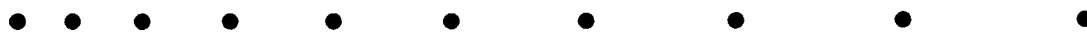


State of Oregon

Enterprise Information Technology Strategy



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The State of Oregon
Information Resources Management Council

October 1998

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THE STRATEGY

In a rapidly changing world, government's success depends, in part, upon its ability to quickly and intelligently mobilize resources in response to a range of complex problems and opportunities. This ability demands clear, current, and accurate information about resources and program performance.

In the absence of a coherent enterprise vision and plan, government agencies and institutions typically manage their information resources independently. The result is information systems and technologies that are often incompatible and duplicative. Oregon governments need to manage their information resources as strategic assets. The enterprise – our educational entities, libraries, state and local governments and other information partners – can benefit as we work toward a shared information environment.

The success of Oregon governments' service goals and initiatives will depend, in large measure, on the effectiveness of our information systems. If we are to successfully respond to the challenges that lie ahead, support business goals and objectives, improve programs, measure performance, make good policy decisions, and respond to rapid changes in business requirements, we must continue to improve our ability to manage our information resources. This will not be possible without careful planning.

In 1991, the legislature passed Senate Bill 1210. This legislation states, "*Information is a strategic asset of the state which must be managed as a valuable state resource.*" In 1995, the legislature passed Senate Bill 994. This statute directed the Oregon Department of Administrative Services (DAS) to "*...coordinate the consolidation and operation of all telecommunications systems used by the state and state agencies.*" It also asked DAS and the Assistant to the Governor for Telecommunications Policy to "*...seek methods for using state resources and investments to bring the benefits of advanced telecommunications to rural communities and to increase the use of telecommunications in commerce in the state.*"

To these ends, Governor Kitzhaber issued Executive Order 98-05, directing DAS to reconvene the Information Resources Management Council (IRMC) to oversee the development of this five-year Enterprise Information Technology Strategy for Oregon.

The IRMC, established in statute in 1991 (ORS 291.038), was reconvened in April to oversee the development of this strategy. The IRMC is composed of 22 members representing the three branches of government, local governments, all levels of education, and the private sector (see Appendix C). In addition to the IRMC, over 75 people participated on five workgroups:

* *Enterprise* refers to the combined interests and missions of Oregon state government, including all three branches, higher education, community colleges, K-12 education, local and county governments and communities of interest serving a public interest mission. All of these sectors are represented on the Information Resources Management Council, including the Oregon Legislature, Public Utility Commission and Judicial branch.

- Business Processes;
- Network Architecture;
- Internet Applications;
- Governance and Management of Standards;
- IT Workforce Development.

The IRMC began by reviewing a strategic assessment of Oregon's technology strengths and weaknesses, industry trends, and other states' strategic technology plans. This information was used to educate council members on current technology issues and opportunities. The Business Processes workgroup was assigned the task of inventorying and prioritizing the state's most critical business processes. These prioritized business processes were given to the other workgroups to provide a focus and context for their deliberations. Each workgroup was charged with identifying goals, strategies and recommendations that support the state's critical business processes.

A goal of this strategy is to create an information environment where Oregon's citizens and public servants enjoy the usefulness of information, not the limitations of proprietary and independent systems. Such an environment is predicated upon the development of statewide technology standards and easy access to enterprise information and data. It requires unprecedented cooperative planning and development to meet statewide and interagency information and service delivery needs.

This strategy is guided by several considerations. First, statewide or interagency information resources are neither static nor easily defined – they extend to any data, information, applications or facilities in which two or more agencies have a stake. Second, an approach to data and network sharing must be defined cooperatively wherever these communities of interest exist. Any one agency's plans and acquisitions of potential interest to the community of agencies must be subject to peer review. Third, statewide or interagency data should be collected only once, at the source, only if it is truly needed, and shared with all that legitimately need it. Fourth, a common communications network should service shared destinations for voice, data, and video traffic. Fifth, the antidote to proprietary systems is a serious commitment to planning for and vigorously procuring interoperable systems.

Acknowledging the five considerations above, the IRMC identified a comprehensive vision and set of principles for the use and management of information technology for Oregon governments.

VISION

Oregon's state government enterprise – its educational entities, libraries, state and local governments and other information partners – uses a mix of electronic and information technologies to provide citizens with many basic services in a friendly, efficient and accessible manner. The public has access to these tools so that cost, time or location does not limit their interactions with government agencies and officials. Information technologies are used within Oregon government to improve the quality of service, increase productivity, achieve efficiencies in the delivery of services, and help achieve the state's growth management goals. The state government enterprise accomplishes these outcomes through the prudent investment in and shared use of electronic technologies.

To achieve this vision and to support the continued improvement in services provided to the citizens of the State of Oregon, public servants must seek opportunities to promote collaborations and partnerships to overcome barriers of cost, jurisdiction, time or geography. The practices to be followed, which will help achieve this vision, are to:

- Increase public access to government information by making frequently requested government information available online 24 hours a day, 7 days a week, 365 days a year;
- Acquire technology that is adaptable and interoperable;
- Foster partnerships;
- Select open architecture solutions that are designed for long term growth and utility;
- Make information accessible through shared network infrastructure;
- Design system flexibility that allows users to develop unique solutions that suit individual needs;
- Reduce transaction times for those using government services;
- Leverage state information technology investments to benefit multiple agencies, governments and its citizens;
- Get the maximum benefit of current information and technology;
- Improve opportunities for enterprise growth and development throughout the state; and
- Increase the quality and quantity of distance learning offerings.

PRINCIPLES

Oregon's enterprise information technology systems will be designed and coordinated to:

- Continually improve the state's key functions and services;
- Share information easily through all levels of government and with its partners;
- Encourage all levels of government to work together, aggregating resources where possible to meet all needs, including community needs whenever feasible;
- Accommodate and improve citizen access to public officials and employees, information, and services.

OPERATING PRINCIPLES

Services: Services should be distinct and measurable. Service should be customer driven. Customers include citizens, the appropriate leadership in municipalities, school districts, and federal and state agencies.

Costs: All costs, both direct and indirect (including overhead, costs of borrowing and depreciation) should be clearly identified and assigned to each service. Portions of Oregon's electronic infrastructure may require subsidies due to initial investment requirements, geography, and demographics. Any subsidies should be direct and explicit.

Measuring Rates and User Charges: Rates, fees, and user charges for services should be estimated in advance of acquisitions. Customers should have an opportunity to select services via a contract arrangement. Customers should be charged based on the number of service units they use. Rates, fees, and user charges should be at or below market rates. Long term communications/computing contracts should be avoided since computing and communications costs are declining.

KEY STRATEGIES

During its five months of deliberations, the IRMC and its workgroups identified numerous strategies and recommendations that must be acted upon if Oregon governments and educational institutions are going to be successful in the 21st century.

These deliberations produced initiatives that cut across the boundaries of the workgroups. These cross-cutting elements constitute this strategy.

Year 2000

For the next year or so, the state will have to focus many of its resources on finding and fixing systems that are not Year 2000 compliant. Failure to do so could result in the inability to carry out critical government functions. Successfully meeting the Year 2000 challenge is a fiscal, operational, and political priority when considering all new technology investments for the next 12 to 24 months. As investments are made to correct Year 2000-related problems, the initiatives and standards outlined in this strategy should be adhered to wherever possible.

Tactical Initiatives

This Biennium:

- Develop and implement a statewide Year 2000 communications plan.
- Develop branch and agency business continuation plans. These plans should describe how services will be provided if mission critical system fail because of the Year 2000 date change. Based on these plans, develop an enterprise-wide business continuation plan.
- Conduct realistic assessments of progress against remediation schedules. This will identify systems that may be at risk of not being fixed on time.
- Inventory and assess interfaces with data trading partners to make sure data exchanges are Year 2000 compliant. Conduct interface tests in 1999.
- Monitor external sectors and regulated industries in Oregon whose Year 2000 remediation is essential to public health, safety, and welfare.

Enterprise Technology Architecture

An enterprise technology architecture is a framework and set of guidelines that are used to build and manage information systems. It is based on industry and international standards. The ideal architecture permits access to the entire system of computers, applications, databases, and network services through a single workstation that is easy to use and operates with a common user interface.

A technology platform is made up of computers, databases, and communication networks that act as an electronic nervous system capable of supporting a wide array of applications and services. Today, Oregon's technology platform is more a collection of separate, agency-focused technologies that don't always serve the corporate needs of the government enterprise.

The overarching goal for the state's standards-based architecture is to enable agencies and educational institutions to increase the quantity and quality of services to the citizens of Oregon while at the same time, reducing the cost of providing those services. More specifically, a standards-based architecture will allow us to: improve access to data; implement new systems

more quickly; minimize support costs; leverage available talent and skills; more easily adapt to change; communicate a common direction; and, manage system complexity.

Tactical Initiatives

This Biennium:

- Formalize technology standards management by creating a governance body to select, sustain, change, phase out, and retire standards. Establish a reasonable migration path and period to attain standards. A process for the governance of standards has been outlined in Appendix E.
- Adopt and maintain technical and management standards for (see Appendix E):
 - Network Communications
 - Server and Network Applications
 - EDI and Electronic Commerce
 - Desktop Operating Systems and Software
 - Document Imaging
 - Project Management and Quality
 - Essential Records - Retention and Disposition
- Develop a phased implementation plan to align operations of the DAS and Oregon Department of Transportation (ODOT) data centers.

1999-2001 Biennium:

- Implement a streamlined review process for agencies procuring technology that adheres to state standards. Research and recommend ways to improve the procurement of technology-related goods and services.
- Integrate government electronic mail systems.
- Initiate first phase(s) of DAS and ODOT data center operational alignment.
- Develop a list of changes to legislation and administrative rules needed to support integrated technology solutions.
- Monitor and implement these emerging technical standards (see Appendix E):
 - Network Applications
 - Encryption, Authentication, and Secure Transactions
 - Data Management
 - Database Products
 - Application Development Tools

3 – 5 Years:

- Complete operational alignment of DAS and ODOT data centers.

Statewide Voice, Video, and Data Network

High capacity, high availability networks will enable new ways to deliver government services, educate our citizens, and promote economic development. Voice, video, and data network technologies are converging. The state can no longer afford to develop and manage network resources independently. Oregon state government, city and county governments and educational institutions must make strategic and cooperative investments to prepare Oregonians to take advantage of the technologies that are under development today and will be available in the next two to five years.

As proposed in this strategy, the State of Oregon Enterprise Network (Figure 1) will provide connections to higher education, elementary and secondary education, public libraries, hospitals, governments, government agencies and the Internet itself, via a very high bandwidth network. These statewide connections will promote new and consistent ways of providing services, allow expanded distance learning opportunities, and foster new approaches to growth management, including helping rural Oregon share in the prosperity that urban Oregon has enjoyed.

Tactical Initiatives

This Biennium:

- Create a statewide network advisory subcommittee of the IRMC. This group will assess statewide network needs and provide guidance and recommendations to the IRMC.
- Adopt a minimum set of voice, video, and data network standards.
- Conduct Department of Corrections video visitation pilots.
- Explore opportunities to leverage ODOT Intelligent Transportation System (ITS) investments that support the State of Oregon Enterprise Network development. Assess using state highway right-of-ways as incentives in obtaining cost effective network transport.
- Develop a Video & Online Services (formerly ED-Net) transition strategy for Network II. Transition from satellite-based network to terrestrial network.
- Capitol Mall Backbone – (work in progress – completion December 1998)
- High Speed Backbone Phase 1 – Hub sites at Salem, Portland, Bend and Burns (Ontario possible implementation). (Work in progress – part of the Burns project, completion January 1999).

1999-2001 biennium:

- High Speed Backbone Phase 2 – Hub sites at Salem, Corvallis/Albany, Eugene, Medford and Ashland (completion possible fourth quarter 1999)
- High Speed Backbone Phase 3 – Hub sites at Portland, The Dalles, Pendleton, La Grande, Baker City and Ontario (completion possible second quarter 2000)
- High Speed Backbone Phase 4 – Hub site for Klamath Falls (completion possible second quarter 2000)
- High Speed Backbone Phase 5 – Connection between Klamath Falls and Bend (completion possible third quarter 2000)
- High Speed Backbone Phase 6 – Connection between Burns and Ontario (completion possible third quarter 2000)
- High Speed Backbone Phase 7 – Connection between Eugene and Florence (completion possible first quarter 2001)
- Evaluate opportunities to aggregate and re-bid contracts for voice, video, and data services.
- Develop a coordinated investment strategy that supports ODOT ITS, Department of Corrections video visitation, and State of Oregon Enterprise Network development.
- Expand distance learning and distance education programs throughout the state.

The enterprise network has been designed and will be deployed and managed to support a wide variety of users by all members of the enterprise. When fully deployed (July 1, 2001), the enterprise network will provide transport for voice, video and data. By aggregating the demand of the enterprise, it will be possible to achieve enormous economies of scale and cost savings for use of a high-capacity broadband network.

Not illustrated in Figure 1 are the more than 100 “spoke sites” which will be deployed as part of the enterprise network (see full Network Architecture Work Group report in Appendix E for detailed maps.)

Among the most important applications of the broadband network technology is distance education and learning delivered by and to Oregon’s schools, colleges and universities. These and other uses by the education sector are described in Figure 2.

Functions	Purpose	Sample Applications	Infrastructure	Sectors
Direct Education:				
Courses via interactive video (1- and 2-way video, audio)	Access to students to courses; access to degree, certificate, and teacher professional development programs within geographic regions and statewide	CAM strands for high school requirements, specialized classes unavailable in local schools; college programs/degrees (certificates, associate, bachelor's, master's)	ED-NET I-II, PictureTel (upgrades to VTEL, Optivision), cable networks, OPEN Clearinghouse, technical staff, ITFS, electronic classrooms, training	K-12 + ESDs 2-yr institutions 4-yr institutions
Courses via Internet (online)	Access to/from students at homes, businesses, college campuses, K-12 schools, community learning centers; teacher professional development	Cyberschool, email to students/faculty, online classes and workshops, Web searches for information/data/materials, certificate programs, associate degrees, college minors	Internet via OPEN/OWEN and other providers, school and campus intranets, technical staff, rewired buildings, instructional labs, training	K-12 + ESDs 2-yr institutions 4-yr institutions
Broadcast programming (1-way video, no audio back)	Access to educational programs/materials (wide audience access/mass distribution), teacher/staff development	Citizen literacy, curriculum supplements for teachers, teacher professional development, K-12 classes via satellite, associate degrees via telecourses, cultural events	Satellite (TI-IN, Star Network), cable networks in regions/districts, OPB analog and digitized video channels, ITFS in regions, technical staff	K-12 + ESDs 2-yr institutions 4-yr institutions OPB
Knowledge Production:				
Research and scholarship	Conduct research (applied, experimental) for the creation of new knowledge and scholarship	High-speed computing for analysis of large databases, large database searches, collaborations with other researchers within universities, industry, and government	Internet, Next Generation Internet for high bandwidth connections (Internet II, Abilene, vBNS), centralized computers, rewired buildings, technical staff, training	4-yr institutions
Services:				
Libraries (online) and electronic information services, other resources	Connect all college/university and state libraries electronically for improved access to students in distance education programs, others needing access at home/workplace	Provide reference materials to students and faculty to support educational programs both on and off-campus; provide data searches to employees at worksites/homes	Internet, software, hardware, common databases and standards, joint purchasing agreements, technical staff, rewired buildings, training	K-12 + ESDs 2-yr institutions 4-yr institutions state library
Student services, economic development services	Provide requisite services to students, especially to facilitate movement among educational sectors; assure institutional accreditation; information on education for businesses considering locating in Oregon	General information (Cyberschool, OSSC, ONE, OCCDEC Web pages), admission, placement, registration, pay fees, advising, financial aid, transcripts, degree audits, transfer/articulation (OUS Web-accessible)	Internet, software applications, inter-campus links, telephone, common standards, Web pages, centralized computers, technical staff, training	K-12 + ESDs 2-yr institutions 4-yr institutions OSSC
Community Services:				
Extension services; other statewide and regional services; customized training	Provide education/training noncredit programs (e.g., agriculture, forestry, consumer education, fisheries, transportation, tourism); special economic development projects	Short-term training programs, consulting, informational materials, summer programs for youth, regional services for small businesses	Internet, Web searches, ED-NET I-II, other interactive video, Internet II, technical staff, training	2-yr institutions 4-yr institutions
Management:				
Administrative communications, record keeping, reporting	Provide efficient and effective management and communications services to educational institutions in support of missions; meet state/federal reporting requirements	Email-daily workplace communications, teleconference meetings (reduce time on road), listservs for rapid dissemination of meeting agendas/minutes, budget processes/payroll, personnel/other electronic record keeping, operation of facilities/other infrastructure	Telephone, email, Internet, intranets, video teleconferencing (PictureTel, ED-NET), software packages, joint licensing agreements, common applications, technical staff, centralized computers, training, rewired buildings	K-12 + ESDs 2-yr institutions 4-yr institutions

Internet/Intranet

The Internet and web-based technologies are transforming the way educators educate and governments govern. Oregon government agencies and educational institutions have made and continue to make significant investments to exploit the potential of these new technologies. As we move forward, we must work cooperatively to fully leverage existing and emerging Internet technologies. If done well, we will enable new ways to deliver educational coursework, transform government service delivery, and promote new and balanced economic development opportunities for all Oregonians.

The State's strategic efforts should be focused on developing and communicating a strategic vision for the use of the Internet and the web, including management and governance, throughout the highest levels of state government. Standards need to be established that enable all future applications to support Internet functionality. We must begin developing a corporate intranet for communications and central services where the customers are already connected.

Tactical Initiatives

This Biennium:

- Reconvene the state Internet Advisory Council or a similar group. This interagency group will identify short-term opportunities to implement web-based technologies. This group will provide regular reports to the IRMC.
- Implement a government information locator system (GILS) model to organize and index government information.
- Implement web-based training and central documentation systems.
- Establish an electronic data interchange (EDI) and electronic commerce (EC) task force to identify pilot opportunities, develop proposed standards, and draft EDI/EC policies.
- Design an enterprise-wide intranet.

1999-2001 biennium:

- Establish a service bureau for web-based technology and EC coordination and development.
- Implement two enterprise intranet pilot applications (e.g. car reservations, personnel actions, timesheets, meeting facility scheduling, print orders, purchase orders, contracts, any forms-based activities).
- Implement EDI standards and central EDI services to enable data exchange between systems and eliminate redundancy.
- Implement EC standards and central EC services to enable full commerce with major business partners.

3 – 5 years:

- Use shared networks and/or existing points of presence for citizen access – use Employment Department kiosks, Lottery systems, library terminals, local school systems, and other public access devices to provide services.
- Deliver secured public access to all appropriate data sources within state government, including enterprise document and data repositories, via the web.
- Provide secured financial and informational transactions between the public and any state agency via the web.

Corporate Data Management

We live in a time when our computers and communication systems are relatively easy to interconnect and inter-operate due to *de facto* and international technology standards. However, our ability to organize, exchange, and make sense of data contained in our computer systems is restricted. This challenge is compounded by the fact that important entities of data – such as “offender,” “water,” “client,” and others – are gathered simultaneously by multiple agencies using multiple methods for collection, organization, naming and definition, storage, retrieval, and transmission. Our enterprise incurs substantial costs in terms of redundant data collection, preparation, processing, and storage. These costs have not been quantified, but they are real and they can be mitigated.

Oregon governments and their information trading partners must commit to a corporate data management ethic. Government must get to the point where data can be integrated readily from various sources for policy analysis, program management, and performance measurement. Processes and procedures need to be established to foster interagency and intergovernmental data development and sharing.

However, most would agree that enterprise-scale data management reform is difficult and costly. Oregon should commit to an evolutionary rather than a revolutionary approach to corporate data management. Initial data management efforts should focus on new projects, smaller initiatives and defined communities of interest.

Investments in enterprise data warehouse and data clearinghouse technologies need to be made. Pilot projects should be initiated to strengthen the state’s data administration skill base and demonstrate the benefits of enterprise data management. Opportunities to do this exist among agencies involved with geographic information systems (GIS), juvenile and criminal justice systems, statewide financial management and accounting, the Salmon Plan initiative, and the Community Solutions Team.

Tactical Initiatives

This Biennium:

- Form a Data Standards Task Force. Identify common data needs and recommend changes necessary to existing or planned data to facilitate enterprise-wide integration.
- Expand and extend current GIS development. Overlay onto existing and emerging databases and data sets.
- Design decision support and integrated database pilots for the public safety community and the Community Solutions Team.
- Appoint a Statewide Business Processes Team to continue analysis of the business process inventory and make recommendations to the IRMC.

1999-2001 biennium:

- Deploy integrated databases for the public safety community and the Community Solutions Team.
- Expand the DAS data warehouse to include additional corporate data.
- Establish a data clearinghouse, either at the State Library or at DAS Information Resources Management Division. This would provide metadata (data about data) on existing needs, data being collected, and databases in existence or under development.
- Research and recommend middleware solutions to tie systems together and provide added functionality to legacy systems.

3 – 5 years:

- Expand and extend the enterprise data warehouse. Include and integrate corporate data across the enterprise. Provide necessary data mining tools and training to ensure that information is readily accessible.

Recruitment and Retention of IT Professionals

In recent years, the state has had a harder time recruiting and retaining qualified information technology (IT) professionals. The shortage of IT staff is an international problem that is projected to get worse before it gets better. In addition, the kinds of IT skills needed for the future is changing. These challenges have resulted in a greater reliance on external IT service providers. Not only do these services cost more than in-house staff, but the state loses the knowledge and expertise when a contract ends.

The state has implemented several noteworthy IT recruitment and retention initiatives. If Oregon government wants to be effective in the 21st century and competitive in the IT human resource marketplace, it must do more. To fully leverage its technology investments and maximize the usefulness of its information resources, we must continue to recruit and retain highly qualified

information management professionals. Each organization needs to assess the proper mix of contract versus state staff for implementing and maintaining information systems.

To stay competitive, the state must increase collaboration among state agencies and partner with public and private organizations to improve the recruitment and training of IT staff. We must regularly review and, if necessary, refine state IT classifications and compensation to keep pace with changes in the IT career field. We must also identify opportunities to reduce IT recruitment times, streamline application process for IT positions, and expand state-sponsored training programs. Finally, DAS must upgrade its corporate human resource information system and underlying processes to enable creative and streamlined ways of identifying qualified candidates for state agencies.

Tactical Initiatives

This Biennium:

- Implement the state project management certification program.
- Continue the Information Systems Co-op (IS Co-op). The IS Co-op should regularly report to the IRMC.
- Develop a new Executive Education Program to communicate information resources management issues and opportunities to government executives.
- Conduct an IT training needs survey and identify related training resources.
- Regularly review IT compensation and classifications and make adjustments to remain competitive with market conditions.

1999-2001 biennium:

- Expand statewide training programs (e.g. project management certification, executive education program).
- Expand formal IT recruiting program targeting colleges and universities.
- Complete feasibility study on pooling IT positions and report findings to the IRMC.
- Combine the eight levels of the Information Systems Specialist classification into four and establish salary ranges that are consistent with the market.
- Assess and amend policies that provide increased flexibility for employees trying to manage work and family issues.
- Continue to identify ways to reduce recruiting times for IT positions.

3 – 5 years:

- Implement a new corporate human resource information system.

Next Steps by the IRMC:

- Develop budget/resource estimates.
- Assign lead responsibility for each recommendation.
- Develop work plans for each recommendation. Each work plan should include key activities, timeframes, and lead responsibility.
- Establish a process to review and report progress on reaching the goals set forth in this strategy.
- Establish a process to update and amend this strategy on a regular basis.