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# **OREGON INFORMATION RESOURCES**

***ACCOUNTABILITY, TRANSPARENCY, EFFICIENCY,  
QUALITY, ENGAGEMENT***

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## **Enterprise Information Resource Management Strategy 2015-2020**

*V 1.0 – February 1, 2015*

## Acknowledgements

### Contributors

The 2015-2020 Enterprise Information Resource Management Strategy (EIRMS) update has been crafted in response to guidance and recommendations from variety of stakeholders including: agency directors; administrative business services directors; chief information officers (CIO); enterprise architects; information resource oversight professionals; senior operations and policy analysts; public and private sector subject matter experts; researchers; and consultants. A debt of gratitude is owed those who have worked toward successful government information resource management over the last several years.

Below is a partial listing of those who serve in various enterprise-level governance dedicating hours of time to subjects that have become the focus of this strategy.

**Information Technology Governance Implementation Steering Team:** Mary Abrams; Pat Allen; Tony Black; Jennifer Bjerke; Brian DeForest; Allyson Ford; Steven Hoffert; Michael Jordan; Kris Kautz; Elizabeth Meuse; Kerri Nelson; Barry Pack; Julie Pearson; Scott Robinson; Clyde Saiki; Jim Scherzinger; David Soloos; Ben Tate; Margaret VanVliet; and, Tom Worthy.

**Technology Advisory Team:** Julie Pearson-Ruthven; Steven Hoffert; Terrence Woods; Bill Carpenter; Kurtis Danka; Lorrin King; Ken Smith; Rick Hanson, Julie Bozzi

*To all of these contributors, thank you!*

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## ***A Strategy to Achieve the Objectives of Oregon's 10-Year Plan***

### **Message from the State Chief Information Officer**

2015 will be remembered as a watershed year for the State of Oregon's Office of the State CIO. Since 2010, the Office of the State CIO was focused exclusively upon the oversight of IT activities of state agencies. In January 2014 there were eighteen IT professionals in this office, with half of those working in the State GIS Services (GEO). Of the remaining nine, four professionals work in the office of Enterprise Security Management (ESO), and five in the Information Technology Investment Portfolio (ITIP) group. Eighteen active projects were overseen by this group in January 2014, with no formalized process agreed upon with the Legislative Fiscal Office for how these projects should be evaluated and no tool to facilitate the oversight process. ITIP professionals depend heavily on the activities of the quality assurance/quality control vendors working on projects reporting to the sponsoring agencies performing the work, with little insight or appreciation of the strategies, plans, priorities, or envisioned initiatives of the 162+ agencies, boards, and commissions of the state.

The Director of DAS identified IT governance as a significant need, and much work has been done which proceeds my arrival. The establishment of an Enterprise IT Governance Steering Team (EITG), with delegated authority to direct resources, to establish the charter, principals, membership, and domain of responsibility for decision making was well underway when I arrived. Through the Strategic Technology Officers (STO's), this activity is being operationalized throughout the executive branch. Upon the approval of the Policy Option Package (POP) and December 2014 E-Board request for funding of the Enterprise Security Monitoring tool and the Project Portfolio Management (PPM) tool, this initiative continues to accelerate.

One area that had not received much attention was the development of the meta-models for IT governance: the establishment of a standardized life cycle methodology of IT projects which both the LFO and ITIP oversight process would adhere to; the articulation of the professional objectives for the Office of the State CIO; standardized software development and system implementation methodologies to be used by agencies and vendors as they pursue IT initiatives; stipulation of environments where specific services can or should exist; the articulation of a common data dictionary and models for representation of things important to the organization (to facilitate integration of data); and the supporting work flow processes to enable the previously mentioned life cycle process in cooperation with procurement, budgeting, accounts payable, contracting, QA/QC/IV&V vendors, and other internal and external organizations who support agency IT initiatives. Significant attention could only be given to the development of a unified systems development life cycle with the LFO before demands arising from Cover Oregon took center stage, but completion of the SDLC and to the establishment of the other five models will be undertaken in the next biennium.

Another area which had not received much attention was in the area of rules and policies. Many IT policies have not been reviewed for years, and in many instances no policies exist with practices varying from one project to the next. Rules and policies are created when a desired agency strategy creates a conflict of objectives for the state. This previous year the Customer Utility Board was empowered with the authority to recommend approval or denial of exception requests for ETS mandated services to the State CIO. Three exception requests were heard by the ETS CUB, two found compromises and one was denied. All existing rules and policies will be reviewed in the coming biennium with the expectation of simplification in areas of oversight and expansion to ensure alignment, integration, flexibility, and to reduce implementation time across the entire state.

IT failures have resulted from mismatched capacity, fragmented delivery and governance, suboptimal target outcomes, and the inefficient use of highly skilled technical staff. The current practice of managing in a project-by-project approach does nothing to address these macro issues. The only sustainable way to address these challenges is to start with an in-depth analysis of the current processes used over a full cycle of the development and implementation of a technology solution. With that understanding the IT services delivery teams and the business leaders can work together to deliver better outcomes. This is the challenge this edition of the Enterprise Information Resource Management Strategy intends to address.

Sincerely,

Alex Z. Pettit, Ph.D.  
Chief Information Officer, State of Oregon

## Section 1 - About the Enterprise IRM Strategy

### 1.1 Role of the State CIO

**Authority** - Oregon's State Chief Information Officer (State CIO) is appointed by the Governor under the authority of amendments to law enacted in 2014<sup>1</sup>. **Governance** - The position of Chief Operating Officer (COO) of Oregon state government was established in February 2011. The COO subsequently established an enterprise-level governance framework that provides an avenue to define the enterprise-level priorities and target outcomes for all of state government. This framework also provides the State CIO an avenue to routinely engage top state agency executives and their administrative and technology leadership teams to identify ways and means for information resources to best support attainment of priorities and outcomes. **Accountability** - Under law and in practice the State CIO acts as the information and technology leader for state government. **Strategy** - The State CIO has an obligation under law to biennially to craft an enterprise-level information resource management strategy (EIRMS). Guidance from participants in the various enterprise governance efforts directly influence the nature and content of the strategy. While law requires at least a biennial update of the strategy, in practice strategy deployment is dynamic reflecting an ever-deeper understanding and refinement of the roadmap forward. **Policy** - Law also requires the State CIO to promulgate administrative rules, statewide policies, architecture, standards and specifications needed to align agencies to strategic purpose and predictably realize target outcomes over time. **Action** – Lifting the focus of the OSCIO from a project-by-project approach to the comprehensive design and implementation of standard models and practices will, in turn, lift the maturity, capacity, and capabilities of all agency IT operations. Development of the meta-models governing IT for the State, acquisition and implementation of technology tools to bring these models to life, modification and articulation of policies and rules to memorialize the processes, and the governance structures to decide and prioritize IT investments and activities within understandable boundaries will consume the energies of the OSCIO for the coming biennium.

### 1.2 Purpose

The purpose of the 2015-2020 EIRMS is to:

- **Shared Vision** - Establish a **shared vision** to guide decision making and the use of information resources across state government;
- **Roadmap** - Provide a **roadmap** for a productive, multi-agency approach to information resource management articulating the interdependencies of solutions;
- **Mental Models** - Ensure stakeholders share an understanding of both the current state and **desired model of the future state**; and,
- **Team Learning** - Ensure all stakeholders engage in the process of **shared learning** that is derived from our activities to improve processes and solutions which support service delivery to citizens.

**Predictable Conversion of Strategy to Action** - This strategy guides the evolution of information resource management over time driven by the business. Enterprise architecture is used to reliably convert strategic vision to an actionable roadmap and enterprise operating assumptions that ensure achievement the state's top priorities and target outcomes.

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<sup>1</sup> House Bill 4135 (2014), Enrolled - <https://olis.leg.state.or.us/liz/2014R1/Downloads/MeasureDocument/HB4135>

## 1.3 Guiding Principles

The following Guiding Principles have been crafted to align with the Enterprise Leadership Team's vision to guide the EIRMS implementation over time.

- **Business-driven** - Information resource management is focused on achievement of state and agency mission objectives and the overarching operational requirements of government. To accomplish this, the business must lead technology, which implies the business can articulate how projects and activities support the agency mission, which informs the IT activities and priorities.  
Targeted business outcomes drive information resource management. Facts drive decision-making and investment strategies. Starting with the fundamentals management maps developed with Mass Ingenuity, we will use the Zachman framework to further refine and align the outcomes articulated in the 10 year plan with the programs and supporting projects pursued by agencies in the coming biennium.
- **Oversight, Control, and Transparency** - Effective oversight and control mechanisms guide information resource investments, deployment and use. The implementation of a unified Project Portfolio Management (PPM) tool will help bring the stage gate process to life and enable greater internal and external transparency of progress and activities across the state. Transparency assures fiscally responsible investment management without applying unnecessary procedural burdens or roadblocks.
- **Iterative Progress and Solutions** – Incremental approaches to both solution design and implementation in an iterative process will be incorporated into our meta-models for process definitions. Development of both the designs and actual IT solutions allow us to take advantage of what was learned during development of earlier parts or versions, supporting course corrections when necessary and enabling “go” or “no-go” decisions on whether to continue the investment in a project at predefined points of expected delivery. Modified waterfall, rational unified process (RUP), package enabled re-engineering (PER), extreme programming and various agile software development frameworks are but a few of the methodologies to be reviewed and approved by IT governance.
- **Innovation** – Innovation is the hallmark of relevant IT solution providers. IT solutions which are not innovative are utility services, where quality is uniform among providers with the only differences which make a difference being price. IT continues to be a discipline led by the practitioners, with new innovations appearing routinely, disrupting the best practices for delivering services. Identifying and successfully incorporating these disruptions into the delivery of state services is both a challenge and obligation.
- **Risk Tolerance** - Risk tolerance and management too tightly controlled can keep solutions from meeting business needs. Ensuring risk exposure is empirically articulated is an important aspect to IT governance and project management. Many different measurements are available, including function point analysis, IT technical debt, and other tools mapping likelihood of an event with the severity of impact can all help understand and then address risk through mitigation, avoidance, transfer, or acceptance.
- **Optimization** – Through the process of governance, IT solutions which address common business needs and would lend themselves to shared services will support optimization by reducing the entropy necessary to sustain the resulting systems. Four potential shared services were identified recently in an interactive user lab to discuss legacy systems: procure to pay; human resource information systems; financial and accounting systems; and budget and forecasting systems. By bringing requirements to an architecture review committee, common needs and common solutions can be identified and implemented for the most optimal use of resources.

- **Changeability / Adaptability** - Develop project plans and solutions that can respond to change or adapt in response to emerging challenges or opportunities evolve. This will require considering the use of more flexible solutions which will simultaneously support both internal and external participants as both service providers and recipients.
- **Security Foundation** - Information security and integrity provides the foundation for optimized government operations, making every agency's contribution to that fabric of trust critical. Due diligence in the realm of information security and integrity is an imperative. Newly acquired security tools will assist in monitoring the electronic perimeter and facilitate reporting to the Enterprise Security Office.
- **Strategic Simplicity** - Standardization and elimination of redundancy is used to progressively simplify the information and technology resource base making ever more innovation and optimization possible, including creating strategic capabilities needed to address requirements projected for the future. A bias to use existing state-owned solutions to meet newly articulated needs ensures maximum leveraging of previous taxpayer investment, organizational value, comprehensive functionality, and strategic capabilities for all stakeholders.
- **Measured Achievement and Value** - Ensure achievement and accrued value are incrementally measured and routinely reported as a means to verify and validate achievement and performance.

## 1.4 High-Level Operating Model, Office of the State CIO

The Office of the State CIO serves as the hub of information resource oversight and management for state government. The function of the office is described through this strategy. There are several general themes of activity underway. The operating model of each is different. Examples of general operating themes promoted by the Office of the State CIO include:

- 1) **Baseline Operations** – Accountabilities have been assigned to the State CIO through statute and in practice. These include: stage gate oversight; quality control and quality assurance; IT asset inventory and management; IT meta architecture and planning; as well as rule, policy and standard setting. While a collaborative bias will always underpin these efforts, they are activities undertaken under specific statutory authority by the State CIO.
- 2) **Strategic Review** – In 2014 several agency reviews (referred to as “deep dives”) were undertaken with the objective of taking a detailed look at a troubled IT delivery program. This ad hoc approach makes consistent evaluation difficult without the rubric for evaluation understood ahead of time. It is expected that these reviews will be less necessary as preferred practices and expectations are codified in the form of models and policies supported by technology tools and governance processes to ensure desired outcomes.
- 3) **Program Evolution** – Feedback is the single greatest determinant of human behavior. One fundamental handicap of many State agencies is the limited capacity to solicit and accept relevant feedback from internal and external sources. Contemporary approaches to soliciting feedback offer less formal yet still effective method to evolve key information programs by incorporating social media tools and activities to engage our user communities and stakeholders in novel ways, including communities of practice wikis, portals, interactive surveys, and end user labs to solicit ideas and observations from the communities we serve. Some of these tools are already in use, others have yet to take shape, but all will contribute to the transformation of IT in the state.
- 4) **Multi-Jurisdiction Collaboration** – At the outer reaches of development are topics where no authority exists but where the Office of the State CIO could be used to sponsor the forum and potentially help participants act on takeaways.

## **1.5 State Priorities**

**Transparency & Open Government** - Oregon is considered a model of excellence in transparency (open government) having been ranked #2 in the nation in 2014.<sup>2</sup> The Oregon.gov website is one of the top 10 most intuitive and functional state websites, according to the Center for Digital Government's 2014 Best of the Web awards.<sup>3</sup> Oregon state government partners with key private-sector vendors to offer citizens nearly unfettered access to a broad spectrum of core data to better understand the function and performance. Sustained exploration of evermore innovative ways to present and use such resources is ongoing. **Stakeholder Focus**

- Oregon routinely seeks guidance from stakeholders through facilitated sessions, routine feedback mechanisms, interactive user labs, and surveys. That guidance is then analyzed, thoughtful messages taken to heart, and plans developed to deliver articulated outcomes. Stakeholder values and expectations heavily influence this strategy and serve as a driver for innovation and change to state government operations.

**Enterprise Architecture** - Several agencies of Oregon state government have developed a set of IT system architecture as-built components. Practices and modeling tools focused on the existing IT supporting solutions, with little interaction with business leadership. This has recently shifted to a business-centric approach to architecture for the enterprise as a whole. Enterprise Architecture has been moved front-and-center so innovation and optimization of government operations can reflect a whole-state approach in a way that connects long-term business outcomes to programs and services, supporting the shift of service delivery from a primarily centrally controlled structure to community oriented partnerships and organizations. This holistic transformation of the delivery of services will only be possible through the practice and application of Enterprise Architecture. Using an industry recognized framework for Enterprise Architecture, the state will lead the transformation of services from a centralized to a community orientation. The IT artifacts, along with the IT meta models, will support this transformation and re-orientation. **Business Intelligence / Complex**

**Analytics** – T. S. Eliot wrote: “Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?” The power of knowledge flows from the gathering of parts in the form of data elements, the connections of those parts in information, the formation of the whole of an idea in knowledge, and the joining of these wholes together to form wisdom.<sup>4</sup> The absence of a meta model to inform business data modeling has hampered these efforts and relegated them to data mart and data warehousing activities. Development of a comprehensive meta data model will support more seamless integration of information among agencies to better inform decisions, ascertain policy impacts, and identify potential correlations of activities in one area with outcomes nominally believed to be in the control of another. **Project Oversight** -

Project governance, management and oversight are widely acknowledged as key ingredients in achieving predictability and successful IT development efforts. Project governance provides a formalized process for project identification and prioritization across the enterprise. State gate oversight across the entire project lifecycle ensures: well-defined projects; incremental investments that produce quantified value; and either higher rates of project success or early determination of failure, preventing runaway projects. Of particular concern across Oregon state government is observed weakness in the build phase of IT projects. As previously identified, the development of the remaining five meta-models to inform IT project implementation and system development will further support project oversight.

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<sup>2</sup> USPIRG, Transparency - <http://www.uspirg.org/news/usp/new-report-ranks-transparency-government-spending-50-states>

<sup>3</sup> 2014 Best of the Web Awards - <http://www.govtech.com/cdg/digital-government-achievement/>

<sup>4</sup> Cleveland, H. (1982). Information as a Resource. *Futurist*, 16(6), 34-39.

## 1.6 Foundational Actions Influencing Strategy

Healthy progress has been made over the course of 2014 using a collaborative, multi-agency approach targeting key focus areas. Those efforts have revealed likely courses of action in a variety of areas. Conclusions reached by the multi-agency teams provide initial enterprise direction and have guided the development of this strategy. The 2015-2020 EIRMS is already in process. Multi-agency initiatives underway include:

- **Enterprise Governance** - Oregon's first Chief Operating Officer (COO) has assembled some of the key elements of an enterprise governance framework. The centerpiece of that effort is a multi-agency Enterprise Leadership Team (ELT).<sup>4</sup> The ELT subsequently authorized an Improving Government Steering Team to initiate and oversee statewide initiatives to modernize, streamline, and improve administrative functions to get better results at a lower cost.<sup>5</sup> The ELT is strongly influenced by the Governor's priority objectives voiced in a 10-Year Plan for Oregon<sup>6</sup> that highlights target outcomes in several key areas, including: education; jobs and innovation; healthy people; safety; and, healthy environment. Legislative interests as expressed through law, the budget allocation process, committee engagement, and priority legislative initiatives are an important feature of the enterprise governance framework.
- **Enterprise IT Governance** – In April 2014, the ELT chartered a multi-agency IT Governance Steering Team.<sup>7</sup> Enterprise Technology Services (ETS) is the utility provider and broker of information technology-enabled services. The ETS Customer Utility Board<sup>8</sup> (ETS CUB) provides multi-agency customer-driven oversight of those services. The COO has also chartered a Technology Advisory Board representing small, medium and large agencies. These governance bodies review and make decisions related to enterprise IT services and projects
- **Stage Gate Oversight** - A stage gate oversight process was initiated in February 2014. Legislative and executive branch oversight activities are coordinated in a more unified way to oversee information and technology related efforts using the stage gate approach. Additional emphasis is focused on understanding how a prospective project: fits into an overarching design to optimize government operations; addresses business requirements; accrues tangible, quantifiable business value; and effectively identifies and manages risk. The stage gate approach helps bind together the enterprise-level management functions of design, budgeting, and oversight. Stage gate experience over the past year indicates project flaws are being exposed and corrected much earlier. The Technology Advisory Board formed a multi-agency workgroup that has developed templates to arrive at a common set of expectations for project reporting and approval.
- **Quality Assurance & Control / Independent Verification & Validation**– The Oregon Legislature has charged the Department of Administrative Services (DAS) Director and the State Chief Information Officer (State CIO) with establishing rules, policies, procedures and standards for oversight of the State's information and telecommunications technologies. The purpose of the statewide policy is to provide agencies with the information and direction necessary to satisfy State CIO requirements regarding the delivery of Independent quality management services that enable Independent Verification and Validation (IV&V) for State IT initiatives and legislative direction on quality management for IT Initiatives through the Office of the State CIO (OSCIO). An effort is underway to

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<sup>4</sup> Enterprise Leadership Team - <http://www.oregon.gov/COO/ELT/Pages/index.aspx>

<sup>5</sup> Improving Government / Statewide Projects - <http://www.oregon.gov/COO/ELT/Pages/projects/index.aspx>

<sup>6</sup> 10-Year Plan for Oregon - <http://www.oregon.gov/COO/Ten/Pages/index.aspx>

<sup>7</sup> IT Governance Implementation Steering Team - <http://www.oregon.gov/COO/ELT/Pages/projects/itgov.aspx>

<sup>8</sup> Enterprise Technology Services Customer Utility Board - <http://www.oregon.gov/DAS/CUB/Pages/ets/index.aspx>

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revise the statewide quality policy to strengthen independent nature and value of these services, and is expected to be released shortly.

- **Project Portfolio Management System** - A portfolio approach is imperative in to effectively, prioritize, oversee and manage information resources at an enterprise scale. A multi-agency effort has been undertaken to define requirements and possible solutions for a project portfolio management system. Alternatives have been considered and evaluated. The expenditure limitation for that system was approved at the December 2014 Emergency Board. The system implementation is expected to be begin in February 2015.
- **Technical Services Review** - ETS was established and configured in 2006. Several multi-agency workgroups are currently considering various aspects of that service seeking to understand if offerings are still appropriate in the face of changes in requirements and available solutions. Venue areas being explored include application services, data network services, data storage services, managed computing services, workplace productivity services, and other services.
- **Asset Inventory and Analysis** - An auto-discovery asset inventory is underway across the range the enterprise. This type of inventory is required to provide the reliable facts-base needed to guide planning and disclose opportunities for optimization. OSCIO / Enterprise Security Office is deploying a scanning application in agency networks. This scan identifies: current operating systems; hardware information; installed software; Internet Protocol (IP) addresses; and current patch levels. Agencies will then associate business information to those identified assets including: owner; business purpose; lifecycle status; and application description. The inventory will be used to better manage the distributed resource base and will assist in identifying security risks.

## Section 2 - Strategic Direction and Initiatives

### 2.1 IT Strategic Direction

**Focus of Services** - Units of government that do not provide direct service to external stakeholders are considered internal services. It is important to ensure these internally-focused services clearly align with and promote target outcomes and follow the organization's reason for existence. The way such services are provided has changed rapidly because of advances made possible through technology. Citizen expectations about services they receive have risen making a critical review and evaluation process an ongoing obligation.

*“Effective IT Governance helps ensure that IT supports business goals, optimizes business investment in IT, and appropriately manages IT-related risk and opportunities.”*

*IT Governance Institute, 2014*

**Value Proposition** - State government exists to produce worthwhile and valuable results for citizens. Which needs for what people at whose expense must be answered through a process of governance to inform the evaluation, prioritization and decision-making about services.

**10-Year Plan** - The State of Oregon has adopted the Governor's 10-Year Plan for Oregon<sup>9</sup> organizing a range of key services into six outcome areas. They are: Education; Jobs and the Economy; Sustainable Environment; Healthy Citizens; Safe Place to Live; and, Efficient & Effective Government. This organization of outcomes helps to guide what will be accomplished, for whom and at what cost over the next ten years. Outcome statements and metrics defined by state leaders focus primarily on critical services provided directly to citizens.

**Key Initiatives** - The Office of the State CIO has been established as an internal service provider partner for other agencies and their service providers. The goal is to use the unique view and position of this office in state government to gather and focus practices, resources and expertise to help partners achieve their defined target outcomes and ensure the needs and priorities of the organization and the state are balanced

#### ***2.1.1 Alignment of IT Governance to the Ten Year Plan***

The 10-Year Plan for Oregon guides the evolution and refinement of important state government services including defined outcomes for the delivery programs and services efficiently and within available resources. This initiative aligns with the guiding principles that support this plan:

- Common Vision: Develop a statewide vision for the state investment now and in the future;
- Defined Outcomes: Define specific outcomes with clear accountability to Oregon's citizens;
- Fiscal Sustainability: Deliver programs and services efficiently within available resources;
- Innovative Solutions: Prioritize investments in areas of change and innovation; and
- Informed Decision Making: Rely on evidence-based information to inform policy decisions and decision makers.

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<sup>9</sup> [10-Year Plan for Oregon](#)

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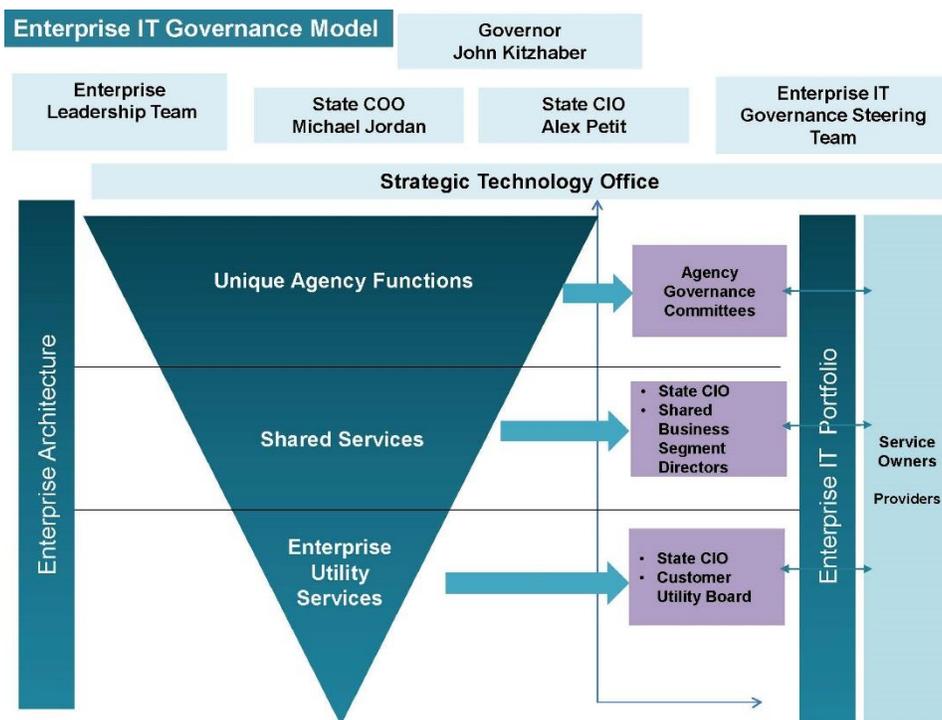
The IT governance model supports the Enterprise Leadership Team's vision for **Improving Government**. Government is to be responsive, accountable and trustworthy in meeting the needs of Oregonians with a special focus on three key strategies:

1. Streamline government services to foster collaboration;
2. Improve government engagement, transparency and accountability; and
3. Utilize and accelerate best practices and partnerships.

### 2.1.2 IT Governance Focus

Some IT projects are best managed at an agency level. Others benefit from management and governance with a wider view, especially those to become shared services and enterprise utility services. The governance framework addresses these requirements by highlighting three key types of services, each with different requirements: **Agency Specific** includes efforts that by statute or policy are unique to an agency; **Shared Services** are those that can be shared across policy or business segments and; **Enterprise or Utility Services** are those common to all agencies.

Enterprise leaders realize the importance of business driving the planning and deployment IT. To address business requirements and achieve targeted business outcomes IT must serve as a strategic partner providing business value.



### 2.1.3 IT Governance Success Factors

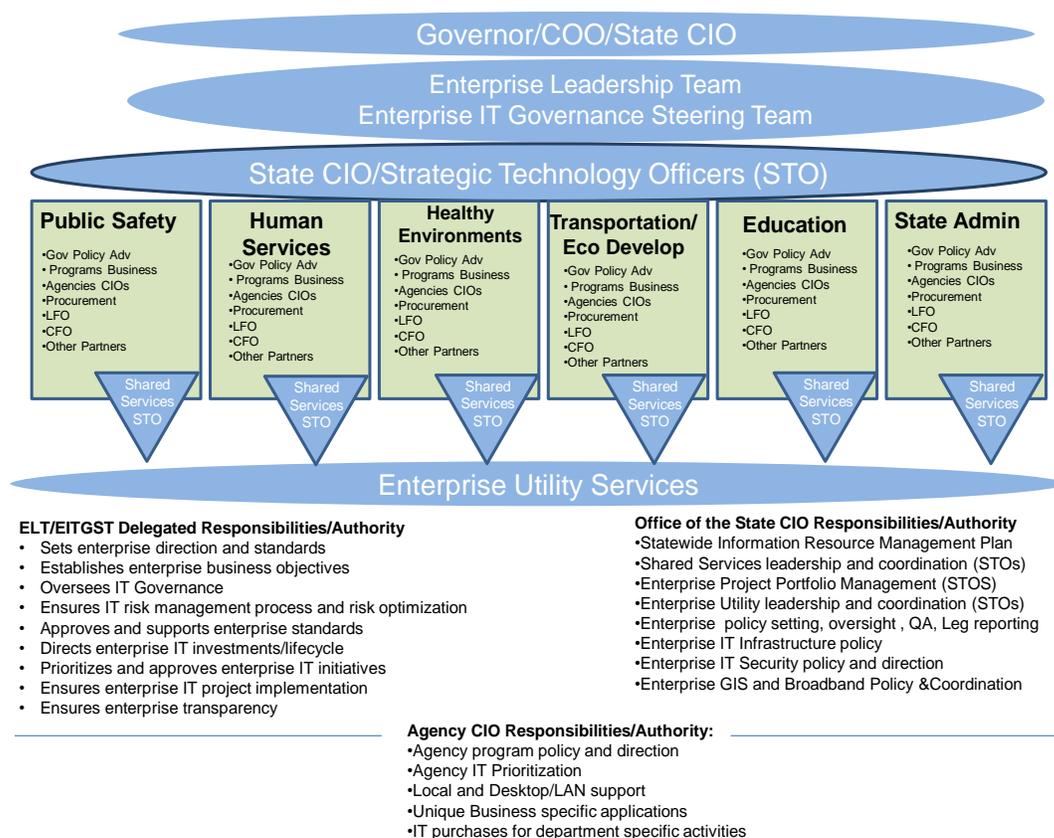
Several factors must be in place to ensure effective IT governance: a State Chief Information Officer is positioned, authorized and accountable to serve as the hub of information resource management for all of state government (strong State CIO); a Strategic Technology Office is established to observe, promote and leverage cross-boundary opportunities; Enterprise Project Portfolio Management practices inform project prioritization, information resource management and a system is deployed to enable and streamline those

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multi-agency efforts; the continued practice of a stage gate approval and oversight process for IT projects and investments; and, the deployment of enterprise architecture positioned to ensure a thoughtful design to business projects, IT investments and assets over time.

### 2.1.4 Strategic Technology Office

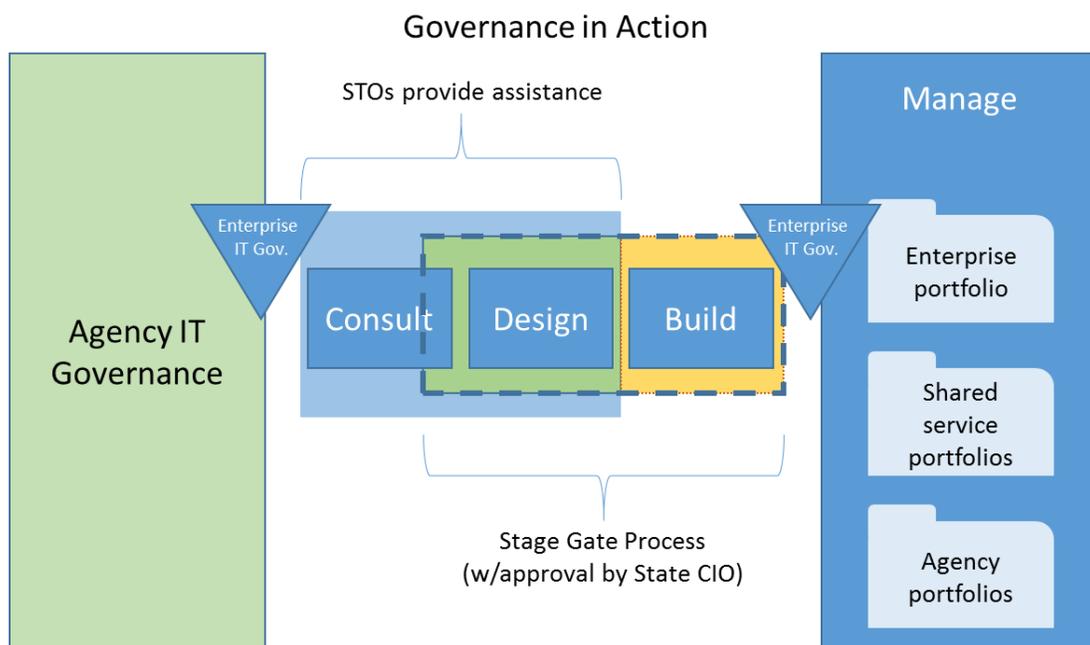
Within the Office of the CIO, the **Strategic Technology Office** serves a unique and valuable role of enabling cross-boundary coordination, education, strategy, planning and oversight roles in key strategic outcome areas. **Strategic Technology Officers** appointed to each outcome area (business segment) serve as senior-level operational strategists, consultants, portfolio managers, coordinators and advisors. They facilitate timely decision-making within the broader statewide context and provide tools and training to support agencies in maturing their own IT governance and project management efforts. They convene agency leaders, administrators, experts and program managers to identify and predictably act on opportunities for sharing and enlightened design across the segment, and to harvest advantages from enterprise services and initiatives. The multi-purpose office ensures enterprise IT governance is fully implemented by undertaking enterprise oversight activities as well as enterprise coordination. The **Oversight Program** consist of policy analysts and quality assurance staff. The **Coordination Program** includes, along with the Strategic Technology Officers: enterprise architects (design); and, enterprise business analysts (composite business requirements). The two programs work together seamlessly to ensure the business objectives of the state are communicated and met through the successful deployment of IT following standards and performance measurement guidelines.



## Section 3 - IT Initiatives

### 3.1 IT Project Flow

The IT governance framework will guide decisions regarding project prioritization and approval. Once approved, Strategic Technology Officers within the State CIO's Office will help agencies move a project through the oversight process. Upon completion, the governance framework will guide decisions regarding where the project will be managed and maintained - at the agency, shared service or enterprise level. This is illustrated graphically in the diagram below. Starting from the left, the IT governance project for each agency identifies and prioritizes projects specific to their agency in cooperation with their agency business leadership. This then informs the Enterprise IT governance process, usually by the Strategic Technology Officer (STO) supporting that family of agencies within a policy group. The five policy groups are Healthy People, Healthy Environment, Jobs and the Economy, Public Safety, and Education. Each will have their own STO, who will work with the agencies in their policy area to identify and promote specific agency initiatives to the Enterprise Governance Model when appropriate. Next the project enters the design and build processes, where solutions are identified, standards applied, and projects go through the stage gate process in incremental delivery components. When projects are completed, they go into an enterprise IT services catalogue, either as an Enterprise (utility) service, a shared service among agencies, or as a bespoke solution residing in the section specific to the individual agency IT portfolio.



### 3.2 Project Portfolio Management Program

As concepts are discussed and decisions are made at various levels, they are captured in the Enterprise Project Portfolio Management System (PPM). That approach, used on a sustained basis over time, allows an enterprise and agency level view of the entire spectrum of IT projects, initiatives and activities within an agency as well as across state government. The initial implementation will begin in February 2015. The first phase of the implementation will track all major IT projects at the stage gate level. The full value of the PPM solution will be realized over time as more project data is captured and sharing opportunity are identified early.

Project Portfolio Management provides unique value by serving as an organizational resource feeding a range of related enterprise functions including: enterprise project prioritization, enterprise architecture; asset management; investment management; oversight; budgeting and funding; and quality management.

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Organizations will still face project failures, but the damage caused by failed projects is effectively reduced by providing the key information decision-makers require to make objective decisions. Project Portfolio Management provides a crucial tool in any effort to assemble a story of achievement, direction and lessons learned.

Project Portfolio Management provides the visibility needed to better understand resource supply versus project and operational demand in both specific IT environments and within the state as a whole. Conditions requiring executive action and informed decision-making can be more readily understood and visualized. The OSCIO uses Project Portfolio Management to solve immediate challenges as well as more enduring planning functions such as improving IT governance and project portfolio management maturity across state agencies.

A Project Portfolio Management System is a key feature of the broader program and serves as the umbrella for statewide enterprise portfolio management and can readily support related functions such as evolving and managing to a composite set of business requirements (requirements traceability). Roll-ups populate an executive dashboard. The effort is positioned so every agency uses these tools and practices for major IT project reporting, creating a common language and indicators of project health. The Project Portfolio Management System does much of the “heavy lifting” needed to reduce the overhead and resource burden of manual processes by allowing the following:

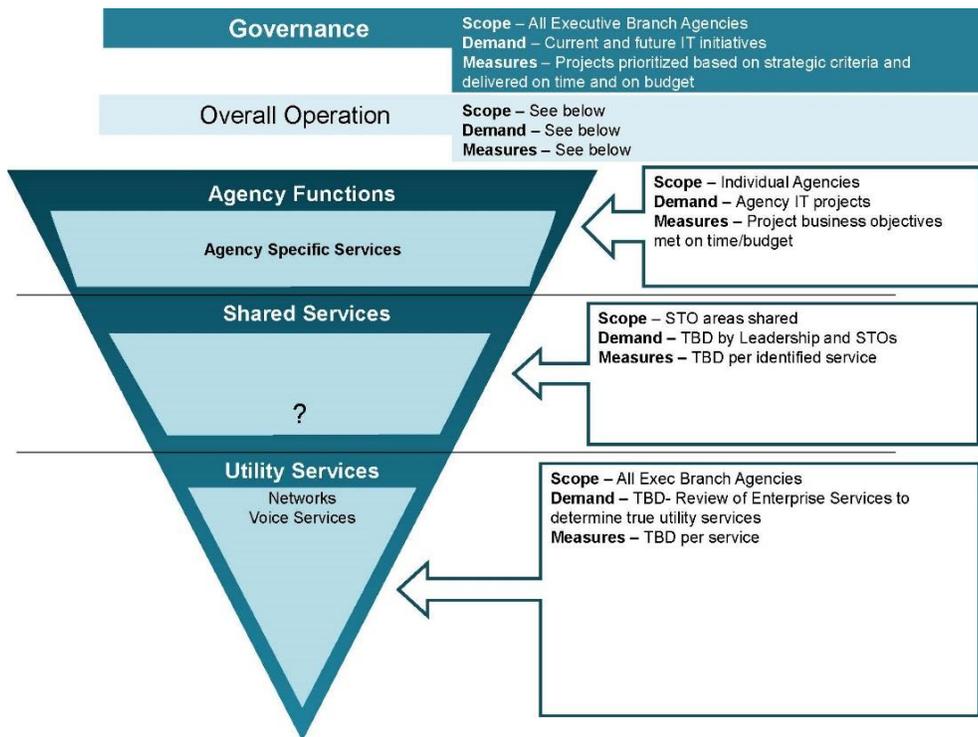
- Highlight risks
- Prioritize programs and projects
- Scenario planning to address business demands
- Help develop long-term investment strategies that meet business objectives
- Balance resources and demand for strategically-aligned capacity planning
- Identify shared service opportunities and duplicate project requests
- Balance demand from multiple sources for proper resource prioritization and load leveling
- Automate stage gate compliance and oversight workflows
- Manage portfolios aligned by business segments to aid in defining shared services

Maturity models are derived from stage theories, and assume that all organizations go through distinct stages over time. Stage hypothesis assumes predictable patterns exist as an organization matures much as those found in the growth of biological entities. This concept has been extended to include models for software development maturity such as the CMMI, EA maturity, IT and business alignment maturity, and maturity of learning organizations. Project Portfolio Management supports this process of increasing maturity:

1. Basic: No portfolio inventory or process.
2. Project inventory: Processes are defined & documented, and projects are aligned to business driver. All projects are consistently captured in a project inventory.
3. Project portfolio: Portfolio analysis is repeatable, predictable, and consistently used to evaluate and optimize project portfolio selection. Portfolio management teams are able to understand, analyze, and recommend optimal portfolio bundles and schedules to technology and business partners.
4. Cross-portfolio: PPM is adopted and used consistently across multiple organizations and portfolios. Analysts can compare and leverage portfolio analysis information across multiple departments. Consistent measures enable cross portfolio analysis, selection, planning and management that supports predictive modeling and internal / external benchmarking.
5. Enterprise: PPM is optimized across the enterprise with a focus on continuous risk mitigation and value creation. Project portfolio performance and risk data is understood and can be

**2015-2020 Enterprise Information Resource Management Strategy**

compared at the individual, within policy areas, and across the entire enterprise. Senior leadership is able to leverage PPM analysis when allocating funds to various portfolios.



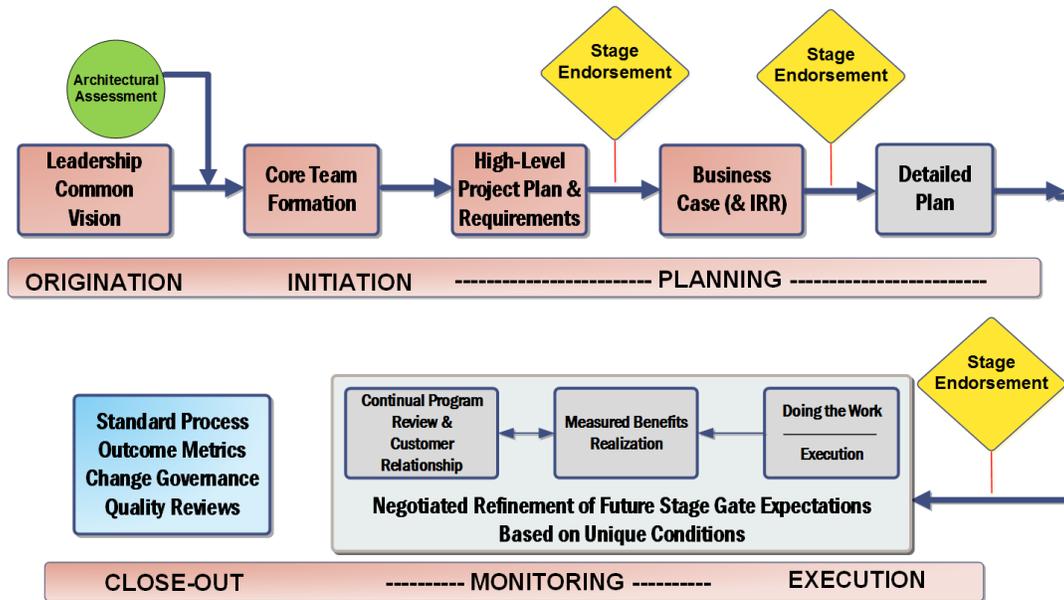
**3.3 IT Governance Measurement**

To measure success of the IT governance model each level is specifically defined. The scope consists of current and future demand for IT. Common performance measurements evolve across the model and specific measurements apply to similar types of investments. Measurement is reported transparently and modified dynamically as required to address business requirements.

**3.4 Stage Gate Oversight and Incremental Value Delivery**

Regardless of where management of a project ultimately ends up on the governance ladder (agency level, shared service level or Utility level), all new major IT projects will develop incrementally, ensuring that key milestones are met before a project continues. This is called stage gate oversight.

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By seeing stage gate oversight as a process and various stakeholders as parts of that process, the conversation is transformed from appropriate process flow, roles, responsibilities, and accountabilities to the collaborative discussions around how to cooperatively ensure success.

A unified approach to stage gate IT project oversight between the executive and legislative branches means that everyone has the same understanding of the record of achievement and roadmap forward. Shifting to facts-based decision-making better arranges that process. Consistently and meaningfully engaging agency executives, business-side leaders and IT project oversight develops a common understanding. Linking all of these actions to authoritative top-level outcomes adds the propellant needed to provide essential momentum. A portfolio view of all efforts (statewide policy / operations / lines-of-business / technology-related) ensures initiatives will fit into an overarching design.

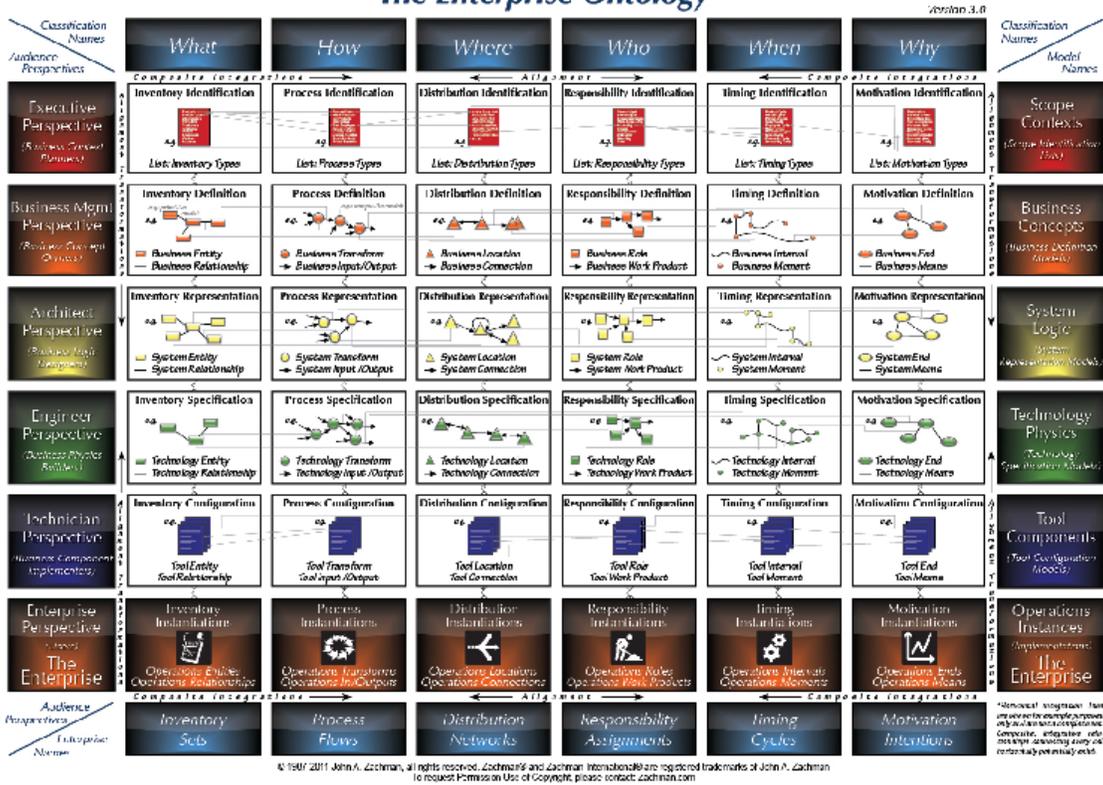
**3.5 Enterprise Architecture**

A key component of enterprise governance is meeting business outcomes. This is best achieved through enterprise architecture. To change outcome statements into activities, a process for breaking activities into smaller deliverables is necessary. With increasing size and complexity of the technology tools, it is necessary to use some logical construct (or architecture) for defining and controlling the components of the enterprise

The Zachman model for Enterprise Architecture has been selected to provide the taxonomy for relating the outcome statements to the concepts that describe the technology components.

# The Zachman Framework for Enterprise Architecture™

## The Enterprise Ontology™



*“The Zachman Framework™ is a schema - the intersection between two historical classifications that have been in use for literally thousands of years. The first is the fundamentals of communication found in the primitive interrogatives: What, How, When, Who, Where, and Why. It is the integration of answers to these questions that enables the comprehensive, composite description of complex ideas. The second is derived from reification, the transformation of an abstract idea into an instantiation that was initially postulated by ancient Greek philosophers and is labeled in The Zachman Framework™: Identification, Definition, Representation, Specification, Configuration and Instantiation.”*

*“More specifically, The Zachman Framework™ is an ontology - a theory of the existence of a structured set of essential components of an object for which explicit expressions is necessary and perhaps even mandatory for creating, operating, and changing the object (the object being an Enterprise, a department, a value chain, a “sliver,” a solution, a project, an airplane, a building, a product, a profession or whatever or whatever).”*

*John A. Zachman’s Concise Definition of The Zachman Framework (2014)*

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**Enterprise Architecture and Standards Program** - To achieve this, the agencies must take the agency outcome statements and outputs from the Mass Ingenuity initiative and break them down into the first two rows of the framework. Outcome statements are by definition composites of primitive elements.

Mass Ingenuity's NOW Management System®<sup>10</sup> provides a framework for transforming state agencies by focusing on accountability, transparency, outcome-based performance management, and overall better government. By implementing the Management System agencies receive highly integrated tools and best practices applied to all daily routine work and strategic initiatives at the program, agency, policy area, and state level. To date, Oregon has improved 37% of 600+ measures across 11 agencies.

These outcome statements reduce further to the six specific primitives components of the Zachman model: What; How; Where; Who; When; and Why. This becomes the basis for the first two rows, which are the Scope (or Planner) row and the Business Process (or Owner) row.

This will be done for every outcome statement as defined by the ten year plan and in co-operation with every agency director. Reasonable interpretation of the Governor's language is necessary, and must be done with the policy director or in some cases with the Chief Operating Officer or the Chief of Staff. Every outcome statement has an impact on the Enterprise Architecture, and is reflected in the organization's design.

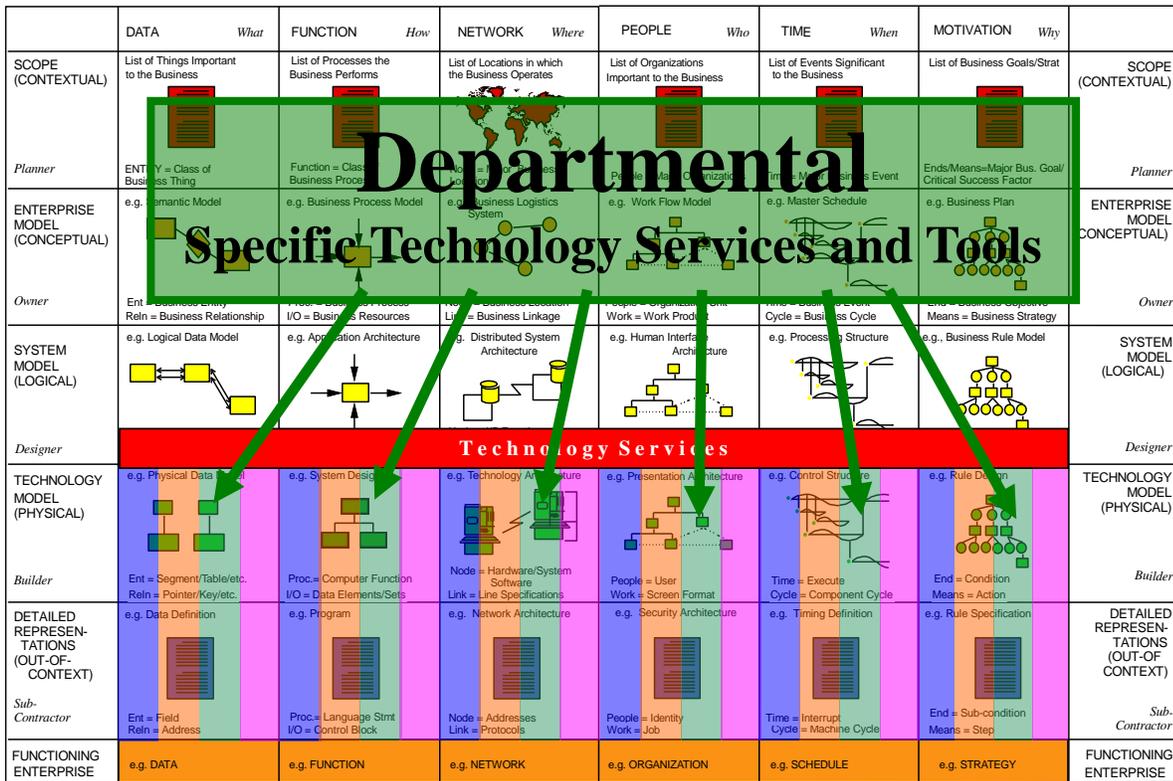
Developing outcomes and architecture is incremental work, and will not happen overnight. Progress is tracked in list format at the first row (scope) and in models for rows 2 through 6. The architecture is future oriented, begins at the broadest level for each cell and is increasingly defined, stopping when a reasonable interpretation makes sense. Enterprise Architecture is an important part of Enterprise IT Governance. Without it the STOs and state leadership will be navigating without a map in the sea of constant change. Decisions will continue to be made in the void of information and unintended consequences will continue to happen. Once the Strategic Technology Office of the State CIO is fully staffed and implemented it is anticipated mapping the entire enterprise will be a multi-year on-going effort. This EA strategy gives us the tools and knowledge needed to get started.

**Converting Vision to Tangible Action** – The architectural model of the state as it exists today is a result of the implementations of solutions in a siloed approach. Applying IT agency by agency has resulted in unique slivers of architecture for each of the 90 or more agencies of the state. The state has successfully accomplished hundreds of IT projects in nearly every agency and department. Although this has implemented “leading practices” into these organizations, it has resulted in the fragmented architecture depicted below.

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<sup>10</sup> [Mass Ingenuity](#)

ENTERPRISE ARCHITECTURE - A FRAMEWORK™



John A. Zachman, Zachman International (810) 231-0531

The technology solutions implemented have unique definitions for the elements of architecture. For instance, as depicted, every data element (column 1) definition is unique to the solution implemented. A parcel address in environmental quality is defined differently from an address in the public safety package, which is different from an address recorded in the tax solution, and different still from an address in human services solutions. To associate information in these slivers, it is necessary for internal or external technologists to write interfaces and connective applications using HTML, XML, business intelligence tools (data warehouses or data marts), or report-writing tools to associate these slivers and roll up information to the levels depicted above row 4. Even providing a uniform “look and feel” to our online services has required technologists to write integration interfaces to support the delivery of information to citizens.

The next graphic depicts the decomposition of outcome statements, master plans, and department strategic plans into the elements of Enterprise Architecture. The state is evaluating a software tool to function as a repository of these models. Outcome Statements, Master Plans, and Department Strategic Plans are all composite models, with elements of many models in them. They will be decomposed to their elemental parts and will be stored in the selected repository.

## ENTERPRISE ARCHITECTURE - A FRAMEWORK™

	DATA <i>What</i>	FUNCTION <i>How</i>	NETWORK <i>Where</i>	PEOPLE <i>Who</i>	TIME <i>When</i>	MOTIVATION <i>Why</i>	
SCOPE (CONTEXTUAL) <i>Outcome Statements</i> <i>Planner</i>	<b>O</b> List of Things Important to the Business <b>S</b> Entity = Class of Business Thing	<b>T</b> List of Processes the Business Performs <b>A</b> Function = Class of Business Process	<b>C</b> List of Locations in which the Business Operates <b>E</b> Node = Major Business Location	<b>O</b> List of Organizations Important to the Business <b>M</b> People = Major Organizations	<b>M</b> List of Events Significant to the Business <b>N</b> Time = Major Business Event	<b>E</b> List of Business Goals/Strat <b>S</b> Ends/Meanings for Bus. Goal/ Critical Success Factor	SCOPE (CONTEXTUAL) <i>Outcome Statements</i> <i>Planner</i>
ENTERPRISE MODEL (CONCEPTUAL) <i>Master Plans</i> <i>Owner</i>	<b>M</b> e.g. Semantic Model Ent = Business Entity Rein = Business Relationship	<b>A</b> e.g. Business Process Model Proc = Business Process I/O = Business Resource	<b>S</b> e.g. Business Logistics System Node = Business Location Link = Business Linkage	<b>T</b> e.g. Work Flow Model People = Organization Unit Work = Work Product	<b>E</b> e.g. Master Schedule Time = Business Event Cycle = Business Cycle	<b>R</b> e.g. Business Plan End = Business Objective Means = Business Strategy	ENTERPRISE MODEL (CONCEPTUAL) <i>Master Plans</i> <i>Owner</i>
SYSTEM MODEL (LOGICAL) <i>Department Strategic Plans</i> <i>Designer</i>	<b>S</b> e.g. Logical Data Model Ent = Data Entity Rein = Data Relationship	<b>R</b> e.g. Application Architecture Proc = Application Function I/O = User Views	<b>A</b> e.g. Distributed System Architecture Node = I/S File (Processors, Servers, etc.) Link = Line Characteristics	<b>T</b> e.g. Human Interface Architecture People = Role Work = Deliverable	<b>G</b> e.g. Processing Structure Time = System Event Cycle = Processing Cycle	<b>I</b> e.g. Business Rule Model Ent = Structural Assertion Means = Action Assertion	SYSTEM MODEL (LOGICAL) <i>Department Strategic Plans</i> <i>Designer</i>
TECHNOLOGY MODEL (PHYSICAL) <i>Builder</i>	<b>S</b> e.g. Physical Data Model Ent = Segment/Table/etc Rein = Pointer/Key/etc	<b>L</b> e.g. System Design I/O = Data Elements/Sets	<b>A</b> e.g. Technology Architecture Link = Line Specifications	<b>T</b> e.g. Presentation Architecture Work = Screen Format	<b>C</b> e.g. Control Structure Cycle = Component Cycle	<b>I</b> e.g. Rule Design End = Condition Means = Action	TECHNOLOGY MODEL (PHYSICAL) <i>Builder</i>
DETAILED REPRESENTATIONS (OUT-OF-CONTEXT) <i>Sub-Contractor</i>	<b>S</b> e.g. Data Definition Ent = Field Rein = Address	<b>L</b> e.g. Program I/O = Control Block	<b>A</b> e.g. Network Architecture Link = Protocols	<b>T</b> e.g. Security Architecture Work = Job	<b>C</b> e.g. Timing Definition Cycle = Machine Cycle	<b>I</b> e.g. Rule Specification End = Sub-condition Means = Step	DETAILED REPRESENTATIONS (OUT-OF-CONTEXT) <i>Sub-Contractor</i>
FUNCTIONING ENTERPRISE	e.g. DATA	e.g. FUNCTION	e.g. NETWORK	e.g. ORGANIZATION	e.g. SCHEDULE	e.g. STRATEGY	FUNCTIONING ENTERPRISE

John A. Zachman, Zachman International (810) 231-0531

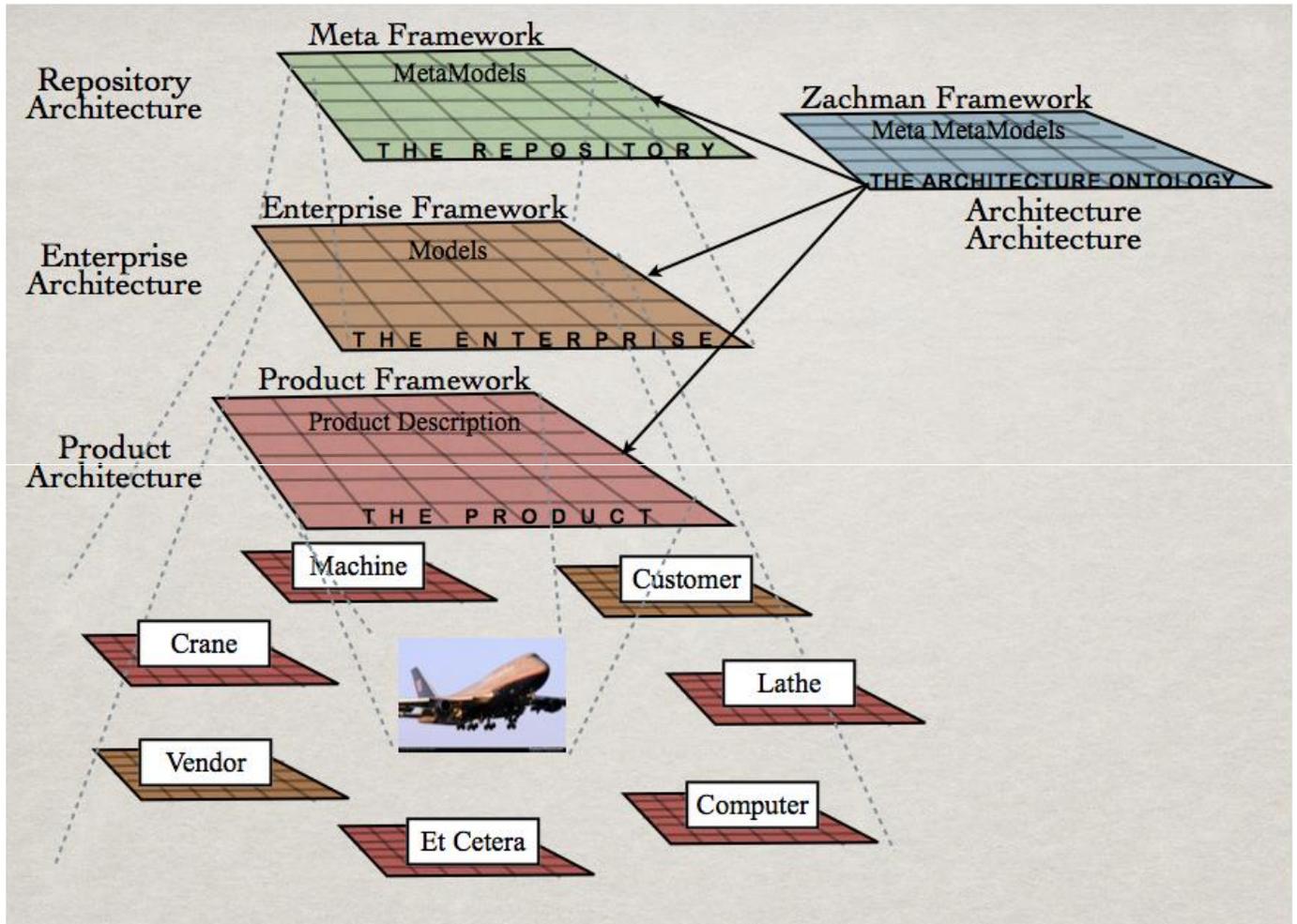
**Converting Requirements and Outcomes to Design Elements** - Each of the multi-agency efforts described are sure to observe unique business requirements and propose target outcomes. Some may conflict, some may be redundant, and there may be gaps in the process to deliver services. Enterprise Architecture provides the means for leaders and the STOs to sort through each policy area to understand how they could offer the building blocks required to assemble a unified design and roadmap to a future state.

### 3.6 Meta Model Framework for IT Oversight

As previously discussed, a framework for oversight must be constructed for the OSCIO to articulate where current processes need to be defined or redefined, and to articulate clearly where standards, policies, procedures, rules, and statutes fall into a logical construct for the agency activities.

Meta-models are the classification of all the descriptive representations of the community of people that are involved in the engineering and manufacturing the enterprise itself, as opposed to engineering and manufacturing the products or defining and delivering the services of the organization. Strictly speaking, the Row 2 models are the models of the enterprise models and therefore meta models, meta relative to the enterprise framework. Column 1, Row 6 is the database of all the enterprise framework models, that is, the database of enterprise architecture, or knowledgebase of the enterprise.

In short, the meta framework defines and manages the forms of the elements in the framework.



## **2015-2020 Enterprise Information Resource Management Strategy**

We will only be focusing on the meta-models relative to the IT services of the State. The following diagram illustrates these six models: data model (informing the data constructs for the enterprise); the process model (informing the processes to be used by the enterprise for the purpose of IT implementations); the location model (informing if services are defined as utility, shared, or bespoke); the responsibility model (informing which agency/organization is responsible for which aspect or attribute of execution); the timing model (the systems development life cycle, which was previously discussed); and the motivational model, which this plan is evolving to become.

Several examples of meta-models have already been discussed, including the stage gate, the model for determining the responsibilities of the OSCIO, and the governance models to determine if a service is utility, shared, or bespoke. Package Enabled Re-Engineering will be presented as a single example of a process model. More work on the meta-models will be necessary to fully define and describe our responsibilities, processes, and interactions with vendors, agencies, and leadership.

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### **3.7 Administrative Information Systems and Package Enabled Re-Engineering**

Successful application and technology integration to support back office support activities is essential to the success of the state. Several of these applications have been in service for over ten years. Agencies have had to find ways to perform processes and manage information that existing administrative information systems do not support. Systems that perform related functions such as recruiting and training/learning have been acquired in recent years. In 2013 the Legislature authorized DAS to development a business case for a human resource information system update.

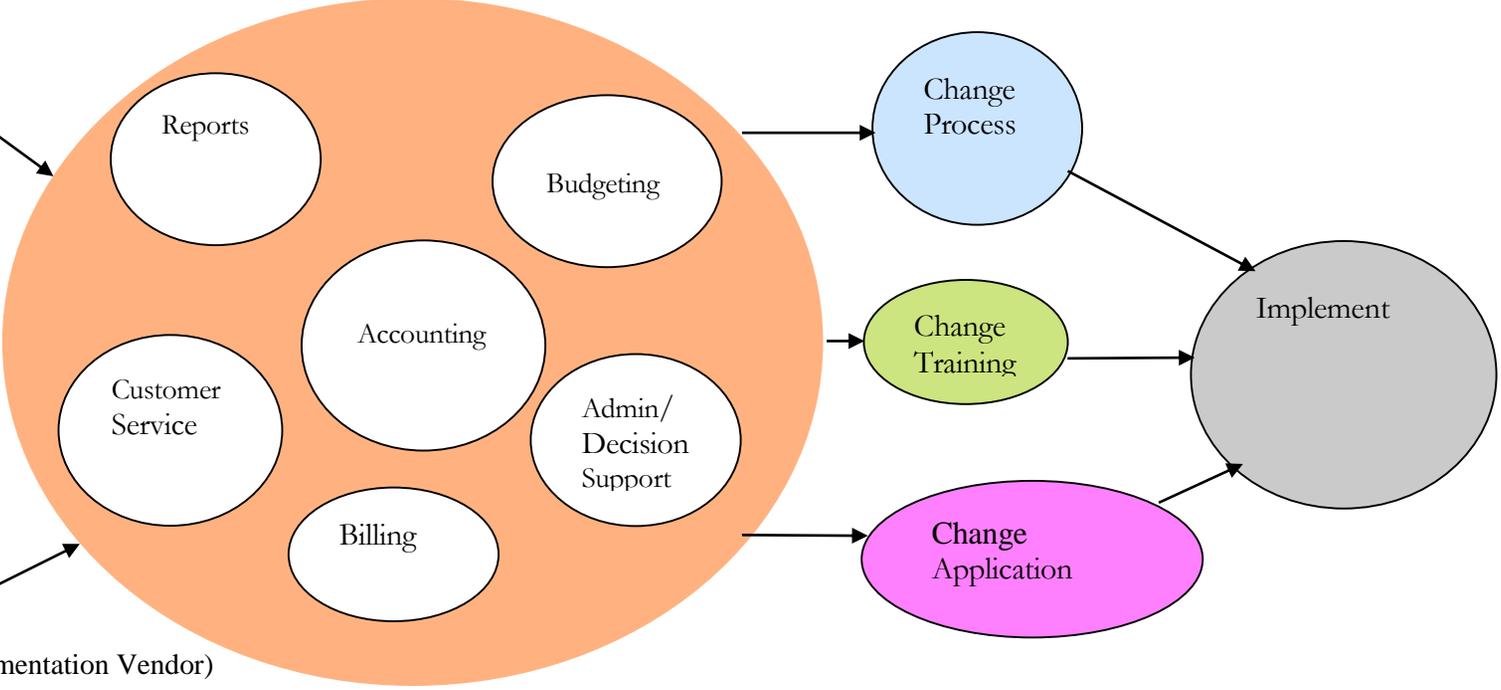
Methodology for this integration must be developed and practiced consistently. To address this need is the strategy of package re-engineering. This process involves selecting a commercially available shrink-wrapped application and retooling the people, process, and technology to support the new system. The State of Oregon has successfully used the re-engineering process in most every agency at some time, helping to increase productivity quickly.

# Package Re-Engineering Model

Focus Teams (4-6 people)  
Current Process  
Experts

Gap Analysis

Application Process  
(New Application & Implementation Vendor)



**Selection Team** - From the Deloitte Enterprise Roadmap Workshop, needs were identified and prioritized. Four primary groups of needs were identified: Human Capital Management; Finance and Grant Management; Budgeting and Analytics; and Procure to Pay. From the Accounting Business Services team and others from the state, a selection team will be created for each identified need. Employees from groups most impacted by the new application will be selected. Each team will in turn be charged with the task of selecting the best software package process available at the time. This selection is critical, as the packaged process forms the foundation for re-engineering. All votes for selection must be unanimous, else the current process cannot be replaced at the time and must be re-visited later.

**Focus Groups** - The model on package re-engineering better explains the process. There are two inputs into the first bubble. These are the new package to be implemented and the current process for performing the tasks necessary to service the state. The bubble is labeled Program Management Office, and is comprised of several smaller bubbles. These smaller bubbles are the focus groups of the overall project. Each of these focus groups is comprised of four to seven members, not including a facilitator and a representative of the new product being implementing. Not every group needs a representative for the new product working full time with the focus team, but when necessary they are included. Each focus group is charged with the responsibility of addressing the critical process they manage. Problems in implementation are brought to the focus groups, and if not addressed in gap analysis are addressed by reconvening the group and discussing possible solutions. Decisions or problems which cannot be resolved are forwarded to the Program Management Office.

Critical application functions are identified as focus groups. One representative from each of these groups is the focus group chairperson, and represents the group to the program management office. In each group, a Strategic Technology Officer will act as the facilitator. In the Program Management Office, a STO acts as co-chair. OCIO's role is to act as the process facilitator, not as a package nor business process expert. All the other focus group chairs and the other co-chair of the Project Management Office are from the business services team that is re-engineering their process.

**Gap Analysis** - First, the project management office reviews several different packaged solutions. They are rated on a feature matrix developed for the evaluation. When the selection is made, this same team is the core group to implement the application. Each focus group then documents how business is done using the current system. Next, these processes are compared to how the new system performs the same tasks, and gaps between how the current system functions and how the new system functions are itemized. This gap analysis is broken down to three different solutions: process changes, which require changing how the organization does something to match how the system does it; focused training, where there is little change to the new process and can be covered through training; and program changes, or changes to the actual application to support needed competitive advantage. If the state has a better process, the software vendor should willingly perform these application changes to enhance their product. These three outputs then drive system implementation. By focusing on what the state directly controls (process and training) and not on what is outside their control (application changes) help the state return to normal operations more quickly.

Gap analysis continues through the implementation. As issues arise, problems are brought to the appropriate focus group and addressed. If additional resources are required or if the solution cannot be agreed upon, the issue is referred to the Program Management Office, who will review all sides of the issue and make a decision.

The Program Management Office regularly reports progress to the Committee for Improving Government and, if appropriate, to the Enterprise Leadership Team.

### **3.8 Asset Inventory and Security Analysis**

In 2014 legislature issued a budget note that requires the Department of Administrative Services (DAS), working with the State CIO, to produce a comprehensive inventory report of all current information technology (IT) assets with a special emphasis on the planned replacement or modernization status of information systems in use by all executive branch agencies. An auto-discovery toolset is being used to conduct the inventory of IT assets to create a complete, accurate and credible resource for informed decision-making. At the same time auto discovery substantially lowers the need for expensive and time-consuming manual processes.

### **3.9 Geographic Information Systems**

GIS is a transformational engine providing state agencies the opportunity to redefine the fundamental elements of service and citizen support and the relationship between the State and the citizens.

GIS is critical segment of the state's enterprise architecture and essential component affecting the design of a variety of systems. Universal addressing, whereby addresses in any database can be associated and conform to standards with addresses in any database could provide new abilities and unique information.

In an effort to reduce duplicated effort and expense, geospatial activities of government organizations must be coordinated. Partnership opportunities must be identified whereby a single organization, or a small group, develops a standardized foundational data set that can be used for many purposes by most other organizations. A recent study conducted for the Governor's Oregon Geographic Information Council (OGIC) found that state and local governments in Oregon spend nearly \$5 billion every biennium on the collection, use (for making decisions, planning and tracking activities, managing resources, etc.), and management of geospatial data, and that \$200 million is wasted every biennium due to inefficient processes, and missed opportunities for cost avoidance and revenue collection.

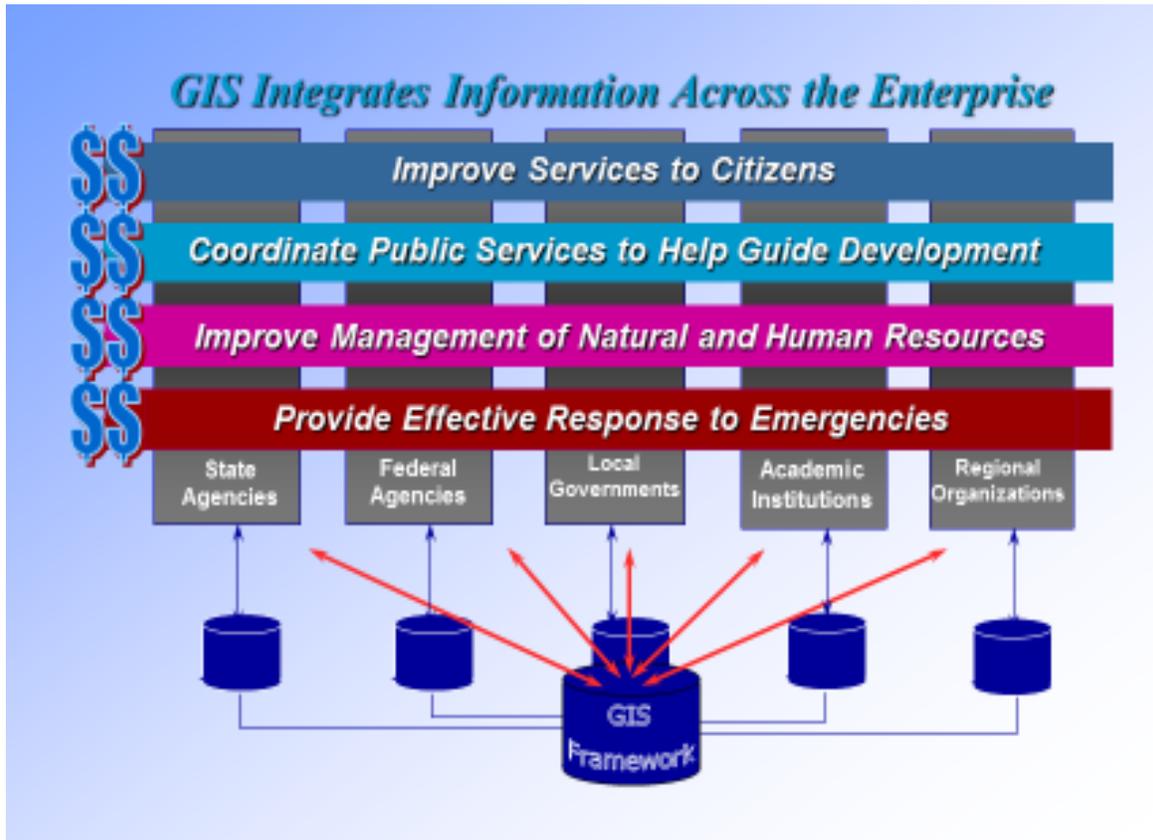
Government business processes almost always require collaborative effort between multiple agencies at various levels. In addition, decisions about one aspect of government service, such as natural resource management, cannot be made without accounting for the effect of those decisions on public safety, economic development, social services provision (education, housing, health care, etc.). Location is the key element that makes it possible to provide government services efficiently and effectively, in a collaborative manner across all levels of government. GIS enables the use of locational data elements (addresses, tax lot IDs, mileposts, etc.) to integrate databases across government silos in ways that permit collaborative business processes to function.

The Geospatial Enterprise Office (GEO) administers a shared digital library of foundational data sets. The library is a joint effort with the Institute for Natural Resources and the Valley Library at Oregon State University. It is housed at the State Data Center and made available to all government agencies and the public. Some shared services have been developed, in addition to the data library, in the form of web-based applications. GEO makes a GIS web platform available to state and local government agencies for simple visualization of geospatial data, along with some relatively simple geospatial queries and other tools. The GIS applications using the web platform all make extensive use of the foundational data sets from the data library, in combination with more detailed, thematic data from agencies that use the platform. For example, the Secretary of State's Office has a voter drop box application that enables users to find the drop box nearest to their location. The Legislature has an application that enables users to find their legislators based on user address. A map helps users visualize the results of both.

OGIC and the CIO's Office collaborated on establishment of a GIS software standard several years ago. On the basis of that standard, an enterprise license was negotiated that provides unlimited use of GIS software

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for a set price each biennium for all state agencies. This provides a wide range of financial and technological benefits to the state government enterprise.



## Conclusion

Often, IT employees are considered to be difficult to coach and teach, with it not uncommon for business leaders to express frustration in simply communicating and understanding intersecting IT and business requirements. In the State of Oregon, our salvation comes in how quickly we will recognize our mistakes and devise and apply the means to correct them. I am very proud of our efforts and energies to do exactly this. We view ourselves as the stewards of our profession, not the keepers of a trade guild whose priority is to take care of our own needs first. Going forward, the hallmark of our efforts is to leave no one behind: not any of the IT staff; not any of our agency partners. We have and will continue to make mistakes, but we will quickly recognize them and collaboratively find the way to correct them in the way which is the most equitable to all parties in a transparent and understandable process. We are not in the business of transferring the risk from IT providers to the agency, and our responsibilities do not end with the delivery of the solution, but with the acceptance and sustainment of the solution as we move forward together to the future. Identifying the behaviors that employees and others can perform to help us achieve the governing objectives will transform the culture of OSCIO to that of the steward, where there is seamless integration of IT and agency personnel at all layers, with expected outcomes articulated into cause-and-effect theories which directly support the business goals the agencies desire.

This concludes the IT strategic plan for 2015-17 biennium. Please direct any questions to Alex Pettit, Chief Information Officer, State of Oregon at [alex.pettit@oregon.gov](mailto:alex.pettit@oregon.gov).