5 Innovation

5.1 Existing Technology Strategies

Montgomery County has demonstrated leadership in the use of technology. Innovation opportunities have been pursued as a result of the development of maturing technology that have clearly shown benefits to business operations, implemented new solutions that streamline technology or business operations as well as those that create efficiencies in management as well as cost.

Innovation in technology, to ensure business success, needs to have defined controls that assist with the decision processes to take automation to new levels. Many organizations have found that best innovation improvements are not necessarily from the strong pursuit, but creation of an environment that sustains opportunity for innovative thought and solution to flourish.

Innovation success factors that promote successful innovative strategies include:

- Ensuring that business improvements and IT developments are aligned early to obtain new outcomes
- Innovation decisions are part of life cycle processes and leadership governance
- Managing creativity and aggressive pursuit of business improvements with metrics and anticipated outcomes

- Continually incorporating ideas and needs with the ability to question investment timing, transparency and impact to the organization.

Montgomery County IT has developed numerous innovative solutions which have been integrated into the County's technology operations support strategies. These forward thinking solutions are continually critiqued to ensure that innovation is not taken too far to the "bleeding edge" which requires the ability to take risks and may yield stranded costs. This plan outlines key areas where this innovation approach has demonstrated proven results while reducing risks and providing measurable results that can be applied to current and future enterprise technology opportunities.

5.1.1 Virtualization

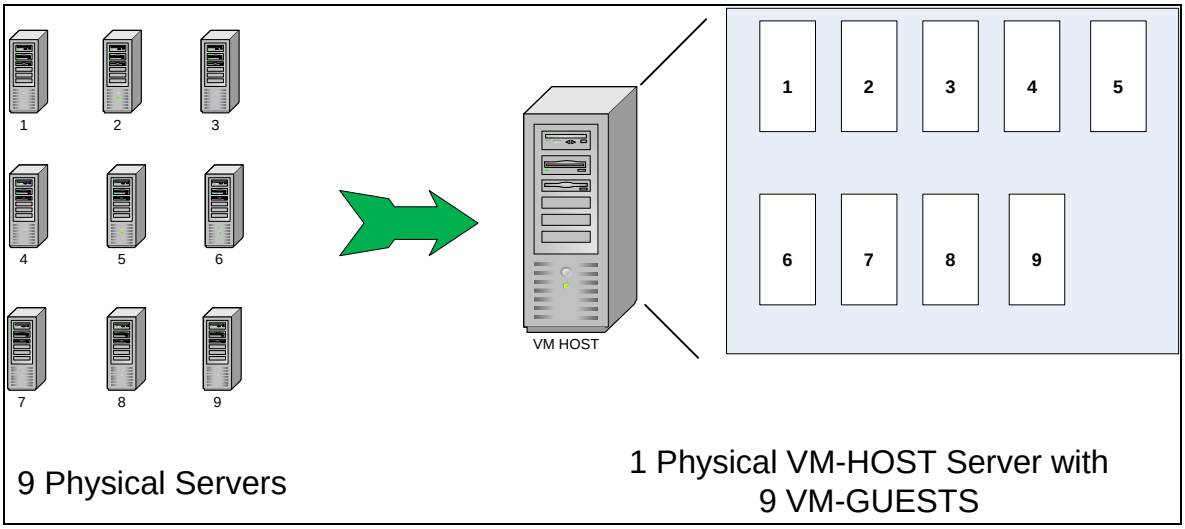
Computer virtualization involves abstraction of Operating System, Hardware and Peripherals with origins in 1960s mainframes. In late 2002 VMware, a x86/x64 server virtualization pioneer, shipped stable commodity OS virtualization products in late 2002. Today there are many vendors marketing products in the arena and this is considered a mainstream technology for servers.

Montgomery County was an early adopter of virtualization, and has been recognized by commercial vendors and government peers as a leader in application of server virtualization. DTS experimented with the technology initially to meet needs for testing and system evaluation. But we soon saw many more opportunities that this technology could provide benefits, and soon the DTS was pushing the envelope with the types of deployments.

The areas that promised improved services, processes and savings and have proven successful are listed below.

Server Consolidation
Virtualization allows multiple servers to run on the same hardware. DTS saw this as a way to reduce number of physical servers and optimize the resources of the hardware. Previously, separate servers were needed because most applications require their own server. With virtualization each application has its own operating system environment but can share the physical server hardware. Most application servers were only using a fraction of the server processing capacity, with virtualization the County is able to load balance and optimize the hardware utilization.

Figure 17 - Server Virtualization



Server Cloning

Since instances of virtual servers are files they can be copied (cloned). DTS quickly realized numerous ways to take advantage of this capability to change how servers are provisioned, how servers are patched and upgraded, and how disaster recovery is approached.

DTS reduced the time for server provisioning from weeks to minutes. DTS maintains master copies of the server standard operating systems it supports and can respond to project and department requests for servers in near real-time.

In conjunction with the adoption of virtualization, the DTS also updated it server hardware specifications to optimize the advantages virtualization offered, including matching the storage configuration to allow for making and storing “snap shots” of the virtual servers at any point in time. This had a dramatic effect on server patching and upgrades and server recovery. Server failures from patching and upgrades has been eliminated, reversion from a failed upgrade can be done easily by going back to the “snap shot.” The technology reduced the testing cycle not only by having additional server resources, it also allowed the segmentation of long many step upgrade processes, so that when a problem was identified staff did not have to start the process from the beginning, they could start from the last “snap shot.” This has saved countless hours of staff time. DTS also took advantage of the “snap shot” technology to reduce the complexity process of and reduced the time of restoring failed servers.

Server Farm Environment Duplication

DTS not only saw the ability to clone individual servers, it used the technology to create complete server farms for specific applications that could be duplicated for different version

testing thereby eliminating resource constraints and conflicts, as well as enabling the Architectural Proof Of Concept process.

Server Maintenance

The County simplified its server inventory by moving to a virtual server environment. The County adopted a single server type that resulted in economies of scale by leveraging acquisitions, simplifying maintenance and eliminating most hardware maintenance contracts. Since the virtual servers can be moved quickly and easily, if a hardware failure occurs on a business critical system it is moved to another physical server while the hardware failure is addressed.

The County's adoption of and exploitation of server virtualization has resulted in significant cost savings and increased the stability and functionality of the County's IT server infrastructure that would not have been possible with physical servers. DTS is continuing searching for new uses for virtualization, with one area being desktop virtualization, as discussed in a later section.

Figure 18 - Server Virtualization Rate

Virtual VM Guest Servers	350
Physical VM Host Server	70
Physical Servers Traditional	98
Total Servers	**518**
Server Virtualization Rate	**78%**

5.1.2 Open source (infrastructure)

DTS was an early adopter of Open Source software and continues look for opportunities to not only reduce licensing costs, but also add or improve functionality and robustness to the IT infrastructure. The adoption of Open Source operating systems, middleware and infrastructure tools have been accelerated because of the use of virtualization, describe above, for experimentation, proof of concepts and hands-on learning.

DTS has be selective in the application of open source targeting areas where open source is mature and where a high return of investment could be realized. A list of the current open source software employed is given below.

Figure 19 - Currently employed open source software

Infrastructure Function	Open Source Software
Virtual Server	VMware
Operating System	CENTOS Linux
J2EE Middleware	JBOSS
Enterprise Monitoring	ZENOSS
Enterprise Services Bus	MULE
Webserver	Apache

Version Control	SVN (subversion)
Tracking (bug, issues)	Trac
Requirements	OSRMT (ALM)
Testing – Web	SAHI
Testing – Performance	Grinder

DTS' open source adoption started with VMware and Linux, which fueled the transformation of the enterprise server architecture.

The DTS Server team had a need to monitor the enterprise server infrastructure and selected Zenoss as its primary Enterprise Server Management tool. Zenoss is similar to high cost commercial products including OpenView ™, Tivoli™, and Unicenter™, and has proven to be even more advanced than the commercial products in some areas. The cost of a commercial product would have been in the millions of dollars.

DTS uses Zenoss for monitoring and alert functionality through the use of the Zenoss console, the ITIL CMDB standard inventory capability for rich modeling of the servers and their patch management and update process, the performance monitoring capabilities for proactive alerts and capacity planning exercises, the email notification capability to alert DTS Server Team Members performing off hours support of critical alert errors such as "System Down" for reactive attention. The system is even more valuable as it sends alerts for excessive CPU, memory or disk usage enabling preventative maintenance before users experience problems.

DTS will continue to investigate opportunistically and adopt open source when it is found to meet the needs of business and fit into the County IT architecture.

5.1.3 Open Source Software Solutions

DTS has had and continues to have pragmatic approach to the use and implementation of Open Source software. The focus is always on the long term stability and supportability of the applications. The Open Source operating systems, middleware and tools have been leveraged extensively and proven highly effective.

To date, DTS has deployed limited Open Source software on enterprise Desktop PC's. The standard desktop now includes CutePDF for the creation of PDF documents improving end user productivity, reducing storage needs, improving document quality, and reducing the need to purchase commercial software for most users.

As this segment of Open Source evolves and matures, DTS will continue to investigate, test and validate applications for use in the enterprise. The usability and supportability issues can be a significant barrier given the large number of users and training and interoperability needs. An example of an application suite that appears nearing maturity that DTS is planning to investigate is Open Office.

5.1.4 Open standards (i.e., LDAP, XML, J2EE, etc.)

The Service Enabled Domain promotes the development of robust, scalable and flexible services for business integration with the County infrastructure. The goal is to achieve a cooperative and secure service and data sharing environment, and to avoid data replication

The County recognizes the importance of developing Services capable of integration with internal and external systems. To maximize the interoperability of County systems, the platform adheres to open architecture, conforming to open standards. The following table lists the County's supported standards and protocols.

Figure 20 - County's supported standards and protocols

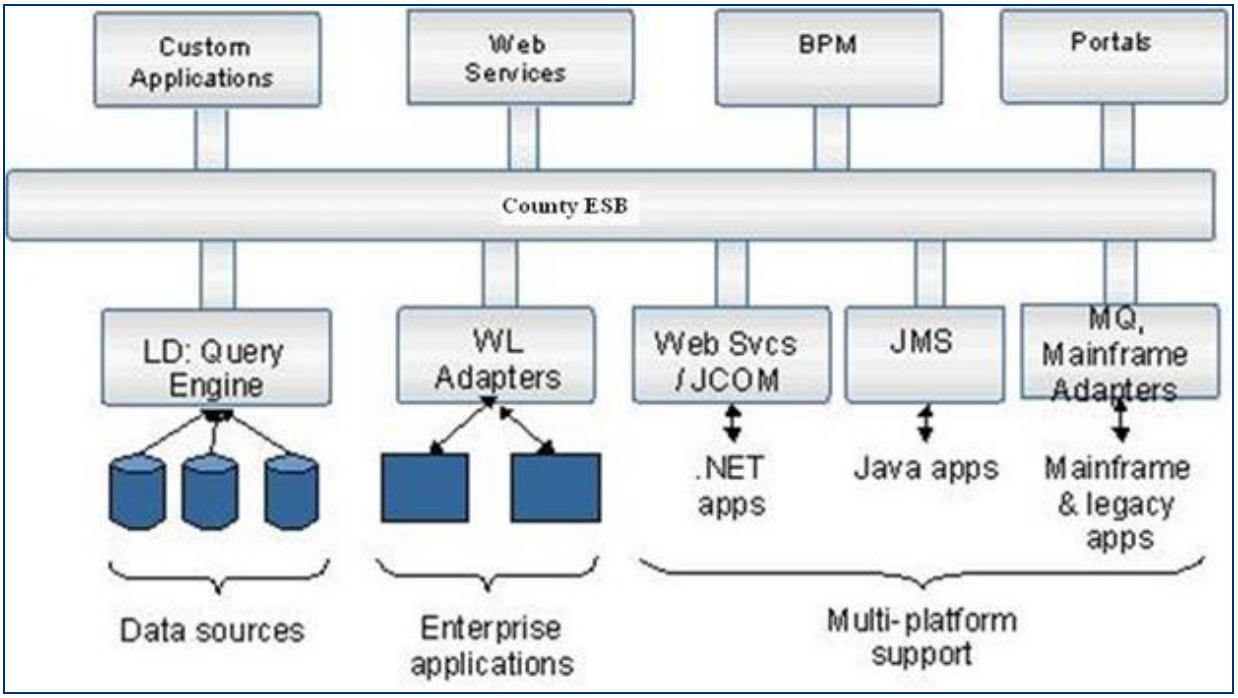
Open DataBase Connectivity (ODBC)
Lightweight Directory Access Protocol (LDAP)
Transmission Control Protocol (TCP/IP)
Extensible Markup Language (XML, XSLT)
HyperText Markup Language (HTML, XHTML)
Java, J2EE
Enterprise Java Bean (EJB)
Java Messaging Services (JMS)
Service Oriented Access Protocol (SOAP)
Secure Hypertext Transfer Protocol (HTTPS)
Web Services Description Language (WSDL)
Universal Description Discovery and Integration (UDDI)

An event-based, messaging model was adopted to help avoid stovepipes (rigid, self-contained functionally organized service solutions for each department, not acting as a single-entity). To do this, the County hosts a healthy mix of services. Some have been developed in-house, and some are COTS (Commercial Off- The-Shelf) solutions. Each application will document and publish well-defined interfaces to the protocols identified in this section.

An events-based messaging service will foster the maturation of service implementations based on Service Oriented Architecture (SOA). The County encourages the use of XML to define event messages, Web Services technologies for integrating .NET and J2EE services and Enterprise Java Bean (EJB) for integrating J2EE services.

The following illustration depicts the Enterprise Services Bus (ESB) developed by DTS as the basis for enterprise messaging services between applications.

Figure 21 - Enterprise Service Bus (ESB)



5.1.5 Environmental (green)

Green Desktops

The average desktop PC wastes nearly half of the energy it consumes as heat. This wasted electricity translates to higher electricity bills and increased greenhouse gas emissions. DCM uses power management features on County computers which can CO2 emissions and save an average of more than $60 a year in energy costs per PC. (Source: http://www.climatesaverscomputing.org/

Since the DCM program started back in 1999, the County has standardized on ENERGY STAR compliant PCs. ENERGY STAR 4.0 is expected to save consumers and businesses more than $1.8 billion in energy costs over the next 5 years and prevent greenhouse gas emissions equal to the annual emissions of 2.7 million vehicles.(Source: http://www.energystar.gov/index.cfm?c=home.index)

Today, the Energy Star compliant workstations, desktops and notebooks can reduce power consumption by as much as 78%. (Assuming an Annual Usage Profiles of 1 hour max performance, 7 hours office productivity, 1 hour idle and 15 hours sleep state for 264 days a year; 24 hours sleep state for 101 days.)

DCM strives to meet or exceed industry standards in energy efficiency, using the latest benchmarks such as Energy Star 4.0 and EPEAT Gold standards. Standardizing on energy efficient computer equipment allows DCM to select power-efficient components.

DCM continues to make informed decisions on all new desktop and laptop models using an Energy Calculator which can help on how changes in power management settings and more efficient hardware options can positively impact energy costs, and can help optimize County infrastructure for high efficiency.

Green Data Center Innovations

In the datacenter, the use of virtual servers has proven very advantageous in the County's efforts to reduce costs and greenhouse emissions and will continue to play a role in continuing the reduction of electrical needs moving forward.

DTS continues to follow best practices in the configuration and operations of the datacenter to reduce costs and greenhouse emissions. DTS has adopted the practice of a hot / cold isle configuration which have been proven to both improve cooling efficiencies, as well as server longevity. DTS is planning to implement further low cost solutions to further improve air flow in the datacenter and thereby reducing cooling costs and emissions.

Given numbers of (350) virtual and (70) physical servers we site in server virtualization section, and applying unit consumptions numbers from vendor websites (7,000 kWh and 4 tons per server annually) we are saving over 2 million kWh of electricity and 1,100 tons of carbon dioxide emissions per year.

5.1.6 Voice over IP

Montgomery County has been a demonstrated leader in the development and implement of new technologies in many areas. One such area, within the Telecommunications Operation, is the inclusion and rapid deployment of Voice over Internet Protocol (VoIP).

Voice over Internet Protocol (VoIP) is a general term for a family of transmission technologies for delivery of voice communications over IP networks such as the Internet or other packet-switched networks.

Montgomery County's Enterprise Telecommunications Team has numerous VoIP efforts included in the solution portfolio. As a direct result of the County's PBX platform upgrade in early, 2007, as business requirements demonstrate the need for enhanced voice services, these modern voice solutions can be integrated without complex changes to the infrastructure. An example of these service opportunities includes:

- IP Soft phone
- Mobility solutions
- Bluetooth headsets
- Wireless PBX phones
- Conferencing and Collaboration Solutions

- Distance Learning
- Desktop Video Telephony
- Wireless PDA
- Push Alerts and Messaged through VOIP display phone
- Unified Communications

All of the above solutions can be supported on the current platform. At the present time, only the IP Soft phone, which is used at the County's Emergency Operations Center, has been deployed for production use.

The Telecom Division is currently in the process of engaging various departments in developing strategies to leverage the systems capabilities in their business functions. Additionally, many of the above trends are being discussed for use in the planned MC311 contact center.

Goal:
Continually analyze and identify business communications opportunities that can be enhanced through the implementation of IP telephony solutions in an effort to automate communications functions and integrate business applications with advanced voice capabilities

5.1.7 Web 2.0 Strategies

DTS has embraced the use of the internet to lower costs, extend the reach of communications and provide online services to County constituents and employees. While the tools, techniques and innovation has accelerated to a significant extent, DTS has integrated and adopted new web technologies as business drivers support the changes with visible and defined objectives.

As a result, DTS's Web 2.0 efforts support the County Executive's (CE) goal of "A Responsive and Accountable County Government." The Web 2.0 strategy uses highly innovative technology to provide comprehensive and cohesive access to information and services. The Web 2.0 program is a component of the County's on-going efforts to enhance the look, feel, navigation and functionality of the County's web portal to provide wide-ranging service options to County residents. The County's web portal has been recognized with numerous awards and distinctions since its initial launch in 2002, and DTS will continue to work with County Departments and Offices to deploy creative, innovative and cost-effective technology solutions to improve the accessibility and utility of on-line services and information.

According to Wikipedia, the term "Web 2.0" describes the changing trends in the use of World Wide Web (WWW) technology and web design that aim to enhance creativity, communications, secure information sharing, collaboration and functionality of the web. Web 2.0 websites allow users to do more than just retrieve information. They can build on the interactive facilities of "Web 1.0" to provide "Network as platform" computing, allowing

users to run software-applications entirely through a browser. Users can own the data on a Web 2.0 site and exercise control over that data. These sites may have an "Architecture of participation" that encourages users to add value to the application as they use it. This stands in contrast to very old traditional websites, the sort which limited visitors to viewing and whose content only the site's owner could modify.

DTS began its Web 2.0 program in response to industry trends showing an increasing demand for on-line collaboration, social networking and social media technologies as well as the increasing availability of Web 2.0 tools and technologies. DTS has worked extensively with the County's Office of Public Information (OPI) and other County Departments and Offices to develop and enhance the County's Web 2.0 solution set. Current Web 2.0 solution components include, but are not limited to, the following elements:

1. Mash-ups
2. Really Simple Syndication (RSS)
3. Weblogs, or "Blogs"
4. Social networking
5. Podcasts

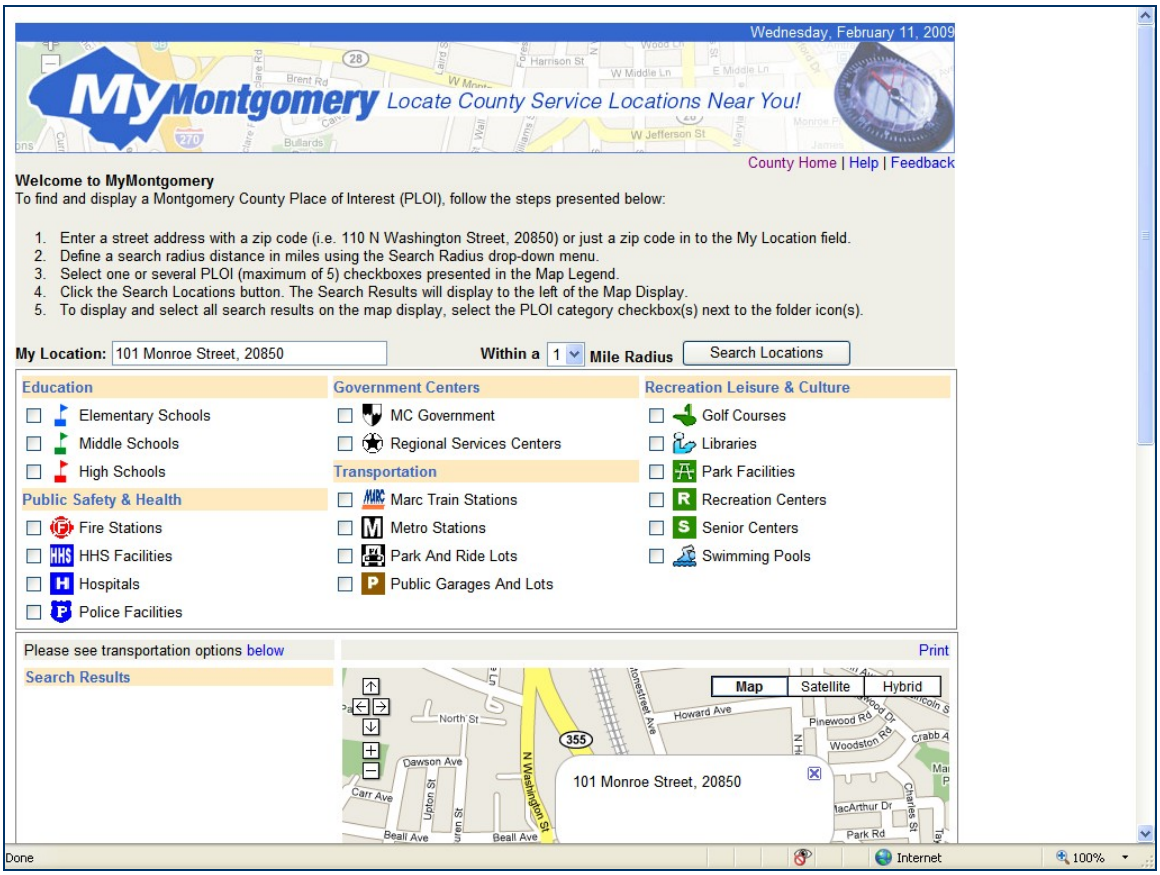
The County's implementation of these Web 2.0 solutions is described in greater detail in the following sections.

Mash-ups

A mash-up is a Web application that combines data from more than one source into a single integrated tool. A mash-up provides easy and fast integration, and is frequently accomplished by access to open software and/or data sources.

The County has deployed several mash-ups on its website. One recent example is the implementation of the "MyMontgomery" tool (Figure 22 – MyMontgomery Home Page), which can be used on-line at the following web address (URL): http://www2.montgomerycountymd.gov/mymontgomery/.

Figure 22 - MyMontgomery Home Page



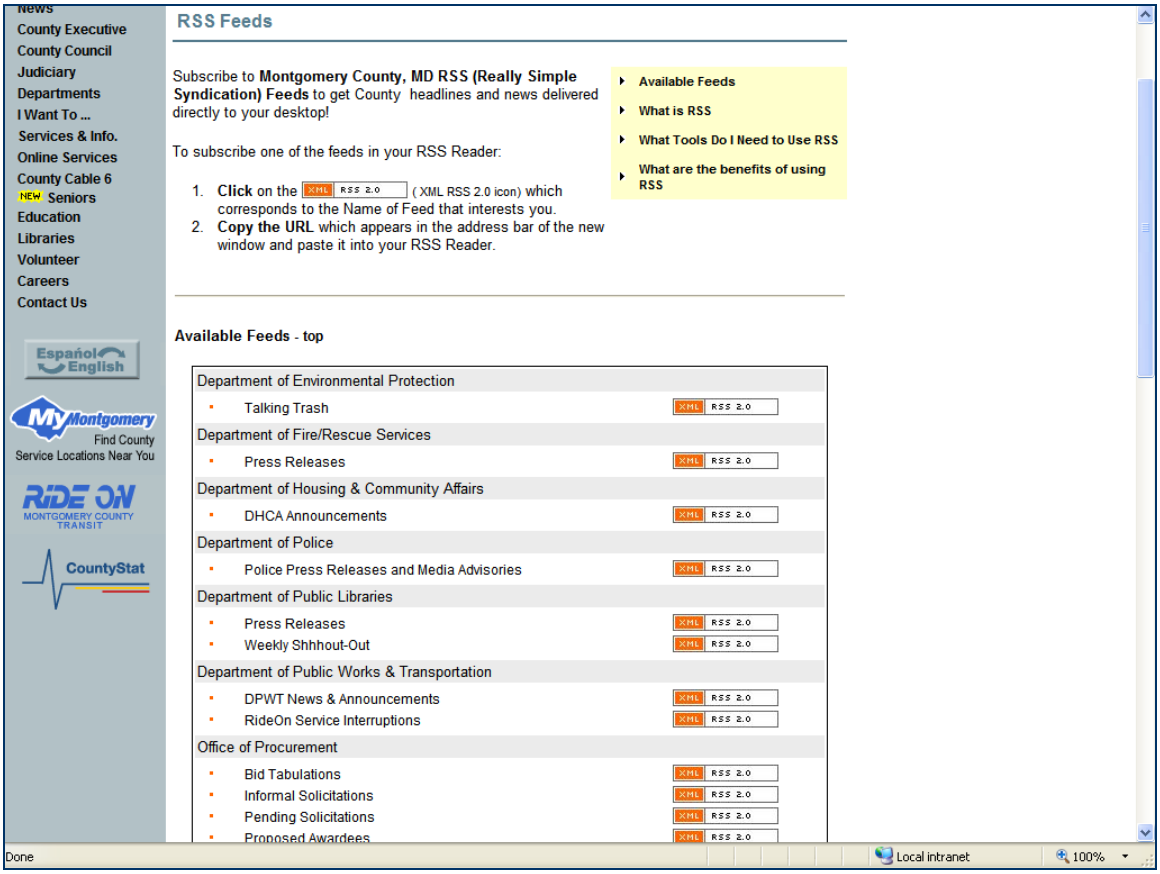
MyMontgomery combines nearly twenty (20) County Geographic Information System (GIS) data layers with Google mapping technology and provides a quick an easy way for County residents to locate County services. DTS incurred no additional or incremental hardware or software costs to develop the MyMontgomery solution because the Google mapping software is made available for free to application developers. Further, the GIS data used within the MyMontgomery application is maintained by DTS and checked regularly to ensure high quality and accuracy. DTS expects to expand the number and types of data layers available on MyMontgomery to further enhance the utility and usability of the solution.

Really Simple Syndication (RSS)

RSS techhnologies provide web users the ability to subscribe to timely updates from favored websites or to aggregate feeds from many sites into one place. RSS feeds can be read using software called an "RSS reader" which can be web-based, desktop-based, a mobile device or any computerized Internet-connected device. The RSS reader checks the user's subscribed feeds regularly for new work, downloads any updates that it finds, and provides a user interface to monitor and read the feeds.

The County has deployed several RSS feeds on its website (Figure 23 – County RSS Feeds). A centralized listing of available RSS feeds may be found at the following URL: http://www.montgomerycountymd.gov/apps/News/RSS/mcgRSS.asp.

Figure 23 – County RSS Feeds



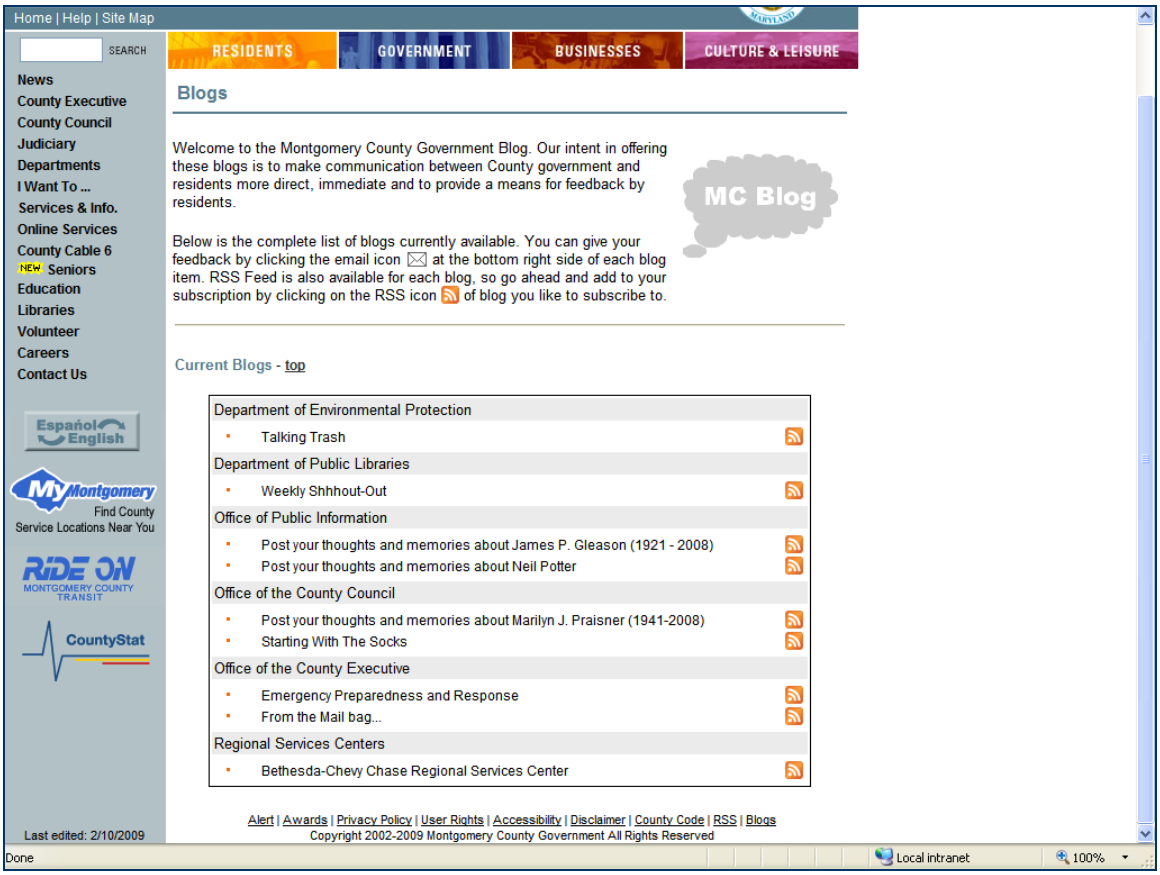
The County provides nearly twenty-five (25) RSS feeds categorized across eleven (11) County Departments and Offices. The web page also provides an overview of RSS technologies as well as links to web sites where users may download required RSS readers. DTS will continue to work with OPI and County Departments and Offices to expand the availability of RSS feeds.

Weblogs (Blogs)

A blog is a Web site, usually maintained by an individual with regular entries of commentary, descriptions of events, or other material.

The County has deployed several blogs on its website (Figure 24 – County Blogs). A centralized listing of available blogs may be found at the following URL: http://www.montgomerycountymd.gov/apps/News/Blog/mcgBlog.asp.

Figure 24 - County Blogs



The County provides access to nearly ten blogs categorized by six (6) County departments and offices. These blogs help to improve communication between County government and residents by making communications more direct, immediate and to provide a means for feedback by residents. DTS expects to work extensively with OPI and County departments and offices to expand the availability and interactivity of existing blogs and to develop and deploy new and interesting blogs.

Social Networking

Social networks focus on building online communities of people who share interests and/or activities, or who are interested in exploring the interests and activities of others. Most social network services are web based and provide a variety of ways for users to interact, such as e-mail and instant messaging services.

In early 2009, OPI encapsulated the County's social networking solution set into a branded offering known as "Montgomery On Demand" (Figure 25 – Montgonery On Demand). This can be accessed at the following URL: http://www.montgomerycountymd.gov/ . DTS contributed significantly to the implementation of the Montgomery On Demand solution set components and provides on-going application and infrastructure support.

Figure 25 - Montgomery On Demand

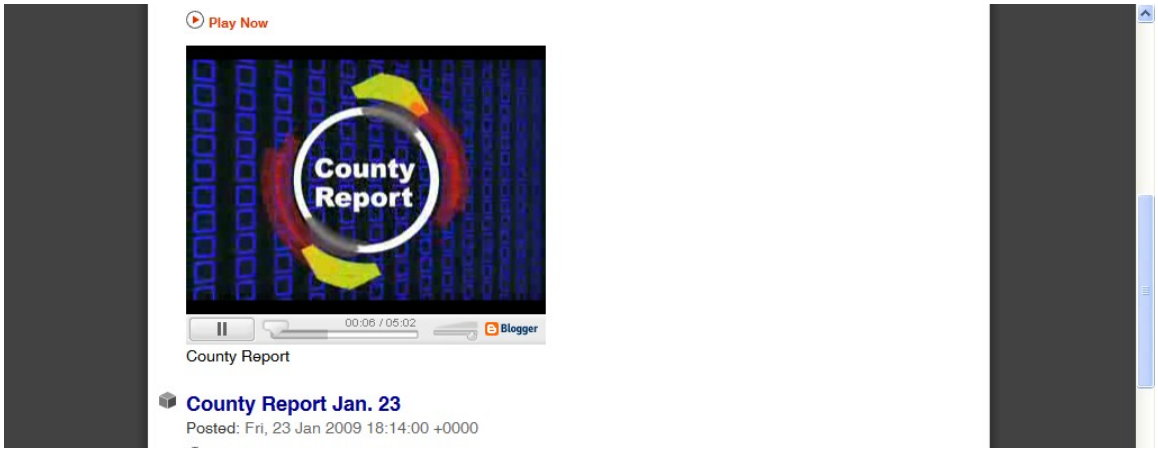
Included in the Montgomery On Demand solution set are links to County content on YouTube, Podcasts on iTunes, access to County's Facebook pages, County Twitter pages, and other critical information such as emergency alerts, newsletters and cable programming. DTS expects that interest in social networking solutions will expand and will collaborate with OPI and County Departments and Offices to continue to expand the County's social networking portfolio.

Podcasts

A podcast is a series of audio or video digital media files which are distributed over the Internet by syndicated download, through Web feeds, to portable media players and personal computers.

The County currently provides access to several Podcasts (Figure 26 – County Podcasts), which may be accessed on Apple itunes, or via the following URL directly: http://feeds.feedburner.com/blogspot/JZrg.

Figure 26 - County Podcasts



In addition to County Report, the Montgomery County Fire and Rescue Service (MCFRS) has a podcast available on the iTunes web site. DTS will work with OPI and other County Departments and Offices to provide infrastructure support for any additional Podcasts deployed in the future.

In summary, DTS, in collaboration with OPI and County Departments and Offices, has deployed several creative, innovative and cost-effective Web 2.0 solutions. Web 2.0 technologies may provide benefits including, but not limited to, enhanced constituent participation, improved on-line services and user interfaces, greater information accessibility, enhanced integration and collaboration, and reduced costs.

Wherever possible and practical, DTS will continue to provide support for the County's implementation of new and enhanced Web 2.0 technologies and business solutions. DTS will advocate Web 2.0 solutions for those County Departments and Offices seeking to deploy technology solutions to enhance creativity, communications, secure information sharing and collaboration. Departments must demonstrate viable business cases driving the need for Web 2.0 solutions, and must leverage existing DTS work intake processes (ex: IT Review, MITIRPS etc.) to initiate new Web 2.0 work programs.

5.1.8 Collaboration

The Team Collaboration Service provides an easy to use online meeting place for internal County teams. Team members can come to a team portal and collaborate on projects using their desktop browsers.

The collaboration service provides some of the following abilities to a team:

- Announcements
- Meeting Agendas
- Document Sharing
- Calendar
- Tasks

- Discussion Board
- Linking Ability

When a team requests a collaboration site DTS allocates an area on the Enterprise collaboration server. DTS maintains the overall server providing proactive server management and backup facilities. When a team requests a new site it is set up by the DTS Site Administrator. The team must designate their own Site Administrator, who will be responsible for the content and administrative duties for the site, including: adding and deleting site users (Users must be County Active Directory members), and management of the content.

DTS maintains a collaboration section on the DTS departmental homepage on the Intranet Portal. The collaboration section will contain information about the service as well as a directory of all the collaboration sites.

5.1.9 Heartbeat performance monitoring

Despite overall success of many web application rollouts, a number of operational challenges mounted to sustain a heterogeneous set of technologies, hundreds of servers and complex networks.

Therefore, in addition to the infrastructure monitoring conducted by DTS (described in an earlier section), DTS also adopted the approach to institute continuous end-user simulated availability / performance monitoring. The “heartbeat” monitoring enables DTS to realize the following:

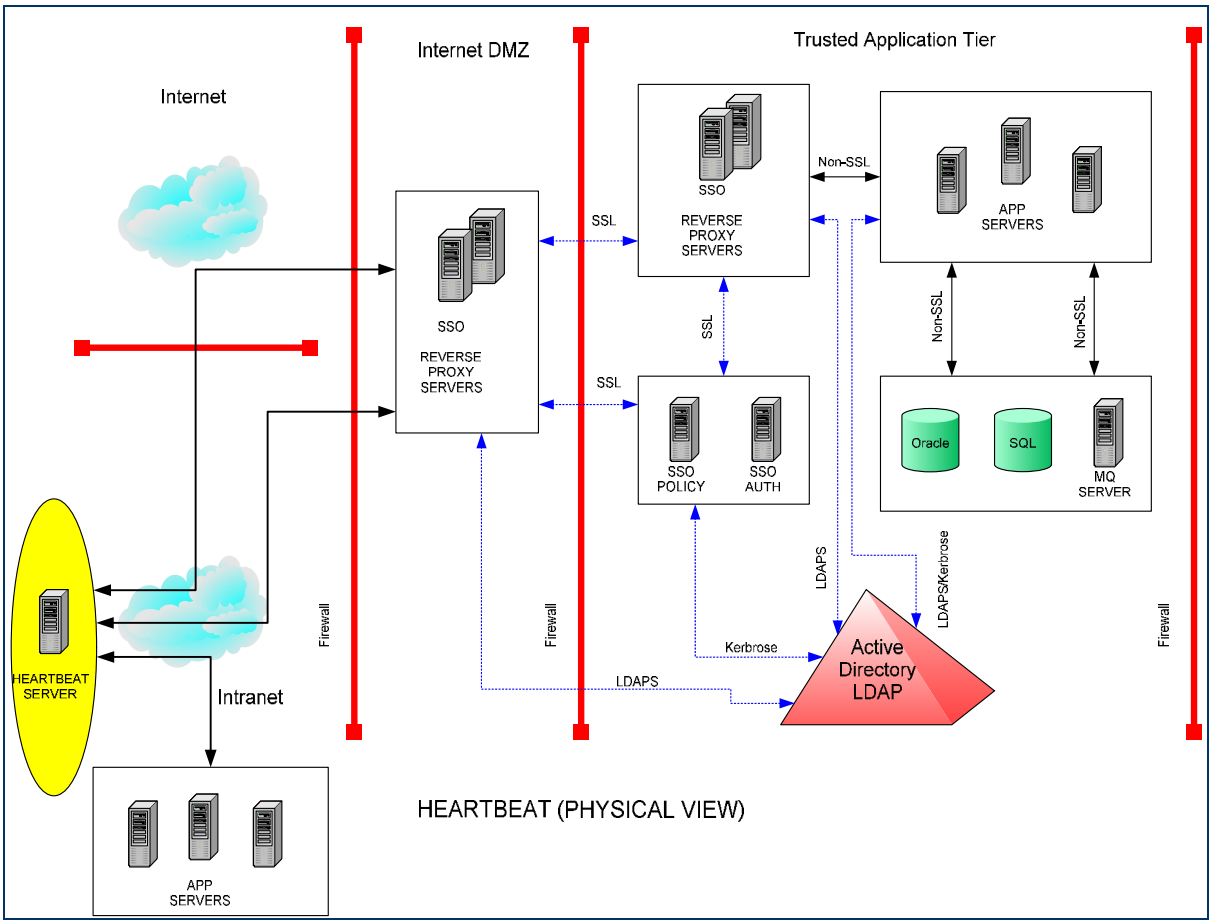
- Higher web application availability.
- 24x7 notification of issues to system engineers via email and/or pagers.
- Better root cause analysis of problems through leverage of historical logs from the monitor.

DTS currently has numerous active HEARTBEAT scripts which include.

- The primary County Internet portal, www.montgomerycountymd.gov
- Several Departmental / agency portals, such as Finance, Recreation, Parks.
- Enterprise Infrastructure: Single Sign-on, Crystal Reports Enterprise, Helpdesk, Imaging, Content Management System, Justice Systems, and MCTime

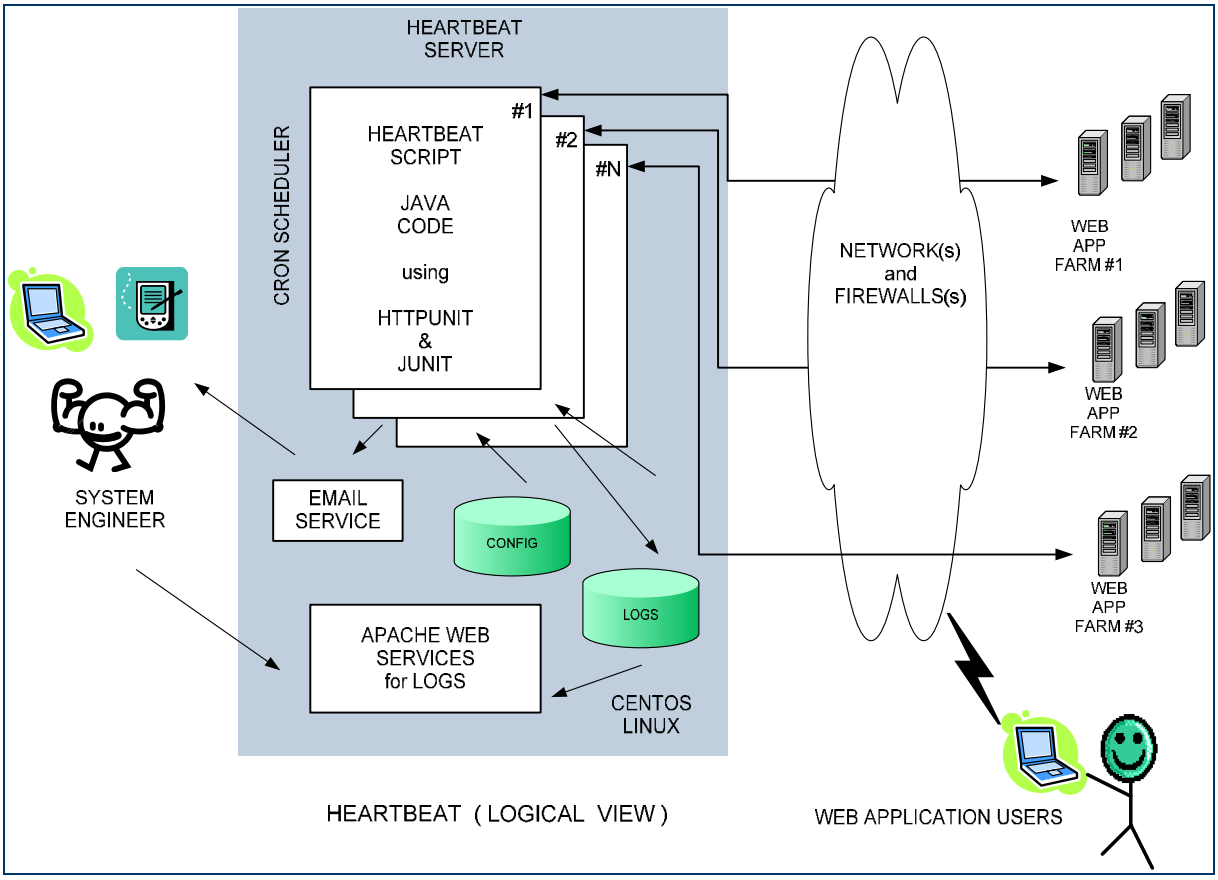
Below is the physical topology of the HEARTBEAT infrastructure. Worth noting, a single HEARTBEAT to one web application validates the health of tens of servers, many layers of middleware, databases and several networks.

Figure 27 - Physical topology of the HEARTBEAT infrastructure



As outlined in the logical view below, individual HEARTBEAT scripts, run in parallel / background monitoring access to web applications, in the event that unexpected behavior occurs, System Engineers are sent emails / text pages. Each HEARTBEAT script is independently configured for windows of operation, repeat intervals and which System Engineers are to be notified.

Figure 28 - Logical view of the Heartbeat Infrastructure



The combination of enterprise monitoring and heartbeats to discover emerging problems and perform preventive maintenance has dramatically reduced disruptive business system outages that impact end users.

5.1.10 Enterprise Architecture Quarterly Assessment

As an implemented, best practice methodology, the Enterprise Architect takes input from the various program, initiatives and systems projects and creates a Quarterly Enterprise Architecture assessment that is published to the CIO, CTO, and DTS Chiefs. The Quarterly assessment identifies potential:

- Enterprise Architecture Framework and processes changes
- New Services – New technical services that can be offered outside the department
- Service Upgrades – Upgrades to current technical services
- Sustaining Services – New processes or tools around sustaining services
- Security Services
- Compliance Services

The update concludes with a section that previews possible research topics looking at future trends that could affect the Enterprise Architecture.

5.2 Existing Business Strategies

The Department of Technology Services (DTS) has a defined focus that centers on outreach, customer support and collaborative innovation. As a direct result, many aspects of the services and support solutions are directed at customer needs from both a business as well as technological aspect.

5.2.1 Self Service

Self Help Information Portal (SHIP)

DCM was looking to enhance the productivity of County employees across all Departments and agencies, by having a single, easily accessible, simple to use portal for sharing and disseminating information. In response to this requirement, DCM developed a Self-Help Information Portal, or "SHIP." The SHIP application is a high level Knowledge Management tool that captures user based institutional knowledge that facilitates self service information and user training. SHIP contains information on topics as diverse as County procedures, information on the location and use of forms, animated training programs, and frequently asked questions (FAQ's) on a wide variety of subjects, processes and programs. With its intuitive and powerful search capabilities, SHIP has become the first place County staff members look for information

SHIP has brought a new degree of consistency to processes and information dissemination. The education programs that have been conducted around its use and the ease of use DCM designed into the system make the tool usable by even basic computer novices. County employees do use this system. Inquiries are growing at a compounded rate of 10% a month during the past six months, and Departments are routinely adding additional content that in turn enhances the usefulness and functionality of the portal.

The benefits this tool has brought to the County are significant. Thus, SHIP has achieved DCM's initial goal of enhancing productivity and morale by minimizing employees' frustration in obtaining information.

Password Reset

In the past, network password-reset issues have constituted the 2nd most frequently used subject in the County IT Support ticket system, with more than 5,000 password-related issues logged per year. (Source: Magic Service Desk tickets)

Employees in need of a password reset were required to contact the County IT Help Desk, who would then reset the password and leave the new password on the employee's voicemail. The process of contacting the help desk, while ordinarily quick, contributes to employee downtime associated with password reset. For those employees without voicemail, the process (and subsequent downtime) was much longer.

Additionally, the IT Help Desk had no viable means of validating a caller's identity prior to resetting a password. An individual who was able to observe or otherwise obtain an

employee's voicemail password (passwords that require no complexity and have no expiration policy) could possibly contact the help desk, request a password reset, and then obtain the new password from the voicemail system, thus gaining all rights and access to information granted to the compromised account.

To address these issues DTS implemented a Password Station and a Password Bouncer application. These secure, web-based products enforce identification proofing and password policies. They utilize a series of personalized challenge questions to assure that an employee's identity is securely confirmed before allowing the password to be changed. The Password Station and Password Bouncer integrate with all major operating systems and enterprise applications.

DCM implemented the system to provide self-service password reset capabilities to County employees within the County LAN as well as those who telecommute or are on travel.

The benefits of this tool have been:
1. Reduced employee downtime resulting from computer/application lockout
2. Increased information security
3. Increased productivity of County IT support staff responsible for system and application support
4. Increased employee satisfaction

5.2.2 Partnerships

Desktop Support

The DCM program established a partnership with a private company for the purpose of enhancing the quality of support to the County's users of personal computers and other mobile data devices. The results of the partnership have been outstanding. Through the innovative use of technology coupled with business process improvements, since early 2006, DCM has successfully resolved 96% of user problems over the phone, without needing to dispatch a service technician to the caller's location. The result has improved worker productivity due to a significant decrease in downtime. Furthermore, DCM and its partner have consistently negotiated deep discounts, in the range of 10-30%, in computer acquisition costs as compared to the State of Maryland and other local jurisdictions. The result: savings of hundreds of thousands of dollars and lower total cost of ownership to the County. Results such as these have garnered the DCM program recognition from organizations such as the Public Technology Institute and the National Association of Counties.

Recently, the International Standards Organization (ISO) established the ISO 20000 performance standard as the first formal international definition of quality best practices in Information Technology (IT) operations management. DCM and it's partner collaborated to make Montgomery County the first, and currently the only, public sector organization in North America to receive the prestigious ISO 20000 certification. This has given the County global recognition for the quality of its IT support programs.

This year, DCM and its partner teamed to create a self-help information portal (SHIP) for use by County employees. This innovative IT tool contains answers to common questions related to the use of the County's software programs, including hundreds of animated tutorials for self education. It also provides all agencies and organizations with the ability to post answers to procedural questions related to their IT operations for the benefit of all employees. SHIP reduces time consuming inquiries to department IT staff and assists in the training of County IT users.

5.2.3 Architectural Proof of Concept

Given a long history of major gaps between what vendor marketing promised and what vendor implementation deployed, DTS looked for a way to reduce County risk resulting in cost overruns, missed schedules and failed projects, due to the following gap areas.

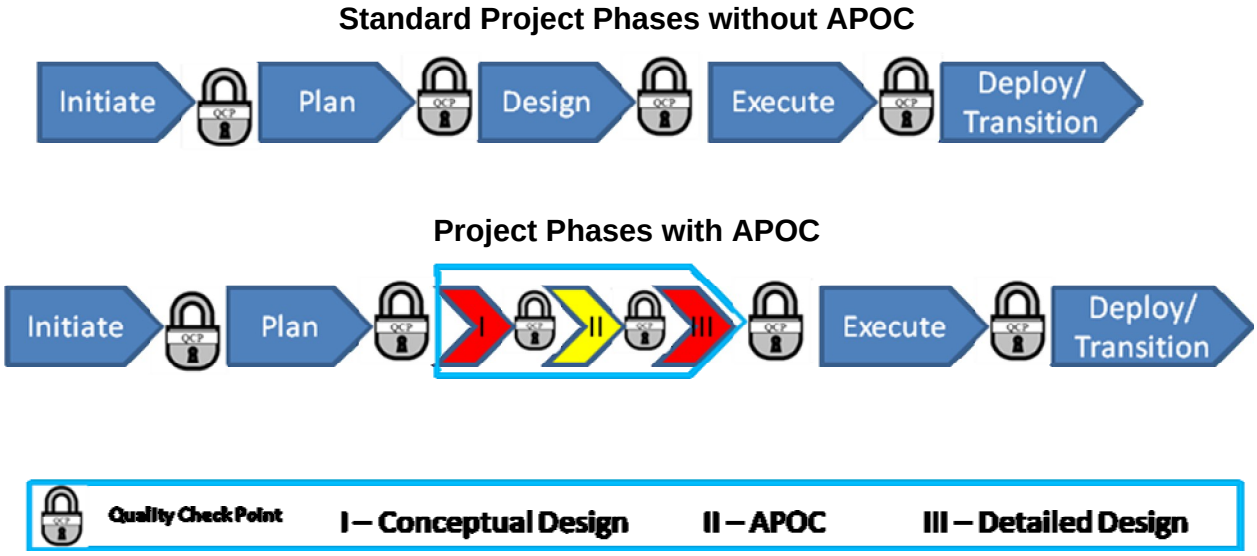
- Missing functionality
- Lack of Compliance
- Technological (Non-Functional) Issues
- Architecture misalignment
- Inattention to County DR, Backup/Archiving, Security, Platforms, Documentation
- Inattention to County Business Process, Data Integration, Administration

DTS's solution was the development of an Architectural Proof of Concept (APOC) approach.
The APOC starts with Risk Identification

- Technological
- Security
- Quality/Performance
- Functional (TBD)

The APOC then defines and executes "sub-project" prior to Execution phase of the overall Project. The APOC Sub-project has well-defined scope, schedule and resources; and begins with well-documented APOC Goals. The result of the APOC is a comprehensive Issue/Risk Log.

Figure 29 - APOC Phases



DTS employs the following specific approach to APOCs

- APOC is a distinct phase of the Project
  - After vendor(s) Identification AND before contract signing
- Scope of APOC is communicated to Vendor
  - Reviewing/Deploying/Testing of over TEN categories, including Security/Platform/Integration/Process/Network etc
- Contract/License details are finalized
- A Tiger-team Formed that deploys a Pilot instance
- Reviews/Deployments/Tests are conducted on the Pilot instance
- Issues/Risks are documented and Communicated
- Implementation solution(s) are identified and documented

DTS has found APOCs to be consistently very beneficial including the following results:

- Vendors on projects with APOCs were able better align their offering to meet County needs and architecture
- Projects with APOCs avoided contract and license challenges experienced elsewhere
- County able to verify vendor solution and identify GAP/Risk before contract execution
- County and vendors able to transform risks to issues; find solutions before project implementation and execution
- County and vendors able to build mutual understanding and trust
- Increasing knowledge of tasks, effort and cost and thereby enhancing project execution

The bottom line of APOCs has proven to be the ability of the DTS to use it a powerful leverage point to with vendors to ensure a successful project implementations.