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Business Continuity

Kentucky Mutual Aid and Interoperability

Executive Summary

In 2005, the Commonwealth of Kentucky launched the Mutual Aid and Interoperability project to correct a long recognized problem that prevented the state's first responders from communicating with one another. This lack of voice interoperability severely limited the effectiveness of agencies in times of emergencies and in situations requiring aid or assistance from neighboring agencies. The Mutual Aid and Interoperability project has corrected this problem by providing first responders with the capability communicating with one another across boundaries in real-time.

This problem of interoperability came about as populations grew and the need for support agencies increased. As these agencies requested and received frequencies for use in their day-to-day operations, they were quickly exhausted. Eventually, new frequency bands were opened to support new requirements. These frequencies were assigned according to availability and propagation characteristics. Unfortunately, this practice has resulted in a number of frequency bands (150MHz, 450MHz, and 800MHz) being used by first responders in Kentucky. In many cases, neighboring agencies have frequency assignments operating in entirely separate frequency bands, which inhibits inter-agency communication. This situation precludes a simple channel sharing plan with which local agencies could share frequencies and the benefits of communicating with each other.

Most local agencies have tried to work around this problem by instituting a policy of radio swaps, cell phone usage, or other proprietary methods. Typically, these methods limited interoperability to two or three agencies, and were expensive, cumbersome, and only marginally effective.

Clearly, our goal was to provide a method of communicating with multiple neighboring agencies simultaneously in real-time, regardless of the frequency bands in use. This capability must be provided without the need for additional equipment or personnel at no cost to the state's first responder agencies without requiring them to carry additional radios or support equipment.

The Mutual Aid and Interoperability project resolved this problem by building a network that provides several common channels in each of the three frequency bands used in the commonwealth. These channels are nationally recognized, dedicated to mutual aid, and any agencies desiring to participate in their use may do so after signing a memorandum of understanding.

This project's cost was less than $2 Million but has provided the means to allow all first responders to communicate with each other, in real time, with no loss of capability, at absolutely no cost. Additionally, current propagations studies have documented mutual aid radio coverage to more than 97 percent of the commonwealth.

Project Description

Prior to the Mutual Aid and Interoperability project, local, county, state, and federal public safety first responders were using private radio systems that could not talk to each other. Technology barriers such as the use of frequency and communication protocols obstruct the seamless transfer of voice communications between first responders. This had proven to be problematic when officials were called to respond to emergencies or situations requiring assistance from neighboring agencies.

Public Safety Agencies across the commonwealth primarily operate in three frequency bands; 150, 450, and 800 MHz. Since most radios did not have the capability to operate on different frequency bands, public safety first responders could not communicate with one another unless they were operating within the same frequency band and were utilizing the same communication protocol.

The Mutual Aid and Interoperability program provides the capability for agencies to tune-in to dedicated pre-defined frequencies using the standard Conventional Analog communication's protocol, which is shared among

one or more public safety agencies. All radios used in the commonwealth have the capability to communicate using the Conventional Analog communication's protocol.

There are several mutual aid channels set aside either formally or informally by the commonwealth and the FCC in the 150MHz, 450MHz, and 800MHz frequency bands. The Mutual Aid standard formalizes the wireless voice communication protocol necessary to achieve communication interoperability among public safety first responders in each of those frequency bands.

For the VHF (150MHz) frequency band, 45 new radio systems were purchased. Of these systems, 38 have been deployed, providing coverage to more than 97 percent of the commonwealth. To maintain backward compatibility, a frequency from an old network was reused as a call channel, and the nationally recognized VTAC channels are being implemented as well. Once the remaining radios are deployed, it is expected that nearly 100 percent coverage will be achieved. The graphic below demonstrates coverage of about 97 percent that has been achieved to date.
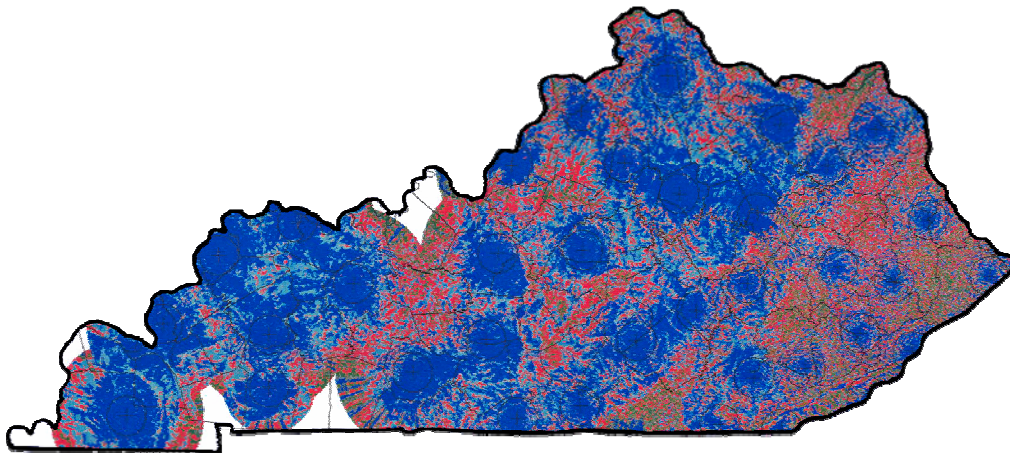
For the UHF (450MHz) frequency band, 45 new radio systems have been purchased and deployed. This network consists of 96 stations, and plans are underway to replace the remaining radios. As can be seen by the graphic below, nearly 100 percent coverage exists today in the channels being used. Once the remaining systems are replaced, the six additional nationally recognized UTAC channels will be implemented.
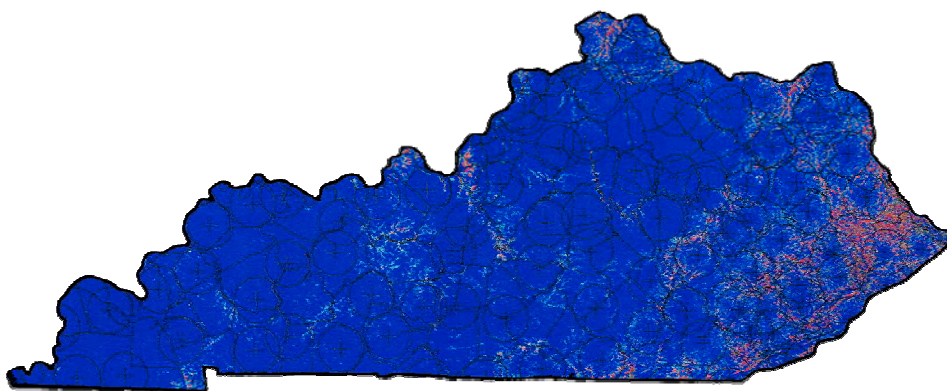
The 800 MHz Band requires the awareness of the existence of NPSPAC Mutual Aid channels for public safety to use. Eighteen 800MHz base stations will provide coverage for the Ohio River valley cities and coverage along I65 and I75 highway corridors. Other areas of the commonwealth are not covered by this plan because these areas are not using the 800 MHz frequency band.

In each of these frequency bands, these channels are carried back to the nearest Kentucky State Police regional post. At these KSP posts, the dispatcher may patch (cross-connect) any or all of the 150MHz, 450MHz, and

800MHz Bands by using their console Base Interface Modules (BIM). This enables a first responder operating on the 150 MHz Mutual Aid channel with the capability to be 'patched' into the 450 MHz Mutual Aid channel on a regional basis. These regions are displayed below.
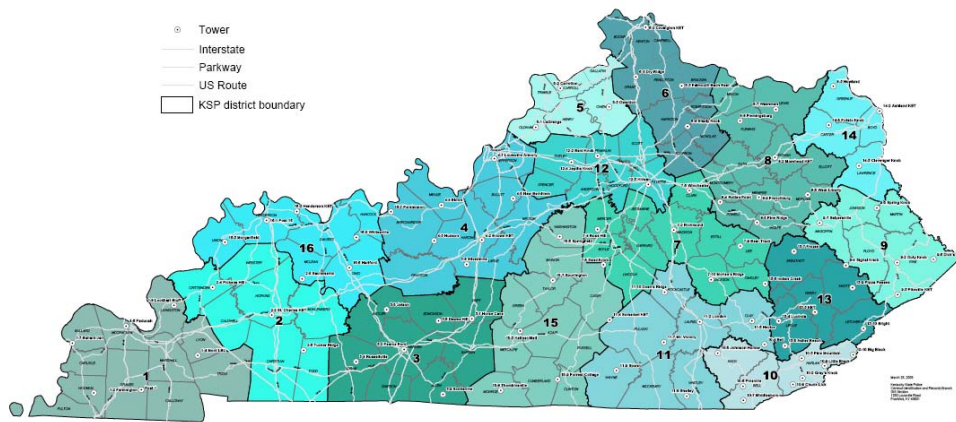
Significance to the Improvement of the Operation of Government

Since this program is available across the state and to all first responder agencies, the structure is now available for inter-agency coordination, incident command and control, and disaster response. True interoperability can be realized now that the primary barriers to effective communications have been removed.

Incident commanders may now coordinate and control multiple agencies and resources from situations requiring only local coordination, up to and including major incidents or disasters that may include multi-state and federal boundaries.

The Mutual Aid and Interoperability program provides a new interoperability capability not previously available that vastly increases our effectiveness and efficiency. It will improve our ability to protect and aid our citizens and first responders.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

The benefits of this Voice Mutual Aid and Interoperability network can be easily envisioned. Imagine any situation that requires a first responder to request assistance from any other neighboring agency. A few examples of situations where this added capability benefits are:

- High speed chases where local or municipal police are in need of assistance from neighboring counties or state agencies
- Natural disasters where coordination of EMS, firemen, and police need to be handled by an incident commander in real-time
- Emergency situations where multiple agencies are needed to handle the magnitude of an event such as plant explosions, and plane and train crashes
- Disasters or emergency situations that cross municipal, county, or state borders
- Other situations where multiple agencies respond to emergencies

The Mutual Aid and Interoperability program provides the following benefits:

- Eliminates the need to implement costly radio swap programs
- Eliminates requirements for additional frequencies
- Available at zero cost
- Allows participants to use their existing equipment
- Uses current staff – no additional staffing is required
- Does not encroach upon any operational frequencies

- Allows use of the existing KSP infrastructure
- Allows dispatchers to initiate and remove patches on demand
- Applies frequencies that are nationally coordinated
- Provides rapid communication access for field units
- Provides coverage for specific areas or over a wide area
- Provides resources that can be controlled by dispatchers or incident commanders

Realized Return on Investment, Short-Term/Long-Term Payback

While it is difficult to determine an exact return on investment, this project can be compared with other states that have implemented, or are planning to implement, far more expensive projects that provide the same basic services provided by Kentucky's $2 Million Mutual Aid and Interoperability network.

Costs savings will be realized in years to come in areas where the ability to communicate in real-time to multiple agencies may prevent situations of unneeded call-outs, duplication of effort, and even prevention of catastrophes.

It can also easily be seen that if this system had not been implemented, individual agencies would have continued to address this problem in any number of incompatible ways. This approach would not only have ultimately failed, but it would have placed the cost burden entirely on each agency, and any economies of scale would be lost.

More than 100 first responder agencies have signed the Memorandum of Understanding with the Kentucky State Police (KSP) to utilize the Mutual Aid frequencies. This number is increasing continually as agencies continue to sign up. Unlike other programs, which have a cost associated with each additional participating agency, this program has a fixed cost for the network and has no diminishing returns on investment. The more agencies that participate in this program, the more likely that we will prevent unneeded events and realize cost savings that cannot be imagined at this point.

At a cost of less than 50 cents per citizen, it is easy to see that this new capability is a low cost system that supports all citizens and pays for itself in potential savings of life, and property.

Cross-Boundary Collaboration and Partnerships

California Department of Health Services Prenatal and Newborn Screening Information System

Executive Summary

The Screening Information System (SIS) implemented by the California Department of Health Services (CDHS) is the critical cornerstone of California's prenatal and newborn genetic disease screening program, one of the largest and most comprehensive genetic screening programs in the world.

CDHS implemented SIS in July 2005 with two major goals in mind: to enhance their existing outdated information technology system and to expand the number of rare genetic diseases they screen for. Today, SIS enables physicians to diagnose and treat a wider range of genetic disorders than previously possible. Using the system, newborns throughout the state are now screened for 75 inherited and congenital disorders rather than the previous 39. Undetected, these rare disorders can cause devastating disabilities. But if caught quickly, they are often treatable. Changes as simple as altering an infant's diet can mean the difference between a normal life versus mental retardation or even early death.

SIS also allows the state to better manage test results and reporting and to achieve more efficient communications and collaboration between the multiple public and private entities involved in genetic screening, diagnosis and treatment. Once identified as having a genetic disease, SIS helps facilitate extraordinary follow-up for affected babies and their families until the disorder is fully diagnosed and treatment is initiated. This process involves an extensive amount of cross-boundary collaboration between labs, case coordinators, counselors, physicians and staff of the CDHS Genetic Disease Branch.

Ultimately, SIS allows CDHS to intervene earlier with more effective treatment of children with a wider range of genetic disorders, thereby radically increasing the chances a baby born with a genetic abnormality in California can live a healthy life.

Project Description

In 2000, the California Legislature authorized a massive enhancement of the state's prenatal and newborn genetic testing information system. The existing 20-year-old legacy system was operating well past its expected lifetime and had virtually no capacity to incorporate new screening programs or meet enhanced screening requirements. The California Department of Health Services (CDHS), which manages the prenatal and newborn genetic screening program for the state, was unable to take advantage of newer, lower-cost computing resources because the current system precluded the introduction of innovative tools, methodology, and system software. End-users faced unacceptable system response times and the list of required system enhancements continued to grow.

At the same time, medical technology was advancing rapidly. The existing system would soon have been unable to interface with new medical technology, which had become increasingly prevalent among screening partners. In addition, CDHS faced the risk that it would not be able to respond quickly to a system failure due to the proprietary nature of the existing system. This risk was life threatening for newborns with genetic diseases that might go undetected if the legacy system went down.

In 2004, before replacement of the information technology system could be accomplished, the California Legislature also mandated an expansion of newborn genetic testing. The existing system and technology could only screen for 39 genetic diseases. The Legislature wanted to expand that number dramatically. It was then up to CDHS to determine how to design and build both expansions under short timeframes, as well as accomplish the difficult task of collecting and managing a much larger amount of data.

Working with Deloitte Consulting, CDHS leaders set out to develop an innovative solution. In July 2005, SIS was launched. SIS is a web-based information system that allows CDHS to better manage its prenatal and newborn genetic screening program. SIS enables physicians to diagnose and treat a wider range of genetic disorders in

children than previously possible; allows the state to better manage test results and reporting; and enables more efficient communications between the multiple entities involved in genetic screening, diagnosis and treatment.

Significance to the Improvement of the Operation of Government

SIS provides enhanced computer support for both prenatal and newborn screening programs. The prenatal screening program screens for genetic and congenital disorders (e.g., Down syndrome, anencephaly, spina bifida, and neural tube defects). The newborn screening program provides screening of newborns for other genetic and congenital disorders (e.g., phenylketonuria and other metabolic disorders, galactosemia, primary congenital hypothyroidism, sickle cell anemia, and other hemoglobin diseases, and congenital adrenal hyperplasia). As a result of both programs, babies are spared lifelong disabilities (including severe retardation) and even premature death.

SIS facilitates collaboration among California laboratories, case coordinators, counselors, physicians and staff of the CDHS Genetic Disease Branch. SIS was designed to transform congenital disease screening and treatment business processes by providing solutions to several problems the legacy system was not capable of solving. Online access by multiple end users was required along with a system capable of processing California's enormous volumes of data. The system had to allow ease of expansion for new types of testing and new disorders and a myriad of complex reporting requirements had to be supported. The system had to provide enhanced security and privacy protections and be HIPAA compliant. SIS has addressed all these issues through a highly modular, scalable and expandable system that includes a data warehouse that supports over 150 operational and analytic reports and ad-hoc reporting. In addition, SIS incorporates the latest generation of specialized congenital screening equipment, called Tandem Mass Spectrometers. This technology has allowed a dramatic expansion in the number of genetic disorders that can be screened for.

The data in SIS also serves as a vital source to support state-required registries of genetic abnormalities, and provides data to meet myriad state and federal reporting requirements, thus allowing state and federal leaders to target public health intervention and education more appropriately.

Technology is a critical component of SIS, allowing for an improved user interface, direct access to on-line reporting capabilities, easier access to necessary information by appropriate medical providers, and improved security and privacy protection. Cutting-edge technology also made it possible to add a matching capability to SIS, which means connections can now be made between prenatal and newborn cases, and all family members' tests can be linked to each patient. This was impossible with the legacy system because it is a highly complicated function due to the nature of medical data, its sources, and formats. Such matching allows creation of a complete genetic profile of the family's risk, thereby increasing the quality and comprehensiveness of the services the state provides to its citizens.

Not only does SIS screen for a battery of prenatal and newborn genetic disorders, but the system also provides extraordinary support to the families in the form of extensive, individual follow-up, counseling, and definitive diagnostic testing. Each baby identified with a positive screen is carefully followed until necessary treatment is initiated. No other state has a system that combines prenatal and newborn genetic screening with case-specific, individualized follow-up and counseling to ensure that each newborn baby who screens positive for a genetic disorder receives definitive diagnostic tests and immediate therapeutic services.

SIS has significantly improved data sharing between all end-users (CDHS staff, laboratories, case coordinators, and follow up specialists). It has allowed real-time, online access to follow-up specialists who, in the past, had received delayed information via faxes and mail. To do this in any state is an accomplishment. To do it in a state as large and complex as California is truly a feat.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

SIS allows health care workers to more readily address the needs of babies born with rare but often treatable diseases. During the pilot phase, an infant girl was diagnosed with a metabolic disorder that interferes with digestion of a particular amino acid. At the time, only 32 cases of the disease had been documented worldwide. Had the girl not been born and tested during the pilot project, she probably would not be alive today.

SIS provides significant benefits to not only the 400,000 pregnant women who are tested each year and the 550,000 newborns tested annually, but also to other important stakeholders, including the State of California, the citizens of California, the genetic disease screening communities, and health care professionals.

In the first year of expanded testing, 105 newborns were diagnosed with rare genetic disorders that otherwise would not have been diagnosed in the first days of life and 20 infants were identified as having Congenital Adrenal Hyperplasia. With early intervention and treatment (sometimes involving nothing more than a specialized diet), these babies will be spared severe disabilities and even premature death. Instead, they will be able to live healthy lives.

As David Swift put it when he spoke about the call he received from his doctor telling him that his daughter, Giana, tested positive for a genetic disorder: "I gasped. I thought at the time it was the worst phone call I'd ever received in my life. I think in hindsight it was the best phone call I've ever received in my life, because…that was the gift of life…. Had that test not caught this, had the screen not provided for the opportunity to know she had this disorder, chances of her dying were probably better than 80%. Had she not died, she probably would have been severely …ill or …retarded. And today we have a precocious, happy, healthy, beautiful little girl."

Every California mother benefits from SIS in that it can, in most cases, eliminate worry that an unborn child has a genetic abnormality. In the cases where test results are positive, educational efforts can be undertaken so the parents understand the disease and are prepared, along with their doctors, to manage it.

The child, the family, the community and the taxpayers of California all benefit through significant cost savings, future cost avoidance, and improved service delivery. Cost savings will be realized through increased efficiency, and reduction or elimination of redundant processes. Future cost avoidances will be achieved through early detection of genetic abnormalities in newborns whose disorders would have gone undetected in the past, resulting in extraordinary lifetime medical costs. Without detection and early treatment, each child born with these disorders would suffer mental retardation, other handicapping conditions or premature death. To illustrate the cost avoidance, considering mental retardation alone, the lifetime costs of care of a single affected newborn have been documented at $300,000 to $1 million. Of course, the emotional cost for the family is incalculable.

Realized Return on Investment, Short-Term/Long-Term Payback

Annually the expansion will detect on average an additional 125 cases of metabolic and endocrine disorders that, if undetected and untreated, would lead to mental retardation, other handicapping conditions or death. Roughly, 105 of these cases are metabolic disorders and approximately 20 are cases of congenital adrenal hyperplasia (CAH). It is conservatively estimated that at least 60 of these cases (50 metabolic and 10 CAH) have disorders where interventions could be life saving and prevent serious handicaps. The costs of interventions for these 60 cases have been estimated to average $100,000 over a lifetime and $6,000,000 in program treatment costs. However, state metabolic specialists estimate that it is more likely that as many as 92 cases may be detected that would involve significant interventions.

Without the expansion's detection and intervention, 20 would result in severe mental retardation, 20 in mild to moderate retardation, and 20 in death.

The lifetime costs of care of individuals who are mentally retarded have been documented and average $1,000,000 for severely mentally retarded and $300,000 for mild to moderately mentally retarded per newborn. The net average in averted costs would be $26 million (20 x $1,000,000 = $20,000,000; 20 x $300,000 = $6,000,000).

In addition, 20 deaths can be prevented each year. If the economic value of $5,000,000 is assigned to each life saved, an additional $100 million in benefits will be obtained.

The net benefit of this expanded testing statewide is approximately $126 million. The net incremental benefit of $126,000,000 achieved divided by the annual screening cost of $9,079,000 gives an overall cost benefit ratio of $13.88 saved for each dollar spent on expanded screening, or $8.36 if the treatment costs are included. However, if the higher estimate of 92 rather than 60 preventable cases is used, these values would be significantly higher.

COSTS

Annual Screening costs:	$9,079,000
Treatment costs:	$6,000,000
Total costs:	$15,079,000

BENEFITS   **20 lives saved**

Lives saved:	$100,000,000
Treatment costs averted:	$26,000,000
Total:	**$126,000,000**

District of Columbia Safe Passages Information System

Executive Summary

In May 2005, the District of Columbia (District) implemented the *Safe Passages* Information System (*Safe Passages*) to enable and facilitate collaboration among multiple disparate government agencies and private sector partners responsible for providing health and social services to the District's neediest children and families. An integration solution, Safe Passages provides automated, real-time data sharing across the organizational boundaries that separate District health and social services (Human Services Cluster) agencies and their external partners. *Safe Passages*' objective is simple: provide a quick, easy way for authorized caseworkers to determine whether their client has a history of receiving services from any other Cluster agency so that they can fully understand the scope of the client's issues and better address the client's needs. *Safe Passages* meets this objective by enabling hundreds of caseworkers to view consolidated client data through a single, web-based common interface. This interface, called the Common Client View (CCV), delivers secure data inquiry functionality that allows an authorized caseworker to view a concise history of client contacts with all District human services agencies.

The four major agencies currently using *Safe Passages* to support case management activities are: the Child and Family Services Agency (CFSA), Department of Mental Health (DMH), Department of Health (DOH) – Addiction, Prevention and Recovery Administration (APRA), and the Department of Youth Rehabilitation Services (DYRS). External partners gaining access to this cross-boundary collaborative system through the four agencies are the independent organizations that are under contract to the agencies for the delivery of specific health and social services. Included among the external partners are: Family Court-sanctioned intervention groups, private medical and social services providers and elementary and secondary educational institutions.

Prior to *Safe Passages*, District agencies functioned as stovepipe operations that rarely interfaced with one another. For example, caseworkers from different agencies would provide services to the same client; however, none of the caseworkers would have knowledge of that client's relationship with any other agency. This inability to access client information across agencies often led to excess effort expended to develop an accurate client history, unknown duplication in the delivery of client services, and servicing decisions that may have been harmful to or not in the best interests of the client. Now, with the introduction of *Safe Passages* to the case management process, Cluster caseworkers who perform life-enhancing and life-sustaining tasks across the human services continuum are able to network together as one virtual team for the benefit of their common clients.

Safe Passages has been designed specifically around the needs and responsibilities of caseworkers in the District's various Human Services Cluster agencies who are charged with coordinating and delivering services to children and families. Now, among other things, caseworkers are able to access sensitive, high-quality information available from other agencies and use a more informed process to assign services to clients. *Safe Passages* makes it possible for District residents with the greatest needs and most profound challenges to have access to higher quality care. Now caseworkers can more completely understand their needs and more carefully monitor their progress by collaboratively interacting with colleagues to make client servicing decisions.

Safe Passages was designed, developed and implemented in less than two years, including the time required to obtain all required legal agreements, at a cost of less than $5 million. Since its May 2005 "go live" date, several

Safe Passages upgrades have been completed in a seamless manner without interruptions in service in the agency case management systems that are linked through the *Safe Passages* integration engine. To date, the District has incurred a total cost of less than $7 million for *Safe Passages* development and enhancement. In a study performed by an independent consultant, the annual recurring financial benefits expected to result from the use of *Safe Passages* will grow to approximately $15 million within five years. Given this, within two years of the system "go live" date, the District will realize a 100 percent return on its investment in *Safe Passages*.

Project Description

In May 2005, the District of Columbia (District) implemented the *Safe Passages* Information System (*Safe Passages*) to enable and facilitate collaboration among multiple disparate government agencies and private sector partners responsible for providing health and social services to the District's neediest children and families. An integration solution, *Safe Passages* provides automated, real-time data sharing across the organizational boundaries that separate District health and social services (Human Services Cluster) agencies and their external partners. *Safe Passages'* objective is simple: provide a quick, easy way for authorized caseworkers to determine whether their client has a history of receiving services from any other Cluster agency so that he/she can fully understand the scope of the client's issues and better address the client's needs.

Safe Passages meets this objective by enabling hundreds of caseworkers to view consolidated client data through a single, web-based common interface. This interface, called the Common Client View (CCV), delivers secure data inquiry functionality that allows an authorized caseworker to view a concise history of client contacts with all District human services agencies. With guaranteed "always on" user access, *Safe Passages* offers the following:

- Provides secure access to real-time, cross-agency client and case data;
- Permits searches for client data against an integrated client database;
- Uses a unique Master Client ID# so that all agencies can keep track of the services they provide to any individual client and learn which clients they commonly serve;
- Facilitates the identification and correction of discrepancies in client and case data across multiple agencies;
- Limits access to client and case data in accordance with agency rules, Health Insurance Portability and Accountability Act (HIPAA) policies, Medicaid and Medicare regulations, and a host of other federal and District laws and regulations;
- Provides standard and ad hoc reports on client demographics and agency involvement.

Safe Passages uses an advanced data access control mechanism to implement the privacy policies established by each agency, ensuring that authorized caseworkers see only the client information that they have a need to see in order to satisfy their service delivery mission.

Safe Passages is built on a secure, scalable, service-oriented architecture that features the preservation, re-use and leveraging of legacy applications and modern citywide technology services; a high level of physical and network security; and a robust enterprise platform that enables rapid data transfer, reconciliation and mass storage.

Safe Passages Technical Architecture Components

| Logical Component/Feature	Description
Collaboration Portal	Implemented as a set of JSF-based portlets in a BEA/Plumtree portal environment. Agency-based hierarchy of communities allows personalization, content control and a high degree of interactivity.
Data Access Control and Audit Logging	Implemented as an extensible framework based on SAML/XACML standards. Supports any degree of granularity in access control. Supports both role-based and instance-based control. Users are authenticated using centralized citywide Active Directory/LDAP and authorized to access data as described in agency-stipulated access control policies.

Logical Component/Feature	Description
Data Exchange and Transformation Components	Implemented as a set of asynchronous components working on the data sources and asynchronous components at the Common Database--data destination. Process uses JMS message queue controlled by Websphere integration server. Allows real time incremental data transfers (e.g., for most agencies the latency does not exceed a few minutes). Supports multiple heterogeneous data sources including: Lotus Notes, Oracle, MS SQL Server, SOAP and other XML sources, and File Systems, including Mainframe VSAM files and Excel spreadsheets. Data transformations are implemented using non-procedural patterned data descriptors based on IBM/Rational UML tools with follow-up automatic code generation for extract procedures, EJBs, EJB descriptors and database DDLs.
Data Matching and Reconciliation	Implemented as a high-performance matching engine on the totality of personal data. Agency record closeness is calculated and used to establish two thresholds: definitive match (to be used to coordinate services across agency boundaries) and potential match (to be used to validate and clean up data). Reconciliation component identifies recommended values for client data in case of discrepancies between agency records and allows users to see original data values with their timestamps and agency ownership.
High Availability and Security	The system is deployed as a layered set of highly available components within a private VLAN within the DC Intranet, spanning geographically remote data centers. Web/portal layer is behind load balancers; the application layer is supported by multi-node and multi-instance distributed Websphere application cluster; and the database layer consists of Oracle replicating servers. During its 12 months of operations, *Safe Passages* has been available to users > 99 percent.

The *Safe Passages* solution has been implemented as an integral part of the District's citywide enterprise architecture. *Safe Passages* uses various web services provided by other District programs (e.g., DC Geographic Information System's Address Validation Services) and, in turn, provides useful web services to other programs (e.g., Client Identity Service). A number of solutions prototyped and implemented within *Safe Passages*, such as the Collaboration Portal, have evolved into citywide enterprise architectural standards.

Significance to the Improvement of the Operation of Government

The four major agencies currently using *Safe Passages* to support case management activities are the Child and Family Services Agency (CFSA), Department of Mental Health (DMH), Department of Health (DOH) – Addiction, Prevention and Recovery Administration (APRA), and the Department of Youth Rehabilitation Services (DYRS). External partners gaining access to this cross-boundary collaborative system through the four agencies are the independent organizations that are under contract to the agencies for the delivery of specific health and social services. Included among the external partners are: Family Court-sanctioned intervention groups, private medical and social services providers and elementary and secondary educational institutions.

Prior to *Safe Passages*, District agencies functioned as silo, stovepipe operations that rarely interfaced with one another. As an example, caseworkers from different agencies would provide services to the same client; however, none of the caseworkers would have any knowledge of that client's relationship with any other agency. This inability to access client information across agencies often led to excess effort expended to develop an accurate client history, unknown duplication in the delivery of client services, and decisions that may have been harmful to or not in the best interests of the client.
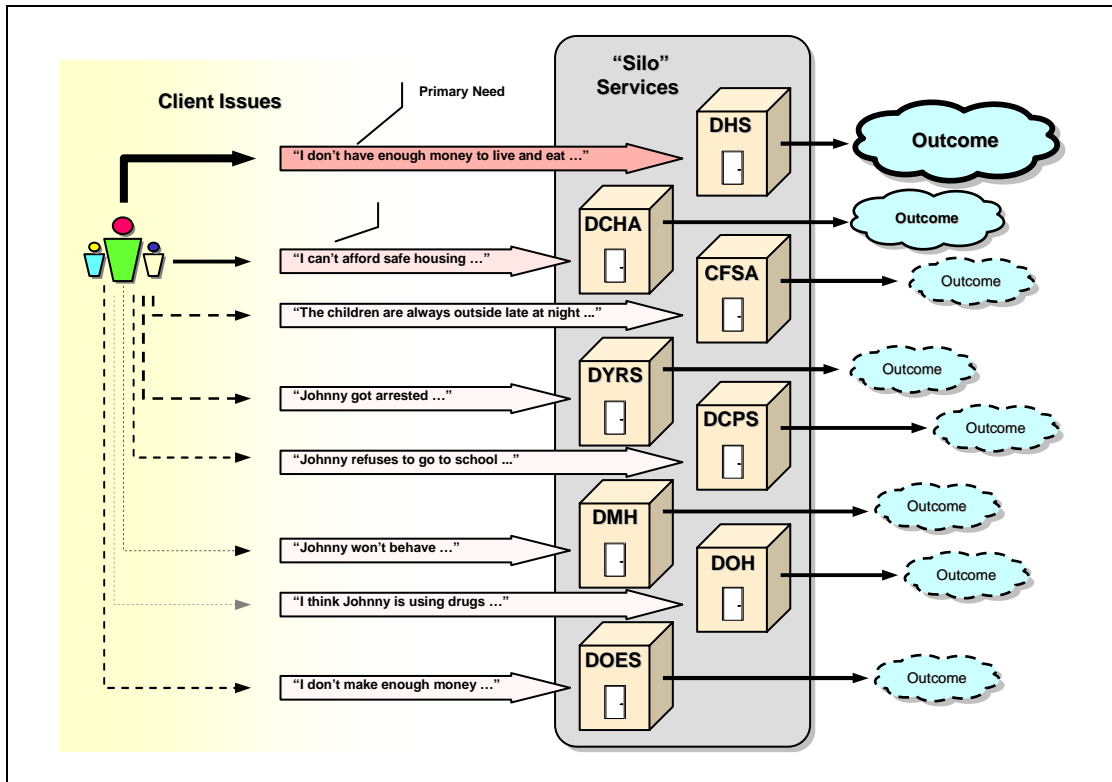
Before *Safe Passages*: Silo, Stovepipe Operations Impeded Intra-Agency Communications

Now, with the introduction of *Safe Passages* to the case management process, Cluster caseworkers who perform life-enhancing and life-sustaining tasks across the human services continuum are able to network together as one virtual team for the benefit of their common clients.
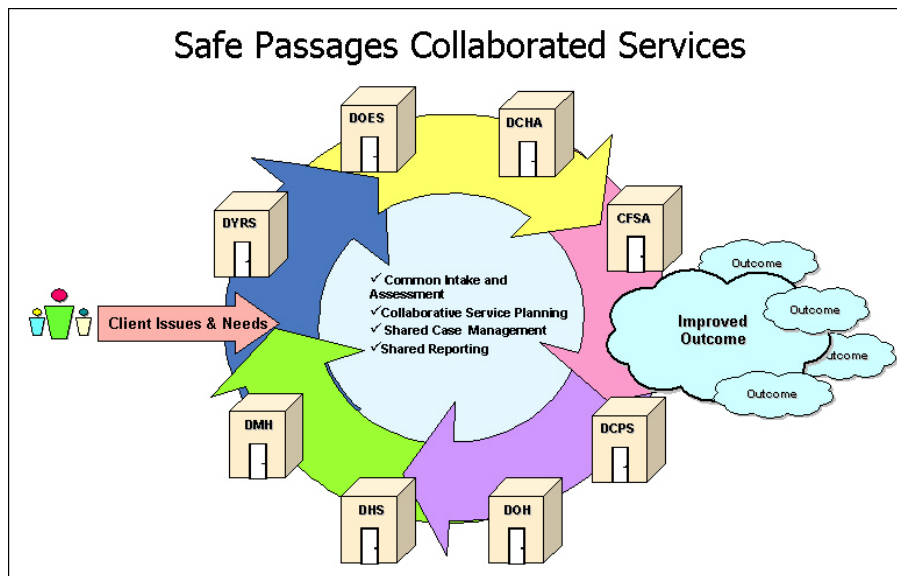
After *Safe Passages*: Collaboration Enabled

Benefits Realized by Service Recipients, Taxpayers, Agency or State

Safe Passages has been designed specifically around the needs and responsibilities of caseworkers in the District's various Human Services Cluster agencies who are charged with coordinating and delivering services to children and families. For the first time ever, caseworkers are able to perform the following:
Access sensitive, high-quality information available from other agencies;
Access the same common interface, the Common Client View (CCV), to view consolidated client and case data;
Freely exchange information with the assurance that only those who need to know and who are authorized to access the data can actually see the information in accordance with HIPAA and other privacy laws;
Discover, in seconds, contact data for peers in other integrated agencies that serve the same client and/or family;
Use a more informed process to assign services to clients.
Information searches that case workers once found very difficult to accomplish are now quite simple. A child and family caseworker who regularly uses *Safe Passages* stated in a response to a survey conducted recently: "It used to take days and weeks just to find out whom my counterpart in DYRS is and what is her phone number, and now I am just a few clicks away from this information!"

In addition, *Safe Passages* provides agency program managers with the ability to generate cross-agency aggregate reports useful for monitoring and improving overall caseworker performance. Program managers are able to better assess the level of services their caseworker staffs are providing and determine how resources should be allocated to meet critical needs. Agency managers are now able to perform the following:
Receive basic intra-agency and cross-agency statistical reports about their client base to facilitate citywide analysis and decision-making on the types of services most needed;
Generate reports regarding the number of cases handled by each caseworker to improve caseworker management;
Analyze client demographic and case management information across agency boundaries to identify service overlaps and, potentially, reduce service costs; and
Access legacy system and current data for review, research and decision support.

Safe Passages enables District-wide coordination of services for vulnerable persons, making it possible for caseworkers and others to do more than they were able to do before the inception of the system. As a result, District residents with the greatest needs and most profound challenges have access to higher quality care, since caseworkers now more completely understand their needs, more carefully monitor their progress and more collaboratively interact with colleagues. Ultimately, *Safe Passages* will be used to impact the way in which health and social services delivery decisions are made so that District residents can be assured that they are receiving the services to which they are entitled, that their families and neighborhoods are receiving the services they require, and that the best possible levels of service are provided cost-effectively and efficiently.

Realized Return on Investment, Short-Term/Long-Term Payback

Many large enterprises seeking to change business processes or reengineer business operations to enable collaboration take a systems implementation approach that requires them to start from scratch. Entirely new information systems are purchased and installed to replace legacy systems that may meet the needs of an individual organization but cannot be adapted to meet the needs of all organizations. This is typically a very time-consuming and costly endeavor, requiring many years to complete successfully.

In its implementation of *Safe Passages*, the District quickly determined that the replacement of the myriad legacy systems that support the Human Services Cluster was not going to be the right approach. Instead of the "start from scratch approach," the District opted to re-use the best of its legacy systems, take advantage of powerful modern tools and ready-made components, and link them together through iterative prototyping and deployment processes. This approach has allowed the District to realize a high return on its investment in the legacy systems serving Human Services Cluster agencies, because this approach eliminated the need to spend millions of dollars replacing older, yet operationally and technically sound systems that three agencies invested a rough estimate of $55 million to purchase. In this way, *Safe Passages* has preserved and leveraged the millions of dollars District agencies have invested in legacy systems.

Safe Passages was designed, developed and implemented in less than two years, including the time required to obtain all required legal agreements, at a cost of less than $5 million. Since its May 2005 "go live" date, several *Safe Passages* upgrades have been completed in a seamless manner without interruptions in service in the case management systems that are linked through the *Safe Passages* integration engine.

To date, the District has incurred a total cost of less than $7 million for *Safe Passages* development and enhancement. In a study performed by an independent consultant, the annual recurring financial benefits expected to result from the use of *Safe Passages* by the four participating agencies will grow to approximately $15 million within five years, as shown in the following table. Given this, within two years of the system "go live" date, the District will realize a 100 percent return on its investment in *Safe Passages*.

Safe Passages Information System: Return on Investment

Benefit Area	Annual Benefit Amount				
	2006	2007	2008	2009	2010
I. Improved Staff Capacity Increased Social Worker Capacity Reduced Overtime Costs Reduced Turnover	$1,370,840	$3,422,500	$4,448,330	$5,474,160	$6,845,000
II. Decreased IT Support Costs Leveraged Common Infrastructure	$40,050	$100,000	$129,980	$159,900	$200,000
III. Improved Effectiveness of Resources Improved Utilization of Revenue Sources Reduced Overpayments	$1,157,550	$2,890,000	$3,756,220	$4,622,490	$5,780,000
IV. Improved Social Service Outcomes Reduced Risk Management Costs Reduced DC Government Expenditures	$411,560	$1,027,500	$1,335,470	$1,643,450	$2,055,000
TOTALS	$2,980,000	$7,440,000	$9,670,000	$11,900,000	$14,880,000

Source: Keane Worldzen Cost/Benefit Analysis Report - 2005

Data, Information and Knowledge Management

Pennsylvania's Global XML 3.0 Document Creation Process

Executive Summary

The Pennsylvania's Justice Network is the Commonwealth's primary public safety and criminal justice information broker. Conceived in 1997 by the Governor's Office of Administration to provide a "virtual single system" for the sharing of protected information, JNET's secure integrated web portal offers a common online environment to over 27,000 authorized practitioners throughout the Commonwealth's 67 counties.

Electronic data exchange and real-time event messaging services have proven to be the cornerstone of JNET. Dating back to 1999, the JNET Steering Committee established XML as an internal messaging standard and JNET began supporting "case file transfers" between agency data systems. By leveraging existing agency systems, JNET was able to ensure that each agency independently controlled their data without compromising the ability to share critical information. Agencies began sharing information through Document Type Definitions (DTD's), however information was shared without standard reference points, and delivery failure resulting from information validation became a key issue resulting from non-standardized data exchanges.

Therefore, JNET implemented a statewide Global Justice XML Data Model (GJXDM) 3.0 document and procedure process. This uniform process set new standards and policies for statewide data exchange, and has resulted in tangible cost savings to Commonwealth taxpayers. Several state agencies, including organizations from the Commonwealth's Criminal Justice Community of Practice, participated in this benchmark process, and have embraced the opportunity to implement a repeatable cost-effective solution for ongoing criminal justice and public safety integration initiatives. The new GJXDM process provides the following benefits:

Consistency across domains, a process that removes technical detail from the design process, and business users become comfortable with a single dictionary (GJXDM).
Consistency across justice entities and platforms has increased public safety, and the timely development of interagency exchanges fosters more agile and effective services and enforcement with substantial tax payer savings.

Guidelines for development efforts have been established, and documented deliverables now exist for contracts and new projects.

Using the new toolset, the Pennsylvania team targeted a child support warrant database and began a 6 week implementation of a new Pennsylvania Child Support Enforcement System Bench Warrant Message (PACSES Warrant Message). As the first exercise using the Commonwealth's Global procedures, PACSES Warrant data offers substantial opportunities for the justice community and citizens throughout the Commonwealth. JNET was the first to offer this data as a statewide application, and for the first time, child support warrants were standardized to provide immediate accessibility to practitioners throughout Pennsylvania. Since the application was released to the JNET user community in 2006, there have been over 12,000 application queries and 8,904 confirmed notification event messages for offenders with outstanding child support warrants. In one case, this project helped to locate a defendant with $70,000 in child support arrears.

Since outstanding child support arrears in Pennsylvania have exceeded $2 billion (February, 2006), and because the GJXDM warrant message allows JNET to publish information about the 35,800 outstanding warrants, criminal justice practitioners have an additional tool that will support the service and collection of these fiduciary responsibilities. The citizens of Pennsylvania will experience more effective and dynamic child support enforcement; directly benefiting the children of Pennsylvania.
JNET has reduced the GJXDM message development process from an average of 9 months to approximately 6 weeks. More importantly, Pennsylvania has implemented a standardized, repeatable process, for all integrated technology solutions, and potential taxpayer savings have been identified in the millions of dollars.

Project Description

Introduction:
The Commonwealth of Pennsylvania's Justice Network (JNET) implemented a statewide Global Justice XML Data Model (GJXDM) 3.0 document and procedure process. This standardized process set new standards and policies for statewide data, information, and knowledge exchange, and has resulted in tangible cost savings to Commonwealth taxpayers. Several state agencies, including organizations from the Commonwealth's Criminal Justice Community of Practice, participated in this benchmark process, and have embraced the opportunity to implement a repeatable cost-effective solution for ongoing criminal justice and public safety integration initiatives.

Background:
The Pennsylvania's Justice Network is the Commonwealth's primary public safety and criminal justice information broker. Conceived in 1997 by the Governor's Office of Administration to provide a "virtual single system" for the sharing of criminal justice and public safety information, JNET's secure integrated web portal offers a common online environment to over 27,000 authorized practitioners throughout the Commonwealth's 67 counties.

JNET provides over 850 municipal police departments, all 67 counties, 54 state agencies, and 42 federal agencies with the ability to conduct secure investigations in a web-based portal environment, invoke web services, participate in electronic data exchange, and subscribe to real-time event messaging services. JNET's business partner and virtual private network infrastructure provides secure access to the following agency data sources:

- Commonwealth Law Enforcement Assistance Network (CLEAN)
- National Crime Information Center (NCIC)
- National Law Enforcement Telecommunications System (NLETS)
- Interstate Identification Index (III)
- NY/NJ High Intensity Drug Trafficking Area (HIDTA)
- Pennsylvania State Police (PSP)
- Administrative Office of Pennsylvania Courts (AOPC)
- Pennsylvania Board of Probation and Parole (PBPP)
- Pennsylvania Department of Corrections (DOC)

- Pennsylvania Department of Transportation (PennDOT)
- Pennsylvania Juvenile Court Judges Commission (JCJC)
- Pennsylvania Commission on Sentencing (PCS)
- Pennsylvania Commission on Crime and Delinquency (PCCD)
- Pennsylvania Chiefs of Police Association (PCPA)
- Pennsylvania Coalition Against Domestic Violence (PCADV)
- Pennsylvania Department of Public Welfare Child Support Enforcement System (PACSES)

Problem Statement:
Electronic data exchange and real-time event messaging services have proven to be the cornerstone of JNET. Dating back to 1999, the JNET Steering Committee established XML as an internal messaging standard and JNET began supporting the concept of "case file transfer" between agency data systems. By leveraging existing agency systems, JNET was able to ensure that each agency independently controlled their data without compromising the ability to share critical information amongst JNET partners. This allowed JNET to avoid traditional data ownership issues, and contributing agencies were positioned to focus on the utilization of information and resources.

During 2000, the JNET Steering Committee created the JNET Data Conflict Subcommittee to facilitate the use of agency data and provide governance for the effective use and exchange of information between systems and users. The committee was challenged to identify when legitimate information discrepancies need to be maintained and when differences mandate modifications to data structure in order to account for more accurate or reliable data.

Agencies began sharing information through Document Type Definitions (DTD's). Information was shared without standard reference points, and delivery failure resulting from information validation became a key issue resulting from non-standardized data exchanges. As a result of these two deficiencies, the committee

recognized that effective justice data exchange demanded a common "data dictionary" to address data conflict and help to support inter-agency data compatibility concerns.

Solution:
To minimize data conflict and standardized message development between justice agencies, JNET adopted the Global Justice XML Data Model 3.0 (GJXDM) IOC compliance guidelines. JNET also embraced the SEARCH Consortium's Justice Information Exchange Model (JIEM) tool to improve information exchange efficiencies.

During August 2003, JNET deployed an enhancement to the Certified Driver History application, a cooperative effort between JNET and the Pennsylvania Department of Transportation (PennDOT). This application was the first to leverage GJXDM standards in Pennsylvania, and the implementation received significant recognition throughout the United States.

As additional exchange requirements were identified and implemented, JNET recognized a need to establish a repeatable process for the generation of GJXDM compliant message exchanges. A process was needed to define a set of procedures describing the GJXDM message exchange, and more importantly, the process was required to contain reusable components. In order to ensure that work efforts aligned with the strategic goals of Pennsylvania data exchange standards, technical guidelines were also needed to assist agencies in developing GJXDM schemas and other required documents from the message development procedures.

In 2004, several new information exchange requirements were identified, designed, and implemented. A team of stakeholders from key criminal justice agencies (Department of Public Welfare, Administrative Office of Pennsylvania Courts, Department of Corrections, State Police, Commission on Crime and Delinquency, and JNET) was formed to implement a set of formalized procedures for GJXDM messages. The team began defining a process to develop procedures and technical guidelines that would be used to assist agencies in developing their GJXDM schemas. This team provided the Commonwealth and the National Governors Association (NGA), Center for Best Practices with a deliverable in April, 2006. The deliverable included the necessary documentation, guidelines, and procedures for the creation and implementation of GJXDM messages.

A GJXDM message repository was identified as a requirement for storing message development procedures. The repository would be designed for state agencies who wanted to create applications that produce and/or consume XML messages defined by schemas and procedures. Additionally, the message repository would be used to provide starting points for new message exchanges, it would help to promote the consistent use of GJXDM throughout the Commonwealth, and it would enable the Commonwealth to easily share information throughout the United States.

The Pennsylvania Justice Network currently uses these GJXDM tools for all message development, and is able to implement new services in an expeditious manner with fewer resources than historical processes required.

Significance to the Improvement of the Operation of Government

Documentation, Guidelines, Procedures, and Deliverables:
During the process of collaborating and creating a repeatable process for the generation of GJXDM compliant message exchanges on the JNET infrastructure, a business process defining the creation of new event messages was established. This process defined two major documents to be utilized by JNET partners when publishing a new GJXDM message.

1. The JNET GJXDM Message Development Document was created to provide:
   - A working definition of the JNET GJXDM Message Development process.
   - The roles and responsibilities for parties involved in the process.
   - The outline used by external development efforts where JNET will serve as the exchange medium.
   - The categories of development efforts within JNET.
   - A guide in determining project effort, time, and resource requirements.

This "living document" is continually refined to accommodate the best practices of a JNET specific process in the development and construction of GJXDM compliant XML messages and supporting Information Exchange

Package Documentation (IEDP). The information included in this document serves as the guiding process for all new GJXDM messages constructed and exchanged via JNET.

2. JNET GJXDM Technical Guidelines Document was developed to provide assistance to agencies when creating GJXDM schemas and other required procedures identified in the JNET GJXDM Message Development document. This document includes:
    *   Recommended toolsets for creating procedures during development.
    *   Technical procedures and guidelines for creating documents from the message development process.
    *   Definition of GJXDM message conformance.
    *   Templates for mandatory artifacts.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

By predefining standards, definitions, procedures, and the guidelines required during the development process, business owners and stakeholders are able to participate without understanding the fundamental details of GJXDM. Technical team members focus on technical guidelines, while stakeholders focus on agency business drivers.

Through the use of a codified set of procedures, less effort is required when establishing communication protocols, and more attention is focused on developing business rules and the needs driving the deployment of the new event message. As a result, policy and business resources are able to focus on need-based business drivers when formulating new event messages. By empowering non-technical resources through standardized and formalized procedures, GJXDM encourages business needs while discouraging redundant technical development efforts.

Using the GJXDM Process:
Using the new toolset, the Pennsylvania team targeted a growing warrant database (over 35,800 civil warrants) and began a 6 week implementation of a new *Pennsylvania Child Support Enforcement System Bench Warrant Message* (PACSES Warrant Message). The PACSES Warrant Message was mapped and a new PACSES warrant message was scheduled for deployment to authorized JNET systems and users.

The team's efforts were expanded to develop a comprehensive list of GJXDM message repository requirements that were categorized into hierarchical groupings. Based on the categorized requirements, a repository product was selected for JNET and the Commonwealth of Pennsylvania. Commonwealth technology resources collaborated to choose and implement the Enterprise level message repository that will be used to house statewide artifacts for agencies and stakeholders.

During the development of this toolset, the JNET team conducted a walk through of the Global 3.0 process with the Pennsylvania Department of Corrections. In doing so, the groundwork was established for the implementation of an Inmate Movement message that will assist interested parties in monitoring the movement of inmates among Pennsylvania's State Correctional Institutions. While this message was a bi-product of the team's efforts and it has resulted in a message enhancement for the Department of Corrections, the new PACSES warrant message and the standardized GJXDM development procedures have set the standard for ongoing service recipient, taxpayer, and state agency savings.

Realized Return on Investment, Short-Term/Long-Term Payback

PACSES Warrant Accessibility:
In Pennsylvania, child support warrants are considered civil matters and are not easily accessible through existing criminal justice record systems. As the first exercise using the Commonwealth's Global procedures, PACSES Warrant data offers substantial opportunities for the justice community and citizens throughout the Commonwealth. JNET was the first to offer this data as a statewide application, and for the first time, child support warrants were standardized to provide immediate accessibility to authorized criminal justice practitioners throughout Pennsylvania. Since the application was released to the JNET user community on January 26, 2006, there has been over 12,000 application queries for offenders with outstanding child support warrants.

Expanded PACSES Warrant Functionality:
Building on this application that provides request/reply application inquiry functionality, the PACSES Warrant Event message was identified by the JNET Project Methodology Lifecycle as a critical addition to JNET's Business Plan.

With the implementation of this message, all issued PACSES child support warrants generate an event message that is published to criminal justice and public safety subscribers.

The JNET Notification Service delivers these event-driven notifications to recipients requesting notice of arrests, dispositions, civil and criminal warrants, address changes, death, and protection orders. As of June 2, 2006, JNET has processed over 140,000 confirmed notifications, of which 8,904 (6.1%) were for PACSES warrant notifications. These PACSES warrant notifications were delivered to prisons, probation and parole, public safety employers, district attorney's, and Sheriff's who had a vested interest knowing when civil warrants were issued for individuals on watch lists associated with their business processes.

In one case, Pennsylvania Domestic Relations Officers received a JNET notification indicating that an individual with an active PACSES warrant was arrested on a criminal charge. The officers contacted the arresting agency, brought the defendant to Court, and the Judge ordered the offender to serve a 6 month sentence for eluding the Court and failing to pay child support. The defendant owed over $70,000 in arrears, and illustrated the impact of the JNET notification service and agency collaboration.

Since outstanding child support arrears in Pennsylvania have exceeded $2 billion (February, 2006), and because the GJXDM warrant message allows JNET to publish information about the 35,800 outstanding warrants, criminal justice practitioners have an additional tool that will support the service and collection of these fiduciary responsibilities. The citizens of Pennsylvania will experience more effective and dynamic child support enforcement; directly benefiting the children of Pennsylvania.

Public Safety Process Improvements:
Law enforcement was looking for notorious outlaw motorcycle club leader Thomas Campbell for more than two years after he failed to show for trial on weapons-offense charges in 1999. Years before the Commonwealth's adaptation of a standardized GJXDM process, before wireless access to JNET and other integrated solutions, and prior to accurate processes for warrant management, Police Officer Dennis McNamara was unnecessarily slain by this career criminal.

The officer was investigating a suspicious vehicle for what he believed was a wanted person. The active warrant, unsubstantiated and inaccessible from his patrol car at the time, contained a warning that the outlaw biker "is armed, very dangerous, and will shoot cops." Campbell saw Officer McNamara examining his vehicle, approached the officer, and struck the officer in the right temple with a bullet fired from his weapon. McNamara died at the University of Pennsylvania Hospital a few hours later.

The Administrative Office of Pennsylvania Courts has responded to this, and hundreds of other scenarios and concerns, with the development of a new Magisterial District Judge and Common Pleas warrant message according to the GJXDM requirements. Beginning in June, 2006, the availability of this warrant message, in conjunction with the deployment of a GJXDM compliant statewide Courts system, has resulted in a comprehensive, all inclusive, criminal warrant message for Pennsylvania via JNET.

The ability to search and receive notice of an active warrant for an offender who is in custody has an invaluable return on investment and officer safety. This criminal warrant message, in conjunction with the new PACSES warrant message, results in all Pennsylvania warrants sharing common messaging standards and availability.

Conserving Resources with GJXDM:
In April, 2006, the Administrative Office of Pennsylvania Courts, Commission on Sentencing, and Board of Probation and Parole formed a work group to create a state-wide Pre-Sentence Investigation Court Case Event Message (CCE-PSI). The Courts plan to publish the CCE-PSI event message to the JNET messaging infrastructure under the GJXDM procedures. JNET will store the message and develop an application for CCE-PSI query capability via JNET's web portal.

This application will assist Probation and Parole Pre-Sentence Investigators as well as Intake and Classification Staff at the Department of Corrections. The assistance will be delivered through a GJXDM compliant message

and application engine that provides a comprehensive list of all pre-sentence investigations both ordered by, and submitted to, the Common Pleas Court. On average, a PSI takes 7.5 hours to research, draft, and submit to the Court, and much of this time is spent conducting research that has already been conducted in another county.

During 2004, a total of 101,006 investigations and reports were conducted by county probation staff. Of the total investigations and reports conducted in 2004, 23,433 (23.2%) were pre-sentence investigations. Based on the number of PSI's completed in Pennsylvania in 2004, and the average annual salary of a county probation officer ($38,211 excluding benefits), the Commonwealth will experience a significant decrease in its annual cost to conduct redundant research. Based on 2004 statistics, the implementation of this GJXDM message and the unnecessary research associated with PSI's, the current $3,228,637 expense passed to Pennsylvania taxpayers will be dramatically decreased. This new event message and application engine will dramatically increase productivity, and the need to allocate numerous hours to existing manual verification processes and the authoring of redundant pre-sentence reports will be drastically reduced.

The CCE-PSI message was submitted for approval as per the GJXDM 3.0 procedures on April 12, 2006. JNET management approved the event message, schema, and format on April 24, 2006, and the CCE-PSI event message is scheduled to be published in July, 2006. A significant time savings has been realized when using the developed procedures, and more importantly, practitioners are positioned to provide citizens with the level of service expected from their government officials.

Resource Savings:
The message development process prior to the implementation of these guidelines and procedures would take an average of 9 months to design, develop, and implement. Based on the creation of one new message per month, 5 resources assigned to message inception, and 7 resources involved during each remaining phase, the following annual return on investment is being realized by the JNET Office.

GJXDM Process Benefits	Estimated Commonwealth Savings	Hrs Saved
Defined process, project plan templates, reduction of time required for inception phase.	Savings of 2 hours per person. 5 people x 2 hours x 12 messages = 120 hrs/yr.	120
Clearly defined project roles keep project on track and require fewer meetings.	Eliminate 2 meetings per project. 7 people x 2 one hr meetings x 12 messages = 168 hrs/yr.	168
Artifact templates keep users from "reinventing the wheel."	Savings of 20 minutes per document. 3 documents x 20 minutes x 12 messages = 12 hrs/yr.	12
Messages are clearly documented & cataloged. Components are reused rather than creating new.	Reusable components – approximately 20%. 7 people x 40 hrs/person/message x 12 messages x 20% = 672 hrs/yr.	672
Total Hours Saved		972
Average Annual Resource Per Hour ($85.54) x Total Hours Saved		$83,149.20

In broad terms, the GJXDM process has provided the following benefits:

- For the user of the information: Consistency across domains, a process that removes technical detail from the design process, and business users can become comfortable with a single dictionary (GJXDM).
- To the public: Consistency across justice entities and platforms has increased public safety, and the timely development of interagency exchanges fosters more agile and effective services and enforcement with substantial tax payer savings.
- For practitioners: Guidelines for development efforts have been established, and documented deliverables now exist for contracts and new projects.

Honorable Mention: The District of Columbia Government's DCStat

Executive Summary

The District of Columbia government developed DCStat, an advanced business intelligence system, to provide strategic decision-making and management tools to support officials and leaders in the delivery of services to citizens. DCStat integrates data previously stored on individual systems, analyzes the data to reveal patterns and trends, presents results in a variety of graphic forms, and even notifies city officials of potential problems. DCStat's comprehensive information retrieval and dynamic real-time analysis are helping District leaders make dramatic improvements in the efficiency and effectiveness of government services. DCStat is an indispensable resource for District leaders and their constituents in formulating strategy, monitoring government performance, holding managers accountable, and encouraging innovation.

DCStat combines traditional database methods with advanced Geographic Information Systems (GIS), business intelligence and messaging technologies to enable a smooth transfer of information in and around the District. The system incorporates 150 data sets, including crime statistics, city services requests, geographic features, inspection records and other agency data. DCStat links these data sources to District agency systems to provide operations information to management in the form of reports, charts and maps in near real time.

DCStat allows agencies and departments to share and leverage others' data, making the allocation of resources more efficient and effective. Managers now can access performance results as well as information about each department and employee. This cross-department and cross-agency data sharing heightens managers' awareness of the "big picture," making managers more accountable.

Previous systems only allowed for limited analysis because of paper-processes, disparate databases and outdated data. DCStat automatically refreshes data from various city agencies on a regular basis. Even better, DCStat's ability to rapidly gather, track and analyze data allows city officials to make decisions based on real-time, dynamic information and current conditions. This reduces wasteful spending and increases revenues, enhances public safety and improves service delivery.

DCStat's revolutionary decision-making tools support a performance-driven government, resulting in:
- Improved services due to better targeted goals, more efficiently distributed workloads, reduced employee absenteeism, and integrated computer systems;
- Reduced costs through earlier problem recognition, more efficient resource allocation, and enhanced productivity;
- Increased revenue due to better identification of unenforced regulations, uncollected fines, and tax fraud;
- Enhanced public safety and welfare through better regulatory enforcement, more efficient police deployment, and the ability to design new initiatives like Hot Spots and New Communities.

Since its release in January 2005, DCStat has produced substantial return on the District's $2.8 million investment. DCStat's performance analysis of the Department of Consumer and Regulatory Affairs (DCRA) identified over $6.7 million in uncollected revenue, plus performance enhancement recommendations estimated to save $4 million. This $10.7 million total savings from one agency represents a 382 percent ROI. Using DCStat to assess the District's 20 other large agencies will multiply this return many times. DCStat's contribution to the Hot Spots and New Communities initiatives helped reduce crime 25 percent in the targeted areas and helped create new hope and opportunities in the city's most distressed neighborhoods.

Project Description

Prior to the implementation of DCStat, many District agencies used paper-based processes or outdated, inaccessible databases. Disconnected databases across the city stored data in aging legacy systems. Because databases were not linked or accessible to other agencies—and often times were even inaccessible to different departments within an agency—information was inaccurate and incomplete.

The District of Columbia government developed DCStat to provide more accurate and complete information to assist District leaders in strategic decision-making and to provide city workers with comprehensive views of District neighborhoods and District services. DCStat, launched as a pilot in March 2004 and completed in January 2005, integrates all significant District databases, including outdated legacy systems, to extract, organize, and

display data as actionable intelligence for District officials and residents. DCStat is an indispensable resource for District leaders and their constituents in formulating strategy, monitoring government performance, holding managers accountable, and encouraging innovation.
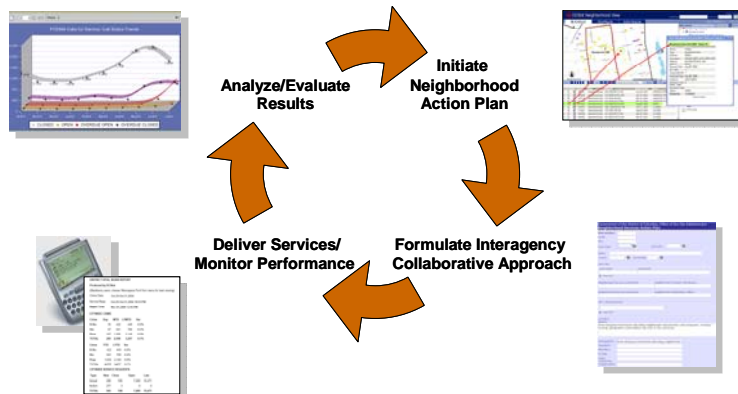
Views:

A variety of applications are offered through the DCStat program. Each is tailored to a specific user group that helps aid in business processes and workflow management. Neighborhood View provides staff members with desktop access to data they need to complete their job duties while Mobile View allows data transfer to mobile workers away from their desks.

Neighborhood View

Neighborhood View, shown below, is a web-based application intended for broad use by District staff. Neighborhood View supports activities of the Mayor's Office of Neighborhood Services as well as other agencies. At their desks and during public meetings, neighborhood service coordinators may access up-to-date information regarding city services, crimes and other activities in specific areas of the District. They may produce maps and graphs to analyze incidents and discover trends.

Executive View

DCStat's Executive View is the primary tool supporting the District of Columbia City Administrator's (CA) Executive Briefing program. Executive Briefings are a forum where District leaders scrutinize agency performance and identify opportunities and methods to improve and innovate. Using DCStat's tools and services, the CA may access operational metrics to analyze the organization's performance and District residents' perceptions of the agency. DCStat produces reports on a variety of agency-wide topics, such as budget performance and employee absenteeism. It permits penetrating analysis of specific programs, allowing managers to discover opportunities to eliminate waste, enhance public safety, improve citizen services, and increase revenue.

Mobile View

Mobile View, shown below, provides access to DCStat using wireless devices. From a PDA, District field workers can query DCStat using a site address, service numbers, property owner name, or other criteria. For example, they may obtain a property summary report that identifies owner and tax assessment information, service request history, housing violation citation records, and crime activity associated with the address. Details are available through a series of screens. Additionally, the system can locate similar incidents nearby to help identify causes or patterns.
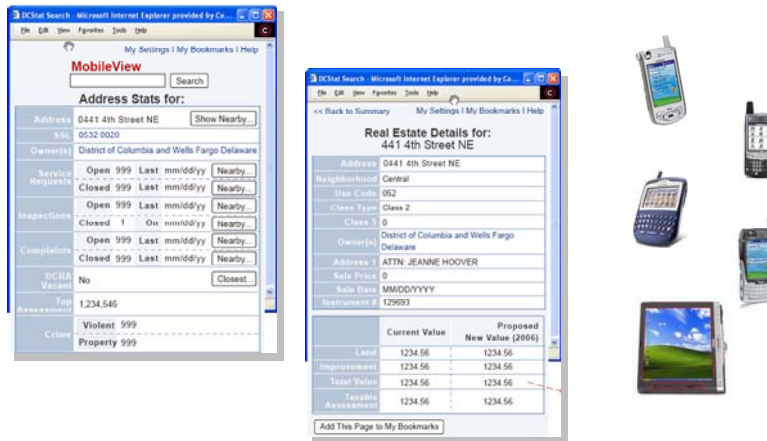
To date, over 200 District employees and contractors in over ten departments have completed DCStat training. Executive briefings will begin in June, emphasizing the agencies' ability to track and view their own data via the web applications as well as verify accuracy and consistency. The data content team contacts agencies, participates in data discovery to identify live data feeds that are useful for inclusion in the application, and assists in establishing data connections as part of the outreach to get agencies involved in data sharing.

Significance to the Improvement of the Operation of Government

DCStat is part of the District's cross-agency strategy to increase open governance and improve citizen services. DCStat aims to help government agencies operate as leaner, more responsive, higher performance organizations that fulfill their responsibilities to residents.

DCStat allows agencies and departments to share and leverage each others' data, making the allocation of resources more efficient and effective. Managers now can access performance results as well as information about each department and employee. This cross-department and cross-agency data sharing heightens managers' awareness of the "big picture," making managers more accountable.

Previous systems only produced limited analysis because of paper-processes, disparate databases and outdated data. DCStat automatically refreshes data from various city agencies on a regular basis. Even better, DCStat's ability to rapidly gather, track and analyze data allows city officials to make decisions based on real-time, dynamic information and current conditions. This reduces wasteful spending and increases revenues, enhances public safety and improves service delivery.

Benefits:
Greater Transparency

DCStat improves government operations by providing access to real-time information, creating agency-specific applications, improving decision-making by providing more data of higher quality, accelerating data sharing between agencies, presenting data to the City Administrator in a format that shows agency performance, increasing transparency within agencies, and supporting all major initiatives of the City Administrator—improve service, reduce costs, increase revenue and enhance public safety. Starting June 2006 the data (in RSS|Atom formats) that has been available internally will also be available to the public. "Starting this month, the District will begin streaming data that the agencies gather through normal operations to the www.dc.gov website," (from Testimony of Mr. Robert Bobb, City Administrator and Deputy Mayor at Public Roundtable on Bill 16-747- June 1, 2006 The District of Columbia Open Government Meetings Act of 2006).

DCStat was used to provide a comprehensive performance analysis of the District's Department of Consumer and Regulatory Affairs (DCRA), which is responsible for enforcing the District's health and safety codes as well as business, occupational, and professional licensing requirements. Using DCStat, analysts developed over 20 data "findings" about problems affecting DCRA's performance and presented associated recommendations for correction. Below is an illustration of one these findings and recommendations (Issue 4):

Issue 4: DCRA/OTR Collaboration

To what extent have DCRA and OTR integrated their processes to reflect the often intertwined nature of tax collection and business regulation?

Key Findings:
- $2.3 million in property tax revenue is not being collected because 262 of the properties DCRA lists as vacant are not taxed at the higher Class 3 rate
- Coordinated enforcement of rental licensing and homestead programs could detect fraudulent homestead deductions worth over $1 million
- DCRA's inability to verify Clean Hands claims against OTR's Clean Hands database results in lax enforcement and lost revenue

Suggested Approaches:
- Create a single list of vacant properties for District
- Allocate portion of new revenue from Class 3 vacant properties for DCRA and OTR
- Accelerate deployment of electronic Clean Hands check to DCRA permitting and licensing applications
- Integrate DCRA and OTR processes and systems to ensure collection of all available vacant property revenue
- Develop and execute a strategy coordinated between DCRA and OTR to identify and prosecute invalid claims for owner-occupant tax relief
- Speed up deployment of Real Property Database (PSMP)

IMPROVE SERVICE   REDUCE COSTS   INCREASE REVENUE [1]

Increased Accuracy of Information
Prior to the implementation of DCStat, many city agencies used paper-based processes or outdated, inaccessible databases. Disconnected databases across the city stored data in aging legacy systems. Because databases were not linked or accessible to other agencies—and often times even inaccessible to different departments within an agency—information was inaccurate and incomplete.

Efficient Resource Allocation
DCStat allows agencies and departments to share and leverage each others' data, making the allocation of resources more efficient and effective. DCStat users receive automatically refreshed data pulled from various city agencies on a regular basis. Even better, DCStat's ability to rapidly gather, track and analyze data allows city officials to make decisions based on real-time, dynamic information and current conditions. DCStat data supports opportunities to reduce costs through productivity increases, better deployment of resources, and the elimination of recurring problems.

Heightened Accountability
Managers now can access performance results as well as information about each department and employee. This cross-department and cross-agency data sharing heightens managers' awareness of the "big picture," making managers more accountable.

Cross-Agency Collaboration
With respect to cross-agency collaboration, DCStat supports multi-agency activities associated with crime based Hotspots and also supports the Mayor's Nuisance Property Task Force. DCStat has improved the Basic Business License Verification application process through the Department of Consumer and Regulatory Affairs.

Basic Business License Verification (BBLV)
DCStat, working closely with the Department of Consumer and Regulatory Affairs (DCRA), developed the Basic Business License Verification (BBLV) application to monitor licensing for residential rentals, home improvement companies and auto repair shops. Through the DC.Gov website, District residents can access information on existing and expired business licenses. When a resident queries a business address, DCStat feeds the information back to DCRA for data analysis using business intelligence software. Training provided by DCStat guides staff

members on how to run reports and investigate the queries made through the BBLV website. Using DCStat tools and discrete information from constituents, DCRA can better monitor and enforce licensing laws.

Mayor's Nuisance Property Task Force (MNPTF)
DCStat supports the Mayor's Nuisance Property Task Force (MNPTF) using a suite of tools, including Mobile View and Neighborhood View. Members of the MNPTF use Mobile View to provide a glimpse of property owner information as well as crime and service requests reported at the address. Neighborhood View provides mapping technology and area overviews and helps the members of the task force understand the "big picture" of related events in the surrounding area.

Hotspot Support
DCStat is proving to be an integral component of strategizing and tracking progress for various agencies involved in the crime Hotspot initiative. It is also used during monitoring meetings. The interactive session provides current crime, service request and other facts for locations on an ad hoc basis during discussions. Participants make requests to see data and pose questions for the system to answer. Past and current performance is compared with baseline figures and year-over-year results. Other results demonstrated are database discrepancies that DCStat found, which has motivated agencies to clean up records and increase diligence of timely response and proper closing of service requests from citizens. For instance, the Metropolitan Police Department (MPDC) has reported a 10 percent overall drop in crime statistics in the focus areas since the start of the program. As other District agencies migrate and share their data through the enterprise repository and begin to use the application functionality, there will be substantial improvements in the level and process of service delivery.

Benefits Realized by Service Recipients, Taxpayers, Agency or State
Although only in its second year of operation, DCStat's revolutionary decision-making tools support a performance-driven government, resulting in improved services, reduced costs, increased revenue, and enhanced public safety.

In one agency, DCStat detected unusual levels of absenteeism among certain employees. Previously, no documentation or proof of the leave abuse existed. Once data was entered into DCStat, it was determined that 17 staff members were absent more than 20 percent of the time and in fact, seven of those individuals were also absent more than 20 percent of the time the previous fiscal year. DCStat was able to show the consistent pattern of leave abuse which, when corrected, saved the agency money by regulating leave and increasing productivity.

Government efficiency and resident service levels improve as—
- Agencies determine how to distribute employee workloads more evenly;
- Managers use Key Result Measures identified by the system to set realistic, measurable goals that monitor performance throughout each agency rather than focusing on high-performance areas;
- Integrated computer systems (within agencies and between related agencies) free employees to focus on their core jobs rather than repeatedly entering data into multiple systems; and
- Agencies identify and correct patterns of excessive absenteeism, helping increase overall productivity.

District costs decrease as—
- Overall productivity increases;
- Government resources are deployed more efficiently; and
- Recurring problems are recognized early, reducing the cost of rework.

Agency revenue increases as—
- Agencies enforce regulations more thoroughly and collect associated revenue;
- Linked systems pinpoint fines that must be collected before other city services are rendered;
- Regulators identify and collect previously foregone application and licensing fees; and
- Tax authorities more effectively uncover and reverse fraudulent tax deductions and incorrect property and business tax rates.

Resident public safety and welfare increases as—
- Licensing laws (many with a safety emphasis) are better enforced;
- Police, health, and safety workers are reassigned to focus on the most distressed neighborhoods;

- The District designs and implements special initiatives, such as Hot Spots and New Communities, and monitor them for continuous improvement; and
- Real time access to city services and crime information is made available.

Realized Return on Investment, Short-Term/Long-Term Payback

Since its release, DCStat has produced substantial direct and indirect return on the District's $2.8 million investment. Within its first year of operation, DCStat achieved over three times its return on investment. The first Executive Briefing session identified nearly $7 million in uncollected revenue by analyzing one of the 62 city agencies in the District. DCStat has also uncovered $12 million in recurring annual tax revenue that had previously gone uncollected.

Additional cost savings through recommendations to reduce waste and improve performance add an estimated $4 million. Extending this out to the 20 sizeable agencies in the District, DCStat can potentially increase revenue by over $100 million in quantifiable ROI. In addition to uncollected revenue, the Executive Briefing identifies potential cost savings by realigning business processes within the agency and fostering coordination and integration between agencies.

The value of enhanced public safety within the District is not quantifiable in dollars and cents. However, helping to reduce violent crime by 25 percent through Hot Spots, DCStat has helped save life and limb in the District's most dangerous neighborhoods and has improved actual and perceived public safety District-wide. By helping to revitalize distressed neighborhoods through New Communities, DCStat is helping to enhance lives and hopes for the least-advantaged residents of the District. These dramatic and invaluable benefits more than repay the District's investment in DCStat.

Honorable Mention: Virginia Mine Mapping System

Executive Summary

The Virginia Department of Mines, Minerals and Energy (DMME) is digitally archiving all maps of underground coal mines in Virginia and making them readily accessible to the mining industry, regulators and the public. DMME has developed innovative, cost-effective tools for data development, data storage, and data delivery. This information system is already changing business practices and producing immediate, lasting benefits in the areas of mine safety, public safety, economic development, environmental protection, and energy resource analysis.

Development of energy resources is critical to our nation's economy. In southwestern Virginia, development of coal and natural gas resources has occurred alongside other land uses such as business, agricultural, and residential for over a century. It is the joint responsibility of regulatory agencies such as DMME and related industries to ensure that resource development is carried out in a manner that provides for public safety, worker safety, and environmental quality.

For decades, DMME has collected and archived mine maps as part of its mine license application review process. These maps were kept as paper files and microfiche indexed with a card catalog. In the past, the archives were useful for various regulatory functions and for assisting customers, but finding all pertinent data and then visualizing the relationships of old mines to new mines and other infrastructure was difficult.

To improve access to and use of these important maps, DMME launched a new mine mapping initiative in the fall of 2002 to:

- Develop a centralized database for the maintenance, search, analysis, and delivery of catalog records and mine map images
- Develop a distributed mapping application for geographic visualization and analysis
- Develop standards and procedures for scanning, cataloging, and georeferencing the images

Since then, DMME's archive of mine map scans in digital format has grown from less than 5,000 to nearly 50,000; and from a database with approximately 27,000 records references nearly 35,000 mine maps. Usage by internal customers stands at 100% as of June 1, 2006.

Through this initiative, DMME has advanced from having a relatively small archive of hard copy mine maps to having a comprehensive, fully searchable digital archive of thousands of mine maps. The new data represents a nearly 900% increase to date in the number of available maps. The expanded information and the new systems for delivery of the information have greatly advanced the Commonwealth's ability to meet strategic objectives in the areas of mine safety, public safety, economic development, environmental protection, and energy resource analysis.
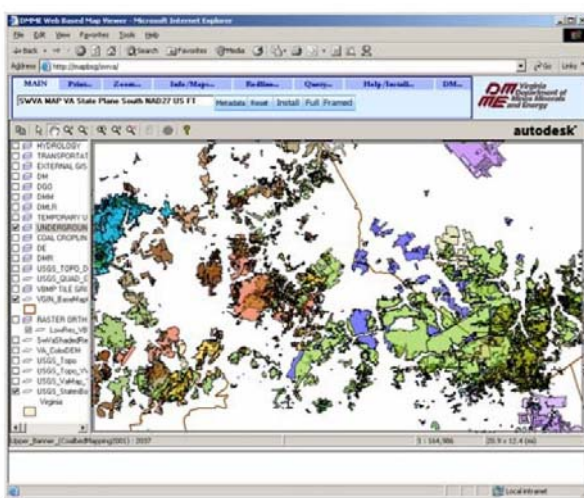
Project Description

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DMME also called upon the coal industry in Southwest Virginia to aid in the effort of locating abandoned mine maps. During conferences and meetings held with engineering providers, requests were made for access to coal company map collections and knowledge regarding other map collections that might exist.

Newspaper ads were placed calling upon individuals to come forward with map collections. The DMME Internet site broadcast a request for map collections to be loaned for scanning.

The resulting mine mapping system is comprised of a Mine Map Image Archive, Mine Map Database with Search Engine, and an Enterprise Mapping Application.

The Mine Map Image Archive contains nearly 35,000 mine map images (or 50,000 mine map scans considering duplicate images and mine maps scanned in sections). Images are stored in either TIF format (from paper originals) or JPEG format (from microfilm originals) and represent more than 27,000 individual mine maps.

The archive is readily available at all DMME offices across the Commonwealth through a wide area network, and to external customers through a Customer Assistance Center with password protection. It has built-in safety checks to prevent users from deleting or altering images.

The Mine Map Database with search engine is a Microsoft SQL Server catalog of all scanned mine maps, including detailed records of the information depicted on each map.
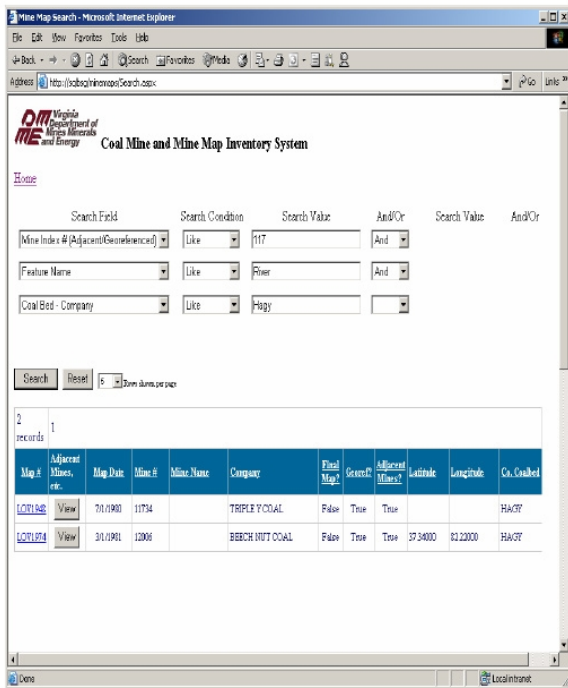
Text based queries on any field or any combination of fields, as well as geospatial queries from the enterprise mapping application, are easy to conduct because of the detailed records in the database. The database also contains references to the network addresses of each image, enabling Web hyperlinks to the images to be displayed with query results.

Because the scanning and cataloging of mine maps and database searches are the responsibilities of DMME offices geographically dispersed around Virginia, DMME developed Web-based data entry and search forms using ASP.Net. The forms allow multiple users to simultaneously enter data or search the database from various locations.

In addition to DMME users, the federal Office of Surface Mining's National Mine Map Archive in Pittsburgh recently began entering information about their map archives directly into the DMME database. The application enforces data quality rules, for example, enforcing known relationships between geographic features and county boundaries.

The Enterprise Mapping Application is a thin Web browser accessible Geographic Information System (GIS). Prior to the implementation of the enterprise application, DMME divisions developed their own geospatial data in separate mapping systems, such as locations of mines, gas wells, and gas pipelines. With the implementation of the Enterprise Mapping Application, DMME was able to display all available geospatial data layers from across the various divisions. These include standard GIS base map layers (for example, roads, streams, railroads, and topography), the Virginia Base Mapping Program's color aerial photographs for the entire state, DMME's mine and well location data, along with raster images from the rapidly growing mine map archive.

Using HTML, JavaScript, and VBScript, DMME staff customized the mapping application's user interface to allow query and reporting capabilities of the mine map database, along with sophisticated spatial search capabilities. Through this interface, users can search, display and analyze DMME's entire spatial data collection (7 TB of data). Additions to the DMME mine map archive represent more than a 1,000% increase in the amount of available information since 2002.

Significance to the Improvement of the Operation of Government

Use of this mapping system is key to the attainment of DMME's business goals and objectives, particularly for customer service, as identified in strategic and operational plans. DMME's first business goal is to "Provide for safe and environmentally sound mineral and fossil fuel extraction." Under this goal, two objectives are directly facilitated by this mapping system:

- To eliminate accidents, injuries, and fatalities at mineral and fossil fuel sites
- To eliminate adverse environmental conditions and public safety hazards resulting from mineral and fossil fuel extraction sites

One measure of success in this area is the annual number of inundations and accidental hole-throughs (mining into an adjacent, abandoned mine) at underground coal mines in Virginia. A 10-year high of nine such incidents occurred in 1998. Since 2002, the year the mine map initiative began, the average has been less than two per year, representing a dramatic decrease in risk to miners and the public.

DMME's second business goal is to "Encourage economic development through customers' wise management of Virginia's energy, mineral, land, and water resources." Under this goal two more objectives are facilitated by the mapping initiative:

- To improve DMME's customers' ability to establish and maintain efficient, viable operations
- To improve DMME's customers' capabilities in the development and wise use of rock, mineral, land and water resources, and energy technologies

By reducing accidents, the mine mapping system reduces the cost of lost equipment and other incident recovery costs for mining companies, thereby improving the efficiency and viability of their operations. Improved delivery of fossil fuel resource information already has assisted in economic development, for example in evaluating proposed power plant sites and in designing the Coalfields Expressway.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

The mine mapping system is designed to serve internal DMME users; it also supports customers in the mining, gas and oil industries, other government agencies, and the general public. Delivery of the system's information enhances:

- ***Mine safety*** -- Avoidance of nearby mine voids is a critical factor in ensuring the safety of workers and damage to or loss of equipment.

- ***Economic development*** -- Wise land use planning requires knowledge of previous land uses as well as information about the proximity of potential hazards such as underground mine voids.

- ***Highway construction*** -- Road projects require detailed knowledge of underground mine voids and gas wells for safety and design purposes.

- ***Coal resource development*** -- Knowledge of previously mined areas is important to the industry for calculating remaining reserves.

- ***Water resources*** -- Water impounded in abandoned underground mines is being actively evaluated as a critical resource for steam generation in proposed coal-fired power plants.

- ***Enforcement of regulations*** -- DMME field personnel inspecting mining, drilling, and reclamation operations need detailed knowledge of permit boundaries, adjacent mines, and gas wells.

- ***Public safety*** -- Water impounded in abandoned underground mines under certain conditions can burst through the rock walls that contain it, causing property damage and even fatalities. These incidents may be preventable with a detailed knowledge of the relationship between mine voids, subsurface geology, and bodies of water.

- ***Resource analysis*** -- DMME works with federal agencies in studies to estimate the nation's remaining fossil fuel resources.

Realized Return on Investment, Short-Term/Long-Term Payback

The projected usage at time of inception included all DMME mine related inspection and enforcement staff. As of June 1, 2006, 100% of planned users access the system, with about 60 users added each month.

The costs for the project included $40,000 for infrastructure and licensing. Internal development costs were about $20,000. The use of in-house developers and existing Microsoft Web tools and software licenses allowed DMME to develop these products with no net increase in general funds from state government.

Recognizing that scanning and cataloging tens of thousands of mine maps would exceed the available time of existing staff, federal funds were sought for this part of the initiative, resulting in a grant of $317,000 from the Mine Safety and Health Administration. These funds currently are being used for scanning and cataloging newly available map collections.

The cost savings for this type of system are complex. One incident, such as Quecreek incident, involving the recent rescue of miners, would cost thousands of times more than the system's cost to the state.

DMME projects that the financial impact of each new mine enabled by information gleaned from the map databases is worth millions of dollars to Virginia's economy. One small mine with 20 employees earning $50,000 per year would provide a $1,000,000 payroll. This same small mine might conservatively produce 250,000 tons of coal; at a rate of $60 per ton, the mine would generate $15,000,000 in product.

Currently, Virginia employs 5,000 miners who produce 30,000,000 tons of coal per year.

Through this initiative, DMME has advanced from having a relatively small archive of hard copy mine maps to having a comprehensive, fully searchable digital archive of thousands of mine maps. The new data represents a nearly 900% increase to date in the number of available maps. The expanded information and the new systems for delivery of the information have greatly advanced our ability to meet our strategic objectives in the areas of mine safety, public safety, economic development, environmental protection, and energy resource analysis.

More information about DMME is available online at www.dmme.virginia.gov.

Digital Government: Government to Business

Michigan Business Portal

Executive Summary

The State of Michigan has undertaken a aggressive strategy that is aimed at positioning Michigan as an economic leader in the 21st century. The strategy involves several state departments, and, is articulated in Governor Granholm's cabinet action plan. http://www.michigan.gov/cabinetplan/. Part of this multi-dimensional plan includes a continued effort to improve Michigan's business climate. Two explicit objectives in this plan are to significantly reduce the time needed to begin operating a business in Michigan, and simplify subsequent transactions with state government. To this end,
Michigan offers a one-stop Business Services portal that allows new businesses to register for key tax identification numbers, online, in minutes, and, hastens by as much as six to ten weeks the time it takes to begin operating a business. This single registration process eliminates 6 distinct tax application forms. http://www.michigan.gov/uia/0,1607,7-118--89978--,00.html. This electronic registration is complimented with a "self-service" web portal allowing business to create a user account giving them secure access to their very own, personalized business portal. https://mi-mall.michigan.gov/UIAEmpWeb/logon.do This business portal allows business to electronically interact with government, using the Internet to file quarterly tax reports pay taxes, and, update information about their business. This portal offers Michigan business a "paper-less" option for interacting with government by eliminating the need for any government assistance in reviewing or updating business transactions or reviewing historical data. This service is available to over 200,000 registered businesses in Michigan. Michigan has achieved our goal of reducing costs in dealing with government, so these resource savings can re re-invested in business.

Prior to the adoption of this technology, getting a business started was very time consuming, labor intensive, and error prone – both for business and government. To begin a business in Michigan, you must first apply for a tax identification number from the Department of Treasury (to pay business taxes). This application form is processed (key-entered), and then sent to the unemployment agency - you must also apply for an unemployment tax registration number (so Michigan can collect unemployment taxes). Two different taxes, administered by two different agencies, using one form that is hand carried between agencies for processing. Once you have received tax numbers and are ready to "do business in Michigan" every subsequent contact with Michigan, for the purposes of paying your business tax or your unemployment tax, or filing wage reports was done manually.

All of this has changed with the introduction of online business registration and, online account maintenance via our business portal. The benefits of our new service for both business and government are significant. Michigan processes over 20,000 new business registrations per year. Michigan receives quarterly tax forms and payments from over 200,000 existing businesses per year (for a annual volume in excess of 800,000). All of this can be done electronically, without State intervention. Our new business portal allows business to avoid paper filing by offering "cradle to grave" electronic interaction with government. This self-service technology has allowed Michigan to re-direct, initially, over 30,000 staff hours associated with manual processing and error correction to other, equally important economic development initiatives, and allowed business to likewise redirect resources towards their business mission.

Michigan developed these technology solutions internally, embracing open systems and open technology. All States share Michigan's vision of using technology to improve services to business, and, as, such, this system can be transferred to other states, as needed and appropriate.

Project Description

Business problem defined
Michigan business had been hampered by a regulatory framework that made it difficult to understand what was required to operate a business in Michigan. Further, once the state received a business registration application, we didn't communicate how long it would take to process the application. This was further exasperated with a paper intensive process for interacting with State government – despite the availability of technology to streamline this interaction. Some of these problems were noted in a study by the Center for Automotive

Research "Michigan's website, on the other hand, is a maze of permitting information without a clear explanation of the expected time necessary to complete each phase – suggesting a complex, uncertain process". (*Smart Programming: Automotive renewal and the Michigan permitting process. Study prepared by the Center for Automotive Research, September 2003*)

Business solution
Michigan's initial approach to helping business navigate the many touch points and regulatory forms needed prior to engaging in business in Michigan began with the launch of our "business start-up" wizard in September 2002. This wizard "aggregates" several forms, representing three state agencies in an easy-to-use interactive application that helps business identify filing requirements, and, complete necessary forms. http://www.michigan.gov/businessstartup.
This interactive tool allows a business to establish a profile, answer basic questions, and, the wizard will provide links to all necessary forms needed to create or purchase a business. The process, while aggregating information in one place, still requires a business to fill out a form (online) print and mail. The business start-up wizard averages 4,000 business registrations per year (this means 4,000 users create an account, and use portions of the application). Completed forms are printed and mailed to three State agencies. Michigan was a pioneering State in using interactive technology to assist business in completing and submitting forms.

Michigan has taken a tremendous step forward with the "maturation" of this fill and print service by offering a fill and electronically file capability. In 2004, Michigan began allowing businesses to register electronically to receive an unemployment tax identification number (one of the critical forms offered via the "wizard") - every business must have this. This was a significant improvement as it reduced from 6 weeks to same day turnaround, and eliminated all staff intervention. Michigan uses "intelligent" form design to accept and validate user input. Common mistakes, such as incomplete entries are eliminated by the use of error messaging and instructions via "pop-up" field messaging. Registration forms received electronically are almost guaranteed to be error free. This is a vast improvement over the traditional 22% error rate experienced with forms submitted via paper. The adoption rate for this new channel was 10% in 2005, doubling to over 20% for the first quarter of 2006.

With the business wizard and electronic filing for an unemployment account number in place, Michigan began looking for additional improvements in government-to-business interaction. In 2005, a cross agency working group made two recommendations to this end.

Recommendation one
Create a business portal that allows business to create a web-based user account that allows for electronic filing and payment of taxes, and, maintenance of business entity information.

Outcome
In 2005, our preliminary business portal was launched with the capability for business to electronically file their quarterly wage report. Thus far, over 19,000 businesses have created an "employee" account. The portal currently allows business to conduct transactions specific to unemployment insurance processing, including:

File a Quarterly Wage Report
Submit a file for Employer Filed Claims (for laid-off workers)
File a Quarterly Tax Report
Pay UIA Taxes
Request/Receive Tax Statements
File a Power of Attorney
Update Account Information (name, address, phone)
View Tax information

Customers create an account using their unemployment tax ID number. For security reasons, passwords are sent by postal mail to the employer's business address. All users of the web portal must agree to an acceptable use policy as an added security measure.

Recommendation two
Create a single electronic process that satisfies tax registration requirements for multiple agencies, spanning six specific tax registrations (unemployment, sales, withholding, tobacco, motor fuel, single business). This was an ambitious assignment, as, data collected and validated for one agency (Unemployment) would need to

validated concurrently for another agency (Treasury), and then written to back-end systems for processing. A single approval and notification process would be needed.

Outcome
To meet this requirement, Michigan decided to extend the utility of our unemployment tax registration application. The design of the system was purposely intended to allow for extension, by embracing a "hub and spoke" design. In this case, the "Hub" refers to a central data repository of collected data, and the "spoke" is the distribution of this data back to multiple agency systems. Michigan now offers a "one-stop" process for registering your business in Michigan. The application was launched in early 2006, and, we have seen encouraging adoption rates. Our initial measures indicate that over 20% of businesses registering for a tax id number from the Department of Treasury are doing so electronically. Since they can also register for an unemployment tax ID at the same time, we have noted a two-fold increase in electronic registrations for unemployment ID numbers. Information about these services has been distributed via a press release from the Governor's Office, and, with a telephone script when business users contact the Department of Treasury.

Significance to the Improvement of the Operation of Government

Business registration – Staff time savings
Electronic filing for an unemployment tax ID and sales tax ID will save the State over 11,000 hours of labor spent on paper handling and error correction in 2006. These staff hours are being re-directed to customer service activities. Prior to the introduction of a web business registration, staff spent thousands of hours moving paper, and, contacting applicants to fix basic form errors. Manual processing of 15,800 error-free paper registrations forms takes approximately 16,000 hours. Manual correction of forms in error (22% error rate) takes a minimum of 2 hours per 4,400 forms, or, 8,800 hours. These numbers are consistent for both registration forms (Unemployment and sales tax). The adoption of electronic filing will eliminate the following activities:

- Mailroom receipt and routing to business unit
- Form scanning and routing to data entry unit, (original form is batched and sent to warehouse)
- Data entry of form, and, flagging of errors. Incorrect forms are assigned to business analyst for resolution
- Resolution can take several days. Phone contact, and / or/ return of document to applicant.
- Mailing of tax ID numbers back to the customer

On-going account maintenance – Staff savings
The adoption of our business portal for quarterly tax filing, tax payment, historical reporting and employer account maintenance will save the state over 18,000 staff hours in 2006.

On a daily basis employers will call, or mail in a request to receive a printout of unemployment taxes paid, and, unemployment benefits that were paid to former employees. Employers have the right to request this information as far back as seven years. Most of the historical data is stored on magnetic tape or microfiche. Locating and printing this data takes hours. The unemployment agency has no dedicated staff to perform this function. It is assigned to workers handling benefit claims. This labor-intensive process has been eliminated. All historical tax information has been scanned and loaded into database tables that every registered business can view online. When customers request this information, they are now referred to the business portal. The unemployment agency receives 4,700 of these requests on an annual basis. This has the potential to save 18,800 staff hours – it generally takes 4 hours per request.

Data and system sharing
Michigan's centralized approach for providing technology services was a key component in the development of this cross agency technology solution. Business analysts from two State agencies (Treasury and Unemployment) helped define common data fields that would satisfy data requirements for both agencies (and six tax registrations). The electronic capture and validation of this data is done "real-time" on the Internet and converted to an XML format. This information is then routed to the two state agencies using our message broker software for distribution to the agency systems. This same information that has been captured for registered users, is saved in a user profile. This profile serves to authenticate business when they "log-on" to use the business portal for subsequent transactions. Our intent is to "pre-populate" subsequent application or permitting forms with this profile information, so, the data is captured only once, and, shared among state agencies. Some of the likely transactions (forms) that newly registered business will likely need to complete will be Articles of Incorporation, or, Articles of Limited License Corporation. Our intention is to make this

"downstream" registration process a feature of the business portal in late 2006. Our technical architecture allows for this integration, and, business will be thrilled about giving the state data only once. No new dollars will be spent for subsequent enhancement. We will continue to use existing staff and contract resources.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

Businesses

- Time saving - the cycle time for receiving any of the six tax identification numbers is reduced to under five days upon receipt of the electronic application. This will save 6 – 8 weeks associated with receiving these ID's via paper.
- Increased business revenue in initial year. Business will gain 30 days to operate, given the reduction in the approval process.
- Convenience – The business registration system is available 24X7
- Penalty fee avoidance –. The six-week processing time to receive an unemployment ID prevents new business from making their first sales tax payment (pre e-registration) resulting in penalty and interest charges.
- Reduced points of contact. The employer portal allows business to supply information once to the state vs. multiple times. For example, the online power of attorney can be completed online, and allows business to authorize others to perform duties on their behalf. This designation is binding for two state agencies.
- Electronic filing and payment of quarterly unemployment taxes via the web portal includes automatic calculation of taxes due. This reduces the number of over or under payments of taxes, and, corresponding correction process.
- Instant notification - paper filing of registration application and wage reports doesn't include any notification of receipt by the state. Electronic submission results in e-mail notification of receipt - reduces phone call follow-up.

State Government

- Ability to re-direct thousands of hours in staff savings to priority agency workload (tax assistance questions, employer / employee unemployment compensation dispute resolution, telephone verification)
- Elimination of 18,800 hours preparing and mailing benefits and credits report.
- Elimination of 11,520 hours to manually process business registration forms.
- Reduced document scanning – every electronic submission eliminates the state from scanning multi-page forms that employers submit.
- Cost savings – Michigan uses a third party to receive paper copy of wage report, and to process unemployment tax payments. This contract has been reduced as 20% of employers now send electronic reports and payment directly to the state via the business portal.
- Data sharing opportunity - Businesses that register to use the portal create an electronic record with key business information. This data (stored in XML format) is shared across systems, thus reducing data redundancy, storage costs, and development costs for web based intake screens.
- The technical architecture model allows for future process/workflow integration schemas.
- Increased tax revenue – accelerated business registration allows Michigan to begin collecting sales and use tax sooner.
- Increased adoption rate for electronic filing – The creation of a one stop registration for six key business taxes will likely entice Michigan's 200,000+ registered business to create a web account for subsequent filing commitments.

Realized Return on Investment, Short-Term/Long-Term Payback

Initial Investment
The tax registration system and business portal cost $1.3 million to develop, and expand over an 18-month period. The up-front cost consisted of the purchase of hardware, software licenses (WebSphere, Oracle, MQ Series), and, contractual programming services. On-going maintenance costs are $335,000, paying for 24X7 hosting, back-up and restore, and, software maintenance and break / fix resolution.

Short-Term Payback
Business savings - Our current adoption rate for online registration for business in 2006 is 20%. If this rate remains unchanged, approximately 4,400 businesses will apply online, each one of them opening their business

30 days sooner than paper filing – resulting in 120,000 additional aggregate days of economic activity in Michigan, and, generation of business revenue and tax revenue.

State Savings - Staff redeployment: – Using current 20% adoption rate for e-registration, Michigan will save 11,520 staff hours in processing business registrations. This translates into 5 full time employees that can be redeployed, rather than adding an additional $375,000 in staff costs for 5 new resources.
Contract savings – Michigan has contracts in place for the data entry of quarterly wage reports, scanning of paper registrations, and, for the entry of quarterly unemployment tax payment forms, and processing of associated tax payments. These contracts are volume based, and, exceeded $1.5 million in 2005. We will reduce these contracts by $250,000 in 2006, based on current adoption rates.

Long-Term Payback
Michigan's goal is 40% electronic filing in 2007 (double the 2006 rate). This is based on a marketing campaign that includes website links from several public / private websites, press releases with business testimonial, and, expanded outreach. The chart below quantifies our current payback in 2006, and, 2007 estimates.

Indicator	Calculation (short term)	Short term (20%) 2006	Long term (40%) 2007
Increased economic activity. 4,000 new businesses will add 30 days to their year one business cycle	30 day gain via eRegistration X 4,000 new registrations = 120,000 additional days of business. Assume each day generates $100 per business	$12 million into Michigan economy	$24 million into Michigan economy
e-Registration: State time savings = 2 hours per registration, and an additional 4 hours correcting forms submitted in error (approx 22% of all submissions)	20,000 annual applications X 20% adoption rate = 4,000 e-registrations X2hours = 8,000. Add 4 hours for resolving 880 forms in error = 3,520 hours	11,520 staff hours	23,040 staff hours
e-Registration: Staff cost avoidance. Had staff resources not been "freed-up" to pursue other work, the cost to hire additional staff may be incurred.	11,520 hours / 2080 (annual hrs of 1 staff) = 5.5 Fully weighted staff cost = $75,000	$375,000	$750,000
Business portal – staff time savings for preparation of summary reports for business requesting 7-year history of benefit charges and credits	4,700 requests for report take 4 hours each to process (locate microfiche, tape, build and print report)	4,700 X 4 hrs = 18,800	37,600
Business portal - Staff cost avoidance.	18,800 hours / 2080 (annual hrs of 1 staff) = 9 @ $75K	$675,000	$1,350,000
Contract savings for keypunch services used to enter wage information reports.	In 2005, 10% of reports were electronically submitted. Contract was reduced $28,800.	$57,600	$115,200
Contract savings for scanning, report preparation and payment processing of quarterly unemployment tax payments	Volume based contract w/ Chase bank is $1 million. Every electronic submission reduces contract obligation.	$200,000	$400,000

Honorable Mention: South Carolina Business One Stop

Executive Summary

South Carolina Business One-Stop (SCBOS) was created in 2005 as the first step in implementing a "one-stop" business portal for registering and performing associated electronic filings and transactions within South Carolina. The business portal can be found at www.scbos.com.

Many states have implemented a Web Site to process registrations and filings for their own agency, but few, if any outside South Carolina, have designed and implemented a portal that crosses agency boundaries. The portal enforces consistency across agencies both in terms of terminology, liabilities and information.

The focus is on making registrations, filings, and payments easier for the business user and at the same time making government more efficient and effective.

The solution involved delivering functionality but collaboration between agencies/partners and appropriate training was just as important.

The SCBOS mission statement is:
> *"To develop a gateway for businesses and professional registration incorporating services offered by state and local governments within South Carolina."*

Instead of depending on combining agencies to gain efficiencies and effectiveness, the approach used in South Carolina is to restructure through integrating external "business touch points" and with internal "agency touch points". Sometimes this concept is referred to as "customer relationship management" within the private sector.

External touch points are those people and functions within individual businesses. Internal touch points are people and functions within state government, counties and municipalities.

The objectives of SCBOS are to better serve the business community by:
- Presenting a unified electronic interface
- Decreasing the time and expense for businesses to obtain Licenses/Permits/Registrations
- Answering Licenses/Permits/Registrations questions more quickly and with fewer resources
- Processing Licenses/Permits/Registrations more quickly and with fewer resources

Description of Problem

Statistical data collected from a study conducted in 1998 by the Information Resource Council indicated approximately 10,000 new businesses start in South Carolina yearly and these new businesses each spent an average of 47 hours to obtain all the necessary license, permits, and registrations to do business. Based on these statistics, the SC Dept. of Revenue conservatively calculated the cost for the business consumers to be $15 per hour and $7,000,000 annually just to become legal business entities.

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Description of Solution

Functionality
South Carolina Business One-Stop (SCBOS) was created in 2005 as the first step in implementing a "one-stop" business portal for registering and performing associated electronic filings and transactions within South Carolina. The business portal can be found at www.scbos.com.

The focus is on making registrations, filings, and payments easier for the business user and at the same time, making government more efficient and effective.

SCBOS utilizes a "wizard" concept that asks questions based on the answers to all previous questions much like a human interviewer. This is different from the concept of an automated form. A wizard, like an interviewer, asks only relevant questions at every step of the workflow. Forms display all questions no matter whether the questions are relevant or not and then after the fact checks the answers for correctness and consistency. By gathering information in an interview driven format, the entering of duplicate information is removed and the prompting for unnecessary information is eliminated.

The wizard involves:
- Providing a data collection mechanism that walks the business consumer through the application by asking simple questions and requesting answers, like an human interviewer.

- Implementing business rules within an agency, e.g., each location may have zero or one Retail Sales Tax License.
- Performing liability checks in "real time".
- Implementing business rules across agencies, e.g., pre-fill the agents name and address for a Dept. of Consumer Affairs workflow that comes from the Secretary of State's data base.
- Implementing prerequisites before a wizard is started, during the execution of a wizard and before the user pays for the Applications that are in the shopping cart. For example, certain questions are dependent on the industry code which has been previously entered.
- Enabling the business user to make one payment for one or more Applications. Automated Clearing House (ACH) Debit ("e-check") or Credit Card can be used for all transactions.
- Defining an Application to address a business function, e.g., "Employer Registration" that can generate one or more actual Licenses/Permits/Registrations.

The SCBOS itself:
- Forwards Licenses/Permits/Registrations to the various agencies for processing and then "listens" for the actual results to be returned. For example, the system "listens" for the return of the actual Licenses/Permits/Registrations numbers.
- Provides for accessing and displaying Licenses/Permits/Registration numbers from various agencies
- Provides for accessing and displaying the status all Licenses/Permits/Registrations that are in process.
- Provides a central accounting processing system.

SCBOS communicates with each agency through standard components named collectors, translators and extractors. Each agency has its own line of business system for processing and storing Licenses/Permits/Registrations information.

SCBOS, as the business portal, can be thought of as the electronic interface to the business public and the "real time" electronic interface to the various agencies.

SCBOS has streamlined the Licenses/Permits/Registrations process for the business consumer, as well as, reduced government paper processing and is well on its way to bringing together this Licenses/Permits/Registrations' process in a single entry point for the agencies involved.

Collaboration
While the technology was important, even more important was the collaboration between agencies. In 1999, South Carolina Department of Revenue's (DOR) Director initiated a small team of DOR personnel to conduct research on on-line business registration programs. The research showed that businesses wanted an on-line registration process to cut the red tape associated with obtaining the licenses and permits to open and operate a business in South Carolina. South Carolina had an opportunity to lead the way by providing businesses with these online services.

On September 22, 1999, representatives from seven state agencies, the Municipal Association, and the Association of Counties met to discuss the idea of making it easier for a citizen to register their new business with the state and local authorities. From this point on, it was no longer a DOR project, but a collaborative effort of the state agencies. The name South Carolina Business One Stop (SCBOS) comes from the goal to create a "one-stop" portal for registering and performing associated electronic filings and transactions within South Carolina. With this in mind, the group formulated the following mission statement:

> *"To develop a gateway for businesses and professional registration incorporating services offered by state and local governments within South Carolina."*

Group participation grew to include: SC Department of Health and Environmental Control; SC Department of Insurance; SC Department of Labor, Licensing, and Regulation; SC Department of Revenue; SC Employment Security Commission; Municipal Association of South Carolina; SC Office of Information Resources; Richland County, Secretary of State's Office; Small Business Development Centers of South Carolina; South Carolina Association of Counties; and the South Carolina Chamber of Commerce. These participants created a subcommittee to look at the conceptual aspects of the project.

This subcommittee, also known as the Business Team, surveyed stakeholders (agencies, counties, and municipalities) in order to gain valuable input. Survey responses indicated the extent of fragmentation and complexity of business registration in South Carolina. The group also researched requirements for the

development of the Internet Web page that will link citizens to business registration information and allow them to register online.

The agencies currently participating in the SCBOS implementation include:
- SC Secretary of State
- SC Employment Security Commission
- SC Department of Health and Environmental Control
- SC Department of Labor, Licensing, and Regulation
- SC Department of Revenue

Training

SCBOS targets business consumers including anyone in the global community desiring to conduct business in South Carolina. SCBOS business consumers consist of Sole Proprietorships, Limited Liability Companies, Corporations, and Partnerships.

A SCBOS Training Team was formed 9 months before the May 24, 2005 go live date. The team consisted of Department of Revenue training personnel, Office of SC Secretary of State personnel, SC Small Business Development Center personnel, along with advisors from other participating agencies and associations.

Many businesses are formed with the assistance of attorney and accountants; consequently, focus groups for these professionals were established. From these focus groups, training needs of these professionals were identified. Other focus groups led us to determine the training needs of the majority of other business users.

A professional training program was developed for accountants and attorneys that met each profession's continuing education standards. For attorneys, SCBOS workshops were established in conjunction with the SC Bar Association and the Small Business Development Centers of SC. The 2006 workshops began in February and are being held in various locations throughout South Carolina. For accounting professionals, workshops will begin in May 2006 (after tax filing season) and will be held in various locations throughout the state as well. The South Carolina Association of Certified Public Accountants (SCACPA) has agreed to help promote these workshops to their members. Prior to the rollout of the workshops, Department of Revenue training personnel conducted a SCBOS pilot with participants from the partnering agencies. A "Train the Trainer" course was conducted for the SC Small Business Development Centers instructors and the facilitators from the participating agencies who would be participating in the SCBOS workshops.

For the majority of our business consumers, on-line training and assistance was developed and implemented. Approximately 250 on-line help messages and a comprehensive list of Frequently Asked Questions (FAQ's) were created and implemented. Interactive tutorials, including audio, were developed in-house by Department of Revenue training personnel for the business consumer. A listing of the tutorials developed thus far is as follows:

How to Add an Entity Administrator
How to Apply for Additional Licenses, Permits, and Registrations
How to Create a Valid User Account
How to Login For the First Time
How to Logout of SCBOS
How to Manage the User Workspace
How to Pay For Applications and Licenses, Permits, Registrations
How to Request to Become an Entity Administrator
How to Reserve and Register a Name
How to Start a New Business
How to Use the Customer Assistance Screen
How to Use the SCBOS Tutorials
How to Use the Shopping Cart
How to View User Messages
South Carolina Business One Stop (SCBOS) Overview
What If I Forget My Password
What If I Forget My User Name

All of the above on-line tutorials can be found on SCBOS at http://www.scbos.com/Tutorials/default.htm

SCBOS is continually reaching out and educating business consumers through various business conferences, business associations, agency newsletters, professional and business publications.

Significance to the Improvement of the Operation of Government

Businesses registering to do business in South Carolina for the first time or existing businesses in South Carolina wanting to expand, must secure Licenses/Permits/Registrations. Businesses view this activity as necessary but would like this process to be as painless as possible. For a new business, reducing the 47 hours it formerly took to register a business is very important. Businesses frequently ask the question "what licenses do I need to do business". Having wizards to guide the user through the process and having "one stop" customer assistance support saves the business both time and money. South Carolina needs additional businesses. SCBOS is a significant step toward making it simpler for business people to work with government and represents another part of our efforts to create an environment that helps businesses grow and prosper in South Carolina.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

Benefits for the business consumer include monetary and other resource savings. Prior to SCBOS, business consumers had to physically wait in lines to gather and complete numerous forms, duplicate information from agency to agency; all in order to register to do business.

Business Consumer Benefits:
- a single point of entry
- a single payment method, without added user fees,
- Guidance through the maze and red tape of the registration process.
- Reduction in cost by time to establish and maintain business information and Licenses/Permits/Registrations.
- Available 24 by 7
- Less frustration and peace of mind that the right Licenses/Permits/Registrations have been obtained to do business.
- Self management of business Licenses/Permits/Registrations

State Agency Benefits:
- Reduced operational expense
- Postage, Printing, Handling
- Data entry
- Reduced application review
- Consistency of data across agencies
- Increased collections as result of complete and accurate data entry
- Immediate receipt of funds
- Improve customer service

Realized Return on Investment

Statistical data collected from a study conducted in 1998 by the Information Resource Council indicated approximately 10,000 new businesses start in South Carolina yearly and these new businesses each spent an average of 47 hours to obtain all the necessary license, permits, and registrations to do business. Based on these statistics, the SC Dept. of Revenue conservatively calculated the cost for the business consumers to be $15 per hour and $7,000,000 annually just to become legal business entities.

SCBOS (www.scbos.com) went live on May 24, 2005. Realized savings calculated since May 24, 2005 through to January 31, 2006 are:

New business savings through SCBOS of approximately 35.9 man years (2080hrs) = $1,095,375.
Projected annual savings: 51.6 man years = $1.57 Million a year.
This figure is based on 50% savings of the 47 hours spent to start a new business.

Currently, SCBOS has 11,207 users, has approved 3,175 new businesses, and approved 9,997 Licenses/Permits/Registrations.

The following table indicates the percentage of registrations occurring in the top ten South Carolina counties and also the percentage of registrations occurring in the top ten states other than South Carolina. (*Statistical data collected 1-31-2006*)

SC County	Percent	State	Percent
CHARLESTON	11.8%	NC	21.7%
GREENVILLE	11.5%	GA	11.0%
HORRY	8.2%	UT	6.3%
RICHLAND	7.9%	CO	5.4%
LEXINGTON	6.7%	FL	4.9%
BEAUFORT	6.2%	NY	4.7%
SPARTANBURG	5.9%	MD	4.0%
BERKELEY	5.7%	VA	4.0%
YORK	4.7%	CA	3.7%
ANDERSON	4.0%	PA	3.5%

SCBOS's three most important measures:

1. Business Established Utilizing—businesses approved since availability of SCBOS.
   - SCBOS reports a total of 3,175 approved new businesses through January 31, 2006. These approvals translate into a new business savings registering through SCBOS of approximately 35.9 man years (2080hrs) = $1,095,375. Projected annual savings: 51.6 man years = $1.57 Million a year. This figure is based on 50% savings of the 47 hours spent to start a new business.
   - Since March 28, 2006, existing businesses that registered by "paper" are now allowed to add their business to SCBOS. These businesses are able to obtain any additional Licenses/Permits/Registrations on-line. A total of 397 existing businesses have taken advantage of SCBOS. Adding 1,487 existing Licenses/Permits/Registrations and have obtained 179 new Licenses/Permits/Registrations.

2. Electronic Process (SCBOS) versus All Processes—business consumer adoption of SCBOS.
   - Since SCBOS went live on May 24, 2005 through January 31, 2006, the Licenses/Permits/Registrations (LPR) originating from SCBOS versus all sources of the same applications has grown steadily. Currently, electronic utilization for the Office of SC Secretary of State is 11.0%. The SC Department of Revenue's electronic utilization is 20.4%. Electronic utilization is continually increasing. Licenses/Permits/Registration fees in the amount of $285,590 have been electronically transmitted to the State Agencies, credited and deposited to the proper States General Ledger accounts.

3. Site usage—statistical data collected on the number of visits and visitors of SCBOS website.
   - Visitors since SCBOS's launch: 111,940; of those 24,993 visited more than once.
   - Visit totals since launch: 201,345; average per day 547; average visit duration of 9.43 minutes with a median duration of 3.24 minutes.
   - Successful hits for the entire site: 5,964,859 with an average of 16,208; home page hits of 255,155.

The basic SCBOS infrastructure is in place. The collaborative lines of communication and purpose have been established with all participating partners. Implementing future opportunities is now a matter of incrementally extending what we already have in place using standard practices. Implementing these opportunities will be an additional benefit for business consumers and partnering agencies.

We are in the process of completing a benefit realization project. This project will provide baseline measurements for agency processes for establishing a business in South Carolina. It will document and summarize high-level process steps, estimated effort time, and estimated elapsed time provided by agency subject matter experts. Upon the completion of this project a more informed and documented

Honorable Mention: Virginia Electronic Permitting System

Executive Summary

Prior to 2001, the Virginia Department of Mines, Minerals and Energy (DMME) utilized a paper-based process for reviewing surface mine related permit applications and renewals. This process was lengthy and arduous due to the complexity of permit applications. A completed surface mining permit application would consist, on average, of 4,000-6,000 pages of paper documents, maps, tables, lab reports, and photographs. The renewal process was nearly as complicated as the initial application. These processes created significant challenges for the agency and for the mining industry as a whole.

To solve this business problem, DMME implemented an electronic permitting process, where permit application documents are submitted electronically via CD/DVD media or simple FTP to DMME's Web site.

Once permit-related documents have been uploaded into the enterprise workflow system, a workflow job is started and appropriate staff members receive assignments. This allows for parallel, rapid review and collaborative analysis by DMME's internal engineers, geologists, hydrologists, agronomists and other team members.

Completed permits are distributed to DMME field staff, who utilize a laptop-based integrated field enforcement system and mobile databases to analyze permit data and to perform field enforcement activities such as violation and closure orders. The electronic permitting system also allows the Federal Office of Surface Mining, DMME's federal oversight agency, to participate throughout the review process without duplicate paper copies.

Electronic permitting provides for a faster review processing and permit cycle turnaround for the coal industry, resulting in an expedited time frame from planning until actual operation of a coal mine site - a great advantage in today's coal market.

Benefits include cost savings for the Commonwealth and industry through permit review time reduction, review quality improvement, reduction in data entry costs, elimination of duplication costs, and the capability to report on the permit review status throughout the permit lifecycle.

As a testament to this system's success, 99.7% of surface mining permit applications in Virginia now are submitted electronically. The time it takes to review, revise and issue permits is shorter and the cost less.

This system has been benchmarked and described by the Federal Office of Surface Mining and peer state permitting programs during the Appalachian Region Technology Transfer Team meeting as the "best in the nation" and a model for other states.

Project Description

Prior to 2001, DMME utilized a paper-based process for reviewing surface mine related permit applications and permit renewals. This process was lengthy and arduous due to the complexity of permit applications. A completed surface mining permit application would consist, on average, of 4,000-6,000 pages of paper documents, maps, tables, lab reports, and photographs. The renewal process was nearly as complicated as the initial application. These processes created significant challenges for the agency and for the mining industry as a whole.

To solve this business problem, DMME implemented an electronic permitting process, whereby permit application documents are submitted electronically via CD/DVD media or simple FTP to DMME's Web site. This process is managed by a stand-alone electronic permitting application that standardizes and validates submission data. This data is field-validated by the responsible inspectors prior to agency review. The stand-alone permit application then is used to submit data into DMME's enterprise workflow system developed by Unisys and integrated SQL relational database.

Once permit-related documents have been uploaded into the system, a workflow job is started and appropriate staff members receive assignments. This allows for parallel, rapid review and collaborative analysis by DMME's internal engineers, geologists, hydrologists, agronomists and other team members.

DMME Electronic Permitting System

Permits Reviewed in Parallel
by DMME Technical Staff
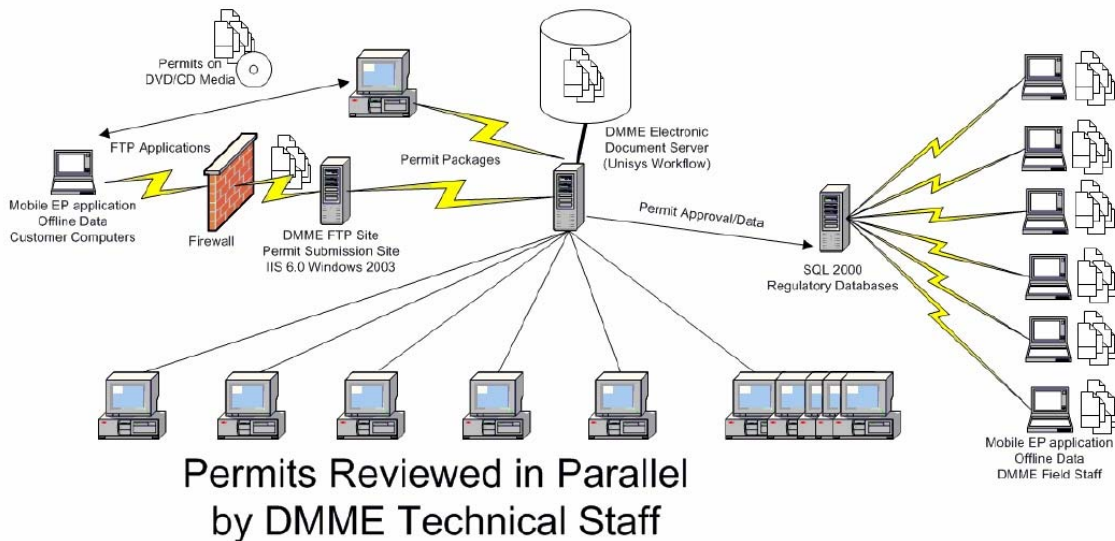
A single permit will consist of 600MB+ of documents on average. DMME's spatial databases are connected to permits at the reviewers' desktops. SQL data creates application-specific layers for use by GIS tools to analyze submitted spatial data and validate permit related information.

Agency reviewer comments are returned to the submitting organization for correction and discussion via the stand-alone electronic permit application. Internal
DMME staff sign off electronically, allowing paperless approval. Review notifications are processed using an internal messaging system with an integrated review launch function from within an e-mail notification.

Completed permits then are distributed to DMME field staff for offline field use. DMME field staff members utilize a laptop-based integrated field enforcement system and mobile databases to analyze permit data and to perform field enforcement activities such as violation and closure orders.

As a testament to this system's success, 99.7% of surface mining permit applications in Virginia now are submitted electronically.

Significance to the Improvement of the Operation of Government

The DMME electronic permitting system has made a huge positive impact on day-today regulatory operations for staff and customers. After the initial rollout, staff support for this application has grown steadily. DMME's field staff members now depend on the electronic permit data to perform every aspect of their inspection processes; most importantly, they now are able to do this work while they are in the field. The electronic aspect of the permit also allows multiple field staff to carry copies of permits, allowing inspections by more than one inspector or emergency responses by other inspectors if the regular inspector is not available.

The technical services staff is better able to manage and control the work process, and in turn have more time to review and complete detailed technical reviews on schedule. The integration of the permits' GIS data has enabled DMME staff to quickly and easily compare GIS and complex permit data to existing spatial data sets using tools such as ESRI's ArcView and AutoCAD. The permitting staff is quickly able to compare reviews of permits as well as to search permit data for specific data, both quickly and completely. This has greatly reduced review cycles and approval times by allowing simultaneous parallel reviews.

The standardization of application form/data submission formats greatly enhances the overall quality of permit submission. Standardization also allows reuse of existing permit data for subsequent permit review and updates. The applicant starts each application with the current approved permit data; this data download allows the business to review all permit data and change information only as needed for the current application, greatly reducing data entry errors.

Automated e-mail notifications allow field and office staff to work cooperatively on reviews, reducing delays. The e-mail notifications also are used to notify peer agencies of required consultation reviews of these permits, reducing the turnaround time even further. This allows these agencies to participate in the review process through remote access to DMME's Electronic Permitting system via CITRIX Metaframe access. The electronic permitting system also allows the Office Surface Mining, DMME's federal oversight agency, to participate throughout the review process without duplicate paper copies.

This system has been benchmarked and described by the Federal Office of Surface Mining and peer state permitting programs during the Appalachian Region Technology Transfer Team meeting as the "best in the nation" and a model for other states.

DMME has provided demonstrations of the technology and process, as well as copies of in-house developed software for evaluation purposes. The following organizations have had or will have EP demonstrated, with many of them having EP loaded on their computers to view and evaluate: Office of Surface Mining, Denver; and the Offices of Surface Mining in Tennessee, Maryland, Pennsylvania, and Alaska. DMME received the 2006 Southwestern Virginia Technology Council (SWVTC) High Tech Award for Government due in part to electronic permitting.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

The mining industry has benefited by the significant reduction in the handling and duplication costs for permit materials, from six or more copies to one for public review. The electronic permits are usable not only for submission to DMME, but for their own staff and for customers. Due to the large size and complexity of these permits, this is a dramatic improvement over a paper-based process.

By storing and providing baseline water monitoring data, the electronic permitting process has allowed DMME clients to share and reuse required monthly monitoring data from other established permits, reducing their cost to submit and maintain permits. Electronic Permitting has resulted in faster review processing and permit cycle turnaround for the coal industry, resulting in an expedited time frame from planning until actual operation of a coal mine site, which is a great advantage in today's coal market.

Industry also has benefited by having the permits in electronic format. If industry officials have questions or concerns on pending applications or even existing permits, they can call the DMME staff and management. Both parties can view the application or existing permit simultaneously on their computers and discuss concerns, eliminating the need for travel to face-to-face meeting at the DMME office.

Citizens have benefited by increased review quality and a reduction in data entry costs and data entry errors, improved site permit accuracy, improved inspection quality, and in turn, increased mine safety. Due to the implementation of electronic permitting, citizens also have benefited through reduced DMME review staff costs through review time reduction.

Realized Return on Investment, Short-Term/Long-Term Payback

The most critical return on the electronic permitting projects investment has been in terms of cost savings for the Commonwealth and industry through permit review time reduction, review quality improvement, reduction in data entry costs, elimination of duplication costs, and the capability to report on the permit review status throughout the permit lifecycle. These improvements are difficult to measure monetarily.

However, it should be noted that the dramatic upswing in energy prices since the start of the project has resulted in a significant increase in permit applications and permit sizes (2000 acres +). This is a trend that can be anticipated to continue indefinitely; native coal reasonably can be expected to gain popularity compared to energy sources that must be imported.

Thanks to the electronic permitting process, DMME has been able to reduce the average time to approve and review permits. DMME's permit review turn-around time is one of the best in the country. Considering the complexity of surface mine permits, the location and terrain of the region, past mining, and interagency review requirements, this is a significant accomplishment.

DMME's cost and time per permit is the best in the region, and possibly the nation.
DMME staff members worked with their peers in neighboring states surface mining programs to establish comparable permitting times. Seven engineering firms operating in these states were contacted by DMME to obtain and average the dollar costs for similar permits. The results of this analysis are below.

Average Time and Cost for a 500-Acre Permit

State	Review	Major Revision	Minor Revision	Cost
Ohio	260	60	30	$100,000
Virginia	47	46	38	$ 85,000
Pennsylvania	127	68	30	$110,000
Tennessee	540	180	90	-----------*
Kentucky	196	196	80	$120,000
Indiana	220	220	13	$110,000
West Virginia	180	138	30	$200,000

*there were no mining engineering consultant's quotes

Industry, ever conscious of time and cost to market, will certainly take this streamlined, cost effective process into account and look favorably on Virginia when considering new locations. New mines bring a proven chain of economic benefits through jobs, investments and taxes that represent yet another significant return on investment for the Commonwealth.

Digital Government: Government to Citizen

Arizona 2-1-1 Online

Executive Summary

In response to Governor Janet Napolitano's call to improve access to vital services, the State of Arizona, working with local government, non-profit and private organizations, has developed Arizona 2-1-1 Online (www.az211.gov) and a 2-1-1 Call Center for use during significant community emergencies.

Arizona 2-1-1 Online is the State of Arizona's comprehensive, statewide source for health, human service and emergency response resources. This innovative system is the first of its kind to effectively link information about local emergencies with public and private health and human services online. Arizona 2-1-1 was developed in partnership with several State agencies, local governments and many community partners including the United Way, Salvation Army, and Red Cross.

Arizona's Chief Information Officer, Chris Cummiskey, has taken a key leadership role in the development of Arizona 2-1-1. He serves as the chair of the Governor's Council on 2-1-1 and the 2-1-1 Community Advisory Committee. His office has provided extensive strategic planning and communication leadership for this important initiative coordinating personnel from dozens of different agencies and programs and working in partnership with a myriad of organizations throughout Arizona in the health/human service and emergency response communities.

The 2-1-1 database has comprehensive listings from State, local, federal and tribal governments, non-profit, faith-based and where appropriate, for-profit providers. The 2-1-1 database includes detailed eligibility requirements, contact information, links to web sites and maps for over 18,000 services in Arizona from over 3,000 providers, including childcare, health care, senior services, counseling, and thousands of other services.

The Emergency Bulletin System of Arizona 2-1-1 Online provides a one-stop shop for information about public emergencies from federal, State, local, tribal and nonprofit emergency response organizations coordinated by the Arizona Division of Emergency Management. In addition, the site provides preparedness information to help individuals, communities, schools and businesses prepare for any emergency. When the State Emergency Operation Center is activated for a major emergency, Newsflashes are posted on 2-1-1 and the public can also dial 2-1-1 to connect with a live operator to access the information in the Arizona 2-1-1 Emergency Bulletin System.

In addition, the Emergency Bulletins are simple to view and contain consolidated information from many different official sources regarding a particular event in a format that is easy for the public to understand. For example, one bulletin can contain official information from an incident command team regarding event status, evacuation routes from the transportation department, shelter information from the Red Cross, volunteer information from local volunteer management organizations, etc.

Arizona 2-1-1 Online is easy to use. It provides ready access to a variety of powerful Find Help search tools. For those who don't know where to turn or how to use the internet, there is also a point and click section for each fundamental public need called Basic Services.

Project Description

Arizona's public and nonprofit health and human service infrastructure provides vital services to millions of Arizonans. While the continuum of service provided by State agencies and non-profit organizations leads to a better standard of living for Arizonans, the resulting network of providers and programs can be incredibly confusing to the public. Given these challenges, Governor Napolitano identified the need to develop a tool that would allow the State's residents to easily navigate between all of their service choices regardless of what agency provides the service.

In recent years, Arizona has also faced critical challenges in keeping the public informed during large-scale emergencies such as wildland fires, monsoons and flash floods. With the additional responsibility of preparing

the public for local or state emergencies, the State of Arizona recognized the need for a system that could be used to disseminate emergency preparedness and response information to the public.

In 2003, Governor Janet Napolitano called for the development of a multi-disciplinary 2-1-1 system as part of the State's Homeland Security Strategy. She asked the State Chief Information Officer to work with stakeholders to look beyond the traditional model for 2-1-1 to a broader vision that would integrate emergency preparedness and disaster response into a one-stop shop with day to day health and human service information. State CIO Chris Cummiskey leads the Governor's Council on 2-1-1 and the 2-1-1 Community Advisory Committee. His office has provided extensive coordination, strategic planning, and communication leadership throughout the development of this important initiative.

Hundreds of State partners were consulted in the development of Arizona 2-1-1 Online including Government Information Technology Agency (Office of the State CIO), Department of Economic Security, Arizona Health Care Cost Containment System, Arizona Division of Emergency Management and Arizona Department of Health Services. Each of these agencies serves as a member of the Governor's Council on 2-1-1. Community and non-profit sector partners were also consulted including the United Way, Salvation Army, Red Cross and Arizona's network of volunteer centers. These organizations and more serve on the 2-1-1 Community Advisory Committee.

The consensus from these stakeholders was that the integration of emergency bulletins and social service programs in Arizona 2-1-1 would provide citizens with a quick and easy way to access valuable information day to day and during times of hardship. After a year of research of other 2-1-1 systems and consultation with constituencies throughout Arizona, the Governor's Strategic Plan for 2-1-1 was issued (April 23, 2004).

Governor Napolitano launched Arizona 2-1-1 Online on June 29, 2005 after just over a year planning including a technical development timeline of eight months. The initial development cost of Arizona 2-1-1 Online was $492,000.

Arizona 2-1-1 Online (www.az211.gov) offers a high level of functionality and usability to access health, human service and emergency response resources statewide. Arizona 2-1-1 Online meets State web standards, so the site's navigation is familiar to State website users.

The 2-1-1 database includes comprehensive listings from State, local, federal and tribal governments, non-profit and faith-based providers. Also included are detailed eligibility requirements, contact information, links to web sites and maps for over 18,000 services in Arizona from over 3,000 providers (i.e. childcare, health care, senior services, counseling, etc.).

The Homepage highlights "Find Help" and the "Emergency Bulletin System." During times of intensive preparation or critical events, the Homepage also includes an "Emergency Newsflash." The "Feature Section" draws attention to key events or changes in health and human services that are of immediate importance to the public (i.e., availability of flu vaccines, enrollment deadline for Medicare Part D, etc.). The Homepage also includes the left menu navigation bar, which is accessible from all sections of the web site and includes Spanish Resources, Volunteer Opportunities, Providers Tools, Basic Services, Find Help, Emergency Bulletins, etc.

The "Basic Services" section provides point and click access to key organizations for those who are unfamiliar with the internet or who do not know where to start looking for help. Also included in this section are canned 2-1-1 searches to find additional providers. They often link to Arizona Self Help, an assessment tool that allows the public to determine eligibility to a dozen benefit programs.

The "Find Help" section has multiple search options. The keyword search feature reviews essential database fields and provides the option to sort results by distance from a zip code to enable the statewide database to perform like a local directory. The search result display allows the user to see details regarding the agency, program or service. Each entry contains detailed information such as operating hours, eligibility criteria, and links to maps and web sites with additional information (applications, screening tools, etc.). The agency listings contain clickable links to all programs and services offered by the agency listed in 2-1-1. "Find Help" also allows users to narrow their search using an "Age Group" or "Target Population" designation. "Directory of Services" and "Advanced Search" features are available for advanced users such as caseworkers, librarians and other service providers. The anonymity of an online system benefits individuals seeking information on sensitive

topics, such as domestic abuse, suicide prevention or whether the person needs to be a US Citizen to obtain services.

The "Emergency Bulletin System" (EBS) is highlighted on the 2-1-1 Homepage with a link to the main EBS webpage for more details and for bulletin searching. The EBS provides a one-stop shop for information (i.e. protective measures, evacuation routes, recovery efforts) about an emergency event from federal, State, local, tribal and nonprofit emergency response organizations. In addition, the site provides preparedness information to help individuals, communities, schools and businesses prepare for any emergency. When the State Emergency Operation Center is activated, the public can dial 2-1-1 to connect with a live operator to access the information in the "Emergency Bulletin System."

Significance to the Improvement of the Operation of Government

Arizona 2-1-1 Online is the first system of its kind to effectively link information about local emergencies with online health and human services. Arizona took a robust set of information and referral search tools (Tapestry by VisionLink) and a web content management tool (developed for Comcare 2-1-1 by Terida) and fused them together into a newly designed, easy to use interface to enable the public and caseworkers to access vital services effortlessly.

Arizona 2-1-1 Online is the State's official outlet for timely bulletins during natural or man-made emergencies, such as wildland fires, floods and other disasters. During an emergency, affected citizens are in need of immediate safety information provided by the 2-1-1 Emergency Bulletin System. These bulletins are updated frequently and can be linked to GIS maps showing the areas affected by a disaster. All government entities (state, local, county or tribal) participating in the emergency response are able to send information to the State Emergency Operations Center (SEOC) where it can be packaged into a comprehensive bulletin for public dissemination. Posting of bulletins can be accomplished from anywhere in the State, including an incident command center, and appear on the web almost instantly.

In an emergency, the public not only needs information about the disaster, but also needs to know about shelters, evacuation routes, vaccinations, food boxes, temporary housing, volunteering and other health and human services to assist them to survive and recover from the disaster. The Arizona 2-1-1 database is an innovative combination of nonprofit and government health and human services. By providing this information through Arizona 2-1-1 Online, Arizona has created a one-stop system for persons in any type of crisis to connect with services available.

Three digit dialing to connect with a live operator to get information about state declared emergencies is available. In the event of a wildland fire or other major public emergency, the State will make the 2-1-1 emergency call centers available in order to disseminate information to the public about the disaster. 24-7-365 call centers are also being developed by the State to complement the online health and human service database. This system will feature live operators using the established 2-1-1 database to answer inquiries over the phone. By building the web-enabled database first, the State is already providing vital information to the public and has created the database for the 2-1-1 call centers.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

The 18,000 service entries included in Arizona 2-1-1 Online provide the public with easy access to a wealth of health and human service information. By combining both public and private services into the 2-1-1 database, the State has created a one-stop website for available services. The State made Arizona 2-1-1 even more comprehensive when it added the Emergency Bulletin System, which disseminates vital information about public emergencies to all Arizonans.

An example of the importance of Arizona 2-1-1 Online to the State was its use when evacuees of Hurricane Katrina were brought to Arizona. Arizona 2-1-1 Online was a valuable tool for evacuees of Hurricane Katrina who were looking for short-term or permanent housing, employment and support in rebuilding their lives. Citizens desperate for information on how they could help the evacuees were instructed by Governor Napolitano and the media to visit Arizona 2-1-1 Online. Within the first seven days that Arizona received evacuees, Arizona 2-1-1 Online received over 30,000 visits from people interested in learning how to locate loved ones, volunteer, and make a donation.

Arizona 2-1-1 is available for other State declared emergencies. It is the State's official source for information to all activated emergency call centers throughout Arizona. During times of public emergency, the Emergency Bulletin System is available by dialing 2-1-1 or over the internet. The incorporation of the Arizona 2-1-1 Online system into emergency procedures allows any government entity – state, local, county or tribal – participating in an emergency response to provide up-to-date, reliable safety information to the public.

In addition, since going live, the number of entries in the 2-1-1 database has swelled to over 18,000 from the initial 15,000 services. Each new entry represents a current benefit to people using Arizona 2-1-1 Online and a future benefit to those who will dial 2-1-1 once health and human service call centers go live. These enhancements ensure that the public can always find a comprehensive list of available emergency and human service resources available in their communities.

Realized Return on Investment, Short-Term/Long-Term Payback

The specific return on investment (ROI) for Arizona 2-1-1 Online to the State of Arizona is outlined below. Though impressive, the true value of the system to the citizens of Arizona is broader than a simple financial benefit. The main advantage is the intangible efficiencies gained through sharing of health, human service and emergency response information between various levels of government, the private sector and the public.

The development cost for Arizona 2-1-1 Online was $492,000 and the estimated five year operating costs are $495,000. Therefore, the total cost for developing and operating Arizona 2-1-1 Online over a five year life cycle is $197,400 per year. There have been about 200,000 visits to Arizona 2-1-1 Online in its first year of operation. Hence, the average cost per visit is $.98. Arizona 2-1-1 Online is currently averaging 10,023 unique visitors per month. Nationally, the average price per call to a 2-1-1 system is $11.38. So Arizona is providing the same information at a substantial savings, $10.40 per contact or $12.5 Million per year (assuming a constant usage of 120,000 per year for five years).

Additional, less tangible benefits include:

1. The system administration tools and the update tickler system in 2-1-1 enable key providers to update 2-1-1 by themselves. Department of Economic Security, Salvation Army and many other government and nonprofit organizations keep their office locations, services and contact information current in the Arizona 2-1-1 database to the benefit of their constituencies. These organizations and many others have discontinued use of their own health and human service databases and now use Arizona 2-1-1 Online.
2. Instead of going to several government and nonprofit agencies for information about a disaster, citizens, reporters, and local governments now go to one centralized place - Arizona 2-1-1 Online - for all necessary updates. In the case of a wildland fire, for example, Arizona 2-1-1 Online includes information about: fire-fighting efforts from the State Forestry Department; evacuation routes from the Department of Transportation; air quality issues from the Department of Environmental Quality; shelters or other evacuee services from the Red Cross and Salvation Army, etc. Based on the increased visits to Arizona 2-1-1 Online during past disasters, it is clear the public is utilizing Arizona 2-1-1 Online to gather invaluable safety information. Now, with the addition of 2-1-1 Call Centers for State declared emergencies, the public has even better access to information about disasters.
3. Arizona 2-1-1 Online also has the potential to mitigate increasing pressures on the 9-1-1 system. Arizona 2-1-1 Online provides up to the minute information about public emergencies. Firefighters and police are already referring people in need to Arizona 2-1-1 Online as an alternative to calling 9-1-1 for emergency health and human service information and to get information during State declared emergencies.
4. Arizona 2-1-1 Online generates reports to inform policy makers on the health, human service and emergency response needs in the State. This information is invaluable to policy makers in terms of setting public priorities and balancing budgets.

e-TAP: New York State's Comprehensive Online Student Financial Aid Gateway

Executive Summary

New York State Higher Education Services Corporation (HESC) was established in 1974 to provide centralized processing of student financial aid programs.

HESC administers the state's Tuition Assistance Program (TAP), as well as the Federal Family Education Loan Program and other state and federal financial aid programs. Among the oldest state-sponsored grant programs in the nation, TAP has earned an enviable record as the most generous scholarship program in the country by giving more than $14 billion to 4 million college students over the last three decades. For the 2006-2007 academic year, TAP will provide approximately $900 million to 400,000 students.

During the 2002-2003 academic year, HESC launched the first phase of its e-TAP solution, TAP on the Web. TAP on the Web is an innovative online alternative to paper application processing. It is an interactive, Web-based application for students who have completed their federal Free Application for Federal Student Aid (FAFSA).

Data from the FAFSA is used to pre-fill the online state TAP application. The student is guided through a series of Web pages where they verify the FAFSA data and enter additional New York State specific information. The result has been a simplified application process for students and parents as well as a 98.5 percent error-free rate for online applications.

During the 2004-2005 school year, HESC continued to improve the TAP process by introducing the next phase of the e-TAP solution, HescPIN. HescPIN is an authentication system that allows students to create a User ID and PIN that can be used to sign the online TAP application. HescPIN allows HESC to give students additional time and opportunity to apply for TAP online. Once acquired, a HescPIN User ID and PIN can be used in applying for TAP in future years.

During the 2005-2006 school year, HESC unveiled the latest phase of the e-TAP solution with the implementation of the online Student Change Form. The online Student Change Form allows students to quickly and easily change application data on file with HESC or report missing data. Changes which would create application errors are not allowed. Comprehensive instructions for students explain the pages and why a field may not be changed. In most cases, the data submitted within these pages is processed within 24 hours.

The benefits:
- Simplify the application process for students and parents;
- Allow faster, more accurate processing because the number of errors is reduced;
- Save significant amounts of money spent on printing, mailing and processing costs;
- Increase accessibility for both handicapped and minority students and parents.

Project Description

New York State Higher Education Services Corporation (HESC) was founded in 1974 to work with the higher education and financial services communities to expand educational opportunities for our students. Today, HESC is meeting that goal by offering comprehensive services for students, colleges, and lenders, such as: Administration of New York State grant and scholarship financial aid programs, including the Tuition Assistance Program;
- Origination and guarantee of student and parent education loans;
- Administration of New York's 529 College Savings Program;
- Training and technical assistance for colleges and lenders;
- Student outreach and loan counseling.

HESC administers the Tuition Assistance Program (TAP) for the State of New York by determining and awarding grants for students attending New York State colleges and universities. TAP awards are based on financial need and, unlike loans, do not have to be repaid. Qualifying students can receive up to $5,000.00 a year from TAP.

In recent years, several business problems have confronted HESC. These include a shrinking state workforce that has created a shortage of knowledgeable and skilled employees, increasing agency operational costs, and increasing manpower costs.

HESC has developed e-TAP as a multi-phase solution to address these challenges. TAP on the Web, HescPIN, and the online Student Change Form are a few of the innovations developed for the e-TAP solution.

TAP on the Web

Students must apply for tuition assistance annually by submitting a TAP application. For nearly 30 years, the TAP application was a paper document. At its zenith, it was a 24-page booklet of forms and instructions. Approximately 1.6 million booklets were printed and mailed each year. From 1998 to 2002, the process was simplified by preprinting the application with federal data, but it remained a paper process.

The first phase of e-TAP, TAP on the Web, was implemented during the 2002-2003 academic year. TAP on the Web is a Web-enabled application that provides an interactive dialog to help the student complete his application for New York State financial aid.

Students completing their federal Free Application for Federal Student Aid (FAFSA) online can link directly to TAP on the Web application where data from the FAFSA is used to pre-fill the online state TAP application. This seamless link in applying for federal and state financial aid is the first in the country. The student is guided through a series of Web pages where they verify the FAFSA data and enter additional New York State specific information. The result has been a 98.5 percent error-free rate for Web applications.

TAP on the Web is a groundbreaking solution to the several problems associated with paper processing:
- With TAP on the Web, students do not enter duplicate information on the federal and state financial aid applications, since data is automatically carried forward in one seamless, online process.
- TAP on the Web is faster than paper processing, since manual data entry is eliminated.
- TAP on the Web is much more accurate. Students who file paper applications are nearly four times more likely to make mistakes or omissions than students using the online application. TAP on the Web is interactive – the student's answer to a question determines the next question asked.
- TAP on the Web improves accessibility for handicapped users.
- TAP on the Web is less expensive since it eliminates the need for HESC to print, mail and process a returned paper application.

For the 2004-2005 academic year, the Tuition Assistance Program awarded $875 million to more than 482,000 needy college students, with 100,000 of the applications being submitted online.

With one month to go for TAP application processing for the 2005-2006 academic year, more than 613,000 applications have been received and processed, with fewer than 30% of applications submitted on paper.

HescPIN

In late 2004, HESC began the next phase of e-TAP by developing and implementing an authentication system, HescPIN. The HescPIN system allows individuals to create and maintain a unique user ID and shared secret. The combination of user ID and shared secret is designed to be used for Web-based transactions in a secure and confidential environment.

HESC improved TAP on the Web by integrating it with the HescPIN authentication system. This enables students to complete their state TAP application on the Web with a new degree of security and ease. Furthermore, improvements were made to store FAFSA data from completed federal applications. Students who missed the Web link from the online FAFSA, or applied using a paper FAFSA, now have more opportunities to complete their TAP application online.

HESC monitors students who complete their FAFSA but have not yet completed their TAP application. Using the FAFSA information, HESC e-mails students a link to the TAP on the Web site where they use their HescPIN to gain access to the online TAP application. Applicants who do not have an e-mail address get a postcard directing them to the TAP on the Web site.

Students who do not respond to e-mails or postcards are sent a paper application. If a paper application is generated, information is provided with the application directing students to the online alternative.

As a result of the successful implementation of HescPIN, TAP on the Web has been re-branded as Anytime TAP on the Web. Anytime TAP on the Web allows students to complete their state TAP application on the Web at their convenience, with fewer time constraints.

In October 2005, HESC won the prestigious New York State Governor's Office of Employee Relations Workforce Champions Award, recognizing e-TAP as "the first of its kind in the nation" and "among the most innovative developments" in the financial aid industry.

Additional solutions are being built by HESC which will use HescPIN to give further secure access to HESC's systems. These future solutions include using the HescPIN to apply for other types of financial aid such as scholarships, and signing master promissory notes electronically, or applying for a student loan.

Student Change Form
The latest phase of e-TAP was launched in late 2005, with HESC introducing the online Student Change Form.

The online Student Change Form allows students to make changes to their application data electronically. HESC saves money and time in maintaining student information.

The Student Change Form is modeled after the format of Anytime TAP on the Web. Students sign into the HescPIN authentication system and then follow a simple set of Web screens that guide them to provide and maintain correct and current information that is used by HESC for processing.

This eliminates the need for students to fill out paper forms to change data or report missing data. Additionally, HESC collects current e-mail addresses as part of this process, allowing the agency to reach out to students faster and more effectively.

Significance to the Improvement of the Operation of Government

Money and time have been saved since e-TAP was first introduced in 2002-2003, and the trend continues. The student financial aid process has been simplified and made more accessible by:
- Leveraging the Internet for the delivery of real-time Web-base applications;
- Leveraging New York State's relationship with the U.S. Department of Education to provide a seamless link for applying for federal and state financial aid – the first of its kind in the nation;
- Simplifying the application for New York State financial aid;
- Improving accessibility for handicapped and minority students.
- Based on this success, HESC was invited to testify before the Advisory Committee on Student Financial Assistance in Washington D.C. to educate Congress on how to simplify access to higher education.
- HESC staff can now concentrate on helping students with more complex problems such as residency, income and financial independence issues.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

HESC's implementation of the e-TAP solution has produced many valuable benefits for our students and their families, our agency and New York State.

Students and their parents now use a simplified process which reduces possible errors, is faster and more efficient, and gives more opportunities to use the Internet instead of paper.

Adhering to strict standards for accessibility for the handicapped, HESC has developed e-TAP to improve accessibility for the disabled and visually-impaired, by supporting speech recognition and "screen reader" technology.

During the 2004-2005 academic year, HESC unveiled a Spanish language version of Anytime TAP on the Web for its Spanish-speaking constituents. This new Spanish language enhancement is part of a spectrum of services that helps Hispanic students and families plan and pay for college. A Spanish language online Student Change Form will be unveiled this year.

HESC's efforts have been well-received, as is seen in the following statement from Dr. Victor G. Alicea, founder and president of Boricua College in New York City:

> "Kudos to HESC! As president of Boricua College, the first Hispanic college on the U.S. mainland, whose primary mission is to serve the Hispanic population of New York State, I've seen how financial, language and cultural barriers and fears have prevented Latinos from taking full advantage of the educational opportunities in New York State, the finest in the land. This new HESC initiative will no doubt open doors to higher education for thousands of Latinos not yet aware of the great educational opportunities that New York State has to offer. We are pleased and proud to publicly thank the state of New York for its leadership and this most invaluable service to the Hispanic community."

College financial aid administrators also benefit from e-TAP because less time is needed to process applications, particularly those with errors. Financial aid payments are now sent more quickly.
HESC and the State of New York benefit from e-TAP by reduced operating costs, enabling HESC to "do more with less." Operating costs have been reduced through:
- Reductions in printing costs;
- Reductions in postage;
- Reductions in data entry costs;
- Reductions in paper and materials handling.

e-TAP has also given HESC the ability to communicate with students faster, helping us keep in better touch with them and keep them informed of their application and award status.

Realized Return on Investment

Operational savings realized by HESC to date have already eclipsed HESC's cost to develop and implement e-TAP. The return on investment is even more significant when the benefits realized by HESC's customers are taken into account.

The graph below shows the increase in TAP on the Web and Anytime TAP on the Web applications compared to other application sources, since the inception of e-TAP.
                    Note: Processing for the 2005-06 academic year is not complete, so figures are not final.
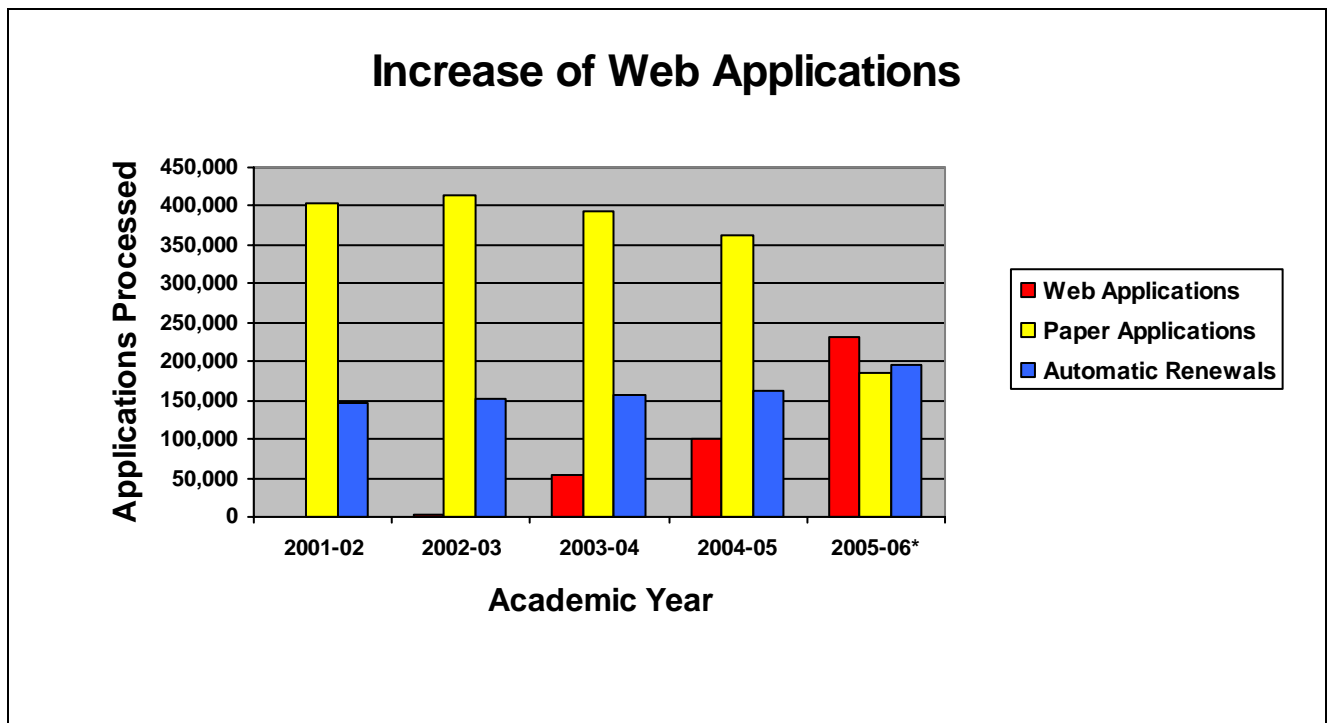
The number of online applications and Student Change Forms processed by HESC under e-TAP has exceeded 645,000.

Accounting for paper and supplies, printing, handling, postage, and data entry costs, the cost of processing a paper application or change form is approximately $3.50. HESC spent about $800,000 to develop e-TAP.

To date, HESC has recouped the entire $800,000 initial investment and has saved an additional $1.4 million, while making the process simpler, faster, and more accurate for students and families. With TAP being an annual program, these savings will grow exponentially as more students take advantage of e-TAP year after year.

Digital Government: Government to Government

Michigan's E-mail Consolidation Project

Executive Summary

The tangible benefits of e-mail consolidation have been well documented for years in the private sector. Indeed, the Michigan Department of Information Technology (MDIT) has reaped the dividends of its investment in messaging:

- Saving over $600,000 this year alone, with a total estimated over 11 million in 4 years
- Increasing services levels and response time by more than 50%
- Making the entire enterprise more secure and resistant to virus attacks
- Reaping staffing efficiencies by allowing a reallocation of over 1.8 million in personnel costs
- And the list goes on and on.

But, perhaps the most compelling reasons for addressing electronic mail do not come from hard dollars or efficiencies. For over three years MDIT has strived to align its technology planning with the statewide business priorities of its agencies. Michigan's planning process pointed out that e-mail is a key element (perhaps THE key element) of a framework that binds state government together. It is a citizen's common gateway to State services, the foundation for a mobile workforce and an essential tool for collaboration and communication. In Michigan e-mail is used to manage financial transactions and enables nearly all self-service applications from driver's license renewal to starting a business. In a disaster situation, e-mail is second only to basic voice communications as the most heavily relied upon system during recovery operations. In short, e-mail and its reliable use is one of the most important functions any government IT organization undertakes.

However, the very popularity and increased demand for electronic mail have been at the heart of government's messaging challenge. E-mail has become a "given" in our society so rapidly that much of the discipline and rigor typically attached to an application of its importance has been overlooked.

After years of scrambling to meet the increasing expectations of individual departments, Michigan found itself in the same situation many state's face; aging infrastructure, a complex maze of messaging solutions that impeded communication and unnecessarily high costs. Through the E-mail Consolidation Project MDIT enabled strategic priorities, brought stakeholders together, defined a common messaging platform and implemented a cost effective solution that has been a foundational element in our governor's efforts to transform state government into a collaborative enterprise.

Project Description

E-mail is the most extensively used application worldwide. It has evolved from a convenient tool to a basic necessity that has become part of the very fabric of our society. In State government, e-mail is a citizen's gateway to services, a department's primary tool for collaboration and (where fully leveraged) a method for increasing productivity and transforming the very definition of the workplace.

Since its creation, the Michigan Department of Information Technology (MDIT) prioritized its e-mail consolidation as one of its top organizational imperatives. With a clear alignment driven from MDIT's planning process, this project answered the Governor's call for more efficient use of resources, met the demand from state departments for greater service levels and moved MDIT further toward its goal of centralizing technology in its primary hosting centers. All while saving significant dollars and creating a firm foundation for the e-workplace in Michigan.

In the wake of the 2003 multi-state power outage, Governor Jennifer Granholm coordinated a review of all applications critical to Michigan's citizens. Across nearly every agency, one application topped the inventory time and again: e-mail. The Dept of Community Health's Disease Surveillance System generates e-mail to track and prevent the spread of health related issues (avian influenza, SARS, bioterrorism). Aside from basic voice communications e-mail is the most heavily relied upon tool in a disaster situation. In Michigan, the Departments

of Human Services, Community Health, State Police, Military and Veterans Affairs, Agriculture, Environmental Quality, Natural Resources and Education all employ e-mail as the focal point for Crisis Management Centers.

Michigan's Department of Information Technology (MDIT) formalized e-mail as a critical business application for our 55,000 users and planned its redesign accordingly. In the year 2000, a business, citizen or state employee in Michigan had a daunting task traversing the state's e-mail systems across its' 19 Agencies. Everything from contacting a case worker to confirming a meeting was disjointed and confusing. The state workers themselves could not send messages to each other consistently and were still relying on paper forms and inter-office memos to transact the state's business. The problem lay in the disparate and complex messaging technologies implemented over time. Michigan's agencies were the home for more than 40 undocumented versions of e-mail solutions. The hardware running those systems was obsolete (servers ranged from 4-7 years old) and in many cases replacement parts were no longer available. The e-mail servers themselves were geographically spread over 600 locations in 83 counties; requiring staff to physically travel throughout the state when issues occurred. Substantial data loss in the event of an outage and consistent "undeliverable" mail were realities agencies and citizens lived with every day. Complete e-mail system failures were a monthly occurrence for the Department of Military and Veteran's Affairs as well as Michigan's Attorney General. Obsolete and undersized servers at the Department of Natural Resources and the Department of Environmental Quality caused persistent delays where e-mail took hours to successfully send, hampering those agencies' ability to track and communicate outbreaks of diseases affecting Michigan's natural resources (Emerald Ash Borer, Chronic Wasting Disease, etc).

E-mail is a powerful tool, but when implemented inconsistently it can become an easy target for cyber attacks. In 2000 spam and virus traffic volume began to trend upward sharply, by 2004 volumes had increased by more than 800%. This flooded e-mail boxes with erroneous, inappropriate and harmful content that made a difficult situation untenable. In short, the situation for email in Michigan added up to unnecessarily high costs, less than optimum services, increased risk exposure and lost opportunities for what was possible and necessary in an e - workplace.

PHASE 1 Bringing Stakeholders Together
Solving the problem required a deep understanding of the business value e-mail provides for each department and a strategy that supported individual departmental goals and mandates while maintaining an enterprise focus. By showing the alignment of the e-mail consolidation to business priorities outlined in the Governor's Cabinet Action Plan and collaborating early with the various departments, MDIT developed its plan with the assurance of agency support. MDIT invited a "Deputy Level" representative from each agency and branch of Government to act as a technology steering committee called the Michigan Information Technology Executive Council (MITEC). MITEC in turn launched a subgroup to establish statewide policies for the email consolidation project.
These policies had an immediate impact on the project by defining that a future consolidated email system was "mission critical" and should be designed with statewide guidelines such as redundancy, disaster recovery provisions and a 100Mb mailbox default.

PHASE 2 Security and a Common Point of Entry (2000-2003)
The first hurdle to overcome was addressing security issues and the more external or "public facing" aspects of e-mail. A unified gateway was developed whose purpose was threefold: 1) to present a common e-mail "identity" (@MICHIGAN.GOV) to all external entities transacting e-mail with the state 2) create a "single point" filter to protect the State from SPAM and virus attacks and 3) allow the State's two predominant e-mail platforms to seamlessly co-exist.

PHASE 3 Improving Support, Citizen Accesses and Enabling the Mobile Worker (2003-2004)
This phase of the effort focused on improving MDIT support levels by eliminating all but the two most widely used e-mail solutions (Microsoft Exchange and Novell GroupWise). Throughout the year 2003, over 700 email servers were upgraded or reconfigured to a standard configuration/version. Although still aging and geographically dispersed, field technicians and clients alike would now know exactly what they were dealing with in the event of an outage. This allowed MDIT to better respond to trouble calls and raised our level of service. State workers saw the additional benefit of accessing their mail from any workstation (via internet mail). Mobile working became a real possibility for ALL agencies for the first time. Teams created a single authoritative source for all e-mail addresses in the State. This effort spanned both email platforms, lowered costs by cleaning up thousands of unused addresses and gave businesses, clients and state workers a single "look up" foundation that they know is accurate and up to date.

PHASE 4 Transforming the E-mail Enterprise (2004-2006)
The final (and most impactful) phase of the e-mail consolidation is now in its final stages. With success in standardizing the e-mail systems from over 40 variations down to two, the stage was set for the physical migration of e-mail systems to a 24X7 enterprise solution. Over 30,000 of the State's e-mail users have already been successfully migrated. E-mail systems are now hosted in the State's premiere hosting center where support is carried out with increased discipline and rigorous processes. Fully redundant configurations in the network, servers and storage ensure 100% uptime and a powerful backup and recovery system guarantee that no data will be lost. This phase reduced staff involved in e-mail support from 36 to 18 and brought the hardware requirement down nearly 90% (from 740 servers to 90).

Significance to the Improvement of the Operation of Government

The e-mail consolidation project has had a profound affect on Michigan's government operations. It has improved security, increased reliability, increased service levels, moved strategic goals of the state forward and has been executed in a manner that could be repeated by other States.

Secure Data: The new enterprise system scans over 400,000 incoming e-mails each day. 60% of those messages are flagged as SPAM or infected and are filtered out, never reaching the user's desktop. Although difficult to quantify, removing the current volume of inappropriate messages from official, actionable correspondences increases worker productivity. Addressing the SPAM issue has never been more urgent. Phishing schemes have taken SPAM from a significant annoyance to a tool of deliberate attack for cyber-criminals that requires an enterprise approach to keep in check.

Alignment to the State's Strategic goals: The consolidated e-mail project offered MDIT the opportunity to meet gubernatorial goals to save money, retool for disaster preparedness and is part of a major "shared services" initiative underway in the State. Also, the 2005 MDIT strategic plan commits to either retire or consolidate 1000 servers this fiscal year. The e-mail consolidation will bring MDIT 740 servers closer to that goal. As the enterprise e-mail servers have been installed in our hosting centers, the additional volume has been a major factor in allowing MDIT to lower storage and hosting charges for all State clients.

Increased Reliability: Recognizing the universal importance of e-mail and its need to be architected for maximum uptime drove the requirement for an "always available" system. Since its first "go-live" day in 2003 not a single department on the enterprise e-mail has lost any data or experienced any significant interruption of service. In addition to the service improvements there are profound "intangible" benefits as well. For the first time workers could search calendars and schedule appointments with certainty. Inboxes are up and active— displaying incoming mail and sending mail almost instantaneously.

Faster Service: New capabilities implemented on the e-mail systems ensure that when administrative issues arise (password resets, etc) MDIT is much quicker to respond. Prior to e-mail consolidation only 15% of e-mail tickets were resolved on the first call; after moving 30,000 users to the new environment, the number of first-call resolutions has more than doubled to 37%. Also, if users inadvertently delete messages, the time required to restore those files has gone from 2-3 weeks down to 2-3 days. The service trend is continuing upward as the final users are moved to the centralized environment.

Transferability of Lessons Learned: E-mail consolidation is a hot topic and the MDIT approach serves as a good baseline for other governments planning similar efforts. First, the outcome of MDIT's collaboration with stakeholders is immediately transferable; the formation of MITEC and that group's decisions can serve other States as an e-mail standards baseline from business units similar to their own. Secondly, Michigan's business case has been shared widely among the States (through NASCIO) and its elements have been used to justify and benchmark e-mail consolidation initiatives. Lastly, the technical architecture of MDIT's unified SMTP gateway can be duplicated anywhere there is a need to present multiple messaging systems in a single "statewide" view.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

The true customers of e-mail are the agencies who use it and the citizens who rely upon it as their gateway to services. The e-mail consolidation project gave Michigan a common e-mail identity, made getting the right state contact easier, enabled telecommuting and mobile workers and kept the State's e-mail from being the source of virus attacks.

Focal Point for Communication: With the advent of an enterprise e-mail solution, citizens, businesses and stakeholders were given a common focal point for on-line communication and self-service coordination (Michigan.gov). Today, the adoption of that focal point has been so successful that the enterprise e-mail system boasts traffic volumes of over one million messages each day (incoming and outgoing). The highest volume of all incoming mail comes from Michigan's businesses applying for permits (environmental, liquor control, etc) and the highest volume of all outgoing mail informs citizens of the status of their recreation licenses (hunting, fishing, etc). The consolidated e-mail technology has enabled cross-agency meeting and resource scheduling. This ability has been critical for a broad spectrum of gubernatorial collaboration efforts to move rapidly. For nearly all cabinet plan commitments (from consolidating business permitting functions to focusing a multi-agency response to struggling local governments) e-mail has proven the foundation for scheduling collaboration sessions, communicating decisions, tracking commitments and bringing state staff together in new and innovative ways.

Streamlined Addresses: The common address book significantly streamlined communication with the State. Today vendors, citizens, government partners and other stakeholders can easily identify state workers and services within state government from a common, up-to-date address book. This has become even more critical as budget issues have meant less physical office locations available for citizens to seek services "face to face".

Enabling the Mobile Worker: The desire to allow case workers more time in the field and a gubernatorial priority to consolidate office buildings fueled the need for a more mobile e-mail solution. With the decision to focus efforts on two e-mail platforms, MDIT went to work architecting common web interfaces to e-mail that could be accessed from anywhere at anytime. For the first time in the state's history, this capability has been extended from a handful of agencies to all departments throughout the state. Mobile e-mail gives even the smallest departments the opportunity for productivity gains.

Virus Prevention and Detection: Prevention and recovery from virus attacks is a benefit to state agencies and customers alike. E-mail is the most common mechanism used to propagate and deliver viruses throughout cyberspace. Michigan's unified e-mail gateway makes certain that all messages leaving the state are clean and not inadvertently passing viruses or other security threats to taxpayers, businesses or other government partners. Likewise, the standardization of e-mail systems has secured the mail internal to the state's network as well. Even with an 800 percent increase in attempted virus intrusions in 2004, MDIT was able to remove 99.94% of all viruses before harm was done. In the old environment infected workstations and e-mail servers would require the on-site visit of a technician to diagnose and repair a virus related problem (a recovery time that averaged 3.75 days in 2004). Today, the estimated recovery time for consolidated e-mail servers is less than four hours. This recovery time has been difficult to validate because no enterprise e-mail server has been infected since the new architecture was implemented (three years ago).

Realized Return on Investment

In addition to the service benefits listed above, the Michigan enterprise e-mail solution was more cost effective than a "siloed" approach. In terms of cost avoidance and hard dollar savings, the investment in consolidation is paying dividends. Migration, training and analysis projects did not require investment (these tasks were accomplished with the existing 18 FTE's assigned). The investment required by MDIT was restricted to the hardware procurement of 74 Mail Servers, 10 SMTP Servers and 6 Directory Servers; totaling $900,000.

Hardware Replacement Cost Avoidance: In early 2003, the servers running the State's email ranged from 4 to 7 years old. The average cost of replacing current equipment was quoted at $3,700 per server and the cost of an enterprise server was less than $10,000 each. The consolidated e-mail approach drastically reduced the number of servers needed from 740 to 90. The total hardware cost avoidance= $1,838,000 with an additional $600,000 a year in hosting charges (assuming a 4 year replacement cycle).

Staffing Efficiencies: 36 FTE's were supporting Michigan's e-mail in 2002; today this count is 18. The reduction in staffing needed to support the enterprise approach allowed MDIT the flexibility to reallocate over $1,800,000 in resources (either reassigning unnecessary staff to priority projects or to remove the resource as a direct cost savings).

"Per Mailbox" Pricing: The price per user/per mailbox for Michigan's 2 platform solution is below industry standards for a single e-mail platform and more competitive than other outsourced alternatives explored. Below is a breakdown of price components as compared to Michigan's previous e-mail systems and a Gartner best practice study updated and validated for 2006.

Costs Based Per Mailbox

Cost Category	Gartner Best Practice (10,000 Users)	Old MDIT Costs (55,000 Users)	New MDIT Costs (55,000 Users)	Michigan Detail (New Solution)
License Fees	$458,000	$1,421,162	$1,421,162	**Includes e-mail, mailbox anti-virus and anti-Spam**
Server Costs	$180,000	$684,500	$225,000	**Server breakdown: 74 Mail, 10 SMTP and 6 AD at an average of $10,000 each. A 4-year replacement cycle is calculated into yearly rate.**
Administration and Staff	$400,000	$3,694,320	$1,847,160	**Estimated actual costs for 18 State FTE's (includes benefits, computers, cell phone, etc)**
Hardware Operations	$170,000	0	$537,000	**Includes monitoring, disk storage (5.5 Terabytes @ 100MB per user), and hosting charges.**
Bandwidth	$81,000	$1,332,000	$162,000	**$150 per server per month (90 servers)**
Planning Deployment Training	$52,000	0	$27,000	***Planning and deployment functions are included in the staff costs above. Training only is reflected here.**
COST TOTAL	$1,341,000	$7,131,982	$4,219,322	**Yearly Costs**
Monthly Cost Per User	**$11.18**	**$10.81**	**$6.39**	**Includes costs for supporting and maintaining both MS Exchange and Novell GroupWise.**

The return on investment below is calculated using Table 1 above (The money saved using new "per mailbox" costs over the old "per mailbox" costs). Projections are given for ROI once the entire user base is converted and an estimated four year return is listed.

Total Investment Required:	$900,000	
Return to Date:	$1,588,723.64	(30,000 users @ current mailbox costs)
Current ROI:	$688,723.64	
Estimated Return Once Complete:	$2,912,660.00	(55,000 Users @ current mailbox costs)
Estimated 4 Year Return	$11,650,640.00	

Enterprise Architecture

District of Columbia Enterprise Integration Stack

Executive Summary

The District Office of the Chief Technology Officer (OCTO) has devised a strategy that integrates multi-agency data, while preserving legacy data investments. OCTO dubs its strategy the District Enterprise Integration Stack (DEIS). The DEIS uses enterprise application integration (EAI) tools to pass data from legacy applications up through an enterprise service bus to multi-agency applications and a citywide portal framework.

This new data and application integration model incorporates an array of enterprise application tools, data warehouses, portal frameworks and web services. DEIS consists of four layers with cumulative functionality.

While web browsers take data and make it accessible to consumers, EAI takes data from one set of servers and makes it accessible to applications on other servers. OCTO's objective was to give the District's highly decentralized IT environment a common communication highway through EAI.

For example, the Mayor's Call Center uses a custom EAI adapter to connect its software to the customer service broker. That broker, in turn, translates these requests electronically into a format that's understood by the fulfillment system at the Department of Public Works (DPW).

And the public sees the benefits. A broken streetlight is fixed. A pothole is filled. Uncollected trash is picked up.

DEIS Level One defines stovepiped legacy application data from 66 District agencies. Level Two allows District agencies to tap into this District-wide legacy data and communicate with each other as needed. Level Three permits interagency collaboration to solve critical citywide problems in areas such as public safety and human services. Level Four invites the public in, offering a common data look and feel so that citizens—and the District employees who serve them—can easily navigate District government services.

While several years from fully achieving this vision, the District is already reaping extraordinary rewards from the DEIS architecture. District-wide adoption rates for integrated applications are up, operational costs are down and agency resistance to change is dissolving. Perhaps the most significant achievement is that residents now frequently comment on the ease with which they complete routine transactions with their government. District resident Don Marlais offered this recounting of his experience using the SRC for a bulk trash pick up service that is fulfilled by the DPW:

> *"The process was remarkably easy and the system quite user friendly. All I had to do is fill out a simple registration form to get a user name and password and then follow the directions on the site. It asked me for a description of the items for pick-up, my address and the location of the item(s) on the property (front, rear, etc.). The entire process took about three minutes. At the end, I was given a confirmation number and pick-up date…the articles were picked-up as advertised."*

Project Description

Six years ago, Washington, D.C., was plagued with one of the worst functioning governments, and technology infrastructures in the country. Today, it can boast one of the best, with a long list of enviable improvements: Many of its public services—including drivers' licensing, tax refunds, policing and snow removal—are now being handled electronically, and intergovernmental communications and collaboration have advanced considerably.

Much of the credit for these results has to do with the District's approach to Enterprise Architecture (EA), suffused with Services Oriented Architecture (SOA) strategies. The District's Office of the Chief Technology Officer (OCTO) guided the development of the Statewide (or Citywide) Enterprise Architecture methodology, compliant with the Federal Enterprise Architecture Framework (FEAF) Level III. After hiring a Chief Architect, and considering various approaches, OCTO documented the current and future EA.

This involved working with top government officials and lines of business (LoB) owners (e.g., deputy mayors and agency directors) to cluster Services Modernization Programs (SMPs) representing vertical (LoBs) and horizontal (e.g., ERP) slices of EA. The approach is top-down driven by business strategy, which then defines the business processes, data flows, applications and, finally, technology. OCTO manages the portfolio of investments based on traceability between modernization projects and business strategy.

The EA approach is highly practical, with a template for EA artifacts, milestones, and project planning deliverables that emphasizes achieving early success stories, and solving significant points of pain, while at the same time leveraging all efforts as a foundation for the future.

What truly sets the District apart is its deployment of advanced SOA solutions, fully integrated within EA planning, to solve government business problems. Earlier IT investment in the District helped preserve dysfunctional agency data silos by granting agencies proprietary interests in their own data. Now OCTO's strategy integrates multi-agency data, while preserving legacy data investments. OCTO dubs this strategy the District Enterprise Integration Stack (DEIS). This new data and application integration model incorporates an array of enterprise application integration (EAI) tools, data warehouses, portal frameworks and web services. The EAI tools are sets of brokers, connectors and middleware that use Extensible Markup Language (XML) to connect existing legacy IT systems.

While web browsers take data and make it accessible to consumers, EAI takes data from one set of servers and makes it accessible to applications on other servers. OCTO's objective was to give the District's highly decentralized IT environment a common communication highway through EAI.

Taking advantage of EAI integration capacities, OCTO linked data from the new ERP applications with critical inherited applications like the general ledger system. The solution worked so well for administrative services that it was extended to human services and customer management initiatives.
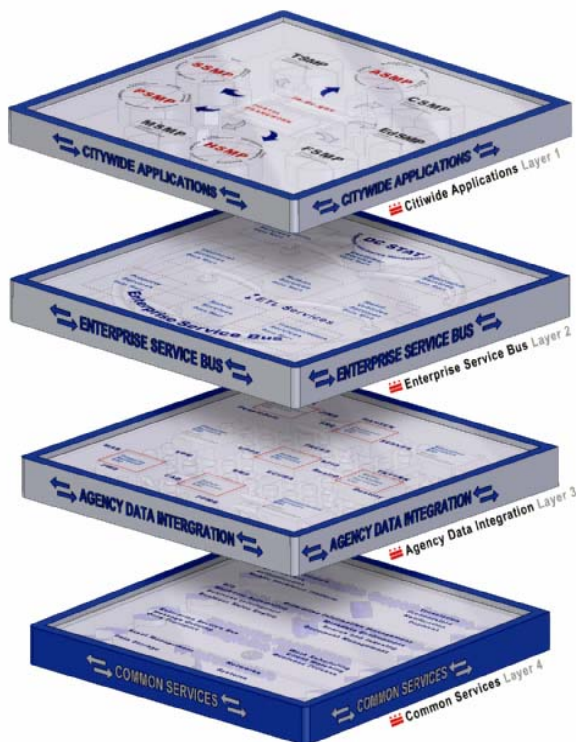
DISTRICT OF COLUMBIA CITIWIDE INTEGRATION MODEL

Layer One of the DEIS divides legacy applications from the city's 66 agencies into nine functional clusters: administrative, financial, human services, education, public safety, motorists, property, customer service and transportation. Each has its own EAI broker, which manages the data dictionary for its functional area. These dictionaries are the Rosetta stones of DEIS. They permit legacy applications to communicate with one another, even though each speaks a different language. They automate multi-agency data communications for the first time, and save thousands of hours monthly in error-prone duplicative data entry and point-to-point communications. For example, the Mayor's Call Center uses a custom EAI adapter to connect its software to the customer service broker. That broker, in turn, translates these requests electronically into a format that's understood by the fulfillment system at the Department of Public Works. And the public sees the benefits. A broken streetlight is fixed. A pothole is filled. Uncollected trash is picked up.

District managers see the benefits as well. The Public Works application automatically reaches out to close a service request at the Call Center when a complaint has been handled, so repeat complaints are minimized and duplicative data entry is eliminated. Citizens can now track the status of their service requests on the government's website. Standing alone, Layer One of DEIS is a model of government responsiveness.

Level Two allows agencies to tap into this District-wide legacy data and communicate with each other as needed. Level Three permits interagency collaboration to solve critical District-wide problems in areas such as public safety and human services. Level Four invites the public in, offering a common data look and feel so that citizens—and the District employees who serve them—can easily navigate government services.

Significance to the Improvement of the Operation of Government

Modern municipal enterprises are typically mixes of highly complex and heterogeneous business and IT environments. Unlike the private sector, where integration strategies have been deployed successfully for some time, government decision makers are unaccustomed to these solutions.

OCTO met this challenge by organizing the District's entire application-level enterprise into the four-tier District Enterprise Integration Stack. DEIS takes data elements from low-level sources and passes them up the "stack" to make them more usable and sharable throughout the enterprise. It's this ability to free data from its original single-agency constraints that makes DEIS so powerful.

The application of enterprise integration strategy across District services achieves substantial cost economies and service-level improvements. The District has nine major services modernization programs (SMPs), each one corresponding to one of the nine EAI brokers described in Layer One and each covering a critical area of the District's core business responsibilities. SMPs go beyond defining agency legacy data to each other (Level One) or sharing that data (Level Two). Each SMP powers a set of major multi-agency applications designed to automate work in that service area, regardless of how many agencies need to collaborate.

For example, several agencies (e.g., Transportation, Consumer and Regulatory Affairs, Health) have disparate processes and systems (often duplicative and siloed even within one agency's departments) for issuing permits and licenses, and conducting inspections. And virtually all agencies rely on accurate and standardized data on building addresses (and attribute data relevant to those addresses). The District's Property Services Modernization Program (PSMP) starts with the government-wide and Line of Business strategies pertaining to real property in the District, and prioritizes related projects accordingly. Some of these now completed projects include: 1) various business process re-engineering efforts; 2) the Master Address Repository (MAR) (authoritative source of all building addresses); 3) the web service that enables all District applications to access the MAR; 4) the Vector Property Map (authoritative source of all property boundaries); 5) imaging of surveyor plats, presently all paper-based; and 6) the web-enabled Permitting System.

While several years from fully achieving this vision, the District is already reaping extraordinary rewards from the DEIS architecture. District-wide adoption rates for integrated applications are up, operational costs are down and agency resistance to change is dissolving. Perhaps the most significant achievement is that residents now frequently comment on the ease with which they complete routine transactions with their government.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

The Enterprise Service Bus (ESB), the heart of Layer Two, is message-oriented middleware that allows software applications to subscribe to information stored in other software applications. The ESB in Layer Two provides a communications channel through which individual systems can "talk" (even though they may not be aware that their partner systems exist). The Call Center information, for example, is now updated every six seconds and is available to any system that has permission to subscribe from the ESB.

The ESB populates the DCStat Enterprise Data Warehouse. This warehouse, driven by a District-wide license for the Business Objects suite, is the repository of information at the District-wide level, and it is used for cross-agency business intelligence as well as for the city administrator's enterprise decision-making dashboard. The city administrator's mandate to publish agency performance information to the DCStat system has supplied enormous incentive for agencies to participate in District-wide integration efforts. The first information to be published via Real Simple Syndication on the www.dc.gov website in June 2006 will be service requests.

The District's nine SMPs are at very different stages of their life cycles. The first SMP, the Administrative Services Modernization Program (ASMP), includes modules for procurement, HR, agency performance management, payroll and property management. It is almost complete after two and a half years of development. Through ERP

software, the procurement module has integrated with a legacy financial system and increased the transparency of the procurement process for program managers.

The second SMP, for human services (HSMP), is rolling out its first modules. HSMP includes District-wide human service case management, claims and complaints adjudication, benefits eligibility and benefits enrollment. The "Preliminary Interview for Benefits," provides a dynamic online questionnaire that helps residents (or their caseworkers) determine which District medical programs they qualify for. Caseworkers use HSMP's Preliminary Interview for Benefits Online to establish, with 99% certainty, client eligibility for Medicaid. This helps them determine up front that they should direct clients to Medicaid-approved service providers, which minimizes the use of local funds.

The advantage of launching these nine programs within the DEIS stack is the ability to create applications that work across agency boundaries. Ask any city or state about its worst administrative horror stories, and human services will usually rank as number one.

When the District's HSMP system is fully functioning, the benefits application system will interact with the case management system. Both, in turn, will be able to work seamlessly with the disbursement system planned within the Financial Services Modernization Program (FSMP). The capacity to present a single face of government to both clients and caseworkers is possible only through the groundwork laid in Layers One and Two. While the SMPs represent great technological sophistication, ultimately, applying technology is not the most important work these programs accomplish. Even more valuable is the chance for District and agency leaders to conduct a rigorous examination of their business processes.

When agencies truly understand what their neighboring agencies are doing and the efficiencies gained from working together, resistance to change dissolves. Then agencies see the structural data flexibility oriented in Layers One and Two as a vital resource to help them reach their own re-engineering goals. Increasing interagency collaboration and efficiencies are valuable benefits of technology. But the direct payoff for citizens comes into play in Level Four, the public face of DEIS. Technological wonders are meaningless if government doesn't work directly for its citizens, and the District has long been notorious for poor public services. Consequently, OCTO has adopted a crystal-clear set of operating tenets for IT interactions with constituents:

- **A single point of entry.** All citizen requests must be routed to a central point of entry so that citizens are not left to wander helplessly among 66 agencies to find what they need.

- **Guaranteed closure.** Every citizen must be assured that his or her request, once submitted, will be fulfilled, no matter which agency or how many agencies are involved in the transaction.

- **Benign service delivery.** OCTO's charge is to make dealing with government as positive as possible. In the first three layers of DEIS, OCTO worked from the inside of government out. For the final layer, OCTO had to flip its point of view, looking at the business of government from the outside in.

Citizens come into contact with government by one or more of six routes. They walk into an office; telephone an office or call center; send mail; send email; use the District's website; and/or submit information through a wireless device. The fourth layer of DEIS serves as a common gateway for all six of these customer channels, provides services to constituents and serves as an information resource for employees. Information must be consistent, accurate and up-to-date for both employees and citizens.

To deal with this challenge, OCTO began with an enterprise license for a web portal. The portal framework presents data and applications from the DEIS stack, whether the customer walks into an office, calls the call center or checks the web. All channels of information remain consistent, up-to-date and accessible.

When the integration plan is complete, every District customer service representative will have access to the same information and transactional applications at their computers. And constituents will see the same data and applications on their computers via www.dc.gov. The last features of the fourth layer are web services that allow citizens to track their transactions across multiple agencies. If a neighborhood group wants to throw a summer block party, permits or licenses are required from five city agencies. Today, these agencies have no way to coordinate with one another, and the neighborhood group has no clear way to navigate among them. They have to start, track and finish five transactions with five agencies for a single event.

The Level Four web services of DEIS connect all agencies in the city, creating a one-stop-shop for constituents. The District is creating a simple set of services that allow different applications and agencies to coordinate data and services about commonly used people, places, things and processes. Three of these services—people, places and processes—are in pilot mode. An example of a "people" service is a single sign-on web service that allows residents to log onto all their applications at one time through an enterprise Lightweight Directory Access Protocol directory.

The most popular "place" web service is address verification, which allows an application to check an address against the District-wide geographic information system and suggest corrections to prevent entry of incorrect addresses into our enterprise systems.

The third pilot is a "process" service. The service request workflow web service (tied to the Customer Service Modernization Program broker) allows users to track their service requests across agency boundaries. When adapted to block parties, this web service will allow the neighborhood group to submit a party permit request just once. The web service will automatically route the request to all five agencies and email the requester once all necessary permits are approved.

Realized Return on Investment

ASMP, the first service modernization program, is not quite complete, but the District is already reaping extraordinary rewards from DEIS in this program. One prime example is the contract and procurement process. To address inefficiencies of paper processing, the DC government implemented the Procurement Automated Support System (PASS) as part of the ASMP. The new system automates all procurement activities, from the initiation of a request to the issuance of a purchase order, the receipt of goods and services, and the creation and approval of invoices. PASS integrates commercial software with the District government's general ledger. It not only allows the District to track data in real time, it also helps provide timely procurement services.

As of May 2006, over $2.5 billion was under the spend management of the system. In addition there were over 3,900 users across all agencies including Public Schools. The District averages 18,000 purchases or contracts each year. Under PASS, the average processing time dropped from 15 days to eight days. This huge decrease in processing time translated into lower administrative costs and much greater customer satisfaction. Procurement managers and program managers have access to the number of purchases and the value of purchases made by each individual—a great value in managing workload and evaluating the performance of each employee. PASS has given the District an opportunity to do more with less.

PASS can save the District approximately $29 million over a five year period beginning with system implementation that was completed in December 2003. It cost the District $9 million to implement PASS. The estimate of the savings breakdown is as follows:

Automate and eliminate the need for off system tracking requisitions	$ 930,000
Increase productivity of processors (3900 Users)	$ 11,800,000
Aggregate purchasing, better contract terms, strategic sourcing and catalog purchases (on a annual spend of $1.4 Billion)	$ 16,300,000
Total	**$29,030,000**

An example of layer two's impact can be found in DCStat, which began operation in January 2005. DCStat is an advanced business intelligence system that integrates data previously stored on individual systems, analyzes the data to reveal patterns and trends, presents results in a variety of graphic forms, and even notifies city officials of potential problems. DCStat uses Enterprise Application Integration (EAI) middleware to make disparate data from 62 city agencies accessible anytime from anywhere in the city, regardless of the age or technology of the systems containing the data. DCStat identified $12 million in recurring annual tax revenue that had gone uncollected year after year due to lack of coordination between the District's Chief Financial Officer and local housing inspectors.

Enterprise IT Management Initiatives

Michigan's Human Resource Optimization Project

Executive Summary

Michigan's Human Resource (HR) Optimization Project was an interdepartmental initiative to increase the effectiveness and efficiency of statewide HR services delivery, by building upon the state's centralized HR management system. This project resulted in an enhanced self-service internet application, a centralized data store, a multi-tiered service center, and the redesign and realignment of numerous human resource processes. Beginning operations in August 2004, the system produced documented savings of $2 million in the first year and over $4.8 million in the second year, and remains on schedule to save $28 million over the first five years - while delivering best-in-class service.

The project was a collaborative effort involving the State of Michigan Governor's Executive Office, the Departments of Civil Service, Management and Budget, and Information Technology, the Office of the State Employer, the Office of the State Budget, and the entire community of agency HR management offices throughout the state.

The overall objective was to encourage employees to resolve their own issues by providing direct access to HR information, while at the same time making responsive support available when needed. To maximize efficiency gains, a three part approach was used:

1. Web based self-service tools were expanded to enhance direct employee interface with the Department of Civil Service HR computer system.
2. These tools were augmented by an "intelligent" knowledgebase, called MI HR (pronounced "My-HR") Information, to provide employees with data tailored to their specified conditions of employment.
3. A multi-tiered service center was established to directly support employees and perform routine transactions as required, thereby optimizing HR systems and reducing resource allocations statewide.

On-line self-service serves about 47,000 active employees with internet access at work or home (estimated at over 85%), offering 70 plus menu items, including 12 areas with direct update functionality (like direct deposit and federal/state withholding), and 3 areas of open enrollment. Self-Service receives about 3,800 visits a day (not counting the 94,860 hits every pay period for on-line earnings statement information). The detailed on-line knowledgebase hosts almost 200 visitors and close to 900 hits per day.

Serving over 55,000 state employees, the MI HR Service Center handles as many as 1000 calls a day. In addition to 27 routine HR transactions that transitioned to the service center from agency HR offices, the center is now also the primary point of contact for statewide activities such as benefits open enrollment, W4 questions, and Medicare Part D inquiries.

Project success is well-quantified, especially for the services provided by the service center. ***Cost savings*** - this program was brought online ahead of schedule and under budget and is exceeding projected savings targets. ***Efficiency*** - group insurance open enrollment flawlessly handled up to 8000 calls and 6000 transactions in the first month, an example of the type of work volume previously distributed across the HR offices of all state departments. ***Customer service and quality*** - with an exceptional rate of return for satisfaction surveys, 97% of respondents indicate they are satisfied, or very satisfied with service, while all cases are closed within service level target time frames and the call abandonment rate averages 1%, independent of call volumes with minimal system down time. Finally, as envisioned, the system resulted in a fourfold increase in the use of enhanced employee self-service.

A new centralized model, $6.9 million in cumulative savings achieved, a reduced overall number of HR positions, and consistently surpassed quality targets, all serve as indicators that this project was well planned, effectively designed and successfully executed.

Project Description

The Department of Civil Service (DCS) is the central human resource agency for the State of Michigan Executive Branch and is the parent organization for the nominated program. DCS is responsible for issuing rules and

regulations regarding the classification of all positions, rates of compensation, testing, performance evaluation, training and development, and conditions of employment. These rules and regulations guide DCS relationships with the HR offices of the 18 primary departments of the State of Michigan. The state employs over 55,000 people of which 72% are represented by 11 different bargaining units. DCS also provides service across the other two branches of state government when efficiency of collaboration does not compromise separation of powers.

Within the state, departmental organizational structures vary greatly, including highly structured and geographically dispersed organizations such as the Department of Corrections; smaller organizations such as the Department of Civil Rights; and organizations with greatly differing mandates such as the Department of Transportation, Department of Natural Resources, or the Department of Labor and Economic Growth. The variety of operational activities performed by these and other departments all rely on a crucial common task, managing their HR needs by functional application of the Civil Service Rules and Regulations.

The HR Optimization Project team was charged with increasing the effectiveness and efficiency with which statewide HR services are delivered. As with any redesign process, the greatest challenges were presented by change. The HR Optimization project faced change in all three traditional project areas – People, Processes, and Technology.

While shared service centers are fairly common within the private sector, they are far less prevalent in the public sector. Understanding the opportunities created by implementing centralized call center facilities, the team's goal was to create a multi-channel, single source service center that would provide continuous internet access where it would be most useful, coupled with a staffed call center for those employees lacking comfort with or access to the internet. The strategic model used to organize objectives included creating:

- A single centralized HR knowledge repository
- On-line availability of HR policy and procedure information in easily understandable language
- A single point of contact for general HR support
- Process realignment that allowed individual agency HR offices to focus on specialized strategic issues while the service center addresses routine issues

A traditional project approach was used, the concept was approved and a project team created. Scope was planned and defined, requirements finalized and a plan developed. "As-is" and "To-be" models were created and a gap analysis completed based on the business requirements that defined the project. Essentially, the team had to ask people about what they did and how it could be done more effectively. Most challenging however, was navigating through this process with people who knew that in many cases success would impact their own jobs.

Working together with representatives from the agency HR offices, the project team identified target processes and procedures and designed new ways to redistribute tasks so that position costs could be saved in accordance with budgetary requirements. These redesigned processes were then married with technology that was new to the conventional HR environment.

In all, 76 full-time equivalent positions were eliminated from human resources areas across the 18 agencies in the first year of operation. This goal was met without terminating employees. Through attrition and placement of individuals in vacancies outside of HR, an additional 62 positions and the associated budget will be eliminated over the next four years.

Employees in eliminated positions were given the first opportunity to fill MI HR Service Center staff positions, both to ease the transition to a centralized process and to take advantage of their institutional HR knowledge. A new customer service classification was created and a best practice review was completed to build selection criteria that would match the best candidates with the new positions needed to staff the service center.

Working with the HR community and relying on subject matter experts, the project team analyzed, redesigned, tested, and reviewed all process changes. Wherever optimal, technology and automation were incorporated to achieve maximum gains as the service center came on-line.

"This was a great opportunity for IBM to implement what is historically a hosted solution, in an onsite environment," explained Adam Jelic, IBM Business Consulting Services Project Manager. "We knew that we faced a number of unique challenges with this project. The state's focus on communications and their comprehensive

change management plan allowed us to overcome the often overlooked and critical challenge of effectively managing the cultural change."

The technical demands of the HR Optimization Project required the integration of several existing systems with new applications in order to create an effective MI HR solution. Content management of the knowledgebase is achieved through an existing Vignette solution and relevant information is presented to the employees based on their defined conditions of employment and as interpreted using IBM's WebSphere middleware. The knowledgebase also links employees to the existing HR web portal, Self Service, in order to perform online HR transactions.

These components are integrated with an IBM configured Siebel application that is used by contact center staff answering phone calls from employees. The Avaya telephony system provides standard menus, queuing of calls and basic information regarding 'hot topics' to assist in answering frequently asked questions before the caller is placed in a queue. The Siebel application provides the contact center with the ability to create, track and resolve calls and cases. The NICE call monitoring and recording system is used by management both for quality assurance and training for customer service representatives. In order to provide the most accurate and up to date information to customers, the system retrieves information from the existing Lawson Human Resources Management System daily. The MI HR solution also provides standard reporting and metrics for continuous improvement of the service center and the customer service representatives.

When presented with the increasingly common challenge of achieving greater results with fewer resources, the Optimization Project team and MI HR staff created a unique and highly effective solution. Rapidly and under close scrutiny, a shared service center was designed and built, processes reengineered, and a complete solution implemented and deployed on time and under budget while achieving or exceeding all savings objectives.

Significance to the Improvement of the Operation of Government

The HR Optimization project is a recent example of the statewide vision and leadership that Michigan is taking with regard to Information Technology (IT) and its strategic deployment to meet business challenges. Encompassing both inter-departmental and public-private partnerships, the project team included carefully selected individuals with specific business and technical skills. This implementation exemplifies the benefits of organizational alignment that runs from transaction level activities through strategic vision. The outcome of carefully integrating technology and business process is a service center that operationalizes the State of Michigan Cabinet Action Plan goal of "Better Government." This goal calls for state agencies to streamline services and implement innovative technology to reduce time, mistakes, and costs. MI HR has demonstrated success on all of these fronts.

The MI HR service center centralized more than 40 HR transactions across 9 different categories including new hire benefit set up, benefit open enrollment, payroll updates, and other personal data modifications. Processes were simplified and standardized to minimize the opportunity for errors. MI HR Information (the new online knowledgebase) was established so that information presented would be tailored to specific employment conditions, taking employees more directly to the information they want and making it accessible twenty four hours a day. These innovations alone meet the challenge offered in the Cabinet Action Plan.

The team also recognized that there are times when human interaction is required but that a methodology was needed to provide service in a measurable, repeatable manner that would be responsive to changing needs. The customers of the MI HR Service Center had high expectations and understandable concerns. The legacy model of customer support in HR was familiar but not optimized for efficiency; general HR activities were duplicated across the state but not necessarily done with frequency at any single location. Additionally, information was stored in multiple locations requiring greater effort to maintain it and increasing the chance that someone would access out of date or conflicting information. With the MI HR solution, information resides in a central repository simplifying maintenance and ensuring consistency.

Now, employee needs are met through general support that can be accessed online at any time, or with expert assistance during expanded hours during the week. A significant fear, that the "personal touch" would be lost, has been alleviated by augmenting secure online access to the information employees need with personal interaction when they prefer it. This approach has also enhanced the ability to accommodate a wider variety of disability issues through a more flexible service model.

Management, in turn, has seen almost $7 million dollars of direct cost savings to date, significantly more than the projected savings goal set for this project. These savings were gained through the thoughtful application of technology and implementation of redesign efforts. By deploying a more efficient system the State of Michigan has been able to respond to the reality of tightening economics by delivering necessary, and in some cases enhanced, services with a reduced workforce and while redeploying subject matter experts to meet strategic business needs.

These achievements have been recognized by others not only for their innovation, but for the repeatability of the developed model. Project success has garnered national recognition and engaged industry attention. The project team has shared its experience and methodology with other state and government groups through presentations at conferences such as the Annual National Association of State Personnel Executives (NASPE) Conference and the Lawson Customer User Exchange. These venues have provided opportunities both to talk about the HR Optimization process and to receive input from other business sectors regarding their experiences. This contact has even led to international interest in the MI HR service center. For example, in March of 2006 project team members hosted a delegation from Singapore intent on learning more about the Michigan model.

The success has also drawn recognition within both business and technological communities, resulting in the Agency Award of Excellence from the International Public Management Association for Human Resources, an Award of Merit from the National Association of State Personnel Executives, and most recently, a Laureate Medal in the Computer World Honors program.

From crystallizing a project vision to creating a first class project team and delivering a call center solution meeting all defined critical success factors; this project has achieved its goals by all technical measures. Ultimately however, it has been the balance of transitioning to centralized services that takes advantage of economies of scale and the ability to deliver the responsive customer support that employees expect and deserve, which has been the greatest measure of the project's success.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

The most immediate benefit has been putting state employees more directly in control of their state employment experience, with on-line access to their records and basic transactions, on-line access to detailed and easy-to-use reference resources, and expanded-hour direct access to knowledgeable Customer Service Representatives to help navigate the system at whatever level is most comfortable for that employee.

Realized efficiency gains from a management perspective include the freedom for agencies to redeploy staff from administrative and HR support roles to more strategic uses, specifically to help other parts of their agency meet operational objectives. Subject matter experts who remain in the agency HR offices can now shift their attention to specialized tasks that support their department. In general, agencies now have increased resource flexibility allowing them to complete more complex activities with greater efficiency than under the legacy support model.

In researching the benefits of deploying a shared service center, the project team recognized the importance of establishing service level metrics that would be both meaningful and challenging to the customer support staff. In addition to setting clear performance objectives, the team wanted the ability to measure progress and provide for constant improvement of service. It was determined that measurements would be made in close proximity to the calls, in real-time where possible, and would be linked with training and education in order to close the feedback loop between growth and outcomes. By integrating quality assurance software with the entire process, the service center is able to:
- Record incoming calls
- Track associated transactions
- Provide managers with live monitoring of calls
- Use actual customer interactions in training customer service representatives to meet established performance standards

In addition, once a call is completed confidential quality of experience surveys are sent to every customer. The results speak for themselves:
- An exceptional rate of return for satisfaction surveys
- 97% of respondents satisfied, or very satisfied, with their experience
- All cases closed within target time frames
- An average of 8,000 calls and transactions per month

- Up to 1,000 calls in a single day during high activity periods, such as benefits open enrollment
- A call abandonment rate that averages 1%, independent of call volumes
- All calls answered within 30 seconds
- A fourfold increase in the use of enhanced employee self-service, using the internet/intranet gateway.

Statistics demonstrate that the Service Center is meeting its objectives and customers say they appreciate the team's hard work.

"The goals of increasing efficiency and saving money, while at the same time maintaining high customer service ratings, required us to fundamentally change the way we deliver HR services in the State" remarked State Personnel Director and Project Manager James Farrell. "In collaboration with our partners in the HR and IT communities, we took this opportunity to streamline business processes and to leverage and apply technology in a strategic manner to meet our goals. With the dedicated efforts of many, we delivered the project ahead of schedule and under budget and are receiving consistently high levels of satisfaction from our MI HR customers."

Realized Return on Investment

As noted throughout this nomination, the return on investment is broad-based, and establishes a foundation for future savings that can become pervasive to state government. The project, completed ahead of schedule and under budget, was predicted to save $2 million in its first year. The service center has achieved that objective and not only remains on target to save the originally projected $25 million in its first five years of operation but, with almost $7 million dollars in cumulative savings through fiscal year 2006, is on target to exceed that goal by more than 3 million dollars. Cumulative savings are calculated from the number of positions eliminated each year and are based on salary and benefits savings using a weighted average starting at $68,100/year for year 1, $72,400 for year 2 and adjusted for economic projections looking forward. These savings are calculated after the operating expenses (approximately $3 million per year, $2 million in staff costs and $1 million in IT systems and support) for the Service center are deducted and funding for the scheduled position reductions are removed from agency line items by the State Budget Office each fiscal year. Additionally, the standardization and centralization of core statewide HR functions are expected to create further advantages for state agencies with the expanded use of the shared services model and the capacity of the MI HR service center.

The hard-number savings are realized primarily as a result of staff reductions--76 positions in the first year and an additional 62 positions in the next four years. Additional unmeasured economies will also continue to accrue from cost avoidance, such as the reduction of general and administrative overhead, and also from the time savings and more efficient use of monetary and staffing resources experienced by agencies and personnel throughout the state. Significantly improved response times and better service to employees are other key benefits not reflected in the financial calculations.

As experience has been gained with the processes planned for MI HR, additional support capability and responsibility has been transferred to the center. Support for employee inquiries related to a statewide dependent audit and responses to retiree benefit questions including implementation of Medicare Part D coverage are examples of added responsibilities. Further explorations include the use of electronic document management within the service center, and pilot testing a post process document storage and retrieval system so that it can be included within processes, where appropriate. This pilot has allowed the deployment of additional technology in a well defined production environment, which will in turn promote identification of new process efficiencies and ultimately lead to simpler data management and faster, more seamless access to information.

This intensively collaborative effort moved from design to full operation in just over one year, delivering the planned services ahead of schedule and under budget. The success of this project will continue to pay dividends regardless of future variations in budget and resource environments. Project success was built in part by establishing a foundation of trust and opening new lines of communication between central and agency HR offices and, as all parties become comfortable with the new processes, additional functions may be transferred to MI HR or similarly conceived service centers and this success will breed greater savings, and successes.

Information Communications Technology Innovations

Michigan's Innovative Fraud Detection Program

Executive Summary

Michigan's Department of Human Services (DHS) is one of the State's largest and most important organizations, managing approximately $5 billion in funds for many of Michigan's critical programs, including food and cash assistance, and child support services. More than 1.2 million Michigan people depend on DHS programs for life's necessities.

To deliver these services to the State's neediest citizens – in a tightly controlled fiscal environment – DHS must get the greatest value possible from each and every dollar spent. Neither the agency or its clients, nor Michigan taxpayers, can afford the misuse of funds through fraud, waste, or abuse.

As part of its efforts to deliver value, DHS's Office of Inspector General (OIG) has implemented some of the most innovative fraud detection methods in the country. Using a sophisticated data warehouse/decision support system as an informational backbone, DHS's OIG has utilized advanced analytics in an unprecedented way to combat fraud activities in the Child Development and Care program [Day Care], and fraud and trafficking in food and cash assistance areas. In so doing, the OIG links data about providers and recipients with Wages data, Unemployment data, national food assistance data, and other sources, to undertake the comparative analysis necessary to achieve breakthrough results.

In fiscal year 2005, the DHS OIG efforts – unprecedented nationwide – identified more than $9.2 million in documented Day Care fraud to be recovered, up from an impressive $3.3 million in 2004, the first year of the data match, and far more significant savings beyond that. OIG now identifies households who have long left Michigan while failing to report their departure. This query alone impacts DHS programs with savings of $1.6 million each year. Moreover, OIG investigators are now much more targeted in their efforts to fight fraud and abuse, and when they confront alleged abusers, they are most often armed with irrefutable statistics and information – meaning their "hit rates" are substantially higher, and the potential for fraud recoveries much greater.

In addition to the monetary savings the agency has realized, and will realize in the future, other major benefits include:
- Savings of future program dollars when fraud is stopped through the "sentinel" effect that puts both clients and retailers on notice that the State has advanced fraud-fighting capability.
- Saving investigation time since analysts and investigators are pulling data from one central source.
- Saving time and money for partnering agencies (for example, the Michigan State Police) by filtering out "bad" trafficking referrals in the food and cash assistance programs.

The benefits of the DHS OIG fraud-fighting efforts do not stop at the state border. Because OIG activities serve as a national model, other states contact DHS to seek the agency's advice. Further, federal enforcement authorities – particularly, the United States Department of Agriculture's OIG – rely on the quality of DHS OIG data and analytics to support their documentation for trafficking search warrants they execute in Michigan, and for evidence in cases that they prosecute.

By utilizing the rapid analytical capabilities of the data warehouse and integrating records from disparate databases, Michigan DHS has established a national model in innovative techniques to battle Child Day Care, Food Assistance, and Cash Assistance fraud. In so doing, the agency has also embodied the principle of "Better Government" as spelled out in the Governor's Cabinet Action Plan. Governor Jennifer Granholm and the State's Department of Information Technology (DIT), view the "enterprise approach" to data sharing as critical to Michigan's success. As the Governor stated recently, "Information-sharing…is absolutely critical to have units of government deliver the best to assist taxpayers. If you cannot share data, then you are not delivering the biggest bang for your buck…"

Project Description

New Business Model + New Vision = New Approach to Fighting Fraud

Two major factors converged to change and enhance the fraud-fighting approach undertaken by the Office of Inspector General (OIG) in the Michigan Department of Human Services (DHS) over the past 24-30 months.

First, DHS itself changed its "business model" by reducing the amount of direct cash assistance it provided to Michigan's needy citizens, and instead offering more third-party services – Child Development and Care (CDC) services and Electronic Benefits Transfer (EBT) for food assistance, as examples – as a way of conveying benefits. The OIG needed to change its own business model to take third-parties into account as it conducted fraud investigations – to "follow the money" in a different direction, so to speak.

Secondly, Michigan Governor Jennifer Granholm had several major priorities when she took office. One was to deliver the greatest possible value to Michigan taxpayers for the billions they spend on State government services. Her Cabinet Action Plan called for Better Government through increased use of innovative technology. She believed that technology and data sharing – the ability to break down silos between agencies – was one critical component in making that happen. Recently, she added that tight budgets presented an "opportunity for technology to emerge in a way that might not have occurred if people were allowed to just do as they always had done. So they are jumping on to share services now."

A combination of this new business model and a desire to advance Governor Granholm's vision prompted DHS's OIG to dramatically alter and enhance its efforts to detect and combat fraud. In addition, like most state agencies – due to adverse economic conditions and early retirements – DHS underwent budget cuts and also experienced a reduction in the number of fraud investigators. That meant its fraud-fighting efforts needed to be as targeted and focused as possible, no simple task when one considers the sheer scope of DHS's reach.

DHS is one of Michigan's largest and most important organizations, managing approximately $5 billion in funds for many of the State's critical programs (including food and cash assistance and child support services). More than 1.2 million Michigan people – among the State's most vulnerable and many of them children – depend on DHS programs for life necessities. More than 473,000 families "cases" receive and spend their assistance benefits via their EBT debit card, resulting in 3.6 million EBT transactions per month. More than 5,000 retail stores participate in DHS's Food Assistance (Food Stamp) program. A monthly total of $121 million in transactions (purchases and cash withdrawals), including $90 million in food assistance purchases, need to be tracked. Moreover, DHS is a highly visible agency – administration officials, the Legislature, the media, and taxpayers track its performance and any errors or misdeeds tend to be highly publicized and often emotional.

To help deal with all of these issues, OIG developed the most innovative fraud-fighting program in the nation – one lauded inside Michigan, and by other states and the federal government.

Linking Data + Advanced Analytics = Breakthrough Results

Using a sophisticated data warehouse/decision support system as an informational backbone, OIG has utilized advanced analytics in an unprecedented way to fight fraud. In so doing, OIG accesses not only DHS provider and recipient data, but also Unemployment data, Wages data, national food assistance data – and other sources – to undertake the comparative analyses necessary to achieve breakthrough fraud detection results.
These fraud detection efforts include the following:

Child Development and Care (CDC) [Day Care] Fraud: First and foremost, OIG implemented a CDC

Reverse Wage Match, linking day care benefits with wages, and establishing parameters to detect potential fraud in the CDC program; a national concern. The majority of DHS Day Care benefits are provided to clients who are working. OIG now uses the data warehouse to correlate those clients who are receiving a high level of CDC care due to "employment" but have low or no income being reported (for example, one analysis looked at those earning less than $500 per quarter – Wages data – but receiving more than $4,000 per quarter – DHS data – in day care benefits). The match has been so successful, that since implementing this project in FY04, DHS-OIG has identified over $17.3 million in fraud and, through the judicial system, has established restitution orders for over $7.8 million. This query and results can easily be duplicated by other states.

A few examples:

- An OIG agent conducted a CDC Reverse wage investigation on a client who allegedly worked at a daycare center. The owner of the center, and the children's care provider, turned out to be the grandmother. The client's eight children were the only ones attending care at the center, yet the grandmother had "hired" her daughter to care for her own children, allegedly paying wages of $1,600, monthly, as reported to DHS. A total of $43,000 was referred for prosecution in this case.

- For four years, a client's "employer" diligently supplied employment verification to DHS upon request. Unfortunately, the client herself was pretending to be the employer in a non-existing business. The CDC Reverse wage match identified her case for investigation due to no income being reported to Michigan Treasury. A total of $107,000 was referred for prosecution in this case.

- An OIG agent conducted a CDC Reverse wage investigation which was prosecuted in September 2004. The agent determined that a DHS client was employed at three different places for less than 30 days over a four-year period, while receiving Child Day Care and Food Assistance Benefits for seven children between October of 2000 and September of 2004. A total of $94,000 was referred for prosecution in this case.

- An Ingham County CDC provider pled guilty to charges of False Pretenses for over billing CDC hours. An OIG specialist compiled over issuance figures of more than $100,000 from the data warehouse showing excessive hours billed for school-age children (who would not be at home and not require day care services during school hours). As a result of plea negotiations, the provider agreed to make full restitution within 24 months.

These types of examples show that advanced data analytics are translating into dollars for the State of Michigan. OIG is now adding Unemployment benefits, wage history, and worker's compensation information to its calculations and expects its hit rate to increase.

Anti-Trafficking Efforts: The DHS OIG is using the data warehouse as part of a sophisticated anti-trafficking effort in the Food Assistance Program (FAP or Food Stamps). These complex analyses involve multiple "data universes" including the DHS electronic benefits transfer (EBT) and food and nutrition databases. Analysts produce retailer matrix reports, individual recipient reports, and individual retailer reports.

Using these techniques, DHS OIG analysts can quickly determine if a particular store has reported unusually high levels of activity (for example, a small convenience store at a gas station repeatedly requesting reimbursement for large purchases from clients exceeding $200). In one case that OIG analysts turned over to law enforcement officials, investigators ultimately found almost $50,000 in a paper bag under the counter of one convenience store, whose manager was paying cash, at a 30% discount, to DHS clients in exchange for their food assistance benefits. The store was then reimbursed for the food assistance benefit at the 100% rate. Food Assistance trafficking at this store is estimated to have exceeded $300,000.

In addition to statistical analyses, OIG analysts are implementing geocoding to gain a graphical depiction of where specific stores are located. In many cases, a recipient who travels a long distance to patronize a store – particularly if there are several stores between their home and the store in question – there is a strong possibility, even likelihood, that fraud is taking place.

Out-of-State Food Assistance Program Transactions: OIG is using the data warehouse to analyze out-of-state food purchases for FAP recipients. While purchasing food outside Michigan is permitted for short periods of time (when a recipient might be visiting a family member, for example), OIG analysts match those recipients who have been out-of-state exclusively for extended periods. This may indicate fraudulent activities across state lines, especially the possibility that a recipient is "double dipping" and collecting FAP benefits from Michigan and another state. Or it may indicate that the person has moved out of Michigan, thereby disqualifying him or her from receiving DHS benefits. Upon case closure, the savings to FAP, TANF (cash), and Medical Assistance programs are immediate; program savings exceed $1.6 million each year.

Michigan's innovative fraud-fighting efforts in these areas lead the nation by conducting these kinds of advanced analytics in the CDC, cash and food assistance areas.

Flexible Architecture + Software Tools = Enormous Capabilities

The technical foundation of the DHS OIG solution is a massively parallel processing (MPP) data warehouse platform, utilizing a relational database management system, designed to incorporate multiple symmetric multi-processing (SMP) nodes that are inter-connected with a high-speed communication link. Each MPP node has its own operating system and memory, enabling the system to process large volumes of data and complex queries. The system has the power and scalability to address OIG's needs, and the scalability to accommodate unlimited future growth.

In addition, the system incorporates a series of software applications that allow easy access to the data and provide many avenues for analytical assessment and problem-solving. These include Business Intelligence/Query tools for querying data directly; a library of pre-defined reports that contains several executive-level and subject-specific detailed reports that may be refreshed easily as new data is added to the warehouse; and analytical software to allow users to compute advanced statistical algorithms to determine trends and build models.

The overall architecture incorporates file servers, desktop computers, printers, and LAN servers strategically distributed across offices throughout the state.

By utilizing the rapid analytical capabilities of the data warehouse and integrating records from disparate databases, Michigan DHS has established a national model in innovative techniques to battle Child Day Care, Food Assistance and Cash Assistance fraud.

Significance to the Improvement of the Operation of Government

By utilizing the data warehouse/decision support system, OIG has dramatically increased the efficiency of its staff (through expedited data and evidence collection), used data analysis to balance workload and make policy recommendations, and enhanced program accuracy and integrity – both of which are DHS strategic plan values – through more intense fraud-fighting measures.

OIG investigators are now armed with irrefutable statistics and information when they confront alleged abusers – meaning their "hit rates" are substantially higher, and the potential for fraud recoveries much greater. Further, OIG is able to deliver information to its 68 investigators in the field faster and more efficiently, by relying on the data warehouse to provide information. For example:

- **Electronic Benefits Transfer (EBT):** Prior to OIG's utilization of the data warehouse, it was nearly impossible for agents to obtain EBT Food Assistance purchase history, since the EBT vendor's system was cumbersome to use and only contains data for the last 180 days. Now, agents can query data at their desktop and have it in a format that is easier to use.
- **Case Management Application:** Under the old system (DHS calls it ARSIG), an investigator's case logs were only available via the screen or by screen prints. No output capabilities existed, and the contractor no longer supports the application. The data warehouse provides total flexibility; OIG staff can pull up a case log and support it by any criteria needed.
- **Child Development and Care, [or Day Care] (CDC) Payment History:** The data warehouse is the primary way of identifying CDC payment history. Without the data warehouse, the system's records only date back 12 months.

In addition, OIG can also monitor the status and outcomes of investigations that have been assigned as a result of these matches and queries. A copy of OIG's case management applications (ARSIG) is stored on the data warehouse and can be queried to identify project cases (e.g., the CDC-Reverse Wage match). Access to this data also allows OIG to determine if a query is successful, or if changes need to be made to the filtering criteria in the report.

In short, the OIG fraud-fighting system enables agents to have rapid and easy access to more timely information than ever before, and provides the knowledge to staff members – through evidence collection and data analysis – to direct investigators to the most promising cases. This increases productivity and makes it far more likely that future prosecutorial efforts will be successful.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

DHS and Michigan taxpayers have received enormous benefits thus far from the innovative fraud-fighting efforts undertaken by OIG. In addition to the hard-dollar ROI discussed in the next section (over $9.2 million in fraud to be recovered, with $10 million more projected this year, plus $13 million in cost efficiencies), other major benefits include:

- Savings of future program dollars when fraud is stopped through the "sentinel" effect that puts clients and retailers on notice that the State has advanced fraud-fighting capability and will use it.
- Saving investigation time since analysts and investigators are pulling data from one source.
- Saving time and money for partnering agencies (for example, the Michigan State Police) by filtering out "bad" trafficking referrals in the food and cash assistance programs.

DHS OIG also uses the data warehouse to target cases for attention and target cases pending with prosecutors or the court system, using the following process:

- OIG identifies addresses for active cash and food assistance recipients who have a pending welfare fraud felony arrest warrant resulting from an OIG investigation.
- Prosecutors and law enforcement personnel are notified of these recipients' addresses to facilitate arrest and prosecution.
- This process helps to fulfill state and federal regulations that say a person with an outstanding felony warrant is not entitled to certain public assistance benefits.

In addition, the benefits of the DHS OIG fraud-fighting efforts do not stop at the Michigan state line. Because OIG activities serve as a national model, other states contact DHS to seek the agency's advice. Further, federal enforcement authorities – particularly, the United States Department of Agriculture's OIG – rely on the quality of DHS OIG data and analytics to support their documentation for trafficking search warrants they may execute in Michigan, and for evidence in cases that they prosecute.

Realized Return on Investment

While OIG's innovative fraud-fighting activities have been aggressively under way for only about 12 months, officials have already documented substantial Return on Investment (ROI).

- Since FY2004, OIG's use of the data warehouse has yielded more than $17.3 million in documented fraud to be recovered. This consists of court orders and voluntary repayments. The CDC Reverse Wage Match alone has identified over $10 million in potential fraud to be addressed in the next year, with a potential for far more significant savings beyond that.
- Further, to strengthen CDC program integrity, OIG promoted the idea of requiring providers to use a unique Personal ID number for billing purposes. This change required some evidence of cost-effectiveness. Because CDC billing information was contained in the data warehouse, OIG examined the "before and after" billing periods to calculate cost savings. The results showed that there was a 3% drop in the number of providers that billed and the cost reduction was also more than 3%, for a projected annual savings of more than $13 million. (Avg. CDC biweekly payroll before PIN change: $18.4M; avg. biweekly payroll after PIN change: $17.8M; avg. payroll savings: $511K; projected annual savings: $13M).
- Further, the ability to access multiple databases to cross reference certain elements has led OIG to a means of identifying cases that have a greater potential for mis-payment. Cost avoidance has improved more than 200% in the CDC program, due in part to more efficient use of data that is more precise and complete. (FY2005 CDC "fraud found" was $9.2M, as compared to $3.3M for the previous FY.)
- Finally, all of these savings have been achieved with a total analyst population of 1-2 full-time staff members supporting investigators. The queries were developed with existing resources in a few months. As a result the ROI to date is very high. As these analysts become even more familiar with the data, they are expected to identify and generate even greater savings, without a need for additional staffing – which means ROI will increase dramatically.

Summary

The Office of Inspector General in Michigan's Department of Human Services leads the nation in using decision support and advanced analytics to combat fraud in the cash and food assistance arena. In so doing, DHS OIG is:

- Increasing the confidence and the "hit rate" percentage of its investigators, and providing them with tools and evidence to strengthen prosecutions.
- Tightening its controls over the expenditure of $121 million per month, more than $1 billion per year
- Generating millions in ROI with a potential for much more
- Improving its ability to provide precise, accurate reports on fraud-fighting activities to the Administration and the Legislature
- Strengthening its partnerships with other state agencies (e.g., Michigan State Police) and federal enforcement agencies (USDA OIG)
- Bolstering the efficiency of its staff and processes

Combined, all of these advancements are ultimately benefiting Michigan taxpayers and enhancing Michigan's reputation as a national leader in using technology to break down silos between agencies and departments, share disparate data, and solve business problems.

Honorable Mention: Commonwealth of Virginia Interoperable Communications

Executive Summary

Roadblocks to effective first responder communication have long plagued public safety organizations; in some emergency scenarios, shortfalls in this area have impeded performance of mission critical public safety duties.

The problem often has been framed solely as a technology problem, arising from the inability of disparate vendor's proprietary systems to communicate with others. Historically, public safety organizations at the local, state and federal level have developed individual strategies based on their own needs and resources – and then cannot communicate with each other via voice and/or data during an emergency.

To best achieve much-needed communications interoperability, the Commonwealth of Virginia first reframed the problem. Planners realized that interoperable communications require cooperation more than technology, and shifted the focus to development of a comprehensive, overarching statewide strategy based on partnerships.

The first step was a locally driven strategic planning process, in partnership with the U.S. Department of Homeland Security's SAFECOM Program and the U.S. Department of Justice's National Institute of Justice (NIJ). Statewide focus groups captured local first responder perspectives on the current state, case for change, future state, strategies and barriers. These commonalities were used to drive definition of mission, vision and key initiatives.

A dedicated office, the Commonwealth Interoperability Coordinator's Office (CICO), was established to guide action in 2004. CICO reports directly to the Assistant to the Governor for Commonwealth Preparedness and facilitates development of the state's overarching strategy for communications interoperability.

Since its establishment, the CICO in conjunction with practitioners across the state have accomplished major objectives in pursuit of interoperable communications, including:
- Established practitioner-based Initiative Action Teams to focus on 800 MHz rebanding, common language and operational protocols, technical standards, mutual aid channels, the statewide 700 MHz Plan, and equipment listings on state contracts;
- Distributed over $4.1 million for local interoperability projects;
- Assisted localities in securing over $7.4 million in federal interoperability grants; and
- Hosted two Statewide Interoperable Communications Conferences to bring together stakeholders and industry.

The **Commonwealth Strategic Plan for Statewide Interoperable Communications** is now the guiding document statewide; its ten-step planning methodology and experience has been adopted and published by the Department of Homeland Security's SAFECOM program as a roadmap to assist other states. Technological,

strategic, tactical and cultural change is now being achieved to the benefit of all, including the most important stakeholders - citizens in crisis and the first responders who aid them.

Project Description

In times of crisis, public safety communications can make a bad situation better – or make it worse. Emergency responders from one county may define a code number as an all clear – and another county may use the same number to indicate significant danger. When responders unite to tackle a crisis, these simple practices can become life threatening.

As the need for coordinated disaster public safety response has grown, first responders have prioritized creation of interoperable systems where public safety agencies talk across disciplines and jurisdictions via radio communications, exchanging voice and/or data with one another on demand, in real time, when needed and when authorized.

To achieve a meaningful interoperability solution in Virginia, the Commonwealth first reframed the problem. Planners realized that interoperable communications require cooperation more than technology, and shifted the focus to development of a comprehensive, overarching statewide strategy based on partnerships.

An information-share partnership was formed with SAFECOM, a division of the U.S. Department of Homeland Security, and a locally driven strategic planning process was launched. Six regional focus groups were held beginning in January 2004 to initiate development of a statewide action plan. Stakeholder input came from more than 146 regional and local participants from 39 localities and represented law enforcement, fire, emergency medical services, transportation, IT, communications, public health, forestry, and hospitals.

This locally driven process provided capture of local perspectives and allowed first responders from many different arenas to share problems, needs and successes. This new approach provided significant information, identified commonalities and provided real, actionable goals.
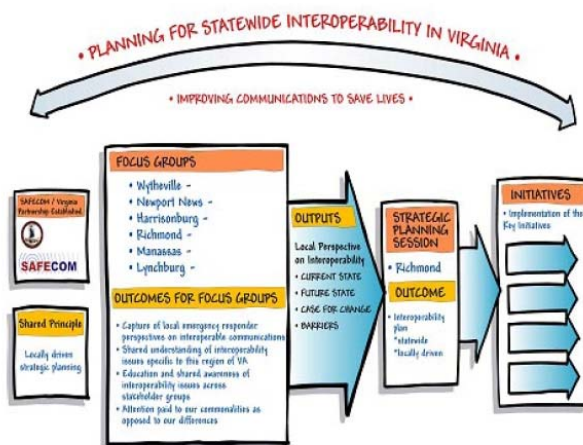
Output from regional focus groups defined the current state, case for change, barriers, and desired future state. A subsequent strategic planning session in Richmond used this information to develop the statewide plan and define initiatives.

A dedicated office, the Commonwealth Interoperability Coordinator's Office (CICO), was established to guide action and facilitate development of the state's overarching strategy. Virginia was the first state in the nation to hire a full time Interoperability Coordinator to focus solely on interoperable communications.

As a direct result of this process, the Commonwealth's first Strategic Plan for Statewide Interoperable Communications was signed in October 2004. Annual updates and implementation are now required by the Code of Virginia. Today, planning, governance, funding, training, exercises, technology and standards are coordinated and standardized across localities and regions in the Commonwealth and with the federal government.

Statewide Agencies Radio System Enabled

One of the most notable of the enterprise interoperable initiatives, the Statewide Agencies Radio System (STARS), now is coming online across the Commonwealth. STARS unites 20 participating state agencies in an upgrade of the existing Virginia State Police (VSP) land, mobile and microwave radio networks. The goal of the

program is to create an integrated, seamless, statewide wireless voice and data communications system interoperable with local governments and various state and federal agencies.

A VHF high band digital trunked system with 800 MHz vehicle repeaters allows for some direct interoperability between local and regional 800 MHz systems and provides a patch to all 134 localities. On completion, STARS will consist of 80 microwave sites, 45 land mobile sites, and VOIP, P25 compliant with open architecture for voice and data. STARS provides field responders remote access to law enforcement databases, intra- and inter-agency text messaging, interface with the VSP Computer Aided Dispatch and GPS support for Automated Vehicle Location (AVL). Roll out began with the capital area in December 2005; scheduled completion statewide is September 2009.

STARS positions Virginia as one of first states to employ an integrated Voice and Data (IV&D) land mobile radio architecture that uses the same mobile radio for both voice and mobile communications. The integration of voice and data networks saves the Commonwealth the expense of a separate data infrastructure.

Commonwealth's Link to Interoperable Communications (COMLINC)

The CICO, SIEC and STARS are all coordinating on the COMLINC project that will allow disparate communications systems to communicate using Voice over Internet Protocol (VoIP) technology. COMLINC will allow the localities with different communication systems to communicate and will also allow these localities to communicate with STARS. COMLINC will allow local dispatchers to establish four patches, regardless of what frequency band the system uses, to connect within the jurisdiction or to other localities; one patch to STARS can then connect to the 20 participating state agencies.

Thus far 41 localities have implemented or are in the process of implementing COMLINC. This technology leverages the existing investments in communication systems while also establishing interoperability. This collaborative effort between the CICO, SIEC, STARS and the localities is a testament to the coordination currently taking place in Virginia to improve interoperable communications.

Community of Interest = Community of Excellence

The pursuit of interoperability has produced regular interaction in the first responder community. Practitioners' input is heard, used, and acted upon in the form of the Strategic Plan. Localities and regions now follow the plan and utilize the standards for both long- and short-term activities. This is their plan – they own it, so there is no need to sell it to them.

In addition to annual conferences, the CICO has produced multiple resources for this community of interest. A Web site, www.publicsafety.interoperability.virginia.gov, is used to distribute information about grants, projects and standards. A Listserv enhances communication and online registration has been created for conferences and workshops.

A Lessons Learned Clearinghouse includes reporting from grantees and contact information for local projects. All areas of the Commonwealth are able to benefit when any one region or locality receives funding and/or training. Recently, for example, the Northern Virginia/National Capital region received information and training on cache radio maintenance – which they shared with their colleagues in the Hampton Roads region.

### Significance to the Improvement of the Operation of Government

The Commonwealth has created an effective governance, management and communication structure united in pursuit of interoperability. All efforts are based on the experience and needs of the local first responder – an important new approach that provides real, actionable goals.

Virginia is the only state in the nation that has a State Interoperability Executive Committee (SIEC), comprised primarily of local first responders, that conducts a competitive grant process to identify local projects to receive funding. The SIEC is specifically tasked with participating on Initiative Action Teams (IATs), considering policy recommendations and elevating them to executive and legislative decision makers.

The State Interoperability Advisory Group provides recommendations and specific practitioner expertise to SIEC; it staffs and manages IATs and is directly responsible for effective implementation of the Strategic Plan. IATs develop specific tasks for and implement initiatives of the plan; they tap into national, state, and local expertise.

CICO provides overarching collaboration that spans all public safety and state agencies. It builds consensus among public safety disciplines, provides a direct conduit to the Commonwealth's Preparedness Office and Governor, manages knowledge and work, facilitates key meetings, and keeps effort focused on practitioners and their needs.

This locally driven governance structure produces a shared understanding of interoperability issues, capture of local emergency responder perspectives, coordinated educational and planning opportunities, and a common mission and vision. Regular communication and conferences facilitate timely planning and initiatives.
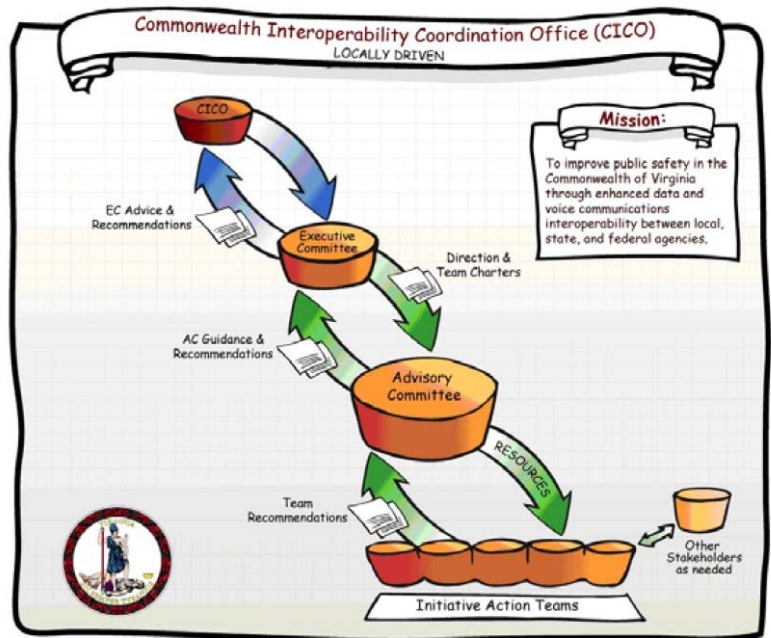
Importantly during this time of rapid technological change, this enterprise governance structure supports localities, regions and state agencies in identifying and obtaining grant dollars. From guiding procurements and developing RFP templates to gathering reporting information from local grantees and evaluating grant proposals for awards, the process ultimately improves public safety. All agencies and localities must comply with and achieve consistency with the Strategic Plan by July 1, 2015 in order to remain eligible to receive state and/or federal funds for communications programs and systems.

The Commonwealth's ten-step planning methodology has been adopted and published by the Department of Homeland Security's SAFECOM program as a roadmap to assist other states. DHS and SAFECOM have also now published a second guiding document, "Lessons Learned from the Commonwealth of Virginia: One Year Later," to further aid interoperable wireless communication development in the states.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

- CICO develops, distributes and promotes interoperability information for elected officials, responders and citizens.

- SEIC standardizes grant coordination by developing RFP templates and supports localities, regions and state agencies in identifying and obtaining grant dollars.

- Group planning leverages state buying power for products and services.

- Strategic Plan establishes clear, measurable objectives shared by all stakeholders.

- Existing and future communication system investments are maximized by leveraging COMLINC and other VoIP solutions that will allow disparate systems to become interoperable.

- Localities now have a common benchmark, communication channels and an advocate to help them achieve common standards.

- The ultimate benefit is an improved response to citizens in crisis - and the safety of first responders who protect them.

Realized Return on Investment, Short-Term/Long-Term Payback

- The Commonwealth Preparedness Working Group (CPWG) recently allocated funding for the statewide plan, marking the first time that Office of Domestic Preparedness funds have been used to implement a statewide interoperability program. $1.7 million was distributed in local interoperability grants through the SIEC, which solicited, evaluated and prioritized 62 separate grant proposals from localities. 20 localities received up to $100,000 each to support local interoperability projects.

- In 2005 the SIEC identified six local projects and distributed $460,500 for local interoperability demonstration projects funded by a NIJ Interoperability Grant.

- The CICO assisted the Virginia Beach Metropolitan Statistical Area (MSA) in obtaining $6 million in interoperability grants from COPS; the CIC worked with the locality to ensure that applications complied with the Strategic Plan, showed a clear link to STARS and focused on a regional approach that included all localities within the MSA.

- The CICO and SIEC recommended that Region 1 be awarded a $1.5 million Office of Domestic Preparedness Grant by the CPWG to link 14 of the 25 localities within the region; the project was completed in June 2006.

- The Lynchburg MSA/Region 3 area was awarded $1,393,894 and the Roanoke MSA/Region 6 area was awarded $866,570 via U.S. Dept. of Justice COPS FY 2005 grants to implement COMLINC. The CICO worked with both localities during the grant submission process.

- The CICO and SIEC have focused on maximizing existing and future communication system investments by leveraging COMLINC and other VoIP solutions that will allow disparate systems to become interoperable.

- CICO facilitated meetings between STARS and Amelia County prior to the county building a VHF High Band communication system. These meetings resulted in Amelia County becoming a primary user of STARS, producing a $7 million savings for Amelia County.

- In June 2006 Governor Kaine announced $2 million in federal funding to support 28 more local interoperable communications initiatives evaluated by the SIEC through the State Homeland Security Grant Program; localities will receive funds in July 2006. Of those 28, three local interoperability projects were funded at $75,000 each and await more information before being fully implemented.

By working together, the public safety community has placed Virginia on a secure path to interoperable communications; the long-term payback will be provided to citizens and first responders in every public safety response.

IT Project and Portfolio Management

Michigan's Project Management and Governance Model

Executive Summary

Michigan's child support enforcement system (MiCSES) is an excellent case study of how a large failing project can be transformed to a successful one with the aggressive application of project management processes. Further, it illustrates how one success can be grown into an enterprise solution with the backing of both the information technology management team and the critical business stakeholders.

Ultimately, the MiCSES project became one of the first significant success stories for MDIT. Today MiCSES serves as a model for other large MDIT projects to emulate. MDIT executives require all high priority projects (generally, those having a cost greater than $5 million) to have a well defined Governance Model and a structured Project Control Office as part of their project charter.

The state was able to avert $147 million in federal financial penalties for fiscal years 2001-2003, including the return of almost $35 million (90%) of the actual penalty paid in 2001. As reported in Michigan's 2006 Advanced Planning Document Update, the total accumulated annual costs for the MiCSES project from inception through FY 2005 were $813,715,649. The total accumulated annual benefit for the MiCSES project for the same period is $1,762,132,066. The Return on Investment (ROI) is 2.17. By retaining the same Governance Model and Project Control Office structure the MiCSES project has delivered greater system stability, greater system availability to end users, and an average cost benefit value of $1M with each major application release.

The first important step toward success taken by the information technology leadership team was the establishment of a project Governance Model which included strong executive sponsorship. Briefing papers on the Governance Model and current project strategy were developed and delivered to Michigan's political leadership. The newly appointed Chief Justice of the Michigan Supreme Court recognized the importance and benefits of a statewide child support system and personally seized upon the role of champion and executive sponsor. Another important component of the Governance Model was the inclusion and active participation of key child support program stakeholders and decision makers, in concert with the MiCSES state and contractual project management team.

Equally important was the establishment of a Project Control Office which set the standards, performance metrics, and processes for day-to-day operations. The independent Project Control Office was instrumental in providing accurate and timely reporting status, escalated issues and risks, and decisional data to the various leadership layers of the Governance Model.

For MDIT, the success of the Governance Model and Project Control Office methodology did not stop with the MiCSES project implementation. It has heavily influenced the approach to the development of new projects. In order to avoid the pitfalls encountered during the early days of the MiCSES efforts, the Department of Information Technology has established the Project Control Office and Governance Model methodology as its standard for five large, highly visible technology projects representing an IT investment of more than $300 million.

After applying the MiCSES Project Control Office and Governance Model solution across multiple high visibility projects, MDIT is now making the solution its standard enterprise model and methodology for all state information technology projects. Projects are quantitatively evaluated against eight critical business and technology factors.

Project Description

Michigan's child support enforcement system (MiCSES) is an excellent case study of how a large failing project can be transformed to a successful one with the aggressive application of project management processes. Further, it illustrates how one success can be grown into an enterprise solution with the backing of both the information technology management team and the critical business stakeholders.

BACKGROUND: Although Michigan's child support enforcement program has historically been a leader among the states in program performance, the state struggled for more than a decade to achieve federal certification for its statewide automated child support system.

After being one of the states with early success in meeting the initial federal requirements, Michigan's efforts languished with years of only moderate accomplishments and, admittedly, several failed strategies. From 1990 to 2000, Michigan had implemented its automated child support enforcement system in only 73 of its 83 counties. After a decade of work at the state level, the remaining ten counties represented more than half the statewide caseload and each operated a unique county-based system. Michigan failed to meet the October 1, 2000, federal deadline, which triggered escalating federal financial penalties, which in turn spurred higher visibility of the lack of progress within Michigan's political circles. However, this also heightened awareness among state executives of the benefits a statewide child support system would reap for service recipients, child support program stakeholders and the state in general.

In late 2000 Michigan reached a critical juncture, either turn around a failing project in an expedited timeframe or face escalating federal financial penalties for non-compliance with federal mandates. During Fiscal Years 1998-2001 the federal government assessed the state with $68.6 million in penalties, and Michigan was facing the likelihood of another $112 million in penalties for FY 2002 and FY 2003. As is often the case, financial realities sparked a call to action.

A very aggressive timeline needed to be established to avert the additional federal penalties. However, to avoid another failed strategy, it was critical that the linchpin to success reside within the structure and governance of the project itself.

Within the MiCSES project management structure; there were two important changes responsible for the rapid turnaround and subsequent success of this large and complex system development and implementation effort:
1. The establishment of a strong, independent Project Control Office and,
2. The implementation of a responsive and accountable Governance process.

Using this structure and these processes, with the guidance of the Department of Information Technology and the Department of Human Services, the MiCSES Project required 18 months to attain the federal certification which had proved to be elusive for nearly a decade. The federal Office of Child Support Enforcement dubbed the rapid road to success as the "Michigan Miracle" and complete, unconditional federal certification was granted in November 2003.

While the implementation of a Project Control Office (PCO) and a an accountable Governance Model to support significant system development operations was certainly not a new concept in the IT industry, it was unprecedented for a State of Michigan, public sector technology project.

MiCSES SOLUTION: The State of Michigan contracted with Electronic Data Systems to staff and run the MiCSES PCO. The PCO scope of work and deliverables for the PCO included:
1. Development and management of project plans and schedules
2. Software release and scope management
3. Resource leveling and tracking of resource time applied to project tasks and milestones
4. Establishment and support of an issue tracking, escalation and resolution process
5. Development and application of performance metrics and scorecards for monitoring and reporting on project progress
6. Establishment of sound, repeatable configuration management processes
7. Facilitation of communication among the application development vendors.

A hallmark of a successful PCO is the ability to maintain an independent and objective perspective on project status and progress. The State management team was resolute that the PCO's status reporting not only be timely and accurate, but that it also be resistant to any outside pressure (either from the State itself or the application vendor) to put a positive spin on the health of the project. The State management team and the EDS PCO agreed upon specific defined project measurement metrics. Once these were established, variances from the established milestones such as missed dates, undocumented increases in scope, over/under utilization of resources and the like, were reported weekly on project scorecards.

Because of the size and scope of the child support system development and implementation effort, the overall project was broken down into multiple sub-projects. Although statuses were maintained at a very detailed level, high level scorecards for each sub-project, green (on track), yellow (bears watching), or red (needs attention) provided Executive sponsors with an immediate check on the health of the overall project.
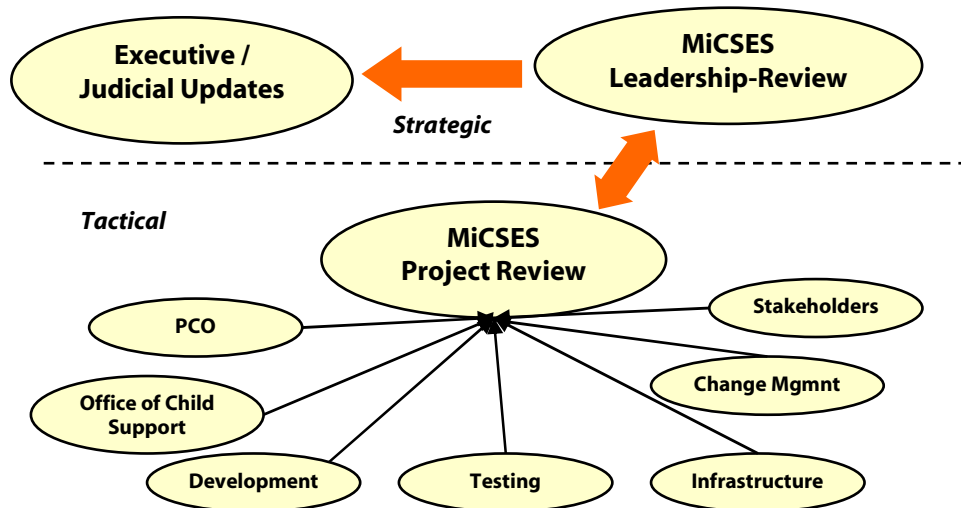
MiCSES project governance operates on two levels, Strategic and Tactical. At the Tactical level, governance is driven down to the individual resource. Each resource was responsible for reporting time against their assigned tasks in the detailed project plan lines, as well as escalating to their management any issues or obstacles to successful completion. At the next level of the model, reported time and related metrics such as earned value were compiled weekly for team level status checks, and the creation of the project scorecards. Still at the tactical level, project scorecards, issues and risks were reviewed and acted upon during a weekly project review. A suite of automated project management tools provided for the automatic escalation of unresolved issues and risks.

At the Strategic Level, the MiCSES Leadership reviewed project statuses, their escalated issues, and any highlighted risks on a bi-weekly basis. The MiCSES Leadership group reached out beyond the day to day project management staff, to be inclusive of decision makers from the various child support program entities and from the sponsoring agencies. The issues and risks escalated to this level were those deemed beyond the resolution purview of the tactical leadership team and required prompt Executive action.

It is important to note that a sub-project, or even the entire project, being reported in red status was not in and of itself viewed in a negative light. On the contrary, this was an opportunity to identify those issues which needed management or executive attention, to identify and remove project obstacles, and to provide the impetus to make the necessary mid-course adjustments that helped keep the project on time and within budget.

ENTERPRISE PROJECTS: In order to avoid the pitfalls encountered during the early days of the MiCSES efforts, the Department of Information Technology has established the Project Control Office and Governance Model methodology as its standard for five large, highly visible technology projects. Current projects, representing an IT investment of more than $300 million, include:

Michigan Medicaid Management Information System (MMIS): The objective of this technology project is to procure the transfer of a "Certifiable" MMIS to support Michigan's Medicaid program areas including: benefits administration; claims and encounter processing; contract management; eligibility and enrollment; financial services; member services; program investigations; provider services; service authorizations and referrals. The project is projected to cost $53 million.

Crash Process Redesign: Michigan's Crash Project Redesign (CPR) transformed an aging traffic crash reporting system into an up-to-date, efficient statewide system, providing public safety agencies with a rich database of timely and accurate information for traffic safety decision-making. The total cost of CPR was $5 million.

Bridges: This $140 million technology project will replace, update, or integrate all of the systems which support intake, registration, eligibility and benefit determination, and delivery of assistance and services with a transfer system. The resulting implementation will simplify both the business and technical environments in order to more efficiently and effectively assess client eligibility and provide assistance and services to the client with the goals worker relief and improved accuracy in eligibility and benefit determination.

Unemployment Insurance Agency: UIA's information technology systems used to administer Unemployment Insurance benefits, taxes and trust fund accounting are spread over several systems and platforms of varying ages. UIA will be implementing a $60 million integrated system, through the application of new, and leveraging existing, technologies so its core businesses and several secondary systems are able to data share, real time, across functions.

Driver License and Vehicle Registration: Business Application Modernization (BAM) is a multi-phased $46 million project that includes re-engineering the business processes, developing requirements and building a technical infrastructure to support the Department of State's key business functions related to driver license and vehicle registration.

ENTERPRISE MODEL AND METHODOLOGY: After applying the MiCSES Project Control Office and Governance Model solution across multiple high visibility projects, MDIT is now making the solution its standard enterprise model and methodology for all state information technology projects as evaluated against these eight weighted criteria:
1. Inclusion in the Governor's Cabinet Action Plan;
2. Alignment with Department of Information Technology goals;
3. Level of cross agency collaboration;
4. Project visibility or political sensitivity;
5. Amount of organizational process change required;
6. Level of coordination;
7. Project size in staff and budget;
8. Level of technology customization.

These same criteria are also used by the Department of Information Technology Strategic Management Team. This team, made up of the top MDIT executives uses this criteria and methodology in determining and prioritizing organizational strategic and tactical initiatives.

Significance to the Improvement of the Operation of Government

The primary purpose of the Project Control Office and Governance Model methodology is to provide comprehensive and consistent project management practices, along with reliable, metric based statuses. The process provides for management of the big picture and the interdependencies between programs and projects to achieve both project specific and enterprise business change objectives and benefits.

IT Operational Maturity: The utilization of a Project Control Office and an accountable Governance Model process, not only supported the success of the MiCSES project; it has also played a role in the growing organizational maturity of MDIT. Engaging state agencies and external stakeholders in IT strategy and governance have been a critical success factor in the agency's evolution to a nationally recognized leader in IT consolidation.

Predictable Results: MDIT is implementing the methodology at the enterprise level and for its own internal operations and projects in order to achieve controlled, reliable and predictable project results with real cost savings and reduced total cost of ownership.

Cost Effective System Development: Guided by the successful Project Management and Governance Model, the statewide implementation of MiCSES has provided the foundation for gains in efficiency and effectiveness in the system development process. For example: new federal legislation, regulations, or operational enhancements result in the regular issuance of policy changes by ACF-OCSE. These changes, in turn, must be implemented at

the state and local level, frequently requiring supporting associated automated system changes. Making the system changes once, at the state level, produces annual savings in hundreds of thousands dollars for contractual IT expenditures at the local level.

Data Reliability and Timeliness: In another example of the positive results from this methodology, the Crash Process Redesign reduced the wait time for the availability of data related to traffic crash incidents from one year to 60 days or less.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

The Project Control Office and Governance Model methodology maintains project sponsor support and alignment with the programs objectives.

Active Stakeholder Participation: The Governance Model provides for regular, active stakeholder involvement in the system development and implementation process. This drives both accountability and ownership of the IT project. In the example of the MiCSES project, MDIT functioned as technical partner of the child support program, first assisting in the implementation of all federal requirements. Now, the same Project Control Office and Governance Model structure is in place to turn a focused attention on meeting local child support program business requirements and is driving the successful management of on-time delivery of system improvements and enhancements.

Consistent Public Policy and Client Services: The consistent application of policy and program changes attained through the implementation of effective and efficient state level technology systems brings about equality in client service, irrespective of the clients door of entry.

Supporting Client Services: Using the new statewide child support enforcement system as a tool for enforcing and collecting on child support orders, Michigan's child support program continues as one of the national leaders in support collections, with more than $1.38 billion collected and disbursed for FY 2005.

State and Agency Benefits: With award of a fixed price application maintenance and development contract in 2004, with continuation of the Governance Model and Project Control Office, the MiCSES project has realized greater system stability and availability to end users. The combined cost avoidance and increased cost effectiveness has had an average value of $1M with each major application release (about two major releases per year). In addition, the MiCSES project achieved CMMI Level 4 compliance in May 2005.

Realized Return on Investment, Short-Term/Long-Term Payback

Savings and Cost Avoidance: The short term pay back on Michigan's investment in a statewide child support enforcement system is clearly the abatement of federal penalties. In total, the state averted $147 million in penalties for fiscal 2001 – 2003, including the return of almost $35 million (90%) of the actual penalty paid in 2001.

Efficiencies gained from the on-time and on-budget delivery of the Crash Project are saving the state $4.6 million over just the first three years on a $5 million investment. This includes cost savings, cost avoidance, revenue recovery, time savings, and more efficient use of assets.

MiCSES Return on Investment: It is a federal requirement that states complete an annual cost benefit calculation as part of their annual systems' Advance Planning Document Update (APDU) funding proposals. The cost benefit analysis is based on a revenue stream model as provided by the federal Office of Child Support's publication Companion Guide 3: Cost/Benefit Analysis Illustrated for Child Support Enforcement Systems. And, although the MiCSES system represented a very substantial investment, the State is seeing also seeing very substantial positive return.

As reported in Michigan's 2006 APDU, the total accumulated annual costs for the MiCSES project, through FY 2005 were $813,715,649. The total accumulated annual benefit for the MiCSES project, through FY 2005, is $1,762,132,066. The Return on Investment (ROI) is 2.17, calculated by the total benefits divided by the total costs.

Continuing Operational Benefits: Using CMMI as an information technology industry standard measure of performance, Level 4 compliance indicates a level of maturity marked by documented and repeatable processes, reliable metrics, requirements traceability, defect tracking, and change management. CMMI Level 4 compliance is a good predictor of continued success. While Governance Model and Project Control Office helped MiCSES attain CMMI Level 4, the continued adherence to these processes across projects in MDIT will also provide on-going cost benefit for all new technology projects.

Honorable Mention: North Carolina EPMO and Portfolio Management

Executive Summary

Upon his appointment as North Carolina's State CIO in May 2002, George Bakolia realized significant problems existed in statewide IT governance. In July 2004 he was able to get legislation passed that made the State CIO responsible for the oversight of projects developed by state agencies. The legislation mandated the establishment of a team of project managers who would work for the State CIO and would work with individual agency projects. To focus on business needs, the project review process also included two analysts from the North Carolina Office of State Budget and Management. In addition, the State CIO purchased a portfolio management tool to complement the work of the project managers.

The statewide project management office was established in mid 2004 and now includes a director, six project managers and two quality assurance specialists. The office develops and enforces project management and lifecycle methods, establishes statewide documentation standards, performs project approvals, monitors projects and performs quality assurance. It also provides advisory services to agencies, including evaluations for troubled projects and training. One of its more unique responsibilities is that a project manager is assigned from the EPMO to each major state project to mentor and assist the departmental project manager.

A portfolio management software tool, supported by three business analysts, became operational for project portfolio management in August 2005.   It currently has 250 users in 21 executive branch agencies. Sixty major projects totaling about $750 million are being managed at project, agency, and state levels. The tool provides a broad range of processes that follow project management principles, including an automated workflow for project approvals and monthly reviews, document management, project forms and templates, capabilities for determining investment priorities, and staffing resource constraints.

Project documentation required by the software tool has been modeled after industry recognized standards, such as PMI and IEEE.

As a result of these changes, budget overruns have decreased from around 7 percent to 5 percent, schedule slippages have improved from over 20 percent to less than 10 percent, and requirements delivered versus promised have leaped from missing 14 percent to providing almost all. Two large-budget, high-visibility, and politically sensitive projects have been reorganized and redirected in a positive and timely manner through the involvement and recommendations of the project management office and the coordinated attention of project, agency, and state executives.

Project Description

Upon his appointment as State CIO in May 2002, George Bakolia realized significant problems existed in statewide IT governance. In July 2004 he was able to get legislation passed that made the State CIO responsible for the: 1) review and approval of all major projects (defined as those costing over $500,000); 2) development of project management, quality assurance, and architecture review processes; and 3) approval of project managers and assignment of a project management advisor (PMA) to all major projects. The enabling legislation gave the State CIO authority to suspend projects that did not meet specific performance standards. The legislation also assigned additional project approval and performance review authority to the Office of State Budget and Management (OSBM) and the Office of State Controller in order to provide more fiscal oversight.

Since the project management office was established in late 2004 and the portfolio management software was implemented in August 2005, the following problems have been improved:

Work efforts for project reporting were cumbersome and time consuming and information was not presented in a meaningful format.
Improvements: Fill-in templates and forms have replaced paper-based project approvals and monthly status reports, and documentation is consistent, understood, useful, and secure at project, agency, and state levels. Formats of tool documentation and workflow methodology are based on industry-recognized standards for project management and system development life cycles.

Governance rules, process flows, and signoff disciplines were inconsistently applied, misunderstood, and laxly enforced.
Improvements: Manual (e-mail enabled) workflow has been automated with role-based access, review, and approval rights at the project, agency, and state levels. Other features include an audit trail of actions and comments, automatic notifications of actions required, and reporting of workflow status. Discipline is enforced at the three levels of workflow (project, agency, and state) and for all required approvals/signoffs.

Decision-making was late and ineffectual.
Improvements: Responsibility and accountability for decision-making is built into the automated workflow with mandatory reviews and signoffs. Requisite factual information is timely, well structured, and useful. Detailed project analyses and research by EPMO staff supplement tool reports to provide balanced and complete pictures of risks, potential problems, troubled situations, along with associated recommendations.

Staffing resources for identifying problems and applying corrective actions were insufficient.
Improvements: Risks are tracked and managed through the tool to assist in anticipating problems. PMAs closely follow assigned projects and offer advice and assistance to project teams, agency project management offices, and state reviewers.

Comprehensive analyses and reporting were not available.
Improvements: Tool generated reporting includes: 1) a dashboard showing the status of seven key monthly performance factors giving visual indications of progress, 2) a monthly status report for each project, and 3) agency and statewide portfolio level reports. The tool assists in many analyses (such as automatically calculating risk scores).

The formation of a statewide project management office and the implementation of the portfolio management software tool were designed to support better project management and improved processes, practices, and procedures at the project, agency, and state levels. A key success factor for these actions is that they focused on: 1) enabling effective management and improved performance at the project level, 2) supporting fully informed and timely reviews and approvals by IT and business executives at the agencies, and 3) facilitating the involvement of the state's budgeting and fiscal oversight organizations with the State CIO's project approval and monitoring process.

The project management office uses a five-phase project development methodology. The five phases are: 1) initiation, 2) planning and design, 3) execution and build, 4) implementation, and 5) closeout. Formal approvals are performed at three points in the development cycle. The approvals ensure: 1) all preceding work has been completed acceptably, and 2) the project is in position for completing the next phase(s) satisfactorily.

The quality assurance staff members evaluate monthly status reports; assess progress in seven categories including PMI's triple constraints of time, cost and performance) (overall, schedule, deliverables, funding availability, budget, scope, and milestones); and prepare recommendations. Ratings for the six specific categories are: green (no action required as variances are within acceptable tolerances or deviations), yellow (potential problems as variances are slightly beyond normal experienced tolerances or deviations), and red (serious problems with excessive variances or deviations from plans). Depending on ratings, actions range from none required, to e-mail notifications project managers, to formal written notifications to agency heads, with recommendations for corrective actions. Severe situations can lead to suspension of project approvals, resulting in the removal of funding.

All assigned project status ratings are based on quantitative calculations performed by the software tool and qualitative analyses completed by the quality assurance staff. The use of the software tool ensures that

information, analyses, and processes are applied in a consistent, fair, and equal manner and status ratings are assigned with clearly defined and well-understood guidelines. For both project approvals and monthly monitoring, all projects and agencies are treated the same regarding information, processes, and evaluations; thereby, minimizing misunderstandings concerning criteria, findings, and recommendations.

Project closeout reviews are required on all projects to: 1) measure the planned performance of project versus actual accomplishments in terms of costs, deliverables, timeliness, and quality; 2) validate estimated costs and benefits – reassess business cases – by determining if the investment is performing as expected and if the management decisions necessary to achieve the benefits to the taxpayers or value to the public (such as business process reengineering, head count reductions, etc.) have been made; 3) ascertain whether the continuation or modification of the project is necessary to meet business or financial objectives or operational or user requirements; 4) evaluate the agency's capability to operate and maintain the investment efficiently and effectively over its lifespan; and 5) identify effective management practices and document lessons learned.

Portfolio Management Software Tool

The project management tool was purchased in late 2004, and the project portfolio implementation effort started in early 2005. By the fall 2005, design, configuration, and training efforts were completed, and the tool was used to manage all projects. The implementation of the applications portfolio component of the tool began immediately following the project work, and it is on schedule to be completed the end of this summer. About 120 data elements are being entered for over 900 applications, and the first analyses of these will be completed in August 2006 so that management plans can be developed for them by early fall. Components of the investment portfolio management part of the tool were used this spring to manage the workflow for IT expansion budget requests for the current session of the General Assembly. Over 100 funding requests followed the technical and fiscal review and approval process managed by the tool.

A three-person portfolio management staff is responsible for: 1) researching and understanding underlying portfolio management business theories, disciplines, and concepts and developing approaches to implement them in state government; 2) providing business related advice and training to users; and 3) managing the operations of the software tool, including reconfiguring it as necessary. Tool users include IT and business executives, financial and budgeting staffs, business managers, and IT planning and management personnel at project, agency, and state levels of government.

Significance to the Improvement of the Operation of Government

Project approvals and monthly status reporting processes have been strengthened, streamlined, and simplified through the work of the project management office and the implementation of the portfolio management software tool. The governance process for project approval and monitoring has been easier for agencies to follow and understand; there is more consistency in the evaluations of project readiness to proceed to the next phase(s) and the grading of monthly performance; and the process is more valuable to project teams, agency IT and business personnel, and the statewide project management office. The tool and processes provide for: the use of common data; evaluations against specific, measurable, and agreed-upon criteria; analyses and reporting geared to the early identification of problems; and current and trending information useful for appropriate and timely decision making.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

History has shown that projects have a much better chance for good outcomes if: 1) adequate business cases have been prepared; 2) all required prerequisites for moving to the next phase have been completed; and, 3) status reporting is appropriately focused, performed frequently, and consistently applied. The project management office and the software tool have contributed to these factors. The following improvements have been identified from post implementation assessments of close out status versus original plans: 1) budget overruns have decreased from around 7 percent to 5 percent, 2) schedule slippages have improved from over 20 percent to less than 10 percent, and 3) requirements delivered versus promised have leaped from missing 14 percent to providing nearly all.

Project, agency, and state leadership actions for addressing challenges and resolving problems have become more proactive and decisive. Several politically sensitive, publicly visible, and large-budget projects

experiencing extensive performance issues have been restructured and redirected before cancellation became the only option.

Realized Return on Investment, Short-Term/Long-Term Payback

With a statewide portfolio of 60 projects totaling approximately $750 million implementation costs, a small improvement in schedule or budget variances equates to significant dollars. The combined costs for creating the statewide project management office and implementing the project part of the portfolio management tool were about $1 million. Combined annual operating expenses for the project management and portfolio management groups are around $3.5 million. A one-year payback, therefore, requires an annual dollar benefit (in schedule shrinkage, budget reduction, quality improvement, etc.) of $4.5 million or a little over one-half of one percent of the $750 million implementation costs. Given the improvements in schedule, budget, and requirements cited above, it appears that this financial objective is being achieved.

Honorable Mention: Title & Registration User's System of Tennessee (TRUST)

Executive Summary

In response to concerns from the Legislature and the Governor's Senior Staff, as stated by numerous stakeholders, including the public, County Clerks, vehicle dealers, lending institutions and insurance companies, the Department of Safety launched a re-engineering project to eliminate the problems associated with the state's current Title and Registration system. This re-engineering project was known as the Title and Registration User's System of Tennessee (TRUST)

Over the last several years it became apparent that the existing Title and Registration system was unable to keep up with the growing workload being placed on it, and the associated processes have become slow, backlogged and labor intensive.

The State of Tennessee's Office for Information Resources (OIR) was charged with developing a project strategy and methodology to implement a Title and Registration system that would keep up with the growing demand placed on the State of Tennessee.

To accomplish this, OIR integrated both a short-term and long-term development and implementation strategy. The short-term strategy created a new technical infrastructure to support new system functionality used to ease the use of its business users. All this was accomplished within a very short period of time and well under budget. The long-term strategy integrated additional functionality while not interfering with the business user's daily workload. Additionally, this strategy provided a medium for a product rollout strategy that minimized risks. Altogether, the short-term risks were accomplished on time and under budget.

To reduce the "time to market", this project leveraged the latest proven J2EE technologies and IBM Rational development methodologies. This use of technology allowed the business users to see and feel the product early and take ownership of the product, thus becoming a part of the project's success.

A series of "Town Hall" meetings with county clerks were held to address the expectations of the business groups. These meetings allowed the county clerks an open forum to have questions answered about the progress of the application, as well as providing a direct input into the specific items that they needed to be addressed. All this was performed while technical teams pushed forward completing technical design requirements.

Within one year, four of eight phases have been implemented on-time and under budget. Additionally, the business community and senior administrative staff are extremely pleased to see progress and to hear that their project is being well received by the business community.

Altogether, this project has been, and remains, successful due to the creation of a sound and proven strategy, a solid methodology, strong project management and continual monitoring of the customer expectations. The customer backlog of title and annual registration transactions has been reduced from six months to two weeks.

Project Description

Currently, there are approximately five million vehicle registrations and three million titles processed annually, with the title and registration division generating $250 million in yearly revenue. In the fall of 1997 the division's backlog reached an all time high of six months, creating an unacceptable wait time to receive a title. While the backlog had been reduced in the past, it was only reduced through the use of overtime and the addition of temporary staff. When staff reductions occurred it resulted in an increase to the backlog of work. It was obvious that staffing was not an acceptable solution to the systemic problem of poor processes and inadequate technology. This led to a re-engineering effort of the existing legacy application.

The largest shortcoming of the legacy Title and Registration application was centered on the use of vehicle title number and not the citizen. In order to shift this focus to the citizen, the project established a proper data model for the new Title and Registration system. While the legacy application had been constructed on a hierarchical database structure, the new model needed to shift to a relational model. The project team quickly realized that this component was essential for success and time was needed to execute the plan. In the end, a quick success was needed to rally support from the stakeholder groups.

Replacement of the antiquated microfilm document capture application was the next focus of the project. For years, the Title and Registration division has been retaining the business records on microfilm. The image retrieval process was very time intensive. For example, when supporting documentation was needed from a county clerk, a call was placed to the central office, the proper roll of film was retrieved, the image looked up, the image printed and then faxed back to the clerk. This was an issue, especially if the customer was standing in front of the clerk at the time.

The first phase of the project was to replace the microfilm retention with the state-of-the-art document imaging system. This would provide every county clerk access to the document repository, from their own office while the customer was standing in front of them. This effort was then tackled as phase one.

While phase one was being developed, tested, implemented and rolled out, the technical team was working to make the paradigm shift from the hierarchical model to the relational model. The risk of this phase was enormous, yet through the dedication of the team, this was executed with zero downtime or impact to the end user.

Altogether, the completion of this phase put into place the capability to address problems within the system by establishing the proper data architecture.

Technical Description:

With a strong plan in place directing the project, the decision to leverage today's current relational database technology with improved data attributes was made. This goal was achieved through IBM's Universal DB2 Database Management System. The new application was architected to support the future delivery of motor vehicle services via alternate channels, such as self-service kiosks and internet transactions. The ability to provide customers with additional options provides a new level of customer service while also being cost effective for the state.

Moreover, it was important to realize that as technology evolves and becomes more prevalent in our everyday lives, there will be a greater expectation for new and more accessible means of service delivery.

In the end, an implementation strategy was created to allow for an incremental deployment plan by releasing eight distinct, stand-alone phases. The eight phases where used to reduce overall risk. To gain consensus with the stakeholder groups, this approach was presented to each of the 95 county court clerks in a series of town-hall meetings.

The following is a description of the first five distinct phases used in the project:

- ***TRUST Phase I*** replaced the present microfilm data storage capabilities with a new imaging system. This deployment gave the customer the ability to electronically save and store all the documents associated with car titles and registrations. This phase also gave the county clerk the ability to retrieve

the scanned documents at each of their workstations. This eliminated phone calls, filing time, and most importantly the waiting time of the citizens being served.

- **TRUST Phase II** was the deployment of new workstations and printers in each of the 144 title and registration service locations across the state of Tennessee. It also included the installation of new high-speed telecommunications lines with each of these sites.

- **Trust Phase III** established the proper data model for the future while still supporting the legacy system. This data model provided both the technical shift needed and the ability to move the focus from the vehicle to the customer from a business standpoint.

- **Trust Phase IV** modified the front end processing to be web capable. All supporting documents are now bar coded to allow a county clerk to simply scan the bar code in order to pre-populate the data entry screens. No search process is necessary.

- **Trust Phase V** will expand the capabilities of the system established in Phases III and IV by adding a statewide point-of-sale system which included cash drawer, barcode reader, credit card reader, electronic signature capture pad, receipt printer, and check franking device in each office. This allowed a transaction to be initiated on the workstation, processed, fees figured, cash drawer operations performed and daily balancing performed.   It also included the creation of the proper financial reports, including automatic and / or manual updates to the state's financial system. An integrated inventory system also tracks controlled stock (plates, placards, etc.) in all phases of the supply chain, from order through sale.

Significance to the Improvement of the Operation of Government

The heart of the re-engineering project was the replacement of the division's twenty-five year old mainframe system. This presented the division some unique complications and obstacles. These obstacles included:

- A lack of edits adds to data integrity problems, thus leading to multiple records for the same information. A tremendous amount of effort is required to clear resulting errors.

- Inability to do ad-hoc reporting. This was especially problematic for management, as they had little to no data from which to manage the operation.
- Missed opportunities to collect revenue owed, such as child support, because no links existed to other state systems.
- Enhanced compliance with financial responsibility requirements.
- Poor tracking of controlled stock
- Poor financial reporting.

The new distributed system added functionality that included:

- **Improved Accountability:** Through the integration of systems that were previously stand alone applications, the state is able to recognize and realize revenues that previously went uncollected.

- **Improved Credibility:** The State can now offer information to the citizens instantly. Information ranging from a history of the previous owners of a vehicle, the complete listing on all of their vehicles owned and instant retrieval of the documents related to their titling of the vehicles.

- **Enhanced Accounting and Inventory Control:** Through the use of the integrated Point of Sale application, not only is there a tighter control mechanism in place for the accounting of all money collected, but the controls are now available to track a vehicle license plate all the way from manufacture to the actual check that was written to purchase the plate.

- **Improved Relationships and Processes:** With the continued use of the new application, county clerk offices now have the ability to enter vehicle registration transactions real-time into the system. This yields a better communication between offices, helping to reduce fraudulent vehicle registrations.

Benefits Realized by Service Recipients, Taxpayers, Agency or State

Customer Benefits: The State of Tennessee has greatly improved their processing efficiencies with the replacement of paper documents with scanned images. The State also can now capture a Title and Registration transaction with all the appropriate financial controls in place to ensure regulatory compliance. The State now has the ability to safeguard and account for all the controlled stock and track each inventoried item as it moves from the manufacturer to the county and then to the customer. The State has gained visibility to the work in process with the help of automated workflows that drive the work to the appropriate person in an efficient manner.

Improved Service Levels to the Agency and County Clerk Offices: The county clerks can now provide greater customer service by having the ability to take credit/debit cards for payments. They can also reduce the wait time by having the ability to scan a bar code to find and pre-populate the data fields needed to process a transaction.

Taxpayer Benefits: The cost savings associated with eliminating an outside vendor who supplied much of the new functionality now provided in the new TRUST system will be significant. Also, the efficiencies gained with the system will improve customer service levels and make the process of applying, renewing and processing Title & Registration requests much easier.

Realized Return on Investment, Short-Term/Long-Term Payback

Heightened program and service efficiencies resulted in significant reductions in expenditures, while maintaining or increasing service levels (See sections B and C).

1. *Return on Investment (ROI):* The annual return on investment was 10% for this project.

2. *Estimated Short-term Payback:* This project will break even in year six.

3. *Estimated Long-term Payback:* This project's Net Present Value (NPV) using 10 years and a five percent discount rate is $4.6 million.

4. *Increased Service Demand:* Staff requirements should remain stable, while service demand continues to increase.

5. *Savings and Cost Avoidance:* Total hard dollar benefits recouped in direct cost reductions as well as the ability to perform more work without the addition of staff is equal to $1 million over the next ten year period. Total soft dollar benefits conservatively total $12 million over 10 years. The soft dollar benefits include efficiencies that OIR and the state's agencies experience using a more up-to-date system. The soft dollar benefits also reflect the effects of pervasive process improvement. Additionally, it includes estimated cost avoidance resulting from a more up-to-date system being implemented.