Employee and personnel benefits paperwork is eliminated.

PRISM provides for immediate verification of employment for employees seeking loans, references, etc. Verification of employment can be a difficult task for an organization as dispersed as Federal Express; PRISM greatly simplifies this task. The average verification of an employment transaction takes a total of 15 minutes from employee request to completion by management.

### ***Processing job changes***

Federal Express management believes that every employee should have access to information

about job opportunities within the corporation, and that every employee is free to seek the most satisfying employment opportunity within the company. The job posting and bidding facility within PRISM helps achieve these goals. (This facility is discussed in detail in a later section of this article.) The PRISM core supports job changes through its online organization chart and its assignment of position numbers based on reporting hierarchy. When an employee changes positions and/or changes locations, PRISM tracks the employee through its position numbering facility. When an employee's position number is changed, PRISM automatically updates the corporate organization chart. Thus, Federal Express always has a current-to-the-minute organization chart.

### **Job Training and Testing**

Federal Express employees have access to extensive training through a network of 1,200 personal computers and over 25,000 online terminals. All aspects of course enrollment, training, and testing are coordinated by PRISM. Figure 3 depicts the training and testing process within Federal Express.

#### ***Employee training***

Federal Express has an extensive support structure for continual employee training and education. The company supports over 4,000 different courses through interactive video training. Most courses adapt to individual students in response to their inputs; topics for which the student has demonstrated knowledge are covered quickly so time can be better utilized on less familiar topics. Employees train according to their work schedule at Federal Express, not according to a predetermined class schedule.

Each employee's complete training history is available online through PRISM. Employees are tested twice a year and are therefore motivated to keep their training history current. Recurrent testing drives the training and testing process, as depicted in Figure 3.

#### ***Employee testing***

The PRISM system manages the testing program for Federal Express. Once again, employees can

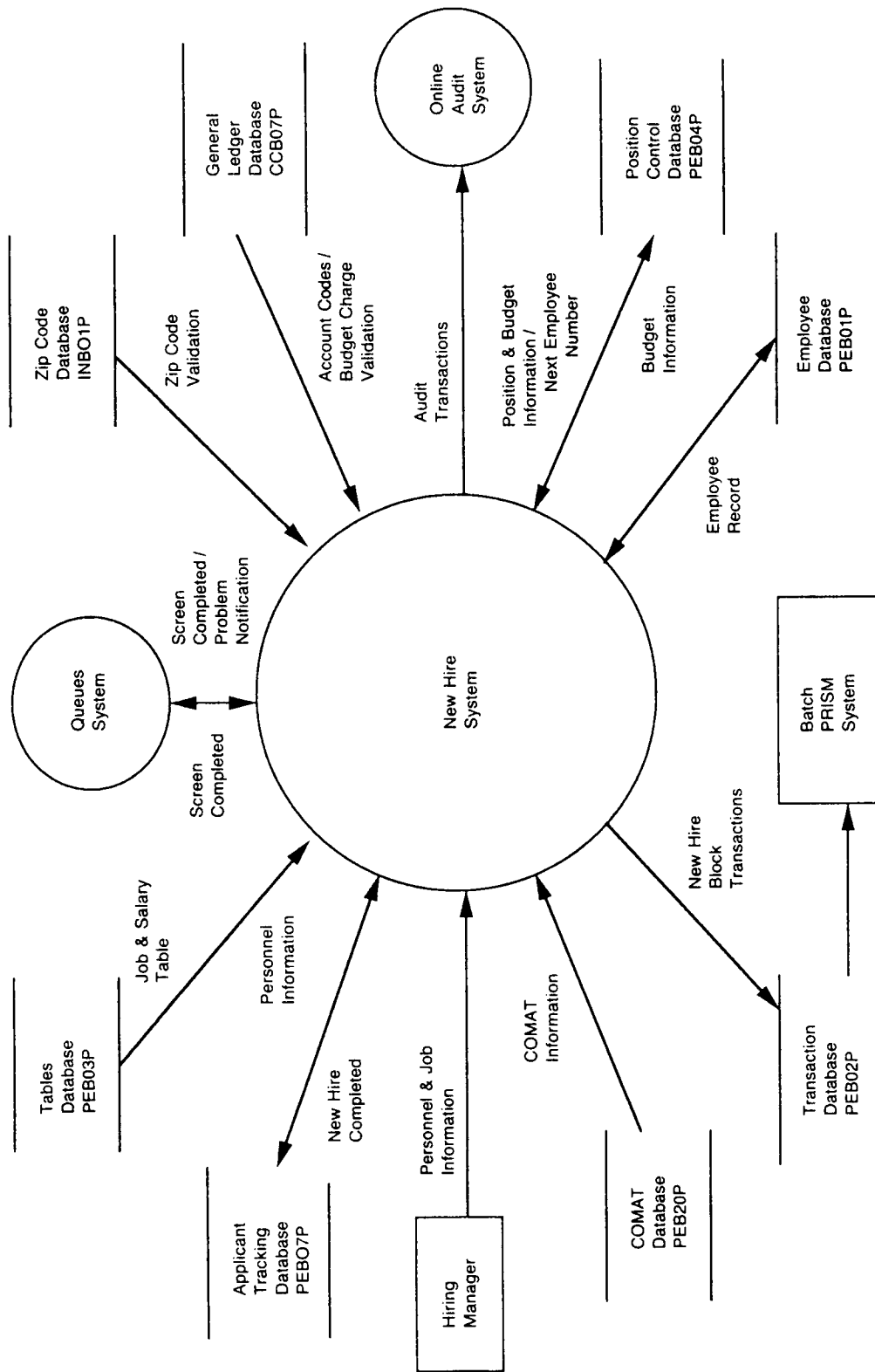


Figure 2. New Hire System Overview

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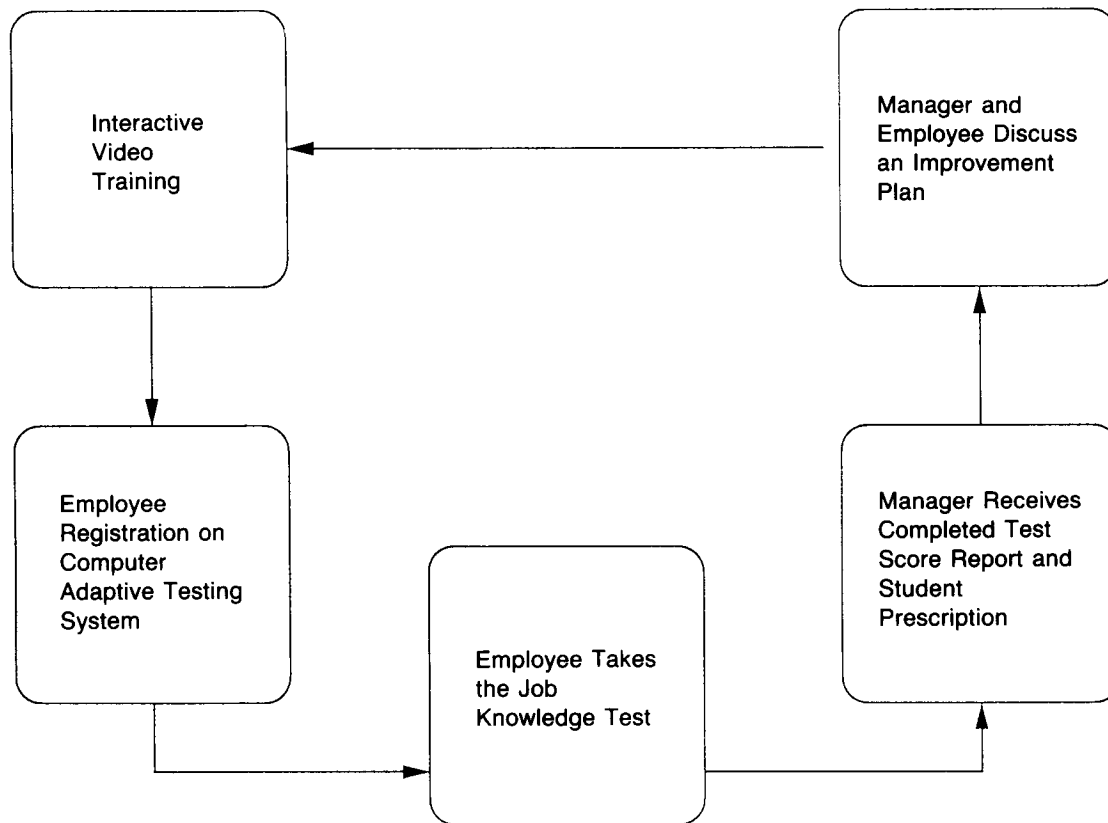


Figure 3. Automated Training and Testing cycle

schedule testing according to their work requirements. Employees are responsible for logging onto PRISM and taking appropriate examinations. PRISM automatically generates electronic mail messages to managers, reminding them to inform employees of upcoming examination deadlines.

Test results are almost always available the same day the exam is given. Because of PRISM, the Federal Express personnel/training staff has time to focus on the more satisfying aspects of their jobs, such as providing specialized training.

### Job Posting and Bidding

Every employee is free to seek his or her most satisfying employment opportunity at Federal Express. Job descriptions and wage schedules are maintained by PRISM and are available to any worldwide employee online immediately after

posting. Managers, not the personnel department, post every hourly position vacancy on the PRISM job posting and bidding system. Any interested employee can view the open positions and apply for a position online from any terminal in the worldwide Federal Express network. PRISM responds to an employee's interest by verifying the employee's qualifications for the position, providing an authorization screen for the employee's supervisor, and, if authorized, adding the employee to an electronic candidate list for the hiring supervisor. PRISM provides pertinent data such as seniority, job history, training history, test scores, and evaluations to the hiring supervisor, all online. For positions governed by hiring rules, PRISM ranks candidates accordingly. Complex and different seniority rules for different job classifications, as determined by corporate policy, are automatically applied. PRISM automatically updates the corporate organization chart to reflect hiring decisions and other staff

changes. The complete process is accomplished without any paperwork required to complete, transport, or store, and without additional data entry. Figure 4 shows the primary interfaces of the job posting and bidding system, officially referred to as electronic job change applicant tracking system.

Federal Express pays employees a premium when they are employed in a high-cost geographic area. Premiums result in wage schedules that vary by specific job and by location. Federal Express operates throughout the world, so wage schedules are very complex. PRISM maintains all wage schedules and provides that information to any employee. Federal Express thus supports the desires of its employees to move both professionally and geographically within its organization.

## Safety

Safety, a concern of any air-services operation, is primary to the mission of Federal Express. PRISM supports the safety program in many ways. All job-related injuries and responses are reported online through PRISM. The system automatically coordinates with workman's compensation and government agencies as appropriate for the specific injury. PRISM also interfaces with the Federal Express risk management system, the drug testing system, the aircrew assignment system, and the aircraft weight and balance system to ensure that all government and company policies are followed.

## EEO/Affirmative Action

PRISM has greatly enhanced compliance with governmental guidelines for equal employment

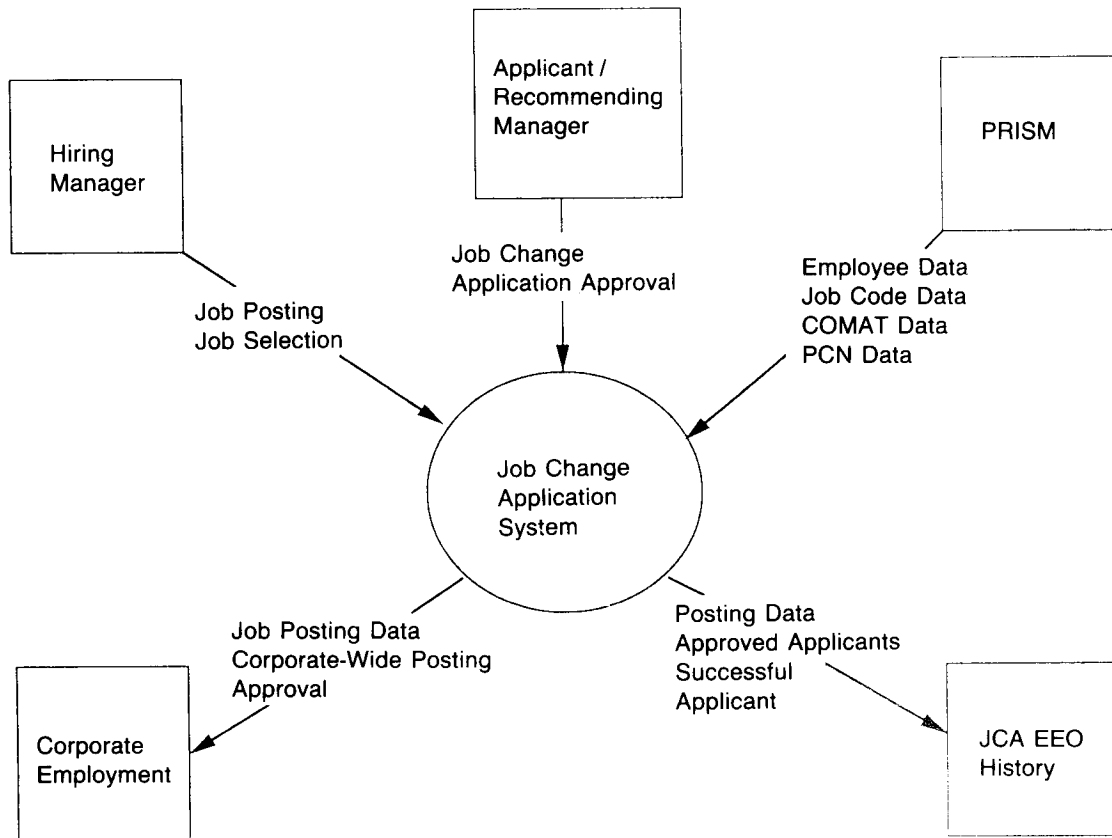


Figure 4. Electronic Job Change Application Tracking System

opportunity and affirmative action. Essentially, PRISM provides an online affirmative action plan that is tracked and updated on a daily basis. Close tracking and feedback of minority employment coupled with management efforts to take remedial actions benefit the company in several ways. For example, these mechanisms minimize the risk of litigation, improve work force morale, increase compliance with government regulations and guidelines, and increase the likelihood of retaining and obtaining government contracts.

The system categorizes various jobs at Federal Express by EEOC-defined job groups (e.g., systems analyst, programmer, etc.). Census data are entered once a year into the system, thus providing the distribution of personnel in each job group by gender and minority status. A daily report compares minority/gender-based availability versus employment level by each job group. Such rapid feedback facilitates the timely correction of disparities between availability and employment.

## Employee Motivation Subsystems

While all of the functions described previously have a positive impact on employees, there are specific applications in PRISM with direct ties to employee motivation. This section describes two such applications: MBO/PBO administration and survey feedback action.

The management by objectives (MBO) program includes a management compensation program. Points are assigned for targeted projects and objectives for a manager and recorded into PRISM by the supervisor. As progress is made toward the accomplishment of these projects and objectives, points are earned and recorded into the system. A manager can monitor his/her progress toward the objectives at any given time. Finally, at times determined by senior management, PRISM forwards the "earned points" information to the payroll system, where bonus/incentive checks are produced without any intervention or further action by the supervisor, the payroll employees, or the recipients. The project by objectives (PBO) program is essentially the same as the MBO program, except that it is geared toward professional employees at technical and consultant levels.

Another unique employee-oriented application in PRISM is the survey-feedback-action system. The concept predates PRISM. Historically, every company employee has been surveyed to obtain perceptions about his/her immediate supervisor and the company as a whole. With currently over 90,000 employees (more than a tenfold increase in 10 years), a manual execution of the survey was becoming extremely difficult and costly to administer. PRISM facilitates the electronic execution of this annual survey. Within a certain time-window, each employee can complete the survey on a computer terminal. Once the administration period is over, results are compiled and relevant reports are forwarded to the appropriate personnel.

The survey consists of questions related to the company and the immediate supervisor of the employee. It has a standard set of 29 company-related questions that have been asked every year for the past nine years. In addition, there are 10 questions related to local employee conditions (e.g., about the immediate work-area manager). The standard 29-question-based results provide time-trend data on the company's overall performance as viewed by the employees. These include such vital information as an industrial relation index, a leadership index, and an overall index. The leadership-related questions provide feedback to the manager from his/her employees. The manager as well as his/her supervisor receive the survey results. Subsequently, the manager and the employees hold a feedback meeting to discuss the employee responses. The manager develops an action plan to address the issues raised by the employees. Additionally, employee concerns may be reflected in the manager's performance appraisal.

## Organizational Impacts and Benefits

Federal Express's corporate philosophy puts an extraordinary emphasis on the development of its employees. This strategy underscores the "people-service-profit" concept upon which Federal Express was founded. The organizational efficiency and effectiveness generated by focusing on the basic organizational elements (employees and management) in turn result in



higher levels of service, which in turn result in higher profits for the organization. It is a sound business strategy that has worked well for Federal Express. The "people-service-profit" strategy has largely been enabled by the PRISM system. Consequently, PRISM's impact is vast and perhaps incalculable; we categorize the impact into strategic benefits and specific organizational benefits.

### *Strategic benefits*

The ability to design a more adaptive, responsive, and flexible organization can improve a company's strategic position (Keen, 1989). Strategic advantage can be obtained by targeting five competitive forces: directly competing firms, new entrants, substitute products, buyers, and suppliers (Porter, 1980). Based on Porter's work, many authors in MIS (e.g., Rackoff, et al., 1985) have developed models for strategic information systems that focus on competitors, buyers, or customers.

The PRISM system does not directly target competitors, buyers, or customers although, as described later, it has direct linkages to several external entities. Rather, the PRISM system provides a significant strategic advantage to Federal Express over its competitors by greatly enhancing the company's organizational flexibility. The system provides the ability to quickly and effectively respond to changes in the market place, and facilitates change management. Opportunities in the marketplace, therefore, can be quickly exploited as they present themselves. The quick-delivery business is becoming increasingly competitive and complex. For a global firm, organizational complexity multiplies for a variety of reasons (Keen, 1989), e.g., significantly increased coordination and operation across time zones and locations, increased breadth of activities, time stresses due to geographic dispersion and shortening of planning and delivery cycles, and increasing deregulation. Federal Express faces all of these factors. PRISM enables management to deal with such changes rapidly and effectively. Furthermore, such a system provides operational efficiencies and benefits, which in turn can be targeted against competitors (O'Brien, 1990). Such advantage can come from low-cost leadership and/or by providing higher levels of quality/service. Federal Express has

largely adopted the latter approach. For example, the implementation through PRISM of uniform, timely, and quality training has resulted in couriers who are trained to respond to customer queries in an accurate and consistent manner.

It is revealing to examine the organizational flexibility provided by PRISM in light of the emerging literature on the subject. Allen and Boynton (1991) state that the two criteria of greatest importance in choosing an IS architecture are overall efficiency and flexibility. They describe two extreme architectures, i.e., the "low road" or an all-out decentralization, and the "high road" or a complete centralization. PRISM is largely based on the "centralized" architecture and successfully exploits all the advantages of centralization, i.e., fast change, integration, efficiency, flexibility, and strategic use (Allen and Boynton, 1991). Elsewhere, Egelhoff (1991) discusses specific information processing capacities/IS strategies of organizations in response to environmental uncertainty and equivocality. The five information-based responses in order of increased environmental uncertainty are: rules and programs, hierarchical referral, goal-setting, vertical information systems, and lateral relations (Galbraith, 1973). PRISM's support for vertical information systems (e.g., it addresses many layers of the organization) and lateral relations (e.g., it enables direct contact between individuals, matrix designs, and non-hierarchical interfaces) provides the capacity to deal with considerable environmental uncertainty.

Egelhoff (1991) provides two process dimensions of information processing. These dimensions, although defined in the context of multinational corporations, are equally applicable to large, complex organizations. One dimension defines an information processing event as routine or non-routine. The second dimension describes the interdependency between transacting parties as sequential or reciprocal. The two dimensions generate four extreme combinations. Given the complexity and transnationalism (Bartlett and Ghoshal 1989) of the Federal Express organization, the need for non-routine-reciprocal information processing is significant and growing. The PRISM system not only provides the routine-sequential information needs for organizational design and operation but also facilitates the non-routine-reciprocal information requirements.

Strategic advantage derived from organizational design and flexibility can be sustained by innovative, creative, and state-of-the-art application of information technology. For a complex organization, the impact of systems such as PRISM has been tremendous. PRISM has allowed Federal Express to effectively manage and constantly innovate in times of rapid growth and competition. While the company has experienced explosive growth (a more than tenfold increase in employees in less than a decade) and intense competition, the company has effectively managed human resources and provided new services that build employee commitment and morale. Some of these services were described in the previous "Employee Motivation Subsystems" section. All of this has been accomplished without significant additions to the staff of the personnel department.

An insightful analysis of strategic impact can also be made by examining the strategic grid proposed by McFarlan, et al. (1983) in the context of Federal Express and particularly the PRISM system. The strategic grid recognizes the relationship between organizational strategy and the effect of information technology (IT). The grid characterizes the role of IT in the organization based on the strategic impact of existing systems and of those under development (i.e., the applications development portfolio). Both impacts can be low or high. As shown in Figure 5, each of these combinations represents a different impact of IT on the organization.

Typically, as a firm begins to use information technology, it is in the "Support" quadrant. Based on organizational demands, the firm may move to the "Turnaround" quadrant by emphasizing the development of applications that provide competitive advantage. From Turnaround, the path to the "Strategic" quadrant may be direct or via the "Factory" quadrant.

Federal Express can be mapped to the strategic grid over time. Although the grid examines the entire application portfolio, this paper focuses on the PRISM evolution. Federal Express, a company that came into being in the 1970s, had a very brief "Support" period. It always emphasized the strategic role of technology, so it quickly moved into the Turnaround quadrant. (In terms of strategic applications, PRISM is actually much less-known outside the company than is Federal Express' COSMOS package tracking system.)

The company has constantly been at the forefront of technological innovation by means of newer applications and major additions to existing systems. Thus, the company moved quickly and directly to the Strategic quadrant. Current enhancements to PRISM under development include further refinements in computer-assisted employee training (to include hypermedia capabilities) and the ORION (optically recorded information online network) document imaging system. ORION will store images of employee documents on optical disk with an indexed linkage to PRISM's employee records. The company strives to be a leader in the use of state-of-the-art technology and to develop systems far ahead of the rest of the industry.

### *Specific organizational benefits*

Besides its intangible and long-term strategic benefits, PRISM has led to several specific organizational benefits and direct cost savings. The investment in PRISM has been returned many times over on the basis of these direct cost savings alone. These specific benefits are categorized into four areas: impact on personnel division, impact on management, impact on employees, and extra-organizational relationships.

#### **Impact on Personnel Division**

The impact on the personnel division is the most prominent because it directly affects the financial performance of the company. While the total number of employees in the company has dramatically increased from 7,000 to its present 90,000 in less than ten years to keep pace with the business growth, the size of the personnel department has remained fairly stable. Conservatively, without PRISM, the personnel department staff would need to be increased by at least 50 percent to accomplish just the basic personnel functions. This savings alone is worth over \$28 million per annum. Moreover, the extended functionality of PRISM and the various embellishments described earlier could never be accomplished in a manual or a conventional system. PRISM also allows the personnel department staff to offload mundane personnel tasks, thereby providing time to develop the vast human resources at Federal Express. The personnel division can now direct its energies to more strategic rather than operational activities.

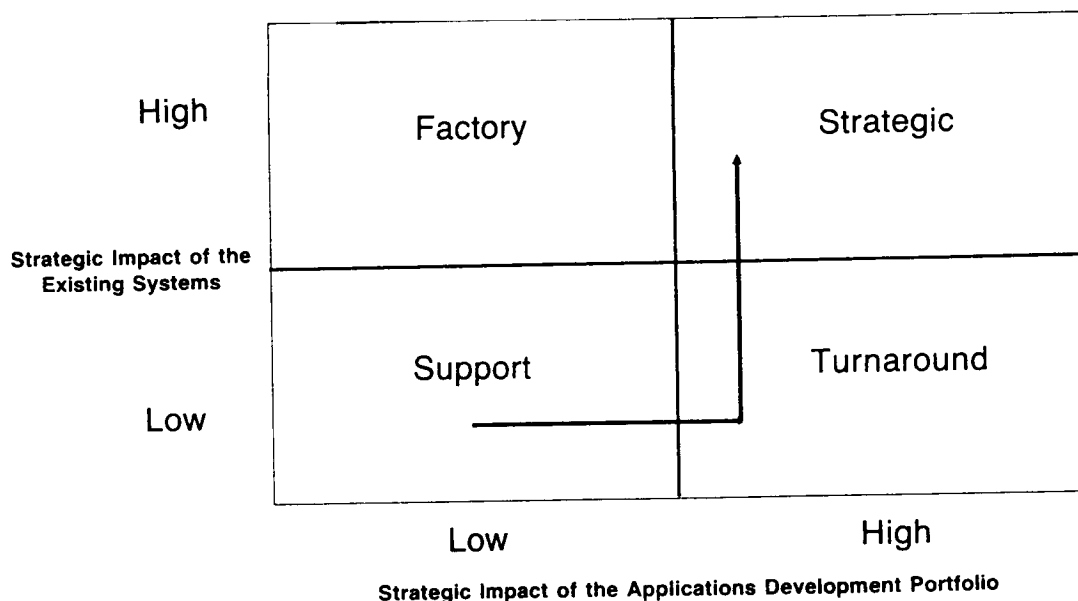


Figure 5. The Strategic Grid and Federal Express' Movement Over Time

#### Impact on Management

All managers interface with PRISM on a regular basis on personnel-related matters. By offloading the clerical and operational tasks to the system, the manager has more time and energy to devote to the real job. Good time management is critical in order for an organization to react more quickly and to better capitalize on change. Specifically, the system enhances management's ability to coordinate and maintain employee documents and transactions. A manager can hire, provide policy-driven pay raises, organizationally transfer employees, calculate and document vacation and sick leave, and review training records, all online. Paperless transactions also greatly improve efficiency and effectiveness.

Another view of management impact can be obtained by reviewing the classical management functions. PRISM assists in all management functions related to personnel. For example, PRISM provides information for staff planning activities by allowing ready access to EEO and affirmative action reports. This information is updated on a daily basis. In addition, information from training, MBO/PBO, and survey feedback action components of the system also facilitate organizational planning. Organizing for new projects, new

locations, or new business is assisted by the capability to instantly access employee classifications, skills, and availabilities, and the capability to quickly affect organizational restructuring. For actual staffing, the system provides the manager direct facilities for hiring, job change, and termination without intervention from the personnel division and without the need for manual processing. For directing, an electronic mail facility is supported where personnel-related directions are electronically communicated to the employee. Many of these directions are system-generated (e.g., notification of required training, completion of surveys, filing of government reports, etc.), and communication is two-way (from the manager to the employee, and vice-versa). Finally, for control purposes, each subsystem of PRISM generates reports and messages listing required actions, exceptions, and errors.

#### Impact on Employees

Employee impact can be summarized in the single word "empowerment." Employees are empowered to review their own records as well as update selected information (e.g., an employee can update his or her address and phone number online). Through an elaborate

system of authorization embedded within the organizational code assigned to each position, an employee can also review selected segments of other employee records (e.g., telephone number and E-mail address). The employee is further empowered to apply for different jobs, enroll in training, provide comments on his or her managers, etc., all online.

Because of the empowerment, the employee can control many organizational tasks without delays, dependence on others, or bureaucratic procedures. Additionally, the ability to review pertinent records assures employees of fairness and equity, and rids them of any suspicion or misgivings about the company or their supervisors. The various checks and balances within PRISM provide for uniform application of policy, which may be advertently or inadvertently compromised in a manual system. These employee-oriented features help maintain a highly motivated and loyal work force with a strong morale and a commitment to the company.

#### Extraorganizational Relationships

Finally, PRISM has several linkages to systems and organizations outside of Federal Express. It produces hard-copy reports for vendors and government agencies. It also provides employee data on magnetic media to retirement and savings funds, insurance and benefits companies, and government agencies. Such computerized interorganizational processing of information lowers the cost of doing business (for all parties involved) and ultimately strengthens their effectiveness and mutual relationship. PRISM also monitors EEO and affirmative action plans, which in turn reduces legal risks and increases the likelihood of retaining and receiving federal contracts. Such interorganizational interfaces improve the company's competitive position.

### Critical Issues

As evidenced in our description, PRISM is a system that cannot be clearly pegged into any of the current classifications found in the MIS literature. While it cannot be called a pure operational system, a reporting system, an executive information system, or a strategic system, it has elements of all, though more of the latter systems. We generically refer to such systems as organizational effectiveness systems, or simply OES.

Several lessons can be learned from the PRISM experience, which may be applicable to organizational effectiveness systems in general. Many of these success prerequisites emanate from the fact that OES is a double-edged sword: while potential benefits are substantial, much more is at stake, and the cost of failure can be significant. Several critical factors have been identified that are key to PRISM's success and impact (see Table 1). As with any generalization, these success factors need to be viewed with caution and modified based on a firm's own unique circumstances.

**Table 1. Critical Issues for an Organizational Effectiveness System**

- Project Champion/Sponsor
- Corporate Culture
- Constant Innovation
- Critical Mass
- Telecommunication Backbone
- Technology
- Accuracy
- User Friendliness
- Security
- Availability and Reliability
- MIS Support and Responsiveness

#### *Project champion/sponsor*

The call for a "project champion" or sponsor or top-management support is a common one in the MIS literature. While top management support is important for any IS project, it is an absolute requirement for a system the magnitude of PRISM. PRISM's scope is worldwide; it affects each and every employee and every manager; its impact is immense; it is based on revolutionary rather than evolutionary concepts; and it demands constant innovation. Moreover, the cost of failure is high. These are ingredients that require the major support of and drive from senior management. Federal Express is fortunate that its founder/chief executive officer and senior executives have always had a healthy appreciation for the value of technology in the conduct of business. They have been willing to invest heavily in high technology applications.

### *Corporate culture*

A corporate culture that trusts and respects employee integrity and professionalism is likely to implement and benefit more from an OES system like PRISM. There should be mutual trust and respect between the management and the employees. Managers must be willing to empower the employees with many tasks, and employees must be willing to accept almost exclusive control of personnel matters by the manager without intervention from the personnel department. Such an environment does not develop overnight—it needs to be nurtured and inculcated by senior management. This kind of environment calls for a participative style of management. Federal Express generally operates on this principle, as the “survey-feedback-action” application described in a previous section illustrates.

### *Constant innovation*

As described in the “Strategic benefits” section, an organization needs to constantly innovate in order to remain in the Strategic quadrant (Figure 5). Without constant innovation, the organization may slip into the Factory mode and eventually into the Support mode because of technological or process obsolescence, further organizational change and complexity, and competitors catching up. The PRISM environment has always been one of constant change and innovation. Current PRISM applications include further refinements in computer-assisted employee training (including hypermedia and interactive video touch-screen capabilities) and the ORION document imaging, which will store images of employee documents on optical disk with an indexed linkage to PRISM’s employee records. It is noteworthy that the new applications in PRISM have been initiated both by management and the systems department.

### *Critical mass*

A system like PRISM requires significant investments in technology. It also requires considerable effort in development and maintenance, and constant refinement. The associated costs may be prohibitively high for small organizations. Small or simpler organizations may be able to function quite effectively with manual or conven-

tional systems. As previously mentioned, a conventional system was satisfactory in the early days of Federal Express when it was small; however, such a system today would be very expensive and significantly less effective compared to PRISM. The lesson to be learned is that larger and more complex organizations can benefit more from an organizational effectiveness system.

### *Telecommunication backbone*

A telecommunication network that provides complete connectivity to all locations of the business is an absolute requirement. In the case of PRISM, every employee must be able to access the system from his or her work location. The company’s worldwide employee locations are interconnected. Federal Express’ telecommunication network is one of the largest in the world. Originally designed for the COSMOS customer package tracking system, the network was designed with enough capacity to handle traffic from other applications such as PRISM. This network and the accompanying software is also able to implement various network facilities embedded in PRISM (e.g., electronic mail and file transfer). Recently the company has acquired the capability to transmit and receive data from its pickup and delivery vehicles directly into various mainframe systems.

### *Technology*

Technology plays a vital role in innovation. Federal Express is constantly evaluating new technologies and implementing them as appropriate for its organization. The ORION project is an example of implementing image-scanning and optical disk technology. Refinements in the job training applications are taking advantage of interactive video and hypermedia technology. In fact, Federal Express has several organizational units that constantly evaluate new technologies and make recommendations for adoption.

### *Accuracy*

Accuracy of information provided by PRISM is critical. Inaccurate information is one of the most serious contributing factors to human resource system failures. The PRISM system provides information on the who, what, when, where, and

why questions related to employment. All of these answers need to be accurate every time, or the system would rapidly go into disuse and neglect. The system must contain appropriate error controls and data integrity checks. For the most part, data must be entered at its source of origination, and the database must be updated on a real-time basis. In the case of PRISM, a small core staff of professional-level employees within the personnel division is dedicated to the task of information accuracy. Accuracy is the daily watchword of PRISM. Besides the core staff, accuracy has been engineered into every task at every level.

### *User friendliness*

From the user's perspective, the dialog with the system is one of the most important components of the system. PRISM is accessed by all employees, many of whom have no previous experience with computers. A friendly user interface is, therefore, a necessity. PRISM achieves its user friendliness, in part, through a hierarchy of menus. Other user interfaces that may be appropriate for an OES include touch-screen, graphics (icons), or hypertext. One test of an extremely user-friendly interface suggested for executive information systems is that the system should require little or no user documentation or training (Watson, et al., 1991). PRISM has very little user documentation; what you get is what you see on the screen. Very little training is conducted on the use of the system, thus generating considerable savings. Federal Express does, however, provide a hotline for functional questions related to PRISM.

As a testimony to its ease of use and utility, the PRISM system is the administrative arm of the personnel department for many employees. Rather than going to the personnel department for administrative items, employees find it far easier to simply consult the PRISM system.

### *Security*

A system that contains sensitive personnel data about all employees and allows access by any employee represents a security risk. Several levels of security are built into PRISM. In addition to the user name and password information, the system randomly asks for several pieces of

information at log-on (e.g., spouse's birthdate, favorite color). These pieces of information are supplied by the employee at the time of computer account creation. More security is provided via the organizational code (org-code) designated for every position. Each employee is assigned a particular org-code. The org-code is hierarchical in design and represents the particular position as well as the entire upward hierarchy of positions. Based on the org-code, an employee is allowed access to selected personnel data of other employees. Generally, there is more access to jobs down in the hierarchy and very little access to jobs up in the hierarchy. Also considering that PRISM provides worldwide access, compliance with various transborder data flow laws is implicit in the security scheme of PRISM. Organizational effectiveness systems such as PRISM cannot compromise on security, and security should be carefully planned and implemented.

### *Availability and reliability*

The system needs to operate at a very high level of availability and reliability. Employees must be able to access the system from all locations at any given time. Federal Express has computer terminals/PCs at every location (a total of over 25,000 terminals worldwide) with easy access by employees. Federal Express has employees working in almost all time zones around the world, thus requiring round-the-clock access.

### *MIS support and responsiveness*

Quality maintenance and innovative changes require a responsive MIS organizational unit. A system the magnitude of PRISM requires a dedicated staff of MIS professionals. This group should have a very good working relationship with the users and be very responsive to user needs. The size and structure of the group should be such that the application development backlog for critical applications is short or else organizational responsiveness will suffer. The MIS group members should have an appreciation and understanding of the workings of the personnel and employee-related business functions. At Federal Express, there is an entire department devoted to maintaining and developing new PRISM applications. This group is headed by an experienced managing director. The personnel

functions are represented by several divisional personnel directors, and in particular by a personnel director in a centralized personnel information control department. There is a close working relationship between the MIS managing director, MIS managers, and the personnel directors.

## Conclusions

Information technologies are no longer just operational, tactical, or technical investments; their critical focus will increasingly be strategic. Past strategic systems focused almost exclusively on external entities such as suppliers, customers, and competitors. This article has shown that internal organizational systems can be far-reaching, innovative, and responsive, and that they can help foster vibrant and dynamic organizations. We believe that in today's fast-changing and globally competitive environment, organizations with the ability to quickly adjust, adapt, and position themselves to take advantage of new and unforeseen market opportunities will have a competitive edge. Organizational effectiveness systems like PRISM will serve as strategic weapons. The PRISM system, with its foundation in human resource systems, has immense organizational significance. In short, such organizational effectiveness systems continually redefine traditional business processes and make managers and employees highly proactive.

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