



Enterprise Architecture

Table of Contents

Vision of Action.....	2
Benefits of EA.....	3
Michigan's EA Framework.....	4
Interactions Among the Disciplines	5
Public Service Architecture.....	6
Information Architecture	8
Solution Architecture	10
Technical Architecture.....	12
Implementing Michigan's EA Framework.....	15
Resource Commitments and Governance	18
Portfolio Assessment	19
Moving to Optimal	21
Standards Development Process	23
Systems Development Lifecycle	25
EA Repository	26
Solution Development	27
Where Are We Headed?.....	28
Integrating EA and Cross-boundary	29
Objectives and Next Steps	30
EA Maturity in Michigan.....	31

Vision of Action

We are pleased to present the 2007-2010 Enterprise Architecture (EA) Plan to fellow Michigan citizens, state of Michigan employees and valued partners. Our EA effort has been a five-year journey that has seen many ups and downs, resulting in significant maturation of our technology and planning approaches.

Looking across state government, we are continuously reflecting on, planning for and delivering alignment between public service needs and technical investment decisions. Given the level of effort involved in any EA initiative, we are constantly challenged “why?” Why spend the time, the energy and, more importantly, why spend the money? How does EA directly benefit our citizens? Questions that can stymie EA in both public and private sectors. Consider this:

- You can build a space shuttle for \$1.7 billion (NASA)
- You can build a major league baseball park for around \$300 million
- A 747 jumbo jet can be yours for \$198 to \$227 million (depending on the trim package)



It is inconceivable to undertake investments of this magnitude without clear plans outlining tasks to the smallest detail or executing plans without strong and pervasive oversight.

It takes structure and discipline to deliver value on a grand scale. A community spending \$300 million on a ball park takes for granted that there will be running water in the bathrooms and that the field will be lit at night. We demand more than the basics; we want our stadium to be more than a building. We want it to drive economic development, invoke a sense of pride and hold a special place in our community. We want something extraordinary, something that “matters.”

Technology is no different—let’s look at the numbers. According to the Center for Digital Government, state and local governments invest a combined \$58.8 billion dollars in technology annually. This equals 34 (and ½) space shuttles, an entire league of ball parks, and a fleet of jumbo jets (with the gold trim) each year. For the money that government spends on IT, citizens expect the basics. They want their driver’s license renewed, they want their tax data to be correct and they want their roads well-engineered. They want all that and, for \$58.8 billion dollars, they want and deserve more. They deserve technology that matters.

In Michigan, our philosophy is that we are called upon to be stewards of the public trust and tax dollars. We believe that our investment in technology demands a rigorous and structured approach that will deliver the most benefit to our citizens. Enterprise Architecture is the process that leverages our extensive planning in a way that aligns our technical investments to public service needs.

Michigan’s journey through EA has taken many turns, encountered a few high hurdles and seen some remarkable successes. In the pages that follow, you will see our vision, our strategy and the tools that we are using to maximize our strengths and address our challenges.

A Look at the Great Lakes State

Michigan’s agencies deliver essential services, making the state a better place in which to live and do business for our 10 million citizens. Michigan’s Department of Information Technology (MDIT) has more than 1,700 employees and is responsible for over 3,350 servers and 55,000 computers. With such a large operation, Enterprise Architecture (EA)—the planning and aligning of technology to support public service needs across 19 state departments—is a critical mapping and planning process used by MDIT.



Which state services does MDIT support? All of them. Whenever a citizen files income tax, pays or receives child support, wins the lottery, applies for a driver's license or starts a business - MDIT helps make it happen. As a comprehensive roadmap and framework for the state's technology, EA designates the on-ramp and off-ramp of technology as well as IT standards and priorities to enable the state's business processes and achieve mission-specific objectives in a timely and cost-effective manner. In today's tight budgetary times, providing technology solutions that save time and money for government and citizens is a top priority. Disciplined innovation is no longer a luxury, but a requirement. MDIT's technology innovation is mapped out by its Office of Enterprise Architecture (OEA). In consultation with key stakeholders, OEA sets technology direction, driving IT adoption and governance, and enabling Michigan to move forward.

Benefits of EA

Alignment to the mission: Putting your money where your priorities are

By setting standards and direction, EA positions technology investments where they do the most good. EA maximizes technology, ensuring that the State has necessary data and tools to deliver services in the most efficient way across all channels of government service.

Reduced costs: Giving back to the bottom line

The goal of Michigan's EA efforts is to reduce ongoing IT costs through volume purchasing, fewer support staff and simpler upgrades. Faster implementation and a simplified, easier-to-support environment result in better value and an improved bottom line.

Increased agility: Never having to say "We can't do that - our system isn't built that way"

EA frameworks provide a ready reference when major changes are demanded on tight time frames. Mapping standards and services with applications allows developers to quickly assess impacts and respond to change. A comprehensive architecture also enables faster design of new systems and ensures a smooth, rapid response to business needs.

Improved security: Keeping hackers off your back

In IT, security issues are a fact of life. On a daily basis, the state of Michigan blocks approximately 280,000 e-mail spam and virus attempts; 17,000 scans by hackers; and nearly 14,000 potential Internet browser-based and Web-defacement attempts. Through the use of strong automated protection tools and mandated security standards, the risk of identity theft, intrusion, data loss and system downtime are dramatically reduced.

Reduced technical risk: Downtime is detrimental to our citizens

EA lends itself to a stable and standard technical environment. The IT planning that happens through EA decreases reliance on old and unsupported technology, allows current resources to support more and reduces the need for expensive, specialty support staff. This translates to fewer systems outages and, in the event of a problem, faster recovery times.

Improved interoperability and integration: Immediate, reliable information is key

By defining standards and specifications for how state systems will talk to each other, the job of integrating multiple systems becomes easier. EA allows the state to make accurate information available, decreases the cost of sharing information and ensures that systems communicate correctly on the first try and for the long haul.

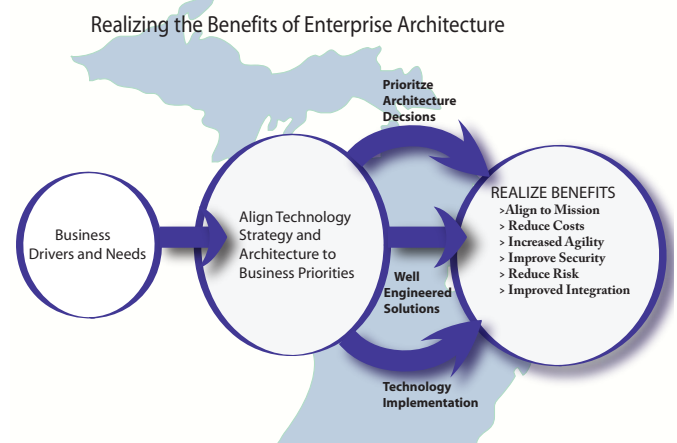


Figure 1 – Benefits of a strong EA program are realized through a disciplined approach, aligned to strategic goals.

Michigan's EA Framework

Michigan's Enterprise Architecture framework consists of four areas, as follows: Public Service Architecture, Information Architecture, Solution Architecture and Technical Architecture. More details on each area are provided in this section.

Public Service Architecture (PSA)

First and foremost, the PSA focuses our state's limited technical resources where they matter most to our clients: state agencies and citizens. We begin by obtaining a clear understanding of the goals, constraints and critical success factors. The next step defines and documents the processes most critical to state operations. With the PSA, Michigan has departed from traditional enterprise architecture bias and terminology. The unique nuances of public service and a need to clearly articulate priorities for technology staff demanded a different approach. Typically labeled Business Architecture in the private sector, Public Service Architecture directs government in the handling of necessary services for our citizens and sets the stage for the other three areas of Michigan's EA framework.

Information Architecture (IA)

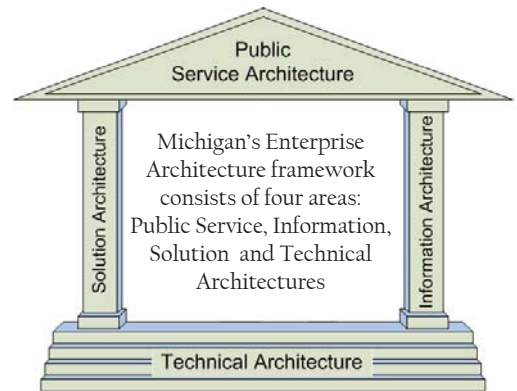
Information is the key component of any system. For the state of Michigan, IA coordinates the use, reuse and sharing of state data. It models, classifies and leverages information needed to support key systems and enables cross-boundary initiatives with federal and local governments. IA focuses on identifying and standardizing innovative ways to use information.

Solution Architecture (SA)

SA is the framework and approach that governs how applications and systems are designed within the state of Michigan. Solution Architecture ensures that technology aligns with the goals outlined in the Public Service Architecture and with the data standards and structures from Information Architecture. SA streamlines the fulfillment of requirements and jumpstarts the design process.

Technical Architecture (TA)

Standard tools are the hallmark of a strong enterprise. TA is the technological toolkit serving as the foundation of all IT initiatives. It outlines the lifecycle and appropriate use for all state hardware and software products. This framework area provides proven models for efficiently implementing standards-based systems.



Interactions Among the Disciplines

The value of Enterprise Architecture is derived from the sum of all its parts. As shown in Figure 2, the interactions within the EA framework create a complete picture of the processes that support sound technical decisions, an efficient organization and the creation of sustainable enterprise solutions.

Public Service Architecture captures changing agency needs, strategic goals, and environmental influences and translates them into information technology priorities for the state. PSA defines what is most important and answers the question, “Why?”

Both Information Architecture and Solution Architecture use the priorities and processes generated from the PSA to focus organizational resources where they will have the most impact. IA adapts information management standards to fulfill the state’s requirements. Solution Architecture creates a repository of high-level design solutions. Together, these framework areas answer the question, “What?”

Technical Architecture is used in conjunction with the SA high-level designs to guide the assembly of technology components into complete solutions that can be leveraged to meet the needs of the multiple agencies. TA combines outputs from the other areas to drive standardization of products and develop consistent implementation/operational policies. This answers the question, “How?”

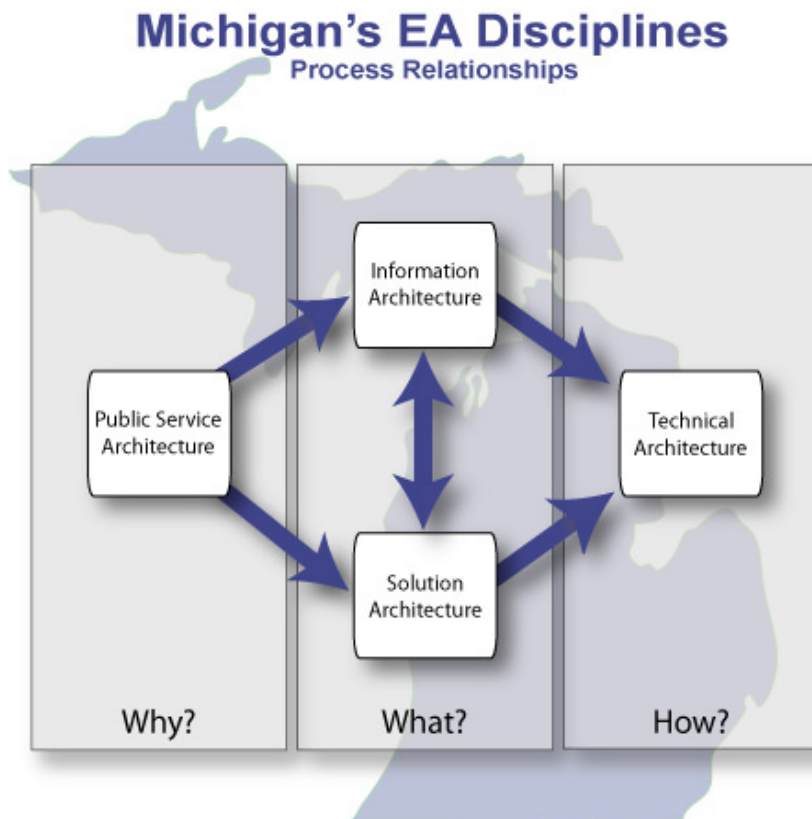
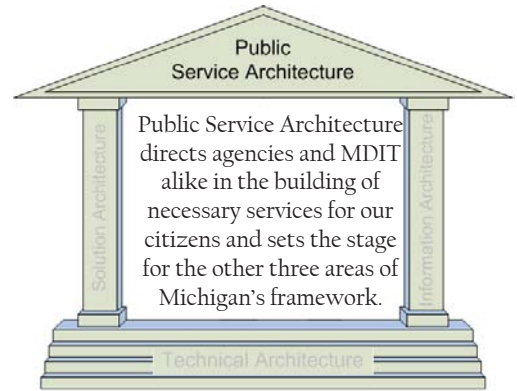


Figure 2 - The processes inherent in the four disciplines of EA interact in a continuous cycle. Initiatives may begin at any level.

Public Service Architecture

Public Service Architecture (PSA) uses Michigan's core priorities to determine the focus of EA. It captures the state's most important work activities, assets and processes. PSA focuses Michigan's limited technical resources where they matter most. To be truly effective, Enterprise Architecture must begin with a deep understanding of what drives the state. It is essential to align EA efforts to tangible business plans that have resources (money and people) assigned to them. Too many EA efforts flounder and fail because they lack detailed commitments, realistic scope and dedicated resources from the organizations that the architecture serves.



Assessment and Progress

Michigan leverages the state's executive branch planning process—the Cabinet Action Plan (CAP)—to define and reinforce technology initiatives. The Office of Enterprise Architecture examines the CAP and the IT strategic plan to determine the most beneficial Enterprise Architecture activities. This analysis results in a list of key drivers of our PSA and a specific work plan with detailed commitments. An explanation of the processes that created these drivers and how they relate to state goals and project prioritization is included in [EA-Appendix A](#).

Statewide Business Drivers

In 2003, Michigan's governor set forth six priority areas to drive the statewide business planning across all state departments. In 2008, work continues in the priority areas and specific cabinet teams have been charged with action. The areas and specific cabinet teams are listed below:

- Education: High Quality Education/No Worker Left Behind
- Economy: Alternative Energy and Economic Development, Vibrant Affordable Communities
- Better Government: Government Savings, 21st Century Economy
- Health and Human Services: Affordable Care and Wellness, Children's Action Team
- Hometown Security: Safe Communities
- Environment: Alternative Energy and Economic Development, Quality of Life

Agency-specific Business Drivers

There are also business drivers specific to each agency. These are used to develop technology plans for each agency's specific needs, including:

- Creating an education lifecycle that presents a student's information as a common view
- Improving homeland security by integrating information and resources of all areas of the state of Michigan's criminal justice community
- Protecting Michigan's citizens and communities by operating safe and secure prisons
- Improving state and local preparations to deter, prevent and respond to disasters or terrorism. Continuing and improving the management of our state's natural resources
- Increasing access to state recreation areas (parks, forests, campgrounds and marina's)

- Protecting Michigan's citizens, retail markets and livestock
- Retaining and strengthening Michigan's existing manufacturing, agriculture and tourism base by creating new jobs
- Keeping Michigan's people and commerce moving by improving our roads and bridges and by increasing highway safety
- Expanding access to quality, affordable health care

Outcomes and Targets

The following outcomes will be achieved through Public Service Architecture:

- Develop Enterprise Architecture work plan aligned with Executive Branch and IT Strategic Plan priorities, detailing tasks and deliverables for the following activities:
- Service-Oriented Architecture (SOA) (Ongoing)
- Identity management (2008)
- Data warehousing and business intelligence (2008)
- Comprehensive mobile application strategy (2008)
- Hosting and data center consolidation (2008)
- Provide detailed business process flows and requirements for large-scale technology initiatives, including:
 - Health and Human Services eligibility systems (2008)
 - Michigan Department of State's business modernization initiative (2008)
 - Medicaid Management Information System (2008)
 - Michigan Integrated Tax Administration System (2009)
- Create a comprehensive plan focusing MDIT resources on prioritized EA initiatives and activities (Ongoing)
- Michigan Unemployment Insurance Agency system rewrite (2010)

See [EA-Appendix A](#) for more details on these objectives.



"Information technology continues to play a critical role in creating efficiencies, and it remains at the heart of everything we are doing to provide government service to Michigan citizens..."

-Michigan Governor Jennifer M. Granholm



Public Service Architecture in Practice...

The Chief Deputy Director for the Department of Human Services (DHS) has observed trends of increasing benefits error rates, worker stress and worker absenteeism in the county DHS offices responsible for issuing food and cash assistance, Medicaid and other assistance programs. Budgetary constraints and early retirements have lowered the number of available staff, while worker caseloads are increasing. These problems are made worse by a conglomeration of computer systems that force workers to spend more time on administrative work than on social work. Improving worker interaction with clients helps families move from welfare to self-sufficiency, improving the health and well-being of Michigan's most vulnerable citizens.

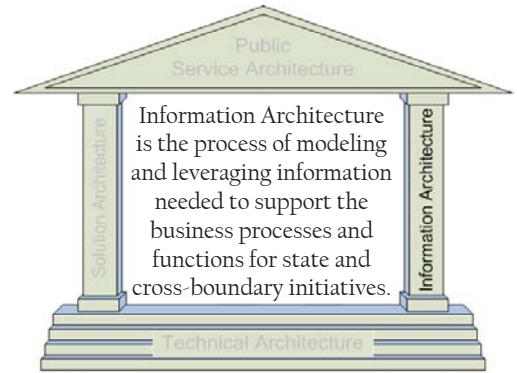
To address these issues, the Chief Deputy works with her counterpart in the IT department to create a project to build a new eligibility system to modernize and integrate the service delivery for DHS. The goals of the project are to:

- Consolidate several legacy systems into one, Web-based system
- Lower the administrative overhead for county office and case workers supporting DHS
- Provide better support for ongoing changes in eligibility policy
- Provide better service with fewer errors for DHS' clients

Identifying the problem and gathering the priorities through PSA helps DHS to define technology and better serve clients.

Information Architecture

Information Architecture (IA) is the process of maturing and governing the information needed to support the business processes and functions for state and cross-boundary initiatives. IA spans organizational boundaries and builds on the requirements identified in the PSA. It is primarily expressed in the form of standards for the creation of data models, information flows and an analysis of the decision-making criteria for each of the activities of the business. IA also addresses information access, data security, privacy and business and information continuity.



Assessment and Progress

Michigan's IA has grown exponentially as a result of inter-agency collaboration on specific agency projects, as well as related MDIT architecture and standards programs. The significant progress to date not only marks the quality and success of existing programs but also establishes the baseline for developing the Information Architecture approach.

Data Sharing

The sharing of data leverages federated, but definitive, information sources across areas to serve diverse public needs. This practice already exists between state agencies with other units of government (local and federal) and with our vendor partners. Types of data currently being shared include: hunting licenses, unemployment data, driver's license information, personal protection orders, customs data, Medicaid information and immunization histories. These and many other data types are used to detect fraud, increase compliance and protect our citizens.

Data Warehousing and Business Intelligence/Analytics

The practice of data warehousing and advanced business analytics are critical components of our decision support systems. They allow us to maximize shared data. To date, 2.3 terabytes of data are consolidated into our statewide warehouse. Analytics tools have helped:

- Locate 15,000 non-custodial parents, enabling enforcement action and child support collection
- Save \$75-\$100 million via statewide health care analysis with the Department of Community Health
- Decrease fraud and error rates in day care, food assistance and eligibility, saving over \$61 million
- Increase productivity by enabling the annual review of over 452,000 tax returns by the Department of Treasury Tax Audit and Compliance staff



Cross-Boundary Information Sharing

Michigan's cross-boundary information sharing initiatives are expanding the use and communication of information across state agencies and beyond state government boundaries. Activity is underway in areas such as: health information networking, permit application processing, geographic information sharing and land use management.

The state's EA program is developing standards for sharing the massive amounts of information available from federal, state, local and private entities to improve decision-making and add citizen value. Examples of cross-boundary information sharing underway:

- Sharing location data via spatial Web services
- Standardizing electronic payments to the state with the Centralized Electronic Payment and Authorization System (CEPAS) initiative
- Creating a Michigan Information Operations Center (also known as a Fusion Center) to expand information and intelligence sharing between homeland security partners

Business and Information Continuity

A complete review of business and information continuity plans is in progress at the state of Michigan. Continuity requirements are being refreshed for the business functions supported by our most critical State systems in consultation with our clients. Simultaneously, an IT business and information continuity core team is documenting the existing disaster recovery and continuity capabilities and capacities that are available within the IT organization to support those business functions. Once these reviews are complete, projects will be initiated to close any exposed gaps.

Outcomes and Targets

Michigan's Information Architecture defines the information management needs and goals identified through the Public Service Architecture process, including:

- Defining owners for all information entities (2009)
- Establishing a common way of describing a citizen and the way the term is used in information systems (2009)
- Creating cross-agency policies for data sharing (2008)
- Develop an open document strategy (2008)
- Providing common data standards for all agencies and other government entity information (2009)
- Reducing data management centers to only three (2012)
- Personalizing views of content and applications for citizens, businesses and state employees (2010)
- Implementing consistent data exchange approach (2008)
- Defining data point-of-recovery (POR) objectives for critical business information (2008)

See [EA-Appendix B](#) for more details.

Information Architecture in Practice...

As the new eligibility system for Department of Human Services begins its requirements for Information Architecture technical staff consider the following scenario:

A couple that has fallen on hard times are seeking benefits for their family. Currently, a caseworker must access several systems, retrieve information from paper files and send out external inquiries to other agencies. The couple must wait for this process to complete, and they must trust that the caseworker can accurately obtain all of the relevant information.

Inaccuracies regarding the couple's income could result in lower benefits or sanctions for over-issuance. The couple and caseworker alike are frustrated by delays and confusion.

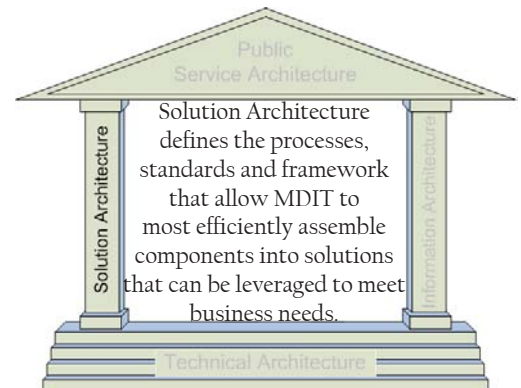
As part of the new eligibility system, information-based requirements simplify the process of accessing and verifying data. The new system is designed to present the data from multiple systems to caseworkers in a clean easy-to-use interface, and direct access to verify income is required.

Data must be shared with other state of Michigan departments and multiple federal agencies. This will require standard file formats, communication protocols, etc. The project team ensures that all these requirements are clearly documented and followed.

Through IA efforts, the struggling couple is able to get the maximum benefits quickly while the state strengthens its ability to leverage information across systems by putting standards in place that protect the integrity, privacy and security of the data.

Solution Architecture

Solution Architecture (SA) defines the standards that allow MDIT to most efficiently assemble technical components into solutions by quickly identifying proven, standard and secure solution designs that can be leveraged to meet the needs of the business. Solution Architecture is expressed in terms of the solution patterns governing application design and evolution. Value can be measured in terms of reliability, scalability, performance, security and decreased support and maintenance costs.



Michigan's approach to EA intentionally separates Solution Architecture from Information and Technical Architecture. The key differences between the three disciplines are in the deliverables and outcomes, as described in the sections that follow.

SA Assessment and Progress

While the bulk of infrastructure and many key enterprise systems are currently leveraged across the state, Michigan is still in the early stages of our journey toward a strong portfolio of standard solutions. Although progress has been made with a number of key systems (financial and accounting systems, a single statewide portal, messaging consolidation, a thin client center of excellence, etc), most software development is still done within teams solely dedicated to a single department. In 2007 Michigan is rolling out a common solutions engineering methodology (SEM) that will standardize technical reviews (solutions assessments) and require all new development to leverage Solution Architecture.

Solution Patterns

In late 2006, the EA team began working on the concept of Solution Patterns. Solution patterns serve as the high level of system design templates. Patterns document the logical layout and form of a technology solution. It does not specify particular technology products, but focuses on the interactions of between components. For example, when building an Internet Web application, the solution pattern will identify the type of servers needed (application server, Web server, database server) and what types of protective measures must be present to ensure security (firewalls, security appliances, etc).

The process to develop a pattern is done through an iterative process. Utilizing the concepts highlighted in the EA Framework the Office of Enterprise Architecture commissioned a team to develop a base set of solution patterns. Working with a small work group made up of MDIT solution development and support team members, the EA core team identified highly mature, broadly utilized and stable solutions. These solutions served as the basis for the initial solution patterns and reference models.

Once a solution pattern is completed Technical Architecture processes are used to develop reference models and standards. (See Technical Architecture for details) Each solution pattern has multiple reference models and standards.

Reference models and standards give MDIT technical teams a complete reference of recommended products, best practices, designs, integration considerations and use standards for every solution pattern completed.

To date, solution patterns have focused heavily on Web-enabled applications, but as we gather information through our EA solutions review process, we will establish a repository of core solution patterns and reference models that provide a preferred architecture approach for the majority of technology projects.

Outcomes and Targets

Following are the state of Michigan Solution Architecture effort targets:

- Solution patterns will be established for the following areas (2008):
 - Service-oriented architecture
 - Identity management
 - Data warehousing and business intelligence
 - Comprehensive mobile application strategy
 - Hosting and data center consolidation
- A common solution assessment repository will be available to MDIT employees (2008)
- 100% of new technology projects will be reviewed through the EA solution review process (2008)
- 90% of existing systems will be assessed through the formal solutions review process (2010)

Please see [EA-Appendix C](#) for samples of specific solution patterns, reference models and details of the review process.



Solution Architecture in Practice...

Department of Human Services' new eligibility system identified the following requirements:

- The system must serve over 12,000 users
- Guarantee availability for 12 hours per day
- Be accessible across multiple geographic locations.

After reviewing these (and other) requirements, the project team works with EA to select the optimal solution pattern for their needs: A Web-enabled application with sensitive data.

Designs included in the solution pattern are specified in the state's Request for Proposal (RFP). If vendors have solutions that do not fall within the existing solution pattern, they are required to explain their rationale and total cost of ownership.

Once selected, the winning vendor completes a Solutions Assessment with the EA Core team. This assessment includes detailed technical documentation and is repeated at key stages in the systems development process.

SA ensures that the new system conforms to the standard solution patterns. The choice of the optimal pattern guides the development team to a proven standard and secure solution.

Technical Architecture

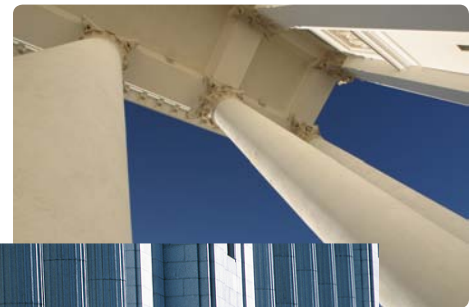
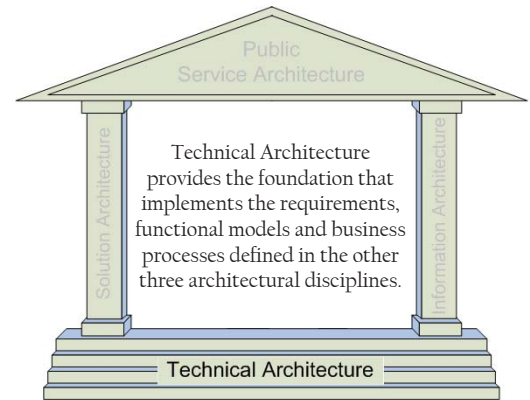
Making sound technology decisions and setting clear direction for the enterprise is one of the most visible EA activities. Maintaining a plethora of disparate products raises costs and reduces MDIT's ability to support the enterprise. Technical Architecture elements are coupled with solution patterns from the Solution Architecture to form a detailed picture of technology. TA is the foundation of the EA framework.

It is the process that selects standard products, mandates best practices for their implementation, and manages each product's lifecycle throughout the enterprise. Decision making in the Technical Architecture is guided by the following guideposts developed within the EA framework areas:

- Best Practices and Usage Standards: Information captured from institutional knowledge as well as research vendors and partnerships.
- Policies, Standards, and Procedures: Developed within the TA as well as by administrative or legislative policy directive.
- Current Architecture Solution Patterns and Reference Models: Detailed descriptions of existing and implementations of standard solutions patterns.
- EA Portfolio Assessment Tool: Although used in all four of the framework areas, the portfolio assessment is especially useful in the TA. Objective data is plotted and jump-starts discussion and analysis (detailed on pages 23-24).

Technology decisions are also informed by our vendor partners. To this end, MDIT has created multiple venues

for input. In addition to the traditional Request for Proposal route, vendors have an opportunity to introduce their product to the state of Michigan via the Horizon and Spotlight programs. The Horizon program provides access to executive leadership on a monthly basis. Suppliers whose products match state priorities may provide brief presentations to the leadership team. Through the Spotlight program, suppliers may provide in-depth demonstrations to executives and subject matter experts. These forums are productive, not only for the vendors who are interested in doing business with the state, but also for MDIT, which is interested in keeping up with market trends and offerings.



TA Assessment and Progress - Setting Product Standards

Standard setting is not a trivial task. The Office of Enterprise Architecture must consistently weigh the unique government requirements for open competition with the realities of staff skill sets, cost and pressure to lower state expenditures. Direct involvement from state agencies is facilitated through MDIT's executive steering committee, the Michigan Information Technology Executive Council (MITEC).

The entire process is designed to be inclusive, iterative and to balance the weight of ongoing support requirements with the rapid pace of technology innovation. The Technical Architecture areas of focus are driven by the needs highlighted in the other framework areas, as well as the need to address emerging technologies that the state will likely adopt.

Product standards developed in the TA include guidelines for installation, configuration (specific versions) and parameters. This detailed information augments and drives the reference models—describing how specific products can be combined to deliver a solution—from the Solutions Architecture. The formal process for developing product standards is detailed on pages 27-29. Some of the key standards developed this year include:

Open Source Products

- Statewide Office Automation (Directory Services, Desktop management, Desktop OS, File Share, etc.)
- Hosting Centers (facilities, installation and configuration of equipment)
- Voice over IP (VoIP)
- Wireless LAN and Communication



Technical Architecture in Practice...

The systems being replaced at the Department of Human Services are on four distinct platforms – two different Mainframes and two different server operating systems. The technology has aged well beyond its useful life expectancy and support staff struggle to meet client expectations.

As part of the development process for the new eligibility system, the IT staff works with EA to ensure only standard products specified in the Technical Architecture are used in the new system.

The products selected are common platforms, already supported by the state of Michigan, the software used on the servers is up to date, standards-based and the system as a whole is readily supported by existing staff.

MDIT staff, outside of the current support team, are knowledgeable about the use and implementation of every product used in the construction of the new system. This ensures a smooth succession plan as employees retire or move on to other duties. Familiarity with the technology cuts installation times in half and volume purchasing discounts significantly lower the ongoing hardware and software costs.

Using a strong TA puts less strain on long-term budgets and IT executives can consolidate the skills required to support the eligibility business functions, improving quality and overall responsiveness.

TA Assessment and Progress - Mapping a Product's Lifecycle

By analyzing industry trends and defining best practices around the use of technology, Technical Architecture maintains and develops technology lifecycle roadmaps. These roadmaps drive adoption and regulation of IT. Information on technical products is gathered from supporting vendors, and strategies for their actual use within the state are planned on a four-year horizon. The roadmaps classify each technology by explicit version or release. EA, working with technology subject matter experts (specialists), manages the identification, classification, and strategic direction of the use of specific technology at the state. EA conducts semi-annual updates to our technology lifecycle roadmaps based on industry changes and technology adoption and implementation. More detail on this work is available in [EA-Appendix D](#).

Objectives and Targets

Following are Michigan's Technical Architecture objectives and targets:

- Enhance processes to drive planning and budgeting for technology governance (2008)
- 80% of solutions designed/implemented according to approved reference models (2009)
- 70% of all solutions administered and managed according to approved operational policies and standards. (2009)
- MDIT will continue to remove redundant or outdated technologies from the technical environment (Ongoing)
- Through virtualization, achieve zero annual growth in total physical number of servers under management (2010)
- Through virtualization, achieve double the average CPU utilizations for managed servers (2010)
- More than half of solutions rely on unsupported products; versions will be migrated to approved, standard platforms (2011)



More details, including a template for our lifecycle roadmaps, are available in [EA-Appendix D](#).

Implementing Michigan's EA Framework

The concepts of Michigan's EA framework are more than academic theory. Coupled with a comprehensive planning process they coordinate and drive technology activity for our state.

The following section outlines the structure and methods used that turn our framework into actionable initiatives. A work plan and resource commitments ensure that progress is made. Critical processes and tools ensure that EA is a sustainable effort that will transform our state through technology. Each element is discussed below.

The EA Work Plan

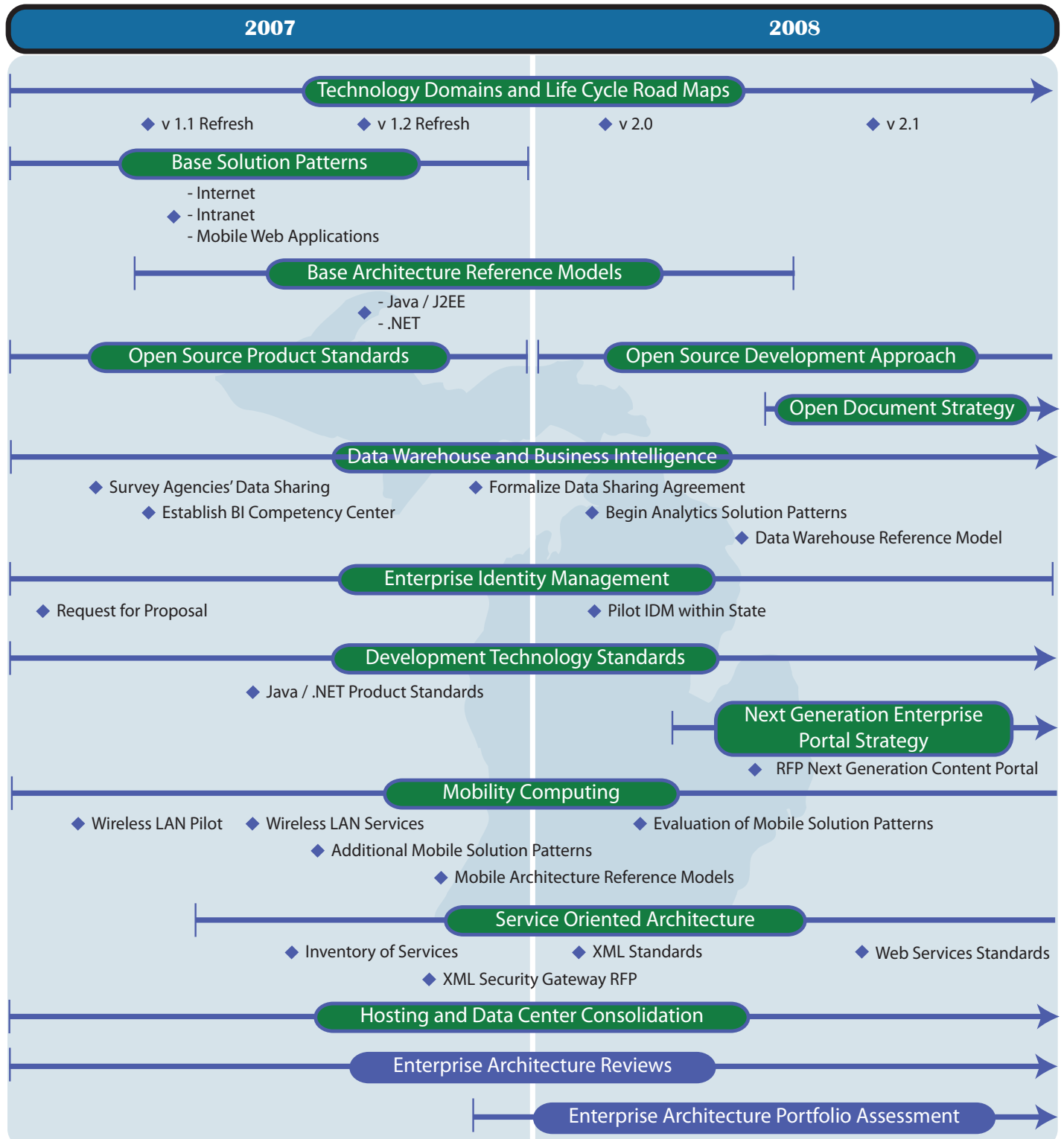
The four disciplines allow Enterprise Architecture to first plan and then realize the vision for Michigan's technology future. This work plan is derived from the planning efforts in the PSA and represents a portfolio of initiatives grounded in true business priorities.

The work plan is approved by MDIT executive management and our client-based steering committee (Michigan Information Technology Executive Council). Progress is monitored every week for deliverables and issue resolution.

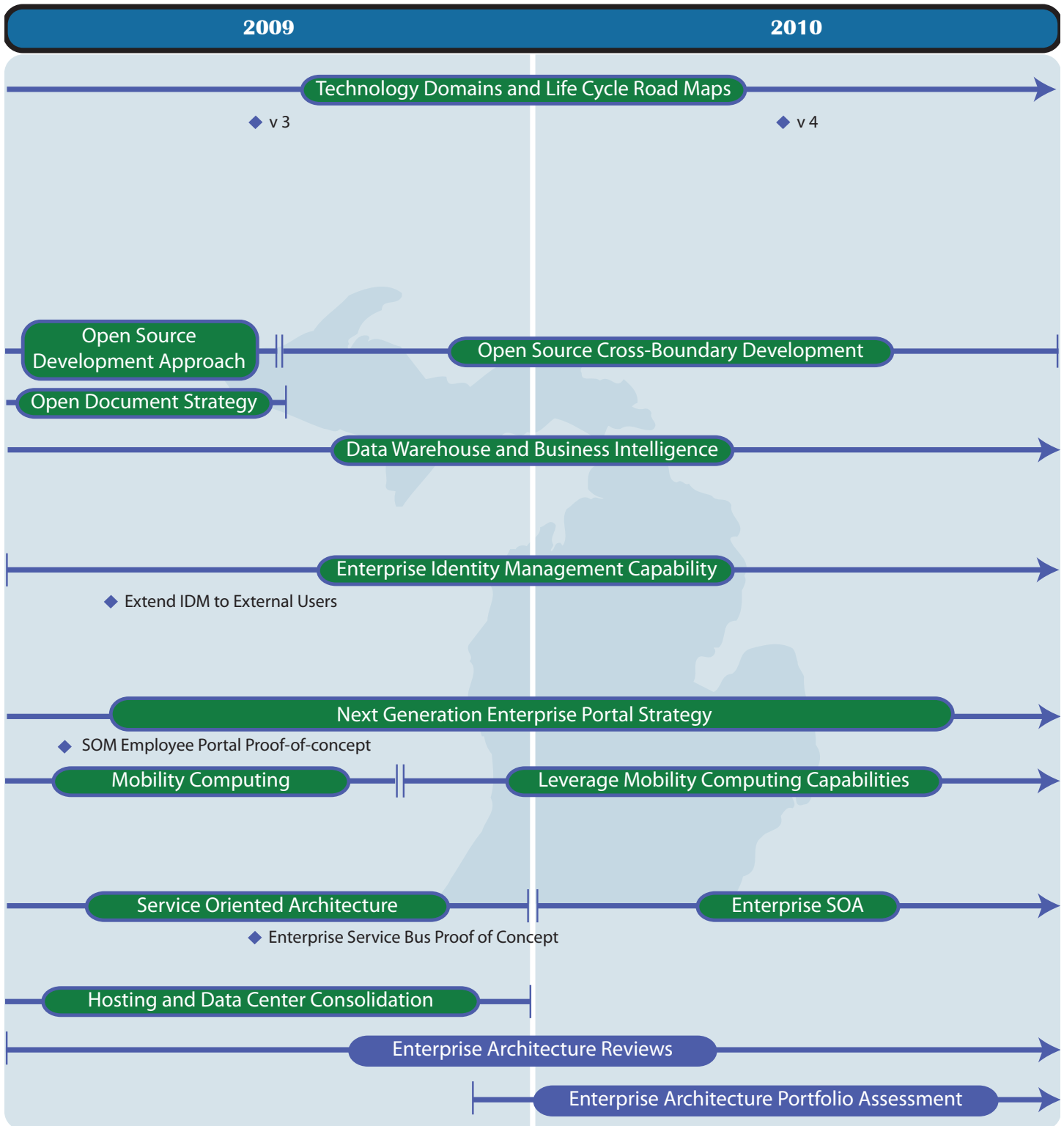
The Office of Enterprise Architecture plan's efforts focus on a multi-year horizon; beyond the current fiscal year. The plan is updated as needed to reflect changing business needs, budgetary fluctuations and the rapid pace of technology innovation. MDIT's EA work plan for 2007-2010 is presented on the pages that follow.



Implementing Michigan's EA Framework



The 2007-2010 Work Plan



Resource Commitments and Governance

Team Charter

At the center of EA activity is the EA Core Team. The Office of Enterprise Architecture facilitates this cross-departmental team of MDIT technical leaders and specialists. The team includes appointed staff from all facets of the MDIT organization: Contracts and Procurement, Enterprise Security, Office Automation Services, Telecommunications, Data Center Services and each software development group serving the state agencies.

The Enterprise Architecture Core Team has the authority to oversee the assessment, adoption and use of technology at the state of Michigan. They establish and utilize processes and procedures to assess technology needs across the four EA framework areas. The architects that make up the EA Core Team have several roles:

- Oversee and advise MDIT architecture workgroups and standards development teams
- Work with MDIT Contract Office to establish the criteria for technology bids
- Develop processes for information dissemination and communication
- Maintain and oversee the processes to select, review, evaluate, approve or deny and prioritize Enterprise Architecture, to include IT standards, policies, strategies, architectures and guidelines
- Conduct technical process engineering
- Perform EA portfolio analysis
- Oversee technology exception reviews
- Review and evaluate vendor proposals

Authority

Decisions of the EA Core Team are binding for the MDIT Organization, but are subject to review and approval by MDIT executive management. Appeals for the EA Core Team's technical decisions are sent to the Executive Technology Review Board, including:

- Deputy Director of Infrastructure Services, MDIT
- Information Officer (Appointed by Agency Services Deputy Director, MDIT)
- Chief Information Security Officer
- Director, Telecommunications, MDIT
- Director of Office Automation, MDIT

The EA Core Team is empowered to appoint persons for architecture workgroups to do technology assessments and adoption planning, standards development teams, vendor briefings and establish processes, as necessary, to enable the EA Core Team to carry out its responsibilities.



Figure 3 – The EA core team is a combination of roles that pull together the technology leadership across the MDIT organization.

Portfolio Assessment

Making EA decisions and prioritizing the EA agenda is a constant challenge. Michigan's EA framework is designed to be pragmatic and flexible, spending resources where they do the most good. This more flexible approach means that even with the high-level priorities defined in the Public Service Architecture, EA must have the ability to quickly assess our portfolio of initiatives, projects and tools in each of the four areas of the EA framework.

Every day the Office of Enterprise Architecture is faced with difficult technical and project priority decisions that have a broad impact on our state.

The EA Portfolio Assessment Model is the premier tool used to assess activities in any of four EA areas. Whether evaluating a new public service offering, an exciting data collaboration project or evaluating the state's desktop tools, this model takes a hard look at objective factors and jump-starts the decision-making process.

This simple model assesses any activity in the EA portfolio across two dimensions:

- The first dimension quantifies the utility the initiative or technology has by determining the level of adoption across state agencies, its overall visibility and intrinsic business value.
- The second dimension is defined as level of maturity, which is measured by scoring a solution for compliance with defined standards, our ability to maintain it, its scalability and whether its implementation currently follows best practices.

Quadrant 1 – Underutilized Solutions

Solutions which cluster near quadrant 1 are highly mature but still have relatively low utility across the enterprise. This practice, technology or activity is a great target for aggregation and consistent, coordinated management. These types of initiatives or products represent areas where cross-boundary implementations and cost savings can likely be achieved by establishing a “center of excellence” that leverages resources in the most efficient manner possible.

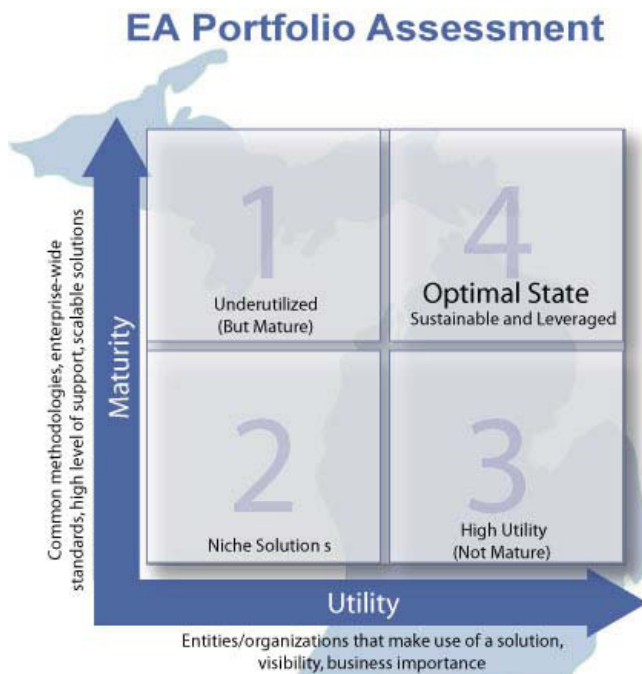


Figure 4 – The EA Portfolio Assessment Model: Each EA initiative under consideration or technology decision is evaluated on two key dimensions.

Portfolio Assessment (Cont.)

Quadrant 2 – Niche Solutions

Solutions and activities which cluster near quadrant 2 do not demonstrate a high degree of maturity, although they are likely mature enough to be considered sustainable given their limited installation and use. Unless overall business requirements change to raise their importance to the enterprise, these solutions typically do not merit resource investment as the statewide impact of EA investments would be minimal.

Quadrant 3 – High Utility Solutions Lacking Maturity

Solutions which cluster near quadrant 3 have high utility but low maturity. These activities are likely surrounding critical legacy systems developed and implemented before Michigan's IT consolidation. Examples include disparate call centers, ERP systems and permitting systems to name a few. When critical functions are implemented with a wide variance of technical solutions the enterprise can be exposed to significant risks, unsustainable levels of staff commitment and unnecessary financial exposure. When these systems are at the point of investment (typically a rewrite or major upgrade), EA works to justify the investment in standardization, process improvement and stabilization to move the entire enterprise to a single solution.

Quadrant 4 - Optimal State (Enterprise Solutions)

Solutions which cluster near quadrant 4 should be held up as examples to the enterprise. Where possible, Enterprise Architecture drives adoption of the standards/methodologies employed by their design, development and support teams across the entire IT organization. This dissemination of best practices encourages collaboration among technical teams and is an important area of focus for the Office of Enterprise Architecture.

Portfolio Analysis Tool

The Portfolio analysis tool is used to align the entire EA portfolio, but has benefit in each of the four framework areas. Some examples of how this tool is used are listed below:

Public Service Architecture: Portfolio/process prioritization and resource allocation.

Solutions Architecture: Evaluating technical solution alternatives.

Information Architecture: Analysis/prioritization of data sharing and business intelligence initiatives.

Technical Architecture: Technology product comparisons, reviews, and prioritization of standards efforts.

Moving to Optimal

In the world of technology, optimal is golden - optimal usage, optimal performance, optimal cost effectiveness. It is therefore the goal of any EA activity to move Michigan toward optimal IT performance, as reflected in figure 5. Each activity, initiative or technical solution falls into a particular realm of IT evolution or “quadrant,” depending on the present state of that activity. To reach the optimal (Quadrant 4), different strategies are necessary.

Solutions that fall into Quadrant 1 are recognized as mature within the state but underutilized. EA works with the primary owners of these solutions, determining how to make them broadly available for use, thereby avoiding the costly and unsupportable problem of creating multiple solutions for the same business problem. In other words, EA provides a means for enterprise-wide solutions so we avoid recreating the wheel from agency to agency.

The primary EA activity for Quadrant 1 solutions is to determine ways to leverage existing, robust and supportable platforms across the state, and enterprise-wide centers of excellence are one approach in active use. An example of EA at its finest, is the approach being followed for the Citrix Meta Frame architecture. MDIT established an enterprise-wide center of excellence based on the work done to provide a robust and stable implementation of Citrix for one state agency. Projects that have a similar demand for a Citrix solution are directed to the center of excellence to utilize the skills and experience of the supporting staff for this mature approach for implementing Citrix.

Quadrant 2 activities are unlikely to warrant additional allocations of limited resources. Activities in this quadrant merit investment in improving their maturity only if utilization is expected to increase enough to represent a substantial improvement in business value.

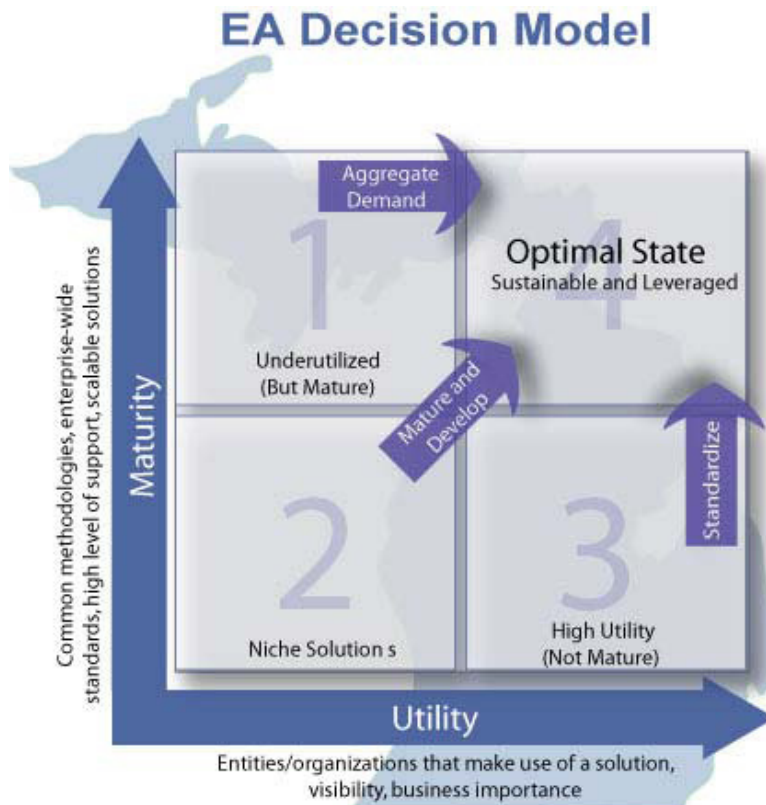


Figure 5 – Moving the Enterprise to “Optimal” can require a different approach for each quadrant.

Moving to Optimal (Cont.)

Solutions that fall into Quadrant 3 are recognized as opportunities for standardization and migration to better-supported technologies. Solutions in this quadrant are heavily used but may represent aging technologies, one-off solutions or systems which are brittle and difficult to support.

Such a scenario is identity and access management (IDM) wherein several applications throughout the state have non-standard approaches for identity management. This includes custom-made solutions for storing usernames and passwords, custom extensions of commercial products and non-standard deployments of technology product stacks. At the time these applications were developed, there were no broad standards for IDM or application delivery. Recently, the EA team spearheaded an RFP for an enterprise identity and access management system, including an application portal for the proposed solution. By developing a common approach to IDM, the EA team will provide a means for resolution that affords improved standardization and supportability. The IDM solution and the accompanying portal are a clear example of moving solutions from quadrant 3 toward quadrant 4.

EA has prioritized evaluation of heavily-used technology solutions to develop and implement standard architectures. The EA standards development process, detailed in the next section of this document, is being followed to mature and manage a standard set of technologies. Architecture reference models with product stacks reinforce the proper use of the standard set of technologies. EA solution assessments are the means through which project teams are directed to use standard technologies and reference models.



Standards Development Process

The process of technology adoption and governance is driven along a defined path by the MDIT's Office of Enterprise Architecture (OEA). One of Enterprise Architecture's roles is to deliver direction and guide decisions on the evaluation, adoption and implementation of technologies across state government. An active role in selection and adoption of new technology is important, but guiding the planning and migration from aged and expired technology is also critical to serving the business needs of our client agencies. Through this process we've adopted the phrase "controlled innovation."

Working hand-in-hand with our Agency Services teams, EA governs the method of introducing technology, assessing total cost of ownership, mitigating risk and moderating the pace of change. A careful balance is needed here: unchecked acceptance of technologies results in too many solutions, a diluted IT talent pool and a challenge in the ability to leverage solutions across agencies and the enterprise. Lock-down restrictions, or limiting technology adoption, limits the services and benefits we can deliver to our citizens. Controlled innovation allows us to balance the advancements that occur in the technology industry with an organized, business-oriented technology planning and governance effort.

To keep abreast of new technologies and their potential use and benefit to the state, MDIT has formal programs and methods to review new technology solutions. MDIT Horizon and Spotlight programs (see "Horizon Program" at www.michigan.gov/dit) offer our decision makers opportunities to review technology vendor solutions on a monthly basis. Critical input and research is also provided by industry analyst organizations, including Gartner, Forrester, and Norex. Finally, our decisions are also guided by best practices from state and national technology communities such as the National Association of State Chief Information Officers (NASCIO). Vendors also have an opportunity to submit their technology solutions through the procurement process in response to a state Request for Information (RFI) and/or Request for Proposal (RFP). Still other technologies enter into use through state and federal policies and programs.

To organize and plan for all of the upcoming and outgoing technology solutions, the state of Michigan utilizes technology lifecycle roadmaps (see [EA-Appendix D](#)).

A Focus on Standards

Standards and their enforcement are the backbone of Michigan's approach to meeting many of its strategic goals and objectives. As such, this process plays a major role in the state's technical architecture. Standards are defined and documented at several levels throughout the Enterprise Architecture process. There are two chief types of standards within this process:

Standard Solution Patterns

Standard solution patterns are concerned with the overall requirements of a given technology domain or process. These standards define what a technology should accomplish, its integration requirements, environmental limitations and business issues it must resolve.

Standards Development Model

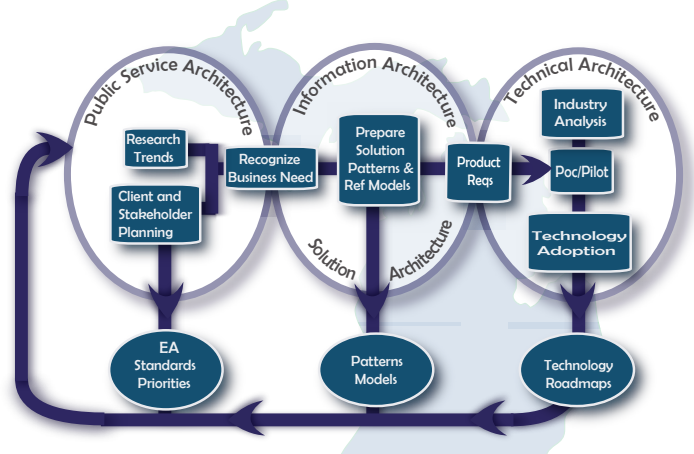


Figure 6 – Enterprise Architecture is fully integrated with the State's common engineering philosophy. It offers many benefits from a quality assurance perspective as well as a qualitative perspective.

Reference Models and Product Standards

Reference models and product standards deal with specific technology product selections. Including preferred version numbers, engineering and configuration specifications and support model definitions. The standards process was created to maintain consistency from the initial recognition of a business need to the ultimate selection of technical solution and vendor. For this reason, MDIT's standards development model overlaps areas within Enterprise Architecture and acts as a consistent oversight check and balance to ensure products meet needs.

Once a business need is recognized, the standards development team prepares the relevant solution pattern. This process consists of requirements gathering sessions involving a cross-functional team of staff from client departments, interested parties and the Office of Enterprise Architecture staff. Once the appropriate solution pattern has been built, the team analyzes whether a reference model can be built from existing product standards. If not, then research and proof of concepts are performed with careful effort to keep the research and development focused on the key criteria of a successful technical solution.

During the proof of concept (POC), the solution pattern and potential reference models are reviewed and questioned for their return on investment potential, viability given the capabilities of alternative solutions and migration challenges faced by particular departments. Additional industry information and analysis are also utilized in the POC/Pilot to support the team assessment and planning efforts. The information gathered is used during a product selection and procurement phase. Once the solution is available to the state, a formal pilot of the technology is conducted. This pilot identifies the optimal configuration, engineering issues and support models of the technology, in addition to any other associated best practices.

These items are documented and become part of the product standard for that given technology and its use. In many situations, as described above, MDIT teams make decisions on the introduction of new technologies and the retention or replacement of existing technology solutions. The entire process is iterative and responsive to the changing technical environment.

Systems Development Lifecycle

In 2005 Michigan began development of common, unified systems development lifecycle termed Systems Engineering Methodology (SEM). The state's SEM has been developed to fully enable Michigan's EA processes.

Mandatory Checkpoints

There are two mandatory checkpoints or reviews throughout the SEM lifecycle. Once, before construction of any new application system begins and, another, before it can be promoted into formal production.

This oversight ensures that standards are followed throughout the process and that needed changes in earlier design specifications are reviewed before technology is widely used. As an integral part of the SEM, the EA team developed a formal process of solutions reviews in 2006. These reviews use a standard approach and an easy-to-use questionnaire to capture the high-level design, integration approaches and technologies used for existing or pending solutions.

From this information, the Office of Enterprise Architecture can intervene to standardize the technologies and processes used. The Solution Review process also opens communication between teams where knowledge can be shared between projects engaged in similar development and implementation tasks. Moreover, this assessment points out exceptions and other anomalies in proposed solutions.

EA Services

Throughout the state's SEM, the Office of Enterprise Architecture offers assistance and support. Each stage of the SEM is mandated for development groups. By using this approach, OEA provides assistance with the following:

- Analysis of alternatives
- Functional design
- Technical design
- Communication of technical requirements to appropriate MDIT enterprise teams

The EA Core Team participates in requests for proposals, develops technical specifications, aligns technical initiatives to statewide business needs and translates technical designs into requirements for infrastructure, security and other service teams within MDIT. The main goals of EA's elective services are to propagate best practices and encourage collaboration among all MDIT technical organizations.

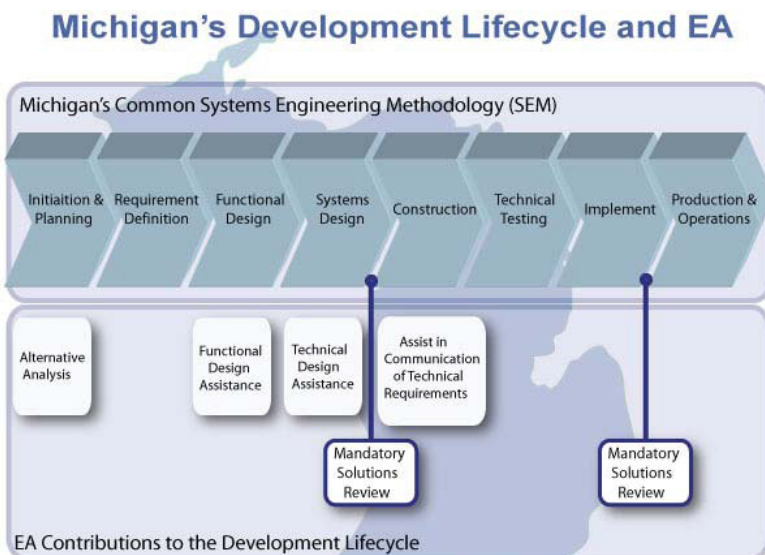


Figure 7 – Enterprise Architecture is fully integrated with the State's common engineering philosophy. It offers many benefits from a quality assurance perspective as well as a qualitative perspective.

EA Repository

In each of the four framework areas there are key documents, deliverables and information that guide EA activities. The direction of technology initiatives must be communicated and available for ongoing use by all MDIT employees. These tools are core to the success of EA in Michigan and act as an institutional EA knowledge base. The following items are representative of what is included in this repository of information:

EA Work Plan

This provides a high-level view of the EA team's initiatives and milestones developed through EA analysis and prioritization. This work plan includes a conceptual presentation of Michigan's future-state architecture. The conceptual architecture is intended to provide a summary view of the solutions, services and technology elements targeted for action, with the aim of building a more consistent and integrated environment demanded by state business drivers.

Solution Patterns

Patterns are developed to aid teams in the design of an initial solution. A solution pattern provides a structure that supports a design idea that can be reused and leveraged across the enterprise, blueprints that identify components at a design or logical level (for example, a data server or an application server) and show the roles, interactions and relationships of components at that level. Initial Architecture Solution Patterns are included in [EA-Appendix C](#).

Reference Models

Reference models are a more detailed representation of specific technology used in the implementation of a solution pattern. They include best practices, standards, development techniques and code samples. They are designed to be continually developed and refined.

Technical Lifecycle Roadmaps

Roadmaps are used to identify and categorize products within our Technical Architecture (TA). Vendor lifecycles are also identified. Roadmaps are used to inform project teams reviewing possible solutions and during implementation planning. They provide guidance to plan for technology governance ([EA-Appendix D](#)).

Technology and Standards Policies

The policies are established to provide overall guidance in the selection and use of technology products at the state. Standards describe the specific products that have been identified as acceptable to meet the goals of the policy. MDIT Technology Policies and Standards can be found at www.michigan.gov/dit and by selecting the "Policy and Standards" link. Specific versions of products will be outlined in the product lifecycle roadmaps as detailed in [EA-Appendix D](#).

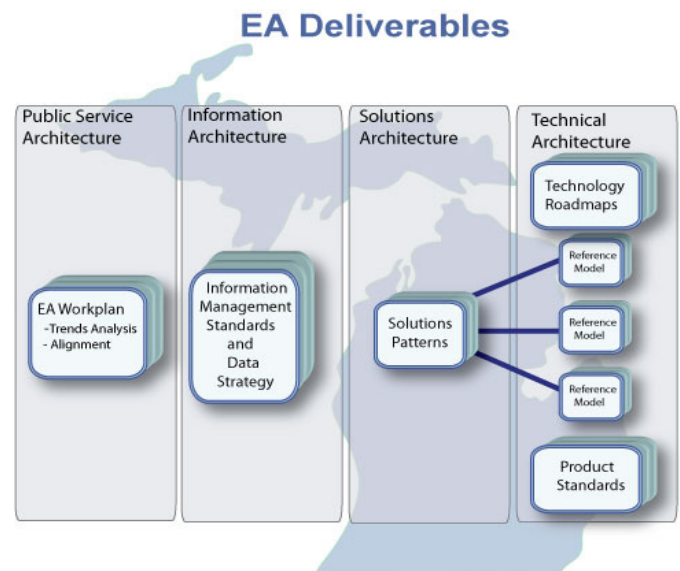


Figure 8 – Key deliverables for each of the four framework areas must be readily accessible to the entire MDIT organization for EA to succeed.

Solution Development

Rapid development of solutions with the EA framework centers around the use of two key outputs; solution patterns and reference models. The process of using patterns and models structures the way MDIT builds reuse into the technical design stage of the SEM. Our goal is to build for reuse from the onset. This very simple process follows three steps:

1. Match requirements to existing patterns
2. Determine if existing reference models will enable requirements (usually multiple options)
3. Evaluate reference models and select the most cost-effective package

At any stage in the solutions development process new solution patterns and reference models can be introduced into the Solutions or Technical Architectures. Additions are approved by the EA Core Team.

Solution Development Process in Practice

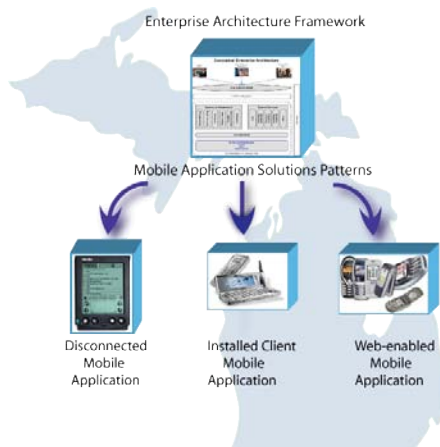


Figure 9 – Solution patterns outline high-level configurations, but stop short of providing any product details.

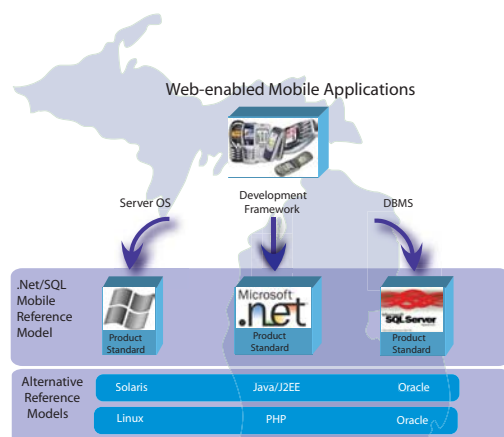


Figure 10 – Reference models combine standard products into preferred “technology stacks” that can be used to implement systems.

The Department of Natural Resources (DNR) is looking for ways they can enable better recreational fishing licensing. Working with their MDIT Development team and the EA Core Team, they evaluate the available solution patterns to determine what pattern best fits their project requirements. During the process of reviewing the available solution patterns (see Figure 7), the project team reviews key information including the basic logic architecture each pattern provides; prerequisites to using each pattern; the base components of each pattern; its strengths and weaknesses; and when other agencies have implemented a similar pattern(s).

In this example, the DNR has expressed that they want to provide the capability for Michigan citizens and visitors to Michigan to be able to order a fishing license online through the Internet. Many of the state campgrounds provide Internet access but for those fishermen that don't bring their computers, the DNR has an additional requirement to also enable licensing through mobile devices that can access the Internet.

From these requirements, one of the solution patterns reviewed is a great match. The Web-enabled Mobile Application Solution Pattern is chosen for the high level design. Figure 8 depicts the dissection of this pattern into its associated Reference Models from the TA framework (simplified). The reference models are available as proven technology “stacks” that projects can leverage.

TA Reference Models will provide enough detail for the project to begin, including: standards for the technology stack specific to the solution pattern, best practices, and mentors within MDIT. The project team chooses to implement their new license renewal system using a combination of Windows, .NET application development tools and the SQL Server database. The DNR technical teams are familiar with the technology outlined within this reference model and utilize this familiarity to ensure success.

Where Are We Headed?

The practice of Enterprise Architecture, particularly Public Service Architecture, can transform government. As EA moves forward, it is playing a key role defining, driving and delivering positive change. In the simplest terms, the future of EA is innovation that supports new and improved business processes for a variety of public service offerings, increasing government service and performance value to the citizen. In their recent publication, “Transforming Government through Change Management: The Role of the State CIO,” NASCIO calls this level of effectiveness government transformation: “Re-form is an attempt to go down the same path more efficiently, transformation involves the development of entirely new paths.”

In Michigan and across the globe, IT is beginning to forge entirely new paths. One of the earliest and most visible manifestations of a transformational EA has been integrated service from collective government entities, such as in Canada’s BizPal. From a longer-term perspective, EA-enabled transformation may also involve using information, communications and technology to transform government goals and desired outcomes, including governance, citizen participation and collaborative relationships.

Several jurisdictions, including Canada (Government of Canada Strategic Reference Model), UK (Transformational Government Implementation Plan) and the U.S. (Federal Enterprise Architecture) have taken steps in developing a transformational role for EA. These approaches are sufficiently flexible that a variety of priority areas can be targeted, ranging from stakeholder needs, such as health, education and economic development; to processes such as revenue collection, business licensing; to organizational silos, like shared administrative services.

Michigan has recognized and is acting upon its EA transformational capabilities and opportunities. Cross-boundary goals and strategies are included in Michigan’s IT Strategic Plan. MDIT’s Office of Technology Partnerships is facilitating statewide formal cross-boundary initiatives that include public, non-profit and private sectors.

The cross-boundary development process has spawned a number of partnerships in areas including health IT, land use, shared services and state/local infrastructure integration to name a few. These transformational goals and initiatives formalize Michigan’s shift from a focus on agency-based efficiencies to a focus on the full range of possibilities that can drive statewide transformation.



Integrating EA and Cross-boundary

Benefiting from research with Gartner, Forrester and the Harvard Policy Group on Network-Enabled Services and Government, Michigan's EA team has identified three major steps necessary to fully integrate a cross-boundary Enterprise Architecture.

Step One: Implementing Change Management

Any truly effective government transformation will require vision, leadership and ultimately a commitment to change from all stakeholders involved. Being jointly established with the MDIT Strategic Management Team and other stakeholders, the change management process and framework in Michigan will be critical to organizing and focusing transformational efforts.

Step Two: Developing a Cross-Boundary EA Framework

The cross-boundary framework builds upon Michigan's planning, change management, innovation and transformation practices. This framework must accommodate increasing complexity as Michigan's cross-boundary maturity level progresses from exchanging data, to conducting transactions, to sharing services as well as other resources and capabilities.

Critical framework elements include:

- Strategies and policies: Identifying and developing appropriate governance structures for sector, tier and service relationships
- Stakeholders and potential partners: Identifying and understanding when communities of practice are ready for cross-boundary transformation
- Processes: Identifying current and potential common or shared business processes
- Resources: Developing principles and guidelines on allocating and sharing costs
- Technologies and solutions: Conducting assessments and keeping up with what is possible and available

Step Three: Develop Explicit Objectives and Next Steps

As detailed on the following page, there are some specific cross-boundary objectives and opportunities for advancement in each of the four EA disciplines. This work will be necessary in order to fully-realize an architecture that reaches across boundaries and maximizes the benefits of IT collaboration.



Objectives and Next Steps

A cross-boundary EA approach has specific implications and deliverables in each of the discipline areas. The following are goals, targets and actions for 2008-2010.

Public Service Architecture

- Identify and assess drivers, disruptive trends, changes in business processes, solutions and technologies that represent opportunities and barriers for the role of EA in cross-boundary solutions and services
- Develop a cross-boundary framework including a targeted business process and public service areas where processes, infrastructure and services can be shared

Information Architecture

- Develop an information exchange, transaction and sharing standard framework for inter-governmental and public/private sector initiatives, including shared services and infrastructure

Solution Architecture

- Develop a portfolio of potential solution scenarios (options) and solution patterns in priority areas such as health, education, economic development and the environment

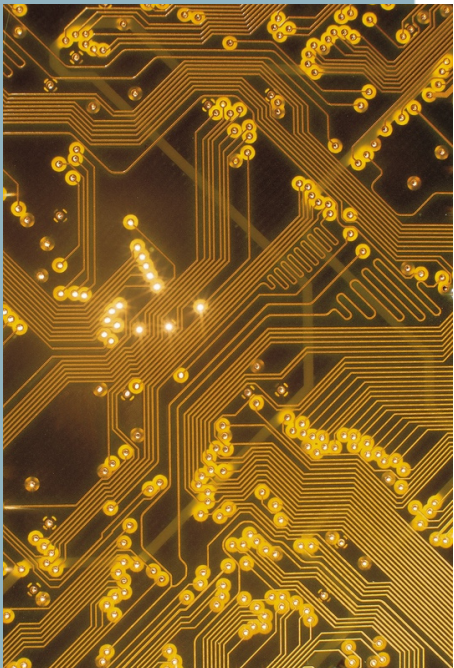
Technical Architecture

- Identify and assess mature or maturing solutions and technologies, and solutions with transformational or high-performance potential, that are suitable for connecting tiers of government, public and private sectors or improving performance and customer service.
- Potential areas for review include:

Government Tiers: service-oriented architecture, enterprise information management, federated identity management, business process management, extensible markup languages, packaged enterprise resource planning (ERP), open source business applications and vertical applications

Public and Private Sectors: Web service-enabled business models, public semantic Webs and security and privacy solutions

Improved Performance and Customer Service: packaged customer relationship management (CRM), content management, location aware applications, and Voice over Internet Protocol (VoIP)



EA Maturity in Michigan

Enterprise architecture is in constant motion. It is a project that never ends. The rapid pace of technology ensures that change will be an ongoing companion for our technical organizations. A strong EA program keeps state government from being held back by technology limitations and sets a stage where true transformation is possible.

We have laid the foundation for Enterprise Architecture in Michigan. Understanding and aligning our EA approach with state priorities was a crucial (and not altogether painless) effort. From this exercise, we have identified our state's core long-term technology needs and have outlined the tactical efforts needed to begin to address tomorrow's needs today.

Michigan's Department of Information Technology is committed to building upon the successes of the past and to looking forward to broad utilization of common technology solutions across our departments and local governments. With a disciplined focus and continued empowerment of technical staff, our EA effort will continue to benefit the state for years to come and ensure that MDIT delivers maximum value for every dollar we spend and build solutions that matter.

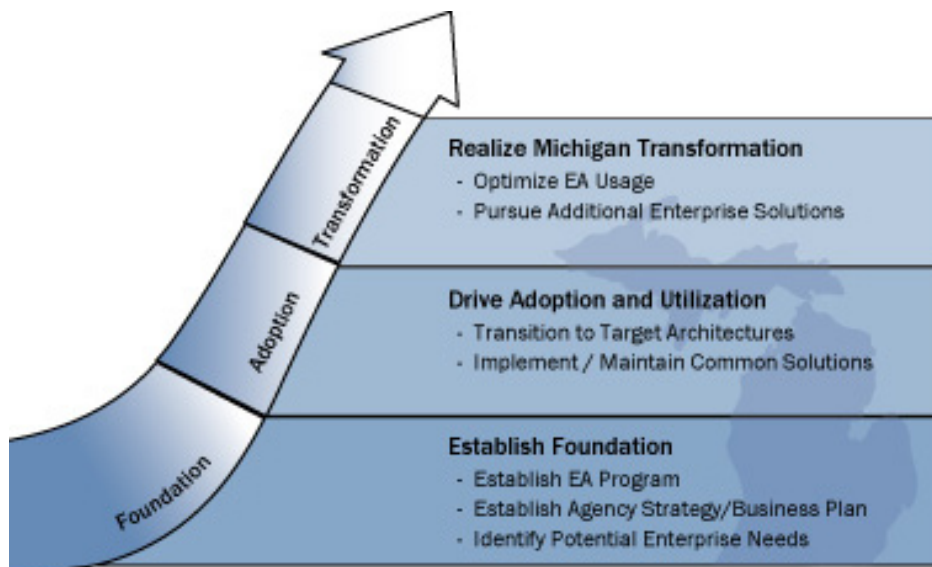


Figure 11. Adapted from a maturity model developed by the Federal Enterprise Architecture Program Management Office