



The e-Michigan Office: Setting a New Standard for e-Government Solutions

An IDC e-business Case Study

THE SUBJECT

The e-Michigan Office was created in May 2000 by Executive Order of Governor John Engler, with the mission of spearheading the State's online initiatives. The Office's first major initiative has been the development of a Web portal to provide a single point of access to the State's online resources.

THE GOAL

The goal of the e-Government portal initiative was to transform a disconnected array of agency Web sites into a coherent, easy-to-use platform for the general public and business community. By making information and services more easily accessible, e-Michigan sought to increase both usage of and satisfaction with the State's online resources.

THE SOLUTION

The State of Michigan's e-Government solution—www.michigan.gov—consolidates the Web-based content and services of 20 State agencies into a single portal. Powered by IBM Business Partner Vignette's content management software running on IBM infrastructure, the portal's features include informational services, fully transactional e-commerce and Web-based self-service. The solution was developed by IBM Global Services, with the assistance of Vignette Professional Services.

WHY IBM

“The fact that IBM proposed a very solid portfolio of products—including its own WebSphere products, as well as products from other vendors such as Vignette—showed us they were committed to meeting our needs first and foremost.”



Table of Contents

Executive Summary	1
Situation Analysis	2
Background	2
The Need: Taking e-Government to the Next Level	2
Action Plan and Decision Process	3
First Steps	3
Challenges	4
Exhibit: Challenges Encountered in the State of Michigan's 's e-business Evolution	5
Solution Profile and Implementation Strategy	6
The Solution: Core Functionality of the michigan.gov Portal	6
Solution Architecture	7
Exhibit: Basic Architecture of the michigan.gov Portal Solution	7
Security Profile	8
The Project: Development Approach and Timetable	9
Exhibit: Development Timetable for the State of Michigan's Portal Solution	9
The Content Management Solution in Action	10
Business Results	10
Exhibit: Overview of the michigan.gov Portal's Business Results	11
Case Epilogue	12

Executive Summary

In early 2000, the State of Michigan launched an initiative designed to consolidate its agencies' Web resources. Spearheaded by the newly created e-Michigan Office, the initiative also sought to simplify and strengthen the State's content management processes, and to provide a single point of end-user access. In April 2001, IBM Global Services was selected to design, deploy and host a solution employing IBM Business Partner Vignette's Content Management Server platform and IBM WebSphere Application Server. The portal, www.michigan.gov, went live in July 2001—on schedule.

In the months following its deployment, average traffic to the michigan.gov site has experienced a nearly five-fold increase over pre-launch levels, reflecting major improvements in performance and ease-of-use. With its next-generation, first-of-its-kind e-government portal in place, e-Michigan continues to add functionality and deeper links to the State's backend systems—enabling richer, more value-added services to be offered to the citizens of Michigan.

The e-Michigan Solution at a Glance

e-business Stage	Integrating
Core Functionality	The State of Michigan's portal solution (www.michigan.gov) provides citizens and businesses with a single point of access to State government resources. Content on the site is grouped into themes, or categories, with the goal of minimizing the number of "clicks" required to reach a destination. In addition to theme-based content and service presentation, the michigan.gov solution allows users to create a personalized profile to customize the information presented at the site. The michigan.gov solution also features a number of secure transactional services, including both e-commerce and Web-based self-service.
Software	IBM WebSphere Application Server, IBM WebSphere Commerce, IBM WebSphere Edge Server, IBM WebSphere Payment Manager, IBM WebSphere Studio, IBM VisualAge for Java, IBM Tivoli Access Manager for e-business (formerly Tivoli Policy Director), Vignette Content Management Server
Services	IBM Global Services
Business Partner	Vignette
Key Benefits	<ul style="list-style-type: none">• Since the introduction of michigan.gov, average daily volume has experienced a nearly five-fold increase—peaking at 755,000 on April 15, 2002.• Shifting content management responsibility to content owners has freed up agency IT staff to work on more strategic IT initiatives, such as developing new online services.• Consolidating the State's Web-based resources on a single platform has allowed agencies to retire or re-purpose servers, thereby reducing ongoing support costs.• The portal's online day-care reimbursement service is expected to save an estimated \$850,000 in administrative and mailing costs.• The State expects its Business Information Lookup service to account for 10 percent of its annual 250,000 information requests, saving nearly \$100,000 in administrative and mailing costs.

Situation Analysis

While the Internet has fundamentally changed the way governments deliver information and services, public sector information delivery still retains many of the vestiges of the “pre-Web” world.

Like most state governments, Michigan had grown its Web resources from the ground up, with each of the state’s 20 departments and numerous agencies developing its own Web presence. This decentralized approach to site development and content management led to a divergence in the quality, look and navigational characteristics of the sites.

Background

Seemingly overnight, the advent of Internet technology made a vast array of information and services available at the click of a browser. This was especially evident in the public sector, where the Web promised faster, more convenient access to state and federal government resources. With a number of “e-government” initiatives completed or under way, the value of the Web as a public service delivery channel has become increasingly evident. Indeed, the Web has enabled the public—the ultimate “customers” of e-government—to gain on-demand access to resources that have traditionally been subject to bureaucracy and red-tape.

But while the Internet has fundamentally changed the way governments deliver information and services, public sector information delivery still retains many of the vestiges of the “pre-Web” world. At the state level, the most prominent of these is a tendency for agencies or departments to create “silos” of information, maintained on a decentralized IT infrastructure. So as the volume and accessibility of state government-held resources have grown, a degree of fragmentation and incoherence has persisted. The result: customers often need to navigate multiple paths—sometimes complex and redundant—to access government resources.

The Need: Taking e-Government to the Next Level

In early 2000, the State of Michigan examined its e-government strategy and saw a system in need of retooling. Like most state governments, Michigan had grown its Web resources from the ground up, with each of the State’s 20 departments and numerous agencies developing its own Web presence. This decentralized approach to site development and content management not surprisingly led to a divergence in the quality, look and navigational characteristics of the sites. Along with sprawling Web content, Michigan also supported a complex, far-flung and disparate IT infrastructure, with many of its servers running in the agencies supported by agency IT staff. This arrangement made the development of a fully-integrated, easy-to-use e-government offering a practical impossibility. So when Michigan Governor John Engler announced his administration’s plan to develop such an offering, the need to reexamine all aspects of the current solution was clear.

To spearhead the effort, Gov. Engler created the e-Michigan Office through an Executive Order that took effect in May 2000. The Office’s core mission was to guide the development of a single, unified State portal—the centerpiece of Gov. Engler’s e-government vision. The broadly defined goal of the portal (www.michigan.gov) was to provide faster, more convenient online access to Michigan’s information and services through the use of state-of-the-art IT infrastructure and applications. More specific goals spelled out in e-Michigan’s charter include:

- *e-Government Coordination*—Facilitating and coordinating statewide development and deployment of integrated e-government technologies

and processes.

- *Citizen Self-Service*—Promoting citizen and organization self-service by providing an integrated service delivery channel for on-demand information-gathering and transaction processing.
- *“One Customer”*—Transforming Michigan’s Web presence from a static, department-centric orientation to a dynamic transaction-and-service orientation that recognizes (i.e., personalizes) customers through a single, integrated view.
- *Public-Private Partnerships*—Fostering cooperative development and partnership with the private sector by making it easier to conduct regular business with the State using Web technology.
- *Economic Benefit*—Creating tangible, economic benefits via cost savings, cost avoidance or revenue generation.
- *Streamlining Government Processes*— Streamline internal business processes to reduce the cost of government and increase state employee productivity.

From the customer’s perspective, one of the key benefits of the portal model is the ability to find information or services without having to know the agency or department responsible for providing them. From the State’s perspective, the benefit of the portal model was seen as the ability to radically improve the efficiency of backend processes, ranging from Web content management to administrative support. What many of these improvements have in common is the use of Web technology to decentralize responsibilities. A clear example is a content management solution, which would enable a large number of non-technical employees to assume content publishing responsibilities from technical staff. Similarly, a Web-based transaction platform would empower citizens, thereby reducing the State’s administrative staffing requirements. By creating the e-Michigan Office, Gov. Engler signified his commitment to embracing leading edge e-business solutions.

Action Plan and Decision Process

First Steps

In the months after its creation (i.e., the second half of 2000), the e-Michigan Office began assembling a composite of the planned michigan.gov portal. As a starting point, e-Michigan performed an in-depth evaluation of the State’s nearly 100 Web sites, rating them on content, ease of navigation, layout and design, functionality and usage volume. The Office also coordinated a series of focus groups (representing various age groups and geographic regions) to obtain feedback on various elements of the portal concept. Having defined the portal’s high-level functional requirements, e-Michigan began the process of identifying and evaluating solution providers. Under its plan, e-Michigan’s solution provider would perform two primary functions. First, it would design and develop the entire portal solution and infrastructure. Second, it would host the solution in a secure, scalable environment. The Office issued a request for

proposal in January 2001, from which it received 16 bids (from providers such as IBM Global Services, EDS and Compuware).

In selecting a solution provider, e-Michigan applied a rigorous set of requirements. On the technology side, e-Michigan was looking for a solution that used best-of-breed, standards-based products that would best adapt to Michigan's legacy IT architecture. In the area of hosting services, e-Michigan sought a provider that could deliver both solid processes and procedures in areas like configuration management and security management, and a highly reliable and available (i.e., 99.9 percent uptime or better) infrastructure. The final—and arguably most demanding—selection criterion was that the provider could deliver a fully functional solution in 90 days. This “rapid deployment” requirement reflected Gov. Engler's desire to deliver value to Michigan citizens within the tightest possible timeframe.

“We were deeply impressed by the processes and procedures IBM had in place [with hosting services] in Boulder. We saw these capabilities as critical to getting the project up and running within our timeframe.”

— Dan Lohrmann, Chief Security Officer, State of Michigan

In April 2001, e-Michigan selected IBM Global Services to develop the solution and host it at IBM's Boulder, CO hosting facility. According to Dan Lohrmann, the State of Michigan's Chief Security Officer, IBM Global Services was deemed superior in all of the project's critical dimensions. “The fact that IBM proposed a very solid portfolio of products—including its own WebSphere products, and products from other vendors such as Vignette—showed us they were committed to meeting our needs *first and foremost*,” says Lohrmann. “On top of this, IBM left us very confident with their ability to deliver the solution in the 90-day timeframe.”

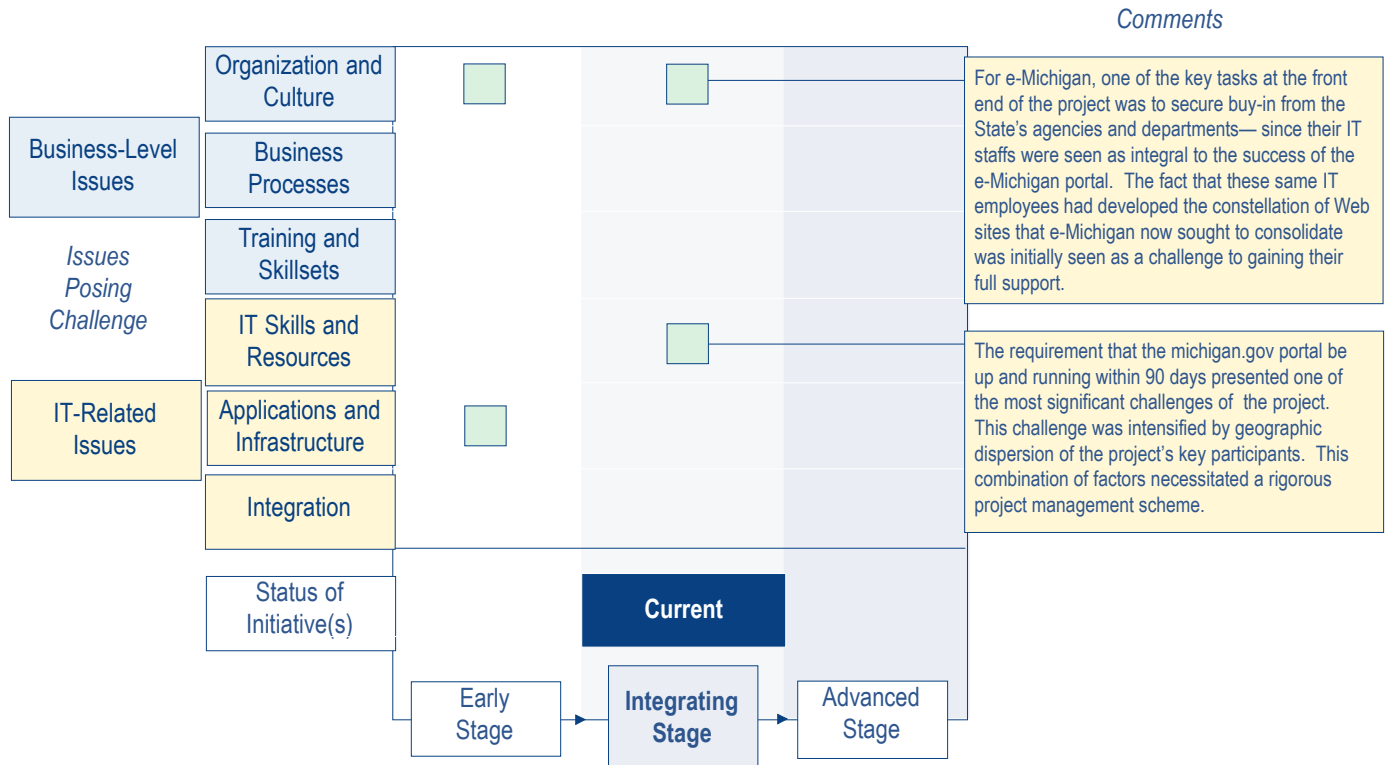
As Lohrmann points out, managed hosting was seen as one of IBM's crucial competencies that made the 90-day timeframe doable. “We were deeply impressed by the processes and procedures IBM had in place in Boulder,” says Lohrmann. “We saw these capabilities as critical to getting the project up and running within our timeframe.” Lohrmann and the selection team were also impressed by the cohesiveness of the team that IBM had assembled for the project, and by the quality of similar, high-profile solutions the team had recently completed.

Because of the central importance of content management in the solution, e-Michigan considered technology strength and market leadership critical requirements for a content management solution vendor. Lohrmann saw Vignette as meeting—and exceeding—these requirements. “Vignette had all the features that we saw as key to our content management goals, including great content management and aggregation capabilities, personalization tools, and reporting functionality,” says Lohrmann. “We also saw Vignette's modular approach as a good fit for our incremental growth strategy.”

Challenges

The key challenge of the portal project was the sheer magnitude and complexity of consolidating more than 100,000 pages of Web content from 20 departments into a single, unified content management framework—all within 90 days. To meet this aggressive timeframe, the deployment team had to overcome the logistical challenge presented by the geographic dispersion of the project's

Challenges Encountered in the State of Michigan's e-business Evolution



Source: e-Michigan Office and IDC

key participants. In addition to IBM's Michigan-based staff (who would develop the solution), the effort would include staff from IBM's Houston software development lab (for testing) and IBM Global Services hosting staff in Boulder (for building the infrastructure). The dispersed nature of the development team—coupled with the project's tight timeframe—necessitated a rigorous project management scheme.

For e-Michigan, one of the key tasks at the front end of the project was to secure buy-in from the State's agencies and departments; their IT staffs were seen as integral to the success of the e-Michigan portal. The fact that these same IT employees had developed the constellation of Web sites that e-Michigan now sought to consolidate was initially seen as a challenge to gaining their full support. However, after a concerted effort to communicate the benefits of the portal model to agency IT staff, the value proposition became clearly evident and the potential for resistance among the IT staff was averted. In fact, at the peak of the project, over 250 IT and business employees were working in cross-agency teams to port agency content to the new solution.

The Solution: Core Functionality of the michigan.gov Portal

The State of Michigan's portal solution—www.michigan.gov—provides citizens and businesses with a single point of access to State government resources. In contrast to the previous agency-based Web site structure, the portal's content is structured using a more intuitive, “theme-based” approach. Content on the site is grouped into six major themes, or categories:

- *Education and Career Development*—Sample information includes financial aid and economic information available to the public from State sources; interactive advice on saving for college tuition, and researching and applying for admission to Michigan's public universities; data about educational performance and available programs; test scores of public school districts.
- *Family, Health and Safety*— Provides information and services in support of Michigan's efforts to provide assistance to strengthen the health, safety and quality of life of families and children.
- *Travel and Recreation*— Provides information and services to assist customers in their Michigan travel and recreational needs.
- *Business Services*— Provides a one-stop resource for businesses, workers, and consumers in need of information and assistance from State agencies.
- *Michigan Government*— Provides Michigan citizens, businesses and employees information on and access to the organizations and individuals of Michigan government as well as the organizations it sponsors and to provide an access point for all levels of government.
- *Licensing, Certification and Permits*— Provides State-required professional and occupational license certification and management information for Michigan's citizens and businesses.

In developing this structure, e-Michigan's planners were guided by the goal of minimizing the number of “clicks” required to reach a destination. By eliminating the need to know which agency or department owns the information, e-Michigan has cut the average required clicks from nearly a dozen to three. In addition to theme-based content and service presentation, the michigan.gov portal is also capable of presenting personalized information to users who choose to create a profile at the site.

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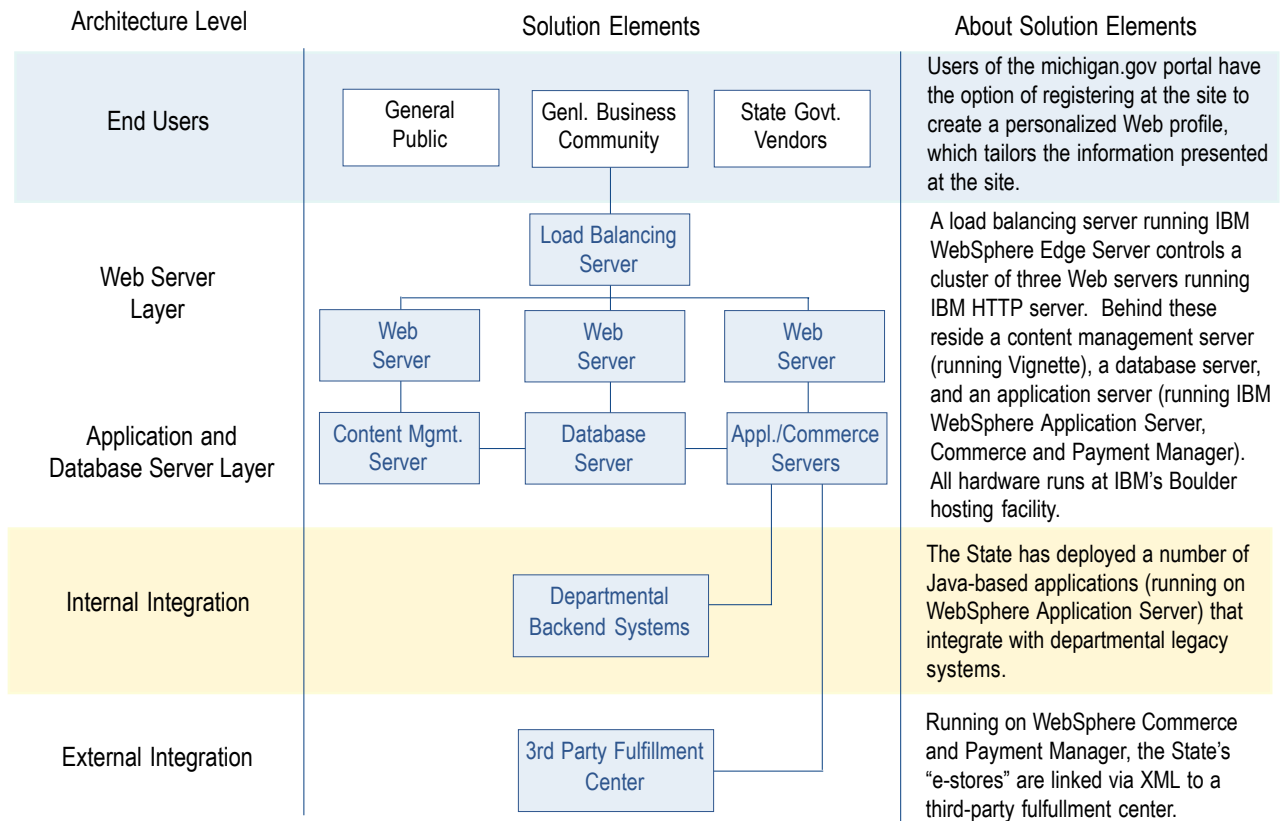
The e-Michigan solution also features a number of secure transactional services, including both e-commerce and Web-based self-service. The site's e-commerce offerings—known as “e-stores”—include a site sponsored by the Michigan Department of Natural Resources that sells wildlife prints, posters and patches, as well as a site sponsored by the Michigan Historical Center. While they are currently standalone sites, e-Michigan plans to consolidate these and all future e-commerce sites into an “e-mall.” In the area of self-service, the Department of Natural Resources offers an online Hunting and

Fishing license and campground reservation system. A system owned by Michigan's Family Independence Agency allows day-care providers to register online for electronic funds transfer and check their account history over time. They can also electronically submit invoices for services to the State.

Solution Architecture

The production environment for the michigan.gov portal is hosted at IBM Global Services' Boulder, CO facility. The front end of the system consists of a cluster of three UNIX Web servers (running IBM HTTP Server) controlled by a fourth UNIX server (running IBM WebSphere Edge Server) functioning as a load balancer. These Web servers link back to three more UNIX servers (located behind a firewall) performing a variety of critical functions. One server runs Vignette Content Management Server, which controls all content-related functions including user personalization through its observation and content recommendation capabilities. Another server functions as the database server for the michigan.gov solution, storing all content entered into the Vignette content management system. The third UNIX server runs IBM WebSphere Application Server (whose function is to run Java applications within the solution) and Tivoli Access Manager for e-business (which is used to enable single sign-on for certain applications running on the portal). Also running on the third server is WebSphere Commerce and WebSphere Payment

Basic Architecture of the michigan.gov Portal Solution



Source: e-Michigan and IDC

Manager, which run on top of the WebSphere Application Server environment and power the solution's e-commerce components.

The e-Michigan solution is integrated with a variety of external sources via software connectors within the WebSphere products. For instance, WebSphere Commerce is integrated via XML with an external fulfillment center (for fulfillment of online purchases), while WebSphere Payment Manager is linked to financial service providers (for credit authorization). The entire solution is linked via a T1 line to a mirrored environment (running the same architectural configuration) at e-Michigan's Lansing facility. [This environment is used chiefly for testing and development of new software releases and template changes.]

Integration of the portal to agency backend applications is also growing in importance. A good example of this is an application known as iChat that allows individuals to purchase background checks of Michigan citizens over the Web. Developed by IBM Global Services (using WebSphere Application Server, Commerce, and Payment Manager), iChat is a Java application that uses XML to access a State Police database running on a Unisys mainframe. As Lohrmann points out, integration with a state's legacy systems has the potential to unlock the greatest intrinsic value of an e-government solution—but also presents one of its most significant challenges. “We envision the portal as an easy-to-use gateway to an array of agency databases,” says Lohrmann. “Building linkages with the State's disparate backend systems will require flexible integration tools and middleware to allow us to do it efficiently and cost effectively.”

Security Profile

The three security issues for the michigan.gov portal include:

- controlling access to pre-approved content
- data security (controlling access to Web servers, application servers and the State's backend systems)
- transactional security

Within the solution, access to unapproved portal content is controlled through the Vignette solution. To provide data security, the solution employs three redundant layers of firewalls. The first is deployed between the Internet and the Web servers. The second firewall is deployed between the Web server and application server layer. The third is deployed between the application server layer and Michigan's backend systems.

Transaction-level security is relevant in two key areas. First, for the portal's e-stores, credit card information is sent via SSL to a financial institution for processing. Credit card numbers are also stored in encrypted format. The second solution element where transaction-level security is necessary is the log-in process required to invoke the portal's personalization capabilities. Here again, SSL is used to secure the transmission of user log-in information.

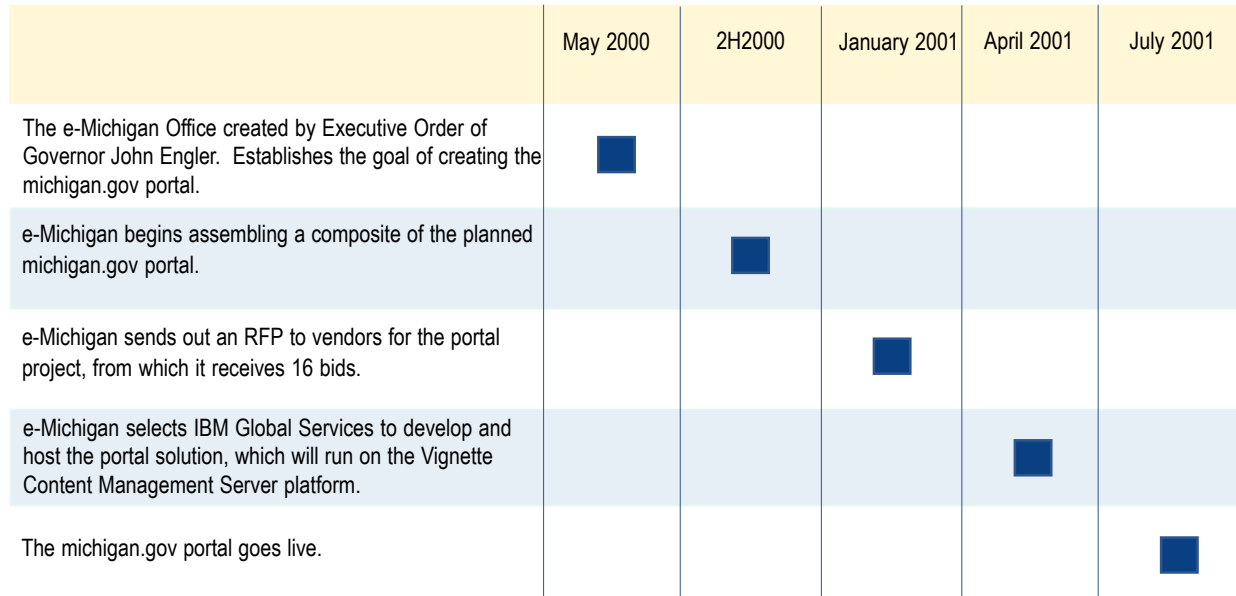
In the area of authentication, the State has taken the first steps toward providing a Single Sign-On capability on the michigan.gov portal, which will ultimately allow users to access multiple portal services in a single user session. The first initiative in this area was a limited-scope, proof-of-concept implementation employing a Java application that integrated Tivoli Access Manager for e-business and IBM Directory Server to enable Single Sign-On. While this capability will eventually be extended to the public portal users, it was initially deployed within two of the State's intranet applications (the e-mail and human resources management systems). In a separate initiative, Tivoli Access Manager for e-business was also employed to provide Single Sign-On for a new Web-based immunization registry application (owned by the Department of Community Health) targeted to all of the clinics, hospitals and doctors' offices in the State of Michigan.

The Project: Development Approach and Timetable

The e-Michigan project involved IBM Global Services staff as well as staff from Vignette Professional Services. IBM Global Services staff designed the overall portal solution and deployed the majority of the infrastructure and applications. The team used IBM WebSphere Studio and IBM VisualAge for Java as its primary development environment. Vignette Professional Services staff assisted in the implementation of the content management portion of the solution, including software deployment, development of the content management workflow, and the training of employees on the Vignette platform.

Development of the michigan.gov portal proceeded in three phases. The first phase, begun in April 2001, focused on the design and deployment of the new

Development Timetable for the State of Michigan's Portal Solution



Source: e-Michigan and IDC

site, including its core content management capabilities. The workflow in the first phase proceeded down two parallel paths. While IBM Global Services staff prepared the technical infrastructure and designed the site at Boulder, another team developed the templates on which the content management portion of the solution would be built. To facilitate template development and the publishing of content, e-Michigan created a Center of Excellence (COE), comprised of Web development staff from various State agencies. By June 2001, the two paths converged with the completion and testing of the solution (which was performed by staff from IBM's Houston software development lab). The michigan.gov portal went live in July, 2001, within the targeted 90-day timeframe for the first phase of the project.

The project's second phase focused on incremental additions to the solution, including the development of e-stores (using IBM WebSphere Commerce) and the proof-of-concept Single Sign-On solution (discussed in the previous section). Features incorporated into the portal during the second phase went live in late October 2001. Under the third and final phase of the project, completed in June 2002, all 100,000 pages of Michigan's agency content were successfully migrated to the portal's content management platform.

According to Michael Wolf, Vignette's Senior Account Executive for Public Sector Sales, the project's smooth execution owes much to the well-defined roles and the seamless interaction of IBM and Vignette implementation teams, and to the e-Michigan Office knowing its business needs. "The skill sets IBM Global Services and Vignette brought to the project were highly complementary," says Wolf. "The breadth and depth of the combined teams' skills—combined with a very rigorous project management approach—were the single biggest factors that enabled us to meet a very aggressive implementation schedule."

The Content Management Solution in Action

By deploying the Vignette Content Management solution at the heart of the michigan.gov portal, the State has in essence "democratized" the content management publishing process—by shifting authority from IT to non-technical staff. Under the standard content creation process, staff input content into templates (created by the development team). Within the solution architecture, data created or changed by staff are sent to a content entry server (a function within the Vignette Content Management Server). Through a workflow process, this content is sent to an approval authority within a particular agency. Upon approval, the content is posted to a content database (part of the Vignette solution) and is published on the appropriate Web site.

Business Results

The creation of the e-Michigan Office signaled Gov. Engler's commitment to establishing a state-of-the-art e-government solution to serve the State's key constituencies. Since its introduction in July 2001, the michigan.gov portal has delivered solid results on a number of fronts. One of the most visible and immediate results, says Bob Rock, e-Michigan's Program Coordinator, is the

Overview of the michigan.gov Portal's Business Results

Business Process Area/Issue	Nature of Benefit	Description or Metric
Site Volume	High Levels of Performance and Availability	Since the introduction of michigan.gov, average daily volume has experienced a nearly five-fold increase—peaking at 755,000 on April 15, 2002.
IT Staff Allocation	Optimization of IT Staff Resource Deployment	Shifting content management responsibility to content owners has freed up agency IT staff to work on more strategic IT initiatives, such as developing new online services.
IT Infrastructure	Server Consolidation Lower Ongoing Support Costs	Consolidating the State's Web-based resources on a single platform has allowed agencies to retire or re-purpose servers, thereby slashing ongoing support costs.
Administrative Overhead	Administrative and Mailing Cost Savings	The State's online day-care reimbursement service is expected to save an estimated \$850,000 in administrative and mailing costs.
Administrative Overhead	Administrative and Mailing Cost Savings	The State expects its Business Information Lookup service to account for 10 percent of its 250,000 information requests, saving nearly \$100,000 in administrative and mailing costs.

Source: e-Michigan Office and IDC

marked increase in site volume experienced since the launch of the portal. “We’ve experienced unbelievable—nearly straight up—growth in site traffic,” says Rock. “The portal’s infrastructure in Boulder has been able to easily handle this traffic, and also provide us with detailed reports that help us understand and track the volume.” Previous to the roll-out of the michigan.gov portal, all agencies received a total average daily volume of approximately 100,000 page views per day. Since the introduction of michigan.gov, average daily volume has experienced a nearly five-fold increase—peaking at 755,000 on April 15, 2002.

The deployment of the michigan.gov portal has also led to a raft of operational benefits related to Web maintenance and support. For example, shifting the bulk of content management responsibility to content owners has freed up agency IT staff to work on broader, more strategic IT initiatives, such as developing new online services and applications. Similarly, by consolidating the State’s Web-based resources on a single, high-capacity platform, agencies have been able to retire or re-purpose servers that had previously delivered content or services—thereby slashing ongoing support costs. On top of these efficiency-oriented benefits, Michigan’s Web portal is now richer, more dynamic and more interactive by virtue of its deployment of the Vignette content

management solution.

One of the most heavily touted benefits of e-government is the ability to conduct traditionally physical transactions over the Internet. And it's in this domain that e-Michigan expects to accrue its most significant business benefits—ranging from administrative cost savings and avoidance to faster processing for citizens and businesses. One of the strongest examples is an application that allows 80,000 day-care providers to submit reimbursement forms via the Web and be automatically reimbursed via electronic funds transfer. By moving from paper-based to Web-based forms submission, the State stands to save an estimated \$850,000 in administrative and mailing costs. Similar benefits are expected from a new Business Information Lookup service that allows citizens to research information about companies based in the State. In the first year of its deployment, e-Michigan expects 10 percent of the 250,000 requests it receives annually (by phone and mail) to be handled over the Web—saving nearly \$100,000 in administrative and mailing costs.

Case Epilogue

“The IBM Global Services team brought a single-minded determination and proven methodologies to the implementation process. Vignette complemented this strength with its expertise in the content management space, namely—what’s the future of the technology, and what direction should we take to make the most of it.”

— Dan Lohrmann

Having successfully deployed the michigan.gov portal, e-Michigan has set its sights on expanding the breadth of functionality of the public site, and bringing the Vignette-based portal model to the State’s intranet. Lohrmann sees the deployment of a portal-based intranet model as delivering a quantum improvement in collaboration across the State’s 20 agencies. “In addition to more timely content, the portal-based intranet will enable widespread use of electronic forms internally, saving money in printing, mailing, and data entry,” says Lohrmann. “On the collaboration side, Vignette’s e-room capabilities will allow us to break down walls across the enterprise by creating role-based communities defined by their authenticated ID.” An example he cites is an electronic gathering of CIOs from different agencies communicating and sharing information in realtime.

Looking back on the project, Lohrmann highlights the team-oriented mindset that prevailed throughout the project as a key reason for its success. “While Vignette Professional Services and IBM Global Services each brought their own well-defined competencies to the project, they functioned as a cohesive, highly efficient team,” says Lohrmann. “The IBM Global Services team brought a single-minded determination and proven methodologies to the implementation process. Vignette complemented this strength with its expertise in the content management space, namely—what’s the future of the technology, and what direction should we take to make the most of it.”

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