

CHAPTER 5 – CENTRALIZED KNOWLEDGE MANAGEMENT

“As we move into this new century, those of us responsible for state government are facing a moment of truth. Colorado business is on the cutting edge of the technology world. It is essential that we transform state government so that we too are prepared for the digital age.”

State of the State Address 2000 – Governor Bill Owens

This chapter introduces initiatives targeted at consolidating disparate departmental systems into standardized statewide systems. The five initiatives are Financial Management / Human Resources (HR) System, Timekeeping, Online Reimbursements, Online Benefits, and Online Job Applications.

A single Project Manager should address these projects in a coordinated manner. This Project Manager should develop an implementation team that includes representatives from across state government. In particular, participation of the Department of Personnel / General Support Services (GSS) and the existing HR and Financial Systems Task Force will be essential to this project.

Figure 5-1: Centralized Knowledge Management Recommendations

Recommendation	Estimated Cost Savings / Cost Avoidance	Support for NCC Goals	Status
5.1. The State should acquire and implement in phases an Enterprise Resource Planning (ERP) system to integrate all of the State’s human resource (HR) and financial management information systems into a single system.	Pending	<ul style="list-style-type: none"> ✓Efficiency and Effectiveness ✓Innovative Technology ✓Collaboration and Information Sharing 	In Progress
5.2. As an initial step towards implementing an ERP system, the State should implement a centralized timekeeping system for all state entities.	\$3.7 million annual cost avoidance	<ul style="list-style-type: none"> ✓Efficiency and Effectiveness ✓Innovative Technology 	In Progress
5.3. The State should implement an online expense reimbursement system to allow employees to request and receive expense reimbursements via electronic media.	Pending	<ul style="list-style-type: none"> ✓Efficiency and Effectiveness ✓Innovative Technology 	In Progress
5.4. The State should implement an online benefits system that allows employees access to benefit data through a web-enabled system.	Pending	<ul style="list-style-type: none"> ✓Efficiency and Effectiveness ✓Innovative Technology 	In Progress
5.5. The State should implement an online job application system to allow applicants to apply for state jobs through a web-enabled system.	Minimal savings	<ul style="list-style-type: none"> ✓Efficiency and Effectiveness ✓Innovative Technology ✓Access to State Government 	In Progress

FINANCIAL MANAGEMENT – HUMAN RESOURCES SYSTEM

There are currently four primary HR and financial systems in use in the State. The Applicant Data System (ADS) contains information related to candidates

seeking employment for open positions in the State. The Employee Database (EMPL) maintains employee demographic data and tracks job history. The Colorado Personnel and Payroll System (CPPS) is linked to EMPL and processes payroll for state employees. The Colorado Financial Reporting System (COFRS)

provides overall accounting and financial management for the State.

Opportunity Statement

This section discusses problems related to the technology supporting ADS, EMPL, CPPS, and COFRS. Technically these systems are supported by databases, user interfaces, and programming languages that are 20 to 50 years old. This obsolete technology includes ADABAS / Natural, COBOL, CICS, and VSAM. The technology offers primitive display capabilities and does not support graphic user interface. Users cannot view multiple screens simultaneously (tiles) or switch between screens (layers).

The impact of the technology obsolescence problem depends upon two factors.

- ◆ Future Demand for Software Modifications: It is reasonable to assume that these current systems are static and will require modifications that would be more feasible with newer technology.
- ◆ Future Availability of Technical Personnel Familiar with these Technologies: It is becoming difficult to find personnel who know the old technologies. The industry expects this problem to increase in severity with each passing year.

Numerous problems with the State’s financial and HR systems make it difficult to respond to executive, legislative, and regulatory requests for information. The following outlines some of these problems:

- ◆ Redundant data;
- ◆ Shadow systems – separate agency information systems that include additional functionality;
- ◆ Restricted data access;
- ◆ Fragmentation of application services support; and
- ◆ A limited and overloaded COFRS account code structure.

Assessment

The trend in the private-sector has been toward integrated Enterprise Resource Planning (ERP) packages for financial and HR management functions. ERP packages offer an integrated foundation for general ledger, accounts payable, accounts receivable, purchasing and other financial functions, as well as

payroll, benefits, and pensions. Most of the ERP applications support automated workflow, Electronic Data Interchange, electronic catalogs, employee self-service, and other cutting-edge features. The enterprise approach integrates all departments and functions across the organization on a single database to facilitate the tracking and sharing of information. The following are some of the features offered through ERP packages:

- ◆ Use of the World Wide Web as a user interface for self-service HR functions;
- ◆ Integration with existing agency systems;
- ◆ A statewide time and labor collection system;
- ◆ Ad hoc query; and
- ◆ Ad hoc reporting and graphic reporting.

There are several alternatives to addressing the limitations of the State’s existing HR and financial management systems. These alternatives include implementing a Enterprise Resource Management system, adding an Internet front-end added to existing systems, building a customized system in-house, privatizing the HR and financial functions, and maintaining the existing systems. These alternatives were evaluated to determine how well each addressed six main objectives: credibility, reporting, functionality, automated workflow, self-service, and integration. The ERP system addresses these objectives better than the other alternatives.

The implementation plan for this project would encompass about five years. A very preliminary estimate of the cost of implementing a statewide ERP system for Colorado places the potential cost at \$49.5 million over a five-year period as shown in Figure 5-2.

Figure 5-2: Colorado ERP System Estimate

Item	Total Costs
Software Purchase	\$15.5 million
Software Maintenance	5.1 million
Hardware and Network	3.25 million
Training	3.25 million
Contractors	16.28 million
Internal Project Staff	6.04 million
TOTAL	\$49.42 million

This estimate is based upon the experience of other public sector entities. NCC found the cost of comparable ERP systems to range from \$20.0 million to \$100.0 million as shown in Figure 5-3.

Figure 5-3: Cost of Comparable ERP Systems

Entity	Estimated Total Cost
University of Colorado	\$32 million
State of Nebraska	\$37 million
State of Montana	\$20 million
State of Florida	\$100 million
State of Kentucky	\$20 million
City of Seattle	\$38 million
State of Georgia	\$52 million
City of Denver	\$20 million

Creative financing alternatives should be explored to help share this risk and lower the cost of development. A phased approach should be taken to reduce risk and improve functional success. This approach should include the use of pilot projects in order to demonstrate proof of concept without a large expenditure of resources. By employing a proof of concept approach, the State hopes to share the risk and responsibility with the vendor to ensure a quality solution.

Recommended Solution

Recommendation 5.1: The State of Colorado should acquire and implement in phases an Enterprise Resource Planning (ERP) system to integrate all of the State’s Human Resource (HR) and financial management information systems into a single system.

NCC’s research found that the State’s financial and support information systems are incapable of supporting basic improvements because they are technologically inferior, are inflexible, and have limitations in their breadth of application.

NCC recommends the acquisition of an integrated ERP information system. An ERP system would integrate HR and financial information into one system. An integrated ERP system will streamline the flow of information, reduce operating costs, enhance worker productivity, and create an information management environment that is more uniform and responsive to the needs of Colorado’s citizens.

Higher Education should be considered with this implementation. It is critical for Higher Education to be included to ensure the ERP systems recently implemented at the University of Colorado, Colorado State University, and Metropolitan State College of Denver are able to fully interface with the State’s system.

In order to comply with recommendations in a recent report by the Office of the State Auditor, we recommend that any future HR and financial systems include the capability to track and report full time equivalent (FTE) employees based on a definition of FTE adopted by the Office of State Planning and Budgeting and the General Assembly.

Justification

This recommendation supports three of the Governor’s goals as described below.

Efficiency and Effectiveness

This initiative would assist the State in moving forward with consolidation of systems and achieving economies of scale. In addition, it would allow the State to utilize the current technologies to achieve better performance without an increase in labor.

As the project moves towards a detailed requirements definition, specific savings attributable to factors such as improved workflow and better cash management must be identified.

Innovative Technology

A new ERP system would include several innovative features such as automated approval processing and web-based transaction entry.

Collaboration and Information Sharing

The new system would be built with an open architecture, which would allow greater access to the data. Lack of adequate reporting capabilities is a major shortcoming with current systems. Improved access to data and enhanced reporting features will be key benefits of any new system.

TIMEKEEPING SYSTEM

The State of Colorado needs to track employees’ time and leave balances. This is necessary for effective management of personnel resources, proper accounting of benefit liabilities, and compliance with federal and state labor laws, including the Fair Labor Standards Act (FLSA).

Opportunity Statement

The State of Colorado does not have a consistent method of tracking employees' time and leave balances. Departments encounter numerous problems by using multiple systems, which requires expending unnecessary resources. Problems are evident in reconciling each system's figures which are generally in separate databases. Many of these systems do not provide the reporting capabilities that departments need today.

Generally, problems in the current process can be detailed at two levels: departmental and statewide. Departments have developed systems to meet individual needs rather than developing one system that addresses all the needs. As a result, some departments have up to three separate systems to handle their timekeeping needs. One system tracks employee leave balances. The second system is for the FLSA to ensure non-exempt employees' are appropriately compensated for any overtime. Some departments have a third system to track hours worked against various projects or federal grants.

The problems at the statewide level center around two issues: the duplication of effort by the various state departments, and the connectivity of multiple systems. Some of the duplicative costs are articulated below:

- ◆ Each department must conduct its own procurement;
- ◆ Each department must conduct staff training for its own system;
- ◆ Competent IT employees must be hired and retained for each system;
- ◆ Employees who transfer to another department may have to learn another system;
- ◆ Each department must develop and staff its own help desk; and
- ◆ Each department's system may produce reports in different formats or collect data using different rules.

Assessment

It is estimated that the State has about 30 FTE involved in timekeeping for the Executive Departments, not including Higher Education. Most of this cost results from coordinators who manually gather completed timesheets and enter data into the various timekeeping systems. Departments are attempting to reduce some of these costs as they move to new systems, thereby

enabling employees to spend more time on other functions.

New systems would incorporate direct data entry by employees with an electronic approval by a supervisor. This would eliminate the need for separate data entry, reduce the time spent in the approval process, and finally, automatically upload data to other systems.

The State would benefit because it would have one statewide system, with everyone using information generated by a single database. Timekeeping would be much simpler, more effective, and more efficient. It would enable the expanded use of the biweekly lag payroll, and payroll officers would find it much easier to comply with FLSA requirements.

Recommended Solution

Recommendation 5.2: As an initial step toward implementing an ERP system, the State of Colorado should implement a centralized timekeeping system for all state entities.

The State should capitalize on the efficiencies inherent in its size, as well as its experience with automated systems, to implement a centralized timekeeping system for all state agencies, including those in Higher Education.

A centralized timekeeping system would enable managers to better manage staff resources. It would act as a tool for:

- ◆ Reviewing the established metrics to complete job tasks;
- ◆ Projecting future resources;
- ◆ Justifying budget needs;
- ◆ Recording actual expenses to specific job tasks for appropriate billing / reimbursement;
- ◆ Determining cost / benefit of the programs implemented in their areas; and
- ◆ Managing time charged against federal grants.

Justification

This recommendation supports the Governor's goals of efficiency and effectiveness and collaboration and information sharing as described below.

Efficiency and Effectiveness

Significant labor cost efficiencies could be attained by the requirements of the centralized system. The system would:

- ◆ Save most state employees the trouble of filling out leave reporting forms;
- ◆ Eliminate supervisors' time reconciling leave slips;
- ◆ Eliminate unnecessary staff time for data entry;
- ◆ Significantly reduce hard copy FLSA time reports;
- ◆ Eliminate staff time necessary to review FLSA forms; and
- ◆ Provide better management reporting capabilities on identified projects.

For the purposes of computing statewide benefits, the following base facts from the 1999 Department of Personnel / GSS Workforce Report were used.

It was assumed that departments representing conservatively 25 percent of the workforce have some existing automated process that reduces the number of time / leave tracking forms and that provides some existing level of editing and reconciliation.

The estimated cost provided by ERP vendors to implement a timekeeping system that would eventually become part of a fully integrated ERP system was approximately \$8.0 million. This included conversion costs, the "as needed" implementation of a scaled back ERP to support EMPL, the interfaces to the existing systems (EMPL, CPPS, and COFRS), any customization, testing, training, documentation, and full implementation. Costs would be reduced if this implementation coincided with a statewide ERP implementation. Estimated annual cost savings total \$3.7 million and are attributable to the following items:

- ◆ Reduction of staff time in filling out leave tracking forms;
- ◆ Reduction in supervisors' time signing and reconciling leave forms to FLSA forms;
- ◆ Reduction of staff time to enter leave information into internal department computer systems;
- ◆ Reduction of work effort to correct leave taken when no leave was available;
- ◆ Time savings for staff time in filling out the FLSA forms every two weeks;

- ◆ Reduction of administrative staff time identifying overtime and processing those FLSA forms to payroll;
- ◆ Reduction of staff time to enter overtime information into internal department computer systems; and
- ◆ Reduction in forms costs.

With the estimated costs for a centralized system approaching \$8.0 million, the system should pay for itself in about 2.16 years.

Innovative Technology

A new timekeeping system should be implemented as a first step towards implementation of a consolidated HR and finance system.

Collaboration and Information Sharing

A new system would be built with an open architecture, which would allow greater access to data. Any timekeeping system must interface with existing legacy systems and with other components of the proposed HR and financial system.

ONLINE REIMBURSEMENTS

The State currently pays approximately 545,000 reimbursements monthly. Almost 102,000 are by warrant, the rest via electronic funds transfer (EFT). Approximately 19 percent of payroll payments are made by warrant. The majority of paper warrants are issued to biweekly employees. It is less efficient to process a payroll warrant than an EFT due to the handling involved.

Opportunity Statement

The State Personnel Director's administrative procedures require all employees be paid using direct deposit unless an agency's chief financial officer approves an exception.

Some departments, through the insistence of their Executive Directors, have nearly 100 percent compliance in the issuing of EFTs. Unfortunately, several departments fail to enforce the provision resulting in many employees continuing to receive warrants (paper paychecks).

To rectify these inconsistencies and realize greater savings, the State Fiscal Rules were recently revised to require that "state employees paid either monthly or biweekly on the State Payroll System shall be on the

Direct Deposit Payroll Program unless an exception is approved by the State Controller, or delegate.”

Employees also complete hard copy forms to request reimbursement of business expenses. Many times this manual process results in production of a warrant instead of an EFT. By automating the workflow of expense reimbursement from request to payment, the State will recognize additional efficiencies.

Assessment

Assuming that the State could achieve 95 percent compliance using EFT for payroll, the State could realize internal efficiencies. Additional efficiencies could be realized through increased usage of EFT for employee reimbursements. Although electronic expense reimbursement is available to state employees, the number of employees enrolled in this program is estimated to be only 10 percent.

During Fiscal Year (FY) 1998-99, the State issued 76,415 expense reimbursements at an average of \$150 per payment. The current cost to process and mail a warrant to an employee is \$11.35, while the cost to reimburse an employee via EFT is \$10.97. Assuming the State could enroll 95 percent of the remaining employees in the electronic expense reimbursement program, the State could realize additional annual savings.

Savings from reduced labor required to process expense reimbursements are pending further analysis. It is expected that the analysis will recognize FTE savings.

Recommended Solution

Recommendation 5.3: The State of Colorado should implement an online expense reimbursement system to allow employees to request and receive expense reimbursements via electronic media.

NCC supports the recommendations made by the State Controllers Office in mandating the use of EFT for payroll disbursement. In addition, NCC recommends a system whereby employees could request and receive expense reimbursements via electronic media, rather than using personnel staff to make the simple entries on their behalf. These electronic solutions would increase productivity and reduce redundancy.

Colorado Information Technology Services (CITS) has reviewed numerous tools and modules that may be used to extend the current system. Such tools most

often consist of an Internet-based front-end or software solutions that integrate into existing systems.

NCC strongly supports and encourages the efforts of the Department of Personnel / GSS staff in providing this Internet-based engineering product, as it is both cost effective and time efficient for state government. The Online Reimbursements solution may be coordinated with the Online Job Application and Online Benefit initiatives to obtain economies of scale. It is understood that these solutions should be integrated into an ERP system.

Justification

This recommendation supports the Governor’s goals of efficiency and effectiveness and innovative technology as described below.

Efficiency and Effectiveness

An online expense reimbursement system would result in efficiencies leading to cost avoidance and / or cost savings.

The specific amount of savings achieved by this solution is currently unknown; however, Application Services, within Department of Personnel / GSS, identified tools that would allow them to implement online services to the existing legacy systems. The costs for these tools should not exceed \$50,000. These tools would serve three initiatives: Online Reimbursements, Online Benefits, and Online Job Applications.

Innovative Technology

This initiative would assist the State in moving forward with web-enabled transactions. A new system should be built with an open architecture, which would allow greater access to data. Any interfaces with existing legacy systems should be built as a bridge / component of a new HR and finance system.

ONLINE BENEFITS

Employee demographic data changes periodically throughout an individual’s term of employment. These changes must be maintained in the State’s information systems. This requires significant HR resources, especially during the short open enrollment period for benefit changes.

Opportunity Statement

Throughout an individual’s employment period, any change to his or her benefit or demographic information currently has to be performed by a payroll

or personnel professional, as employees are unable to gain access to the system to administer their own data changes.

Assessment

An automated online benefit and demographic data entry / change option would provide a more efficient and cost-effective system. Potential benefits include the elimination of existing duplication of effort and a reduction of data entry errors. In addition, online benefits would allow real-time access to benefits and demographic information.

Recommended Solution

Recommendation 5.4: The State of Colorado should implement an online benefits system that allows employees access to benefit data through a web-enabled system.

NCC recommends a system where employees could access benefit data online directly through a web-enabled system, rather than using state personnel staff to make the entries on their behalf. These electronic solutions would increase productivity and reduce redundancy.

CITS has reviewed numerous tools and modules that may be used to extend the current system. Such tools most often consist of Internet-based front-end or software solutions that integrate into existing systems.

The Online Benefits solution may be coordinated with the Online Job Application and Online Reimbursement initiatives to obtain economies of scale. It is understood that these solutions should be integrated into an ERP system.

Justification

This recommendation supports two of the Governor's goals as described below.

Efficiency and Effectiveness

An online benefits system would result in efficiencies leading to cost avoidance and / or cost savings.

The specific amount of savings achieved by this solution is currently unknown. Application Services, within Department of Personnel / GSS, has identified tools that would allow them to implement online services to the existing legacy systems. The costs for

these tools should not exceed \$50,000. These tools would serve the three initiatives listed above and achieve additional savings to those listed in the Online Job Application justification.

Innovative Technology

This initiative would assist the State in moving forward with web-enabled transactions. A new system would be built with an open architecture, which would allow greater access to the data. Any interfaces with existing legacy systems should be built as a bridge / component of a new HR and finance system.

ONLINE JOB APPLICATIONS

Payroll and personnel professionals from the Department of Personnel / GSS and other departments have shared numerous concerns about the inefficiencies of the State's three current HR systems: ADS, EMPL, and CPPS. Of specific concern to the payroll and personnel professionals was the issue of inaccurate and duplicate data entries necessitated when transferring data from the employee application forms to the State's automated systems.

Opportunity Statement

Colorado currently provides job announcements and employment applications online. The State should also allow online completion of job applications. Currently, an individual may download an application from the State's website, or pick up a copy from state employment offices. The applicant must then complete the form and deliver, mail, or fax the application to the appropriate HR department. Upon receipt of an application, personnel professionals manually enter the applicant's information into the ADS. Upon hire, supplementary information is manually entered into EMPL. Finally, additional information must be entered into CPPS so the new employee can be paid.

Assessment

ADS lacks the capability to allow applicants to apply for jobs online. Furthermore, ADS is not integrated with the other systems to provide for a single point of entry for all data.

Since the 1980s, software innovations have automated employers' resume gathering, researching, and tracking abilities through the creation of electronic applications. Many private sector

companies and public agencies currently use electronic employment applications.

An online electronic employment application system would be more efficient and cost-effective. Potential benefits for an electronic application system include:

- ◆ Eliminating the necessity for staff to reenter applicant information into multiple systems;
- ◆ Reduction in data-entry errors; and
- ◆ Increased accuracy and usability of applicant information.

Applicants could benefit by submitting applications online from remote sites rather than downloading current application forms and then delivering, mailing, or faxing the documentation to the requesting department.

Recommended Solution

Recommendation 5.5: The State of Colorado should implement an online job application system to allow applicants to apply for state jobs through a web-enabled system.

NCC recommends a system where applicants could apply for jobs online directly through a web-enabled system, rather than using state personnel staff to make the entries on their behalf. These electronic solutions would increase productivity and reduce redundancy.

NCC has learned that IT professionals within GSS have made similar recommendations and are in the process of seeking options to implement these suggestions in the near future. CITS center has reviewed numerous tools and modules that may be used to extend the current ADS system.

NCC strongly supports and encourages the efforts of the Department of Personnel / GSS staff in providing this Internet based re-engineering product, as it is both cost effective and time efficient for state government.

This solution may be coordinated with the Online Benefits and Online Reimbursement initiatives to

obtain economies of scale. It is understood that these solutions must be integrated into an ERP system.

Justification

This recommendation supports three of the Governor's goals as described below.

Efficiency and Effectiveness

Based on the research from Human Resource Services within Department of Personnel / GSS, it is estimated that an online job application system would save the State 0.9 FTE. Using \$44,478 as the salary for an average FTE, the total annual savings would approximate \$40,000.

Application Services within Department of Personnel / GSS, has identified tools that would allow them to implement online services to the existing legacy systems. The costs for these tools should not exceed \$50,000. These tools would serve three initiatives: Online Reimbursements, Online Benefits, and Online Job Applications. The implementation would pay for itself in about 16 months based on savings from Online Job Applications alone.

Innovative Technology

This initiative would assist the State in moving forward with web enabled transactions. A new system would be built with an open architecture, which would allow greater access to data. Any interfaces with existing systems must be built as a bridge / component of a new HR and finance system.

Access to State Government

This initiative will bring an online service to the citizens of Colorado.