Info Tech Talk

A Newsletter on Enabling Information Technologies by the IRMC E-Government and Technology Department

Are We Entering a Doctorless Era?

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The Internet offers one way for people to reduce their health care costs by allowing them to make changes for a healthier lifestyle and to better define their problem before going to a physician.

Introduction

With virtually all of your health care needs a click away on the Internet, are we far from making the health care profession obsolete? The answer this question is obviously "no." While the Internet can greatly enhance health care, it can not perform surgery or hands-on type care.

But what services can the Internet offer? There is very little administratively that the Internet cannot provide and current advances in technology are allowing the Internet to start enhancing the initial stages of clinical care. With the significant rise in health care costs, everyone is looking for ways to reduce their own health care costs. One way to reduce costs is to minimize the number and amount of interacting one does with the health care system. The Internet offers one way for people to reduce their health care costs by allowing them to make changes for a healthier lifestyle and to better define their problem before going to a physician. This article will provide a glimpse of the health care services available on the Internet.

Everything in health care from "a" to "z" can now be conducted over the Internet. This article will only look at health promotion, self-diagnosis, finding a physician or hospital and obtaining medications on the Internet.

Health Promotion

There are a variety of services available within this category ranging from dietary advice to healthy living. Typically one can find help with losing weight, eating right, improving the cardiovascular system, and stopping unhealthy activities such as smoking. Frequently the sites also offer general information or information on disease processes, current news issues or secondary effects that are associated with the unhealthy activities. Examples are the Phillip Morris Company's Health Issues and Naval Hospital Rota's Health Promotion websites. These sites can target very specific health issues such as smoking cessation, health tips for men or be very general such as the Discovery Health website.

Self-Diagnosis

Internet sites with self-diagnostic services range from free, to paying sites, to sites that offer to treat you after you have completed your self-diagnostic assessment. These sites require that symptoms be entered into a questionnaire and these are compared to a database which narrows down the possible medical conditions that may be causing the symptoms and then provide, in varying degrees of detail, initial treatments or addi-

Baker's Dozen: 13 Technologies for Successful E-Government

By Les Pang, Professor of Systems Management, Information Resources Management College

The E-Government Act of 2002 defines "electronic Government" (or e-Government) as "...the use by Government of web-based Internet applications and other information technologies, combined with processes that implement these technologies, to: (1) enhance the access to and delivery of Government information and services; or (2) bring about improvements in Government operations."

This article identifies and assesses 13 technologies that can be applied to support e-Government strategies. Each of these technologies is described and its actual and/or potential applications to Government operations are discussed.

1. Extensible Markup Language (XML)/Semantic Web/Agent Technology

Called the "language of 21st century commerce," XML is considered the universal grammar to build business languages which will allow business-to-business electronic processes to exchange and control information seamlessly and automatically. "This approach makes possible large-scale automation of electronic commerce, reduces IT system complexity, and will transform cyberspace. The implications to all organizations are nothing short of amazing," says Bruce Peat, co-founder of the XML/EDI Group.

As part of a Defense Logistics Agency's Research & Development program, companies with on-line electronic catalogs are eligible to participate in the Department of Defense's DoD EMALL. This is an Internet-based electronic mall, which allows military customers and other authorized government customers to search for and order items from government and commercial sources. The agency allows companies to display their products and services to the DoD EMALL customer. A customer can order items from the EMALL using a Government purchase card. This approach uses XML in an end-to-end business process.

Let us go a step beyond XML. Most web pages today are designed to be read by humans and not by computers for processing purposes. The Semantic Web will bring structure to the content of web pages and allows software agents to roam from page to page in order to execute complex tasks for users. The Semantic Web was conceived by Tim Berners-Lee, inventor of the web and the Hypertext Markup Language. The World Wide Web consortium (W3C) is working to improve, extend and standardize the system, and many languages, publications, tools and so on have already been developed. However, Semantic Web technologies are still very much in their infancies, and although the future of the project in general appears to be bright, there seems to be little agreement about the direction and attributes of the early Semantic Web.

Agents can parse Semantic Web pages to extract relevant information. These agents can understand and reason about information and use it to meet users' needs and provide assistance. The emerging symbiosis of knowledge about users' desires, preferences, and habits with information garnered from the Semantic Web results than that provided by existing agents.

This technology will impact the retrieval of government information. For example, it can be applied in the search for citizen services such as Veterans' Administration hospitals. An agent coming to a VA hospital's web page will know not just that the page has keywords such as "treatment, medicine, physical, therapy" (as might be encoded today) but also that a certain specialist works at a hospital on Mondays, Wednesdays and Fridays and that the script takes a date range in "yyyy-mm-dd" format and returns appointment times. And it will "know" all this without needing artificial intelligence. Instead these semantics were encoded into the web page when the hospital managers massaged it into shape using off-the-shelf software for writing Semantic Web pages.

U.S. Defense Advanced Research Projects Agency (DARPA) sponsors the DAML (DARPA Agent Markup Language) program. DAML is a markup language that is based on XML for describing objects and the relationships between objects, to express semantics, and to create a higher level of interoperability among web sites. DARPA is developing DAML as a technology with intelligence built into the language through the behaviors of agents, programs that can dynamically identify and comprehend sources of information, and interact with other agents in an autonomous fashion. DAML agents can be embedded in code and maintain awareness of their environment, but have the capacity to behave autonomously. They also have the capacity to "learn" from experience, so that they improve their behavior over time. DAML uses a number of different types of agents (such as information agents, event monitoring agents, and secure agents) for different purposes. DAML's semantic knowledge and autonomous behavior is expected to make it capable of processing large volumes of data much as a human being would process it. DAML includes a type of query language with a specialized ability to find and process relevant information - for example, finding related information on separate web sites and processing it into a comprehensive report.

Klischewski cited several examples in which Semantic Web can support e-Government: (1) citizen information service –

the display of relevant government data to a citizen, based on the context of that citizen (e.g., moving to a new location), (2) electronic agents – use of agents to compare information on different e-government web sites and monitoring the progress of an application, and (3) updates – checking for changes in an e-government web site such as new regulations and updated government employment information.

2. Web Services

Microsoft defines a Web Service as "a unit of application logic providing data and services to other applications. Applications access Web Services via ubiquitous web protocols and data formats such as HTTP, XML, and SOAP, with no need to worry about how each Web Service is implemented. Web Services combine the best aspects of component-based development and the web..."

Gartner reported the following existing government implementations of web services:

- The U.S. Department of Agriculture utilized Web Services to retrieve soil analysis data from separate sources and produce an integrated map based on soil conditions.
- The Colorado Department of Agriculture used Web Services to convert a system that required reports to be run by hand to one in which they can be immediately invoked.
- The National Environment Information Exchange Network, implemented by the U.S. Environment Protection Agency, utilizes Web Services to establish network nodes that initiate requests for information, process authorized queries, and send and receive the requested information in XML.
- The U.S. Geological Survey pilot tested Universal Description, Discovery and Integration (UDDI) to serve as a comprehensive directory of geospatial data.
- The Marche region in Italy is piloting Web Services for cattle registry.

Potential government applications of Web Services include:

- Homeland security (for example, integrating different databases on potential terrorists coming from various agencies)
- Searching for government services
- Integration of front-end (citizen-facing) systems with back-end systems (internal operations) including legacy systems through the application of Web Services.

3. Wireless/Mobile Technologies

Mobile technologies will increase in number -- expect more laptops, personal digital assistants and Tablet PCs — and a hybrid that may evolve from all three form factors. According to Gartner, one should expect to see more networks based on 802.11, Bluetooth, and emerging 3G (3rd Generation) standards.

Governments will look increasingly to "hot spot"-type wireless technologies to provide Internet access in public areas as well as in impoverished neighborhoods. Other potential applications include the following.

- Use of wireless technologies in government- and military-funded educational institutions.
- Application of wireless connectivity for tours of historic places, memorials and museums.
- Field applications such as the electronic warrior and warehouse management.
- Rapid, coordinated response to public-safety threats by allowing greater communication between public safety agencies.
- Intelligent transportation systems (ITS) that rely on wireless communications to perform services such as traveler information, electronic toll collection, automated vehicle location, Mayday alerts, truck rollover warning, and cooperative collision avoidance systems. These functions will benefit vehicles from public transit to rescue operators and general commuters. Safeguarding of the U.S. -- the FBI, for example, is at work on the National Crime Information Center 2000 (NCIC 2000), an online information center to be accessible to all law enforcement communities via wireless systems.

4. Web Portals

A web portal serves as a window to different services. It is a major starting web site for users when they get connected to the web or that users tend to visit as an anchor site. There are general portals such as Yahoo and Excite and specialized or niche portals such as Garden.com (for gardeners), Fool.com (for investors), and SearchNetworking.com (for network administrators). Typical services offered by commercial portal sites include a directory of web sites, a search tool, news, weather information, e-mail, stock quotes, phone and map information, and a community forum.

The Army Knowledge Online (AKO) portal combines many of the tools available both online and offline into a single source, accessible from anywhere in the world with an aim toward single sign-on capability. AKO provides Army information, breaking news, documents, Internet communication, and other functionalities. These channels can display news, web sites, links, weather, email, calculators and dictionaries. With AKO personal pages, the user can add whatever channels they prefer. Army organizations own and maintain community pages on the AKO portal that can be seen by all users. Each community page consists of several channels tailored to that community and acts as a resource for that organization. Also, AKO Instant Messenger (IM) allows users to directly chat with other AKO members.

Baker's Dozen: 13 Technologies for Successful E-Government (Cont.)

13 Technologies for Successful E-Government

1. XML/Semantic Web/Agent Technology
2. Web Services
3. Wireless/Mobile Technologies
4. Web Portals
5. Security Technologies (PKI and VPN)
6. Electronic Payment Systems
7. Smart Cards
8. Geographic Information Systems
9. Radio Frequency Identification Tags
10. Electronic Voting Technologies
11. Biometrics
12. Data Mining
13. Natural Language Interfaces/ Speech Recognition

[Virtual Private Networks] enables the government agency to cost-effectively provide secure private networking for multiple agencies across a common shared network - addressing the needs of different users while reducing wasteful spending.
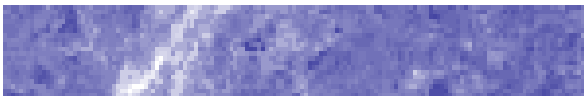
5. Security Technologies

Public-Key Infrastructure (PKI) is a system for generating and managing digital certificates that identify the holder of assigned public and private key pairs. This technology is highly useful for identification or authentication, encryption and digital signing. PKI deployment will help implement electronic signature laws, secure government-to-government transactions and support national smart card plans.

The E-Authentication Project is setting the standards for the Federal Government in the area of identity proofing of individuals and businesses based on risk of online services used. The initiative will focus on meeting the authentication business needs of the e-Government initiatives, building the necessary infrastructure to support common, unified processes and systems for government-wide use. This will help build the trust that must be an inherent part of every online exchange between citizens and the Government. In order to provide authentication services that can be used across government, the e-Authentication project must first identify the full range of authentication requirements for the electronic Government Initiatives and projects. The e-Authentication Initiative teamed with the Software Engineering Institute at Carnegie Mellon University to develop a risk-based approach to authentication requirements, called the e-Authentication Risk and Requirements Analysis, or e-RA. This approach identifies the risks associated with insufficient authentication of users, and it forms the basis for the definition of authentication requirements.

Virtual Private Networks (VPN) is a type of network that uses the Internet as the medium for transporting information. This network uses encryption and other security mechanisms to ensure that only authorized users can access the network and that the data cannot be intercepted.

According to Gartner, VPN enables the government agency to cost-effectively provide secure private networking for multiple agencies across a common shared network - addressing the needs of different users while reducing wasteful spending. It extends the reach of enterprise-wide applications to mobile workers, telecommuters, partners and customers. By often using secure sockets layer (SSL) as the underlying security protocol, VPN allows for truly unrestricted remote access using the Internet for remote connectivity and the ubiquitous web browser as the primary client interface. For example, employees of agencies can gain remote access to the home network using tunneling mechanism. Potential applications of VPN in government include:

● Provides access to extranet applications maintained by individual agencies,

- Addresses the needs of "dial-in" users – for example, some agencies publish applications directly into the VPN (e.g., for doctors and school inspectors), and
- E-mail distribution via a VPN system.

6. Electronic Payment Systems

Electronic payment systems can improve government operational efficiency particularly for agencies involved in quasi-commercial transactions such as the Post Office, the Smithsonian Institute, and the Government Printing Office. Internal Revenue Service has utilized these payment systems in dealing with revenue collection (i.e., e-Filing).

DoD Wide Area Work Flow Receipt and Acceptance (WAWF-RA) is a business solution in which authorized Government vendors and DoD personnel can gain access to the documents required for a payment action in a "paperless" environment. This technology allows vendors and authorized DoD personnel to generate, capture, and process receipt and payment-related documentation via interactive web-based applications. Authorized DoD users are notified of pending actions and are presented with a collection of documents required to process the contracting or financial action. When the payment system is capable of receiving EDI transactions, the WAWF-RA system will send the appropriate EDI transaction sets.

7. Smart Cards

A smart card is a small electronic device about the size of a credit card that contains electronic memory and often an embedded integrated circuit. Smart cards are used for a variety of purposes, including storing a patient's medical records, storing digital cash, and generating network IDs. One popular use of smart cards is to serve as an access authentication mechanism. They are often used as a replacement for paper ID cards and supports employee electronic signatures. In addition, it allows citizens to perform secure and convenient electronic transactions over the web.

The Department of Defense's Common Access Card is based on smart card technology. It combines public-key infrastructure technology for network security purposes and personal identification information. The cards will become the department-wide identification card to be used for electronic commerce, access to facilities or networks, creation of digital signatures for e-mail and storing encryption information. In addition, the cards eventually could include such data as medical and dental information. All of the Department's active duty, reserve, civilians and select contractors are required to use the card.

The cards hold 32K of memory, 13K of which will be set aside for digital certificates and another 7K for use as each service sees fit. Although the cards will contain some personal information, such as name, rank, serial number and blood type for military personnel, DoD might limit how much information is placed on the cards.

8. Geographic Information Systems (GIS)

A GIS combines layers of information about a physical location to give you a better understanding of that location. GIS allows users to view, understand, question, interpret, and visualize data in ways simply not possible in the rows and columns of a table or spreadsheet.

Envirofacts serves as the single point of access to select Environmental Protection Agency (EPA) environmental data. This website provides access to several EPA databases to provide information about environmental activities that may affect air, water, and land anywhere in the United States. With Envirofacts, a user can learn more about these environmental activities in their area or can generate maps of environmental information. A user can retrieve information pertaining to a specific area by entering a ZIP code, city and state, or county and state. If more in-depth information about a particular subject area is needed, one may select from a list of available topics, which includes waste, water, toxics, air, radiation, and land. There is also an advanced capabilities option that goes directly to the queries, maps, or a reports feature.

The Military Traffic Management Command Transportation Engineering Agency (MTMCTEA) developed the Intelligent Road & Rail Information Server (IRRIS). IRRIS is a secure web-accessible GIS that combines static and real-time transportation information into one simple mapping interface. In the year after September 11, government agencies engaged in U.S. military and Homeland Security operations acted to expand IRRIS' capabilities to meet changing needs. During this period, IRRIS has evolved to become a single source of transportation logistics and real-time tracking information. Currently, IRRIS accesses more than 140 different data layers, including a Homeland Security database that is now under development. These data layers include items, such as the location of hospitals, roads, bridges, railroads, waterways, and traffic and weather incidents. The IRRIS database contains one terabyte of data and is accessible by about 500 military users at any given time.

9. Radio Frequency Identification (RFID) Technology

RFID tags or e-tags allow an object to be tracked throughout the supply chain. Although RFID tags are likely to have the

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most impact in areas like logistics and defense, there may be implications for the government in other areas such as national currencies such as embedding RFID tags in notes to prevent forgery.

The DoD is expanding its use of RFID tags to track the movement and location of supplies as well as identify particular shipments. Individuals can place scanning devices in storage facilities or air bases to monitor the coming and going of tagged supplies and relay the information to computers that trace the path of each object. A person could determine the location of their supplies using a personal computer attached to the RFID network.

The government's use of the technology has advanced more quickly than the commercial sector. The DoD set up its RFID system, named the Total Asset Visibility (TAV) network after logistical difficulties arose during the shipment of supplies to troops in the Gulf War. The military has already used the system to coordinate the shipment of supplies to troops in Somalia and the Balkans. It is likely that the government is using the system to help ship supplies to troops now being deployed in the Middle East in preparation for a war with Iraq.

TAV network is the largest RFID network in the world in terms of geographic scope. The military has tagged more than 270,000 cargo containers and placed readers in about 400 locations in 40 countries including sea ports, military bases and rail yards in Asia, Europe, the United States and the Middle East.

10. Electronic Voting Technologies

The Help America Vote Act requires States to eliminate and replace the hanging-chad-prone punch-card machines and mechanical-lever machines by 2004. All States must have a centralized voter database by 2006 (except North Dakota, which does not require voter registration). Trust frameworks built by government and financial communities will facilitate secure, Internet-based voting by 2010, with at least 25 percent of the vote in the 2012 presidential election cast over Internet-linked voting machines.

Internet voting involves voters making their choices online. It is often done using a general purpose personal computer rather than a custom-designed voting machine. Results are not accumulated at the polling place but are sent to the tabulating computer when cast. Results (ballots or counts) are not

sent over a direct modem connection or physically transported to the central tabulator, but are sent over the Internet. Those features make Internet voting a promising technology in some ways but pose special challenges for ensuring authentication, secrecy, and security in the voting process. The present use of Internet voting is currently limited to demonstration projects. For the November 2000 election, voters in several counties in California cast nonbinding votes online, from online voting machines placed in central locations. In the same election, 84 overseas military personnel cast their actual votes via the Internet through a small pilot project run by the Federal Voter Assistance Program.

11. Biometrics

Biometrics involves the use of personal characteristics as a form of identification. These characteristics include finger or hand scans, handwriting, keyboard ballistics (a technique that identifies users based on their typing rhythms), iris scans, facial recognition, and other systems.

Security in the United States and demand for greater safety in the rest of the world will speed up the acceptance of biometrics. Face recognition at airports and borders and fingerprint recognition are associated with the use of smart identity cards. Iris and retinal scans are used by certain government facilities.

E-Government applications involving biometrics include the following:

●   State health and human services agencies and motor vehicle administrations are turning to fingerprint biometrics to reduce fraud and benefits duplication, which will all lead to reduced costs. Present usage features fingerprint registration at the time of benefits or license applications. The requirement for fingerprint registration can deter certain fraudulent applications. Real-time fingerprint scanning to discourage trafficking in valid benefits credentials is the next step, but will require infrastructure changes.

●   The State Department plans to develop "intelligent" passports that will carry facial images with biometric data on advanced computer chips. The department will adopt a standard approved by the International Civil Aviation Organization which selected facial biometrics as the identification tool and high-capacity, contactless chips as the storage device. These chips transmit data via low-power radio frequency, rather than direct contact with a reader device. The State Department called for minimum chip capacity of 64K, double the 32K

minimum designated by ICAO. The department estimates that a single facial biometric image would take up 12K. The chips also would contain biodata and other information secured by digital signatures. While the State Department plans to use facial recognition, the Homeland Security Department's entry-exit biometrics system will store two fingerprint images and a digital photograph of visitors to the United States in databases at consular offices and points of entry nationwide.

12. Data Mining

Data mining techniques can be used to create predictive models to identify often unexpected trends, associations and deviations. These techniques have been used to support risk management and fraud prevention in insurance underwriting as well as for pricing, promotions and replenishment scheduling. E-Government data mining efforts include the following:

- The United States General Auditing Office (GAO) reported that their data mining efforts have led to the identification of fraud, waste and abuse with Department of Defense purchase and travel card programs. Using this technology, GAO found numerous prohibited abusive or questionable purchases of goods and services from vendors such as restaurants, grocery stores, casinos, toy stores, clothing or luggage stores, electronics stores, gentlemen's club, legalized brothels, automobile dealers and gasoline service stations.

- Executive Information and Decision Support (EI/DS) Program Office of the Military Health System (MHS) utilizes data mining tools for extracting and integrating critical data for analysis to help empower the effective management of military healthcare operations. The EI/DS Program Office provides decision support information and tools used by MHS managers, clinicians, and analysts to manage the business of healthcare within the MHS, which serves a worldwide population of 8.4 million active-duty and retired members of the uniformed services, their families and survivors.

13. Natural Language Interfaces/Speech Recognition

Natural Language Search involves computerized comprehension of the structure and meaning of human languages, thus allowing users to interact with the computer using natural sentences. Natural language searches use this technology for information retrieval. This technology will allow "IT-illiterate" citizens to search for relevant content on government portals. Coupled with speech recognition described below, it will give greater use and acceptance of e-government services.

Speech recognition systems interpret human speech and translate it into text or commands. Its importance is in helping the disabled use e-government services through their desktops. Governments may subsidize the deployment of this technology as part of their accessibility initiatives.

Both technologies, natural language search and speech recognition systems, support Section 508 which states each Federal agency shall ensure that their electronic and information technologies allow individuals with disabilities who are members of the public or Federal employees to have equal access to and use of information and data provided by the government.

Conclusion

These technologies are not without its issues and challenges. A sampling of the issues and challenges include:

- Access Issues – One key access concern is called the "digital divide" -- referring to the gap between those who can effectively use new information and communication tools, such as the Internet, and those who cannot due to economic or personal reasons.
- Technical Issues – bandwidth issues, reliability of networks, performance issues, and interoperability problems.
- Human Factors – user acceptance of new technologies, interface problems, cultural changes, and training requirements.
- Resource Issues – financial and manpower limitations of a government agency.
- Incomplete policy and planning – having the vision and motivation to achieve a successful e-government program.
- Insufficient partnerships – establishing collaborative relations among key customers and partners.
- Lack of management or citizen support – executive and customer commitment and ownership of the e-government initiative is essential.

The key to a successful e-government strategy is not only the implementation of innovative technologies but involves overcoming the important issues and challenges such as those listed above.

References: Gartner Group, Federal Computer Week, University of Maryland, Klischewski, University of Hamburg, whatis.com, General Accounting office, Reuters, RF Design, Microsoft, Info Tech Talk, and others.

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(Cont.)

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tional information required. The additional information may require that laboratory, radiological, or special medical tests be performed. Usually when additional information is required a recommendation to consult with a health care provider is also suggested. Frequently self-diagnostic sites can be found on the Internet Service provider home page, such as America Online. Examples of a typical self-diagnosis site can be found at "Your Diagnosis" and a site that will provide treatment after a self-diagnosis assessment can be found at "24 Doctor."

While these [health care] websites can reduce health care costs and make people healthier, they also raise serious concerns...

Finding a Physician

There are a multitude of sites for finding a physician. They range from global sites of all physicians to specialty physicians. The general sites typically provide information for finding any type of physician nationally to locally while specialty sites provide information on a specific medical specialty such as plastic surgery. Many of the sites also offer information on different procedures, current news events in medicine and links to other similar sites. Frequently these sites are sponsored by hospitals, but there are also regional and national sites that require the user to narrow the search down to regional or local information.

Finding a Hospital

Currently most hospitals have their own website providing information on services they offer, general health information and links to health related websites. These types of sites require that the name of the hospital be known. However, if the name of a local hospital is not known then a national or regional hospital site can be used to find a local hospital. For military personnel, frequently "Newcomers" websites will provide information on local military medical treatment facilities. These sites will sometimes also offer information related to the quality of care offered at the hospitals similar to a report card on the hospitals.

Obtaining Prescriptions

Obtaining prescription online is one of the fastest growing industries as well as one of the most controversial. Information about drugs is readily available from multiple sources.

A typical website, such as "Healthtouch," will have the same information available to physicians available for the general public. They provide names, both name brand and generic, indications for their use, contraindications, dosages, and side effects. Websites for buying drugs over the Internet usually divide the drugs into prescription and non-prescription drugs. Many sites will only sell over the counter non-prescription drugs, this limits their liability for misuse of drugs. Sites that sell prescription drugs usually require that a physician write a prescription and that the prescription be provided to the Website prior to them filling orders. However, sites are being established that have their own physicians and they will write the prescription for the purchaser, like "Online Pharmacy Medications." These sites usually have restrictions on the types of drugs for which they will provide this service. The purchase of drugs online has grown so large that the Food and Drug Administration has established a website to help people to properly use the online purchase of drugs services being offered.

Conclusion

There is a wealth of information available on the Internet to educate people on diseases, healthy lifestyles, correcting unhealthy habits, self-diagnostics, finding a physician or hospital and obtaining medications. While these websites can reduce health care costs and make people healthier, they also raise serious concerns. These concerns include the possibility that people will put off seeing a health care provider until it will be more expensive to treat them or they could possibly die; ensuring the privacy of personal medical information that could be compromised accidentally or intentionally; how will we handle someone who misdiagnosis their illness; what if the website is not kept current and has inaccurate information; and how can the quality of the medications being provided be monitored.

The Internet is transforming the health care system into a virtual system in many respects; however, many illnesses require early and aggressive intervention by health care providers, to include surgery, which cannot be accomplished via the Internet, yet. The Internet is getting closer to creating a "doctorless" health care system, especially with innovations like telemedicine where people can interact with a physician on the Internet to include visual examinations, but we are not quite there yet.

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Transforming Financial Management in the Military

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Introduction

The spectacular innovations and advances in information technology that have grown and expanded exponentially over the past two decades have led to major transformations in both government and private sectors. In the government sector, reinventing government became the popular mantra of the Clinton administration simultaneous with the birth of the much-touted so called "information highway."

The organizations within the Department of Defense (DoD) charged with financial management and the provision of pay services began a period of significant transformation during this period as well, by adopting and applying new technologies to the existing processes for finance support. Information technology advances have had a profound impact on internal finance operations within DoD finance organizations both in peacetime support and in support of combat operations forward.

This article discusses some of the significant changes made in the financial management community with respect to the use of the Internet, and specifically demonstrates the advantages of these changes in supporting United States forces in recent and current conflicts such as Operation Enduring Freedom (Afghanistan) and Operation Iraqi Freedom (Iraq).

Background

Finance services within the military establishment has traditionally been delivered primarily via the individual and unique channels of the separate services (Army, Air Force, Navy, and Marines). This produced numerous redundant systems and procedures within the larger DoD. A recognition of the lack of efficiency of these separate stovepipe organizations led executives in the 1980's to creation of the Defense Finance and Accounting Service (DFAS). The Defense Finance and Accounting Service is a competitive and transforming organization whose leaders set out to become the single finance service provider supporting DoD.

Thomas Bloom, the DFAS Director, underscores the organization's vision by stating "the DFAS team will conquer the challenges of tomorrow by transforming DFAS today. The

men and women of America's armed forces, decision-makers, throughout our government and our defense industry partners deserve the very best value in finance and accounting services. DFAS people will not be satisfied with anything else." Delivering the best includes streamlining procedures and ease of access to the "customer" intermediate service providers, the individual service component finance and accounting personnel, and the end users as well.

In dealing with finance services, accuracy of input and timeliness of transaction are key measures of success. These measures apply whether dealing with payments to vendors or with the processing of military pay and entitlement changes affecting the morale and welfare of military personnel and their families. To improve performance and reduce administrative costs, DFAS embraced electronic commerce and made marked progress toward paperless transaction process-

ing. Using the power of the World Wide Web, DFAS provided the central portal connecting a far ranging network of stakeholder organizations within the greater governmental financial community. Voluminous individual service regulations, practically impossible at the end user level to find, apply, or update, were consolidated and more importantly, posted in the DFAS electronic library for easy access. Practitioners within the DoD financial community felt liberated and empowered as the answers to complex finance and accounting questions became easier to locate through web site navigation. Multi-volume regulations like the DoD Financial Management Regulation were now only seconds away. In conjunction with access to the full repository of DoD Forms, finance personnel were suddenly able to concentrate on the quality of service provided rather than being consumed with the search for a particular regulation and form.

Realizing the need for both intermediate and end-user finance support, DFAS included a number of training and self-help materials within its electronic references. Complicated tasks such as reading and interpreting the Leave and Earnings Statement, could be explained via the internet to anyone with access. Finance units on installations both in the continental United States and abroad began to develop local web sites complementing, and taking advantage of, the synergies of the DFAS network. Quick access to military pay tables and calculator programs for the various housing rates were linked to web sites throughout the financial management community. Links from web sites such as that of the 266th Finance Command in Germany, allow soldiers to receive the latest information on the many and varied deployment entitlements immediately without having to wait on periodic briefings or reliance on a submitted paper pay inquiry.

Current And Future Use Of Information Systems

Two issues deserve special attention, first, the emergence of the DFAS "myPay" system, and second, the use of the new financial information systems and Internet capabilities for

finance support in current military operations. To further empower military personnel to access their individual military pay accounts and effect changes on their own to those accounts, DFAS developed a web-based user interface program named "myPay."

This portal represents the most significant step to date in reducing the bureaucracy within the finance support system, and provides near real time access to pay information. As the options available to military personnel expand on the myPay system, there is ever increasing empowerment. Even in austere deployed environments, soldiers are able to access their pay accounts once basic communication capabilities are established. Indeed this year, DFAS announced that the W-2 statements necessary for military personnel filing federal tax returns, would be available online via the myPay system. Eventual reductions in the paper requirement to print W-2 statements and Leave and Earnings Statements as a result of myPay capabilities and increased participation will drastically reduce service cost and decrease the distribution delays so often a part of the previous system.

The combination of improved tactical communications and developments in the DFAS system architecture has also paid big dividends for finance soldiers deployed forward in support of combat operations. Digital senders, Internet access, and new regulatory flexibility allowing less paper copy transaction substantiation have combined to decrease the number of finance personnel necessary forward supporting combat operations. There have been phenomenal results.

A six-man Army finance team located in Uzbekistan during the early phases of Operations Enduring Freedom conducted a volume of finance support transactions normally expected of almost a finance battalion. This was only possible due to the use of digital data transmission devices and Internet connectivity. A slide from an unclassified briefing chart of the 126th Finance Battalion summarizes the significant level of finance support handled by a very small team of finance spe-

Transforming Financial Management in the Military (Cont.)

cialists *(as shown on the right).*

Conclusion

Advances in the application of information technology and new communications platforms have produced astonishing results in the DoD financial management community. These results have led to increased efficiency, reduced cost, and more accurate and timely response to external "customers" and internal co-workers in the financial management commu-nity. The increased efficiencies, and growing Internet access for military personnel, empower end users of pay account information to interact directly with the pay system. Consoli-dation of older financial systems, which were legacies of the era of separate service financial organization independence, has created a more interoperable network. With maturation of new systems such as DFAS's myPay, and further advances in information technology, America can look forward to a reduction in cost with simultaneous increase in service and customer satisfaction in the days to come.

126th FINANCE OPERATIONS

MISSION: Provide Contracting, Commercial Vendor Services, Disbursing, and Military Pay Support to Soldiers, Units, and Civilians in the AOR.

Operations Through 22 FEB 02:

Contracts Paid: 362 for $2,089,283.93
Paying Agents Advanced: 86 for $3,747,287.22
Casual Pays: 1800 for $68,527.44
Checks Cashed: 1027 for $114,055.00
Currency Conversions: 44 for $1,668,955.50

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