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Info Tech Talk

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

Leveraging Taxonomy Architectures in Web Portal Design and Searching

By Brenda Hill, Technical Information Specialist,
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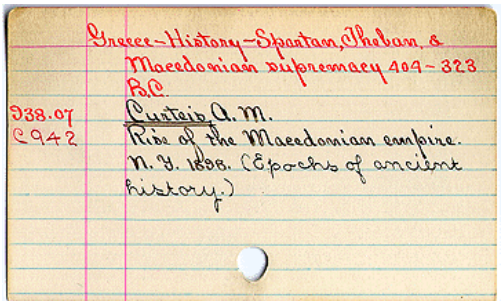
Inside this issue:

Without the use of taxonomies, searching for information...would be much like searching the web using a simple search. The result would be a combination of too much information and false drops.

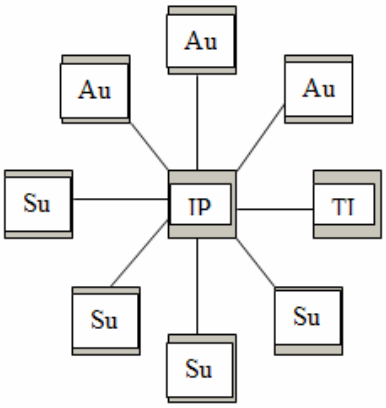
Definition

Effective retrieval of information is dependent on an information architecture based with a strong taxonomy structure. Jean Graef of the Montague Institute defines taxonomy as a "structure that provides a way of classifying things - living organisms, products, books - into a series of hierarchical groups to make them easier to identify, study, or locate."

There are four types of taxonomies: faceted, flat, hierarchical, and networked (plex structure). We see some of these structures in use when we search a library catalog or websites. The records in library catalogs use metadata for describing the items housed in the library. Metadata is a faceted taxonomy. Metadata is simply data about data. A perfect library example is the catalog card.

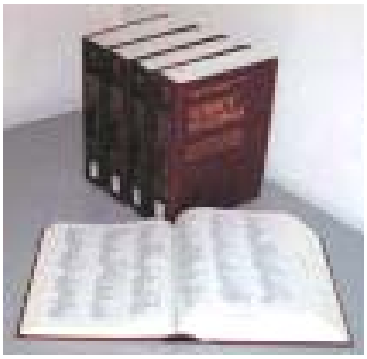


The data on the card gives us information about another piece of information, i.e. a book. In the library catalog model, the data access points (facets) to locate information are author, subject, and title. A visual representation of this model would look like this:



Faceted taxonomy architecture looks like a star. Each node in the star structure is associated with the object in the center.

The library model also uses a hierarchical taxonomy structure for the subject metadata facet. The Library of Congress Subject



Headings (LCSH) and the Library of Congress Classification (LC Class) system are used in academic libraries.

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Leveraging Taxonomy Architectures (cont.)

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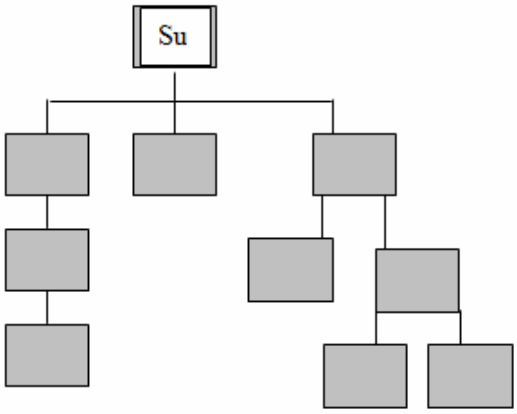
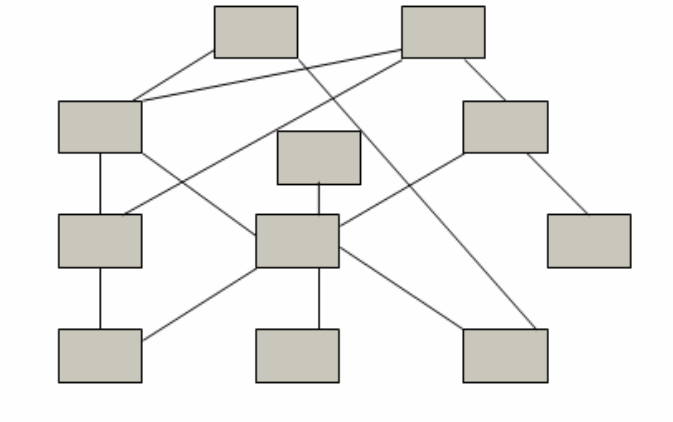
A hierarchical taxonomy is represented as a tree architecture. The tree consists of nodes and links. The relationships become 'associations' with meaning. Meanings in a hierarchy are fairly limited in scope – group membership, type. In a hierarchical taxonomy, a node can have only one parent.



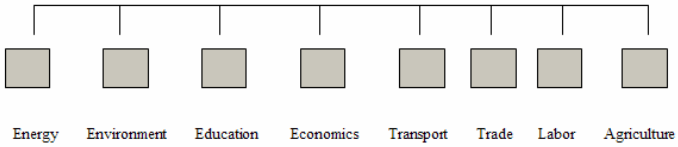
The Yahoo website (which was developed by librarians) also uses a hierarchical taxonomy structure, called a thesaurus. Yahoo uses a pre-coordinate structure:

An example of a network taxonomy can be viewed at "The Brain." Each node on the network can link to any number of other nodes on the network without being locked into a predetermined hierarchical relationship. A visual representation of a network taxonomy is as follows:



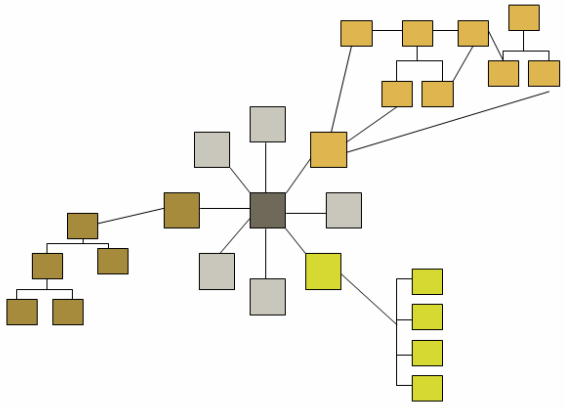
A network taxonomy is a plex architecture. Each node can have more than one parent. Any item in a plex structure can be linked to any other item. In plex structures, links can be meaningful and different.

The simplest of all taxonomy structures is the index. Books, magazines, newspapers and websites are indexed. A visual representation of a subject index would look like the following:



An example of a web site index can be found at The World Bank Catalog web site.

The four taxonomy structures can and usually are used together to provide a robust information architecture. An enterprise information architecture that uses flat, faceted, hierarchical and plex taxonomies would look like the following:



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Application

Human element

Each one of the taxonomy structures, individually and collectively, can be leveraged to effectively organize information in an enterprise web portal for effectively locating information by browsing or searching. Studies have shown that employees spend approximately 15% to 35% of their time looking for information, and that effort results in success 50% of the time or less. (Feldman 2004) Also, 40% of corporate users reported that they cannot find the information they need to do their jobs on their intranets. (Feldman 2004)

A good taxonomy structure allows organizations to effectively control their information assets. Organizations need to control their information assets for two reasons. First, the information must be made technologically accessible and useful for human manipulation and repackaging for the purpose of leveraging the resulting knowledge that contributes to the organization's strategy and mission. Second, it is imperative for an organization to comply with laws, regulations, and standards put forth by governing bodies. In the United States, government organizations must comply with the Sarbanes-Oxley Act, the U.S. Dept. of Defense 5015.2 standard for records management, and the USA Patriot Act.

To reduce the amount of time wasted looking for enterprise data, and to gain control of intellectual property and company records, organizations should begin by assigning an integrated product team (IPT) consisting of knowledge workers, information scientists and computer scientists, and subject matter experts from core business areas of the enterprise to the task of developing an enterprise wide taxonomy. Gartner, Inc. identifies nine best practices for taxonomy creation:

- Conduct a content audit
- Reuse existing taxonomies
- Have the right expertise on the taxonomy project
- Use existing content, document, and portal implementation teams
- Use a mix of human and machine classifications
- Use thesauri to map internal and external terms
- Keep taxonomy structures simple
- Buy and adapt commercial taxonomies where they exist
- Commit resources for ongoing taxonomy maintenance (Logan, Knox 2003)

Technology element

In addition to employing a human element to the development and maintenance of an enterprise taxonomy architecture, technological tools can be employed to maintain and update the taxonomy. Tools such as Teragram, Inxight, and Entrieva *(Editor's Note: No endorsement of these products is expressed or implied)* allow for creating, maintaining, and updating taxonomies and for the auto-categorization of electronic documents. At the point a document is submitted to the software, the software scans the content of the document and places the document within a segment of the taxonomy that is representative of the content in the document. Theoretically, a human never has to review the content sorting, however, neglecting to review the accuracy of the artificial intelligence used for auto-categorization could result in erroneous content classification. Also, language constantly changes, therefore, taxonomy structures will change accordingly.

Process element

Some taxonomy vendors have commercially available taxonomies that can be used as is or modified to fit the environment in which the software would be used. There are also a number of public domain taxonomies, some of which can be found at Taxonomy Warehouse. The American Productivity & Quality Center uses the Process Classification Framework (PCF), which is an universal business process taxonomy currently used by PriceWaterhouseCoopers, Ensco, Solvay Pharmaceuticals, Ford Motor Company, and SchlumbergerSema. (Caldwell 2003) Regardless of the origin of the taxonomy to be applied to an organization's information architecture, whether it is built in-house or a modified commercial version, the taxonomy must be made relevant to the employees of the organization. The taxonomy must also be linked with a search interface. A good example of taxonomies that are linked to search interfaces are Yahoo, library catalogs, and taxonomy building tools that also have a search interface, i.e. Endeca.

Constant human involvement in the process of taxonomy building and maintenance, with the aid of technology and the leverage of commercial best practices should ensure successful enterprise content management and efficient content search and retrieval.

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The Conflict Between Software Development and Funding Cycles

By Professor Russell Mattern

We spend countless hours in the classroom engaged in discussions centered on the development and delivery of software containing the specific capabilities requested by the end-user. The user may be a warfighter or someone serving in a support role. In an effort to provide functionality sooner, we encourage an evolutionary acquisition strategy using a spiral or incremental development process versus the older waterfall strategy (Roberts, 2003). Why?--because software delivered in smaller 'chunks' gets functionality to the user quicker and provides a foundation to build upon. To help us along that path, we refer to Ed Yourdon's book, "Death March" where he discusses the concept of software triage. Developers and users work together to sort through software requirements and place them into the bins labeled 'must dos', 'should dos' and 'could dos' (Yourdon, 2003). Though greatly simplified, this concept helps reduce requirements creep, a major killer of software programs (Standish Group, 1994). After covering the above material and many other aspects of the software acquisition process, we have hopefully convinced another group of information technology (IT) professionals that there are better ways to produce software (Mosemann, 2002). Life is good!

Life is good -- that is until we discuss how the Department resources major software development efforts. It's at this point we get the stares of disbelief that often grow into frustration. Professor credibility plummets, spirits dampen and the distant drumming of disbelief drifts inland as pervasively as fog from the Chesapeake, cloaking us in the Twilight Zone of "You can't get there from here!

What has brought this group of educated students, motivated to produce functional software to their knees? Meet PPBE the Planning, Programming, Budgeting, and Execution process, the Department's means of ensuring that dollars spent on defense programs support the National Military Strategy and National Security Strategy (Roberts, 2003). Born back in the 1960's as the PPBS when Robert McNamara was the Secretary of Defense, the Planning, Programming and Budgeting System was supposed to link weapon systems and supporting systems to the National Security Strategy. It was so successful that it was institutionalized within the Department, receiving an update just recently in the form of the PPBE process. The PPBE process touts a two-year Program Objective Memorandum (POM) cycle, institutes metrics and focuses on execution and performance in the "off years" (Roberts, 2003).

A funding line must be secured through the PPBE process to ensure funding for major new software or software-intensive systems. This can be achieved by including it in the latest POM cycle. This can be devilishly difficult to accomplish due to intense competition from other programs. Even if one is successful getting into the POM, it can take two-to-three years to receive the first dollar of funding. Looking back to the early days of the PPBS, it's easy to understand how software was overlooked in the two-year POM cycles. There just were not huge numbers of software intensive systems. The slow process puts us at risk of not being able to resource major software initiatives or software intensive weapon systems in a timely manner.

So here is the predicament we place our students in. On one hand, we convince them they must produce useable software in six, twelve or no more than eighteen-month increments. Taking longer can create devastating results. The original customer may have moved on leaving you to deliver software to someone who has not been part of the process or someone who now may have conflicting priorities. The program looses funding because it has taken too long or has been superseded by another. The last and most common occurrence is that the capabilities and requirements for the software have changed (Standish Group, 1994),

"The most remarkable finding was that getting low-functionality version of the product into the customer's hands at the earliest opportunity improves quality dramatically" (MacCormack, 2001). In all cases, time is the enemy of software.

Using the PPBE process as it currently stands there is a minimum two-year cycle and more realistically, a three to four year wait for funding . We are asking students to produce four to eight increments of software without resources in the time is takes to get the first dollar of funding,. Said another way, if the need for a software system arises today, it will take two to four years to receive funding for that project through the usual POM cycle. During that time, we have created the expectation that an increment of software should be produced every six months. You begin to understand the level of frustration when attempting to reconcile the software and funding cycles. It simply can't be done.

If time is the enemy of software, then the PPBE process is the enemy of time.

Being smart, dedicated and resourceful, government software development professionals have created a series of work-arounds. Let's look at a few. The primary tactic is to "rob Peter to pay Paul." It goes by other aliases such as, 'salami slicing' and 'taxing' other programs. But what happens when organizations use the work-arounds to compensate for the slow PPBE process?

First, all the 'taxed' programs have fewer funds to carry out development and sustainment. The effect is profound. Pro-

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Notes from the E-Gov Homeland Security and Information Assurance Conference

By Professor Les Pang

The following are highlights from key presentations given in E-Gov Institute's 2004 Homeland Security and Information Assurance Conferences held in Washington, D.C. from November 30 through December 2.

Jamie Gorelick, National Commission on Terrorist Attacks Upon the United States

As a commission member, she assisted in the preparation of "The 9/11 Commission Report" which stated that none of the measures adopted by the U.S. government from 1998 to 2001 disturbed or even delayed the progress of the al Qaeda plot.

There were four key failures:

◊ *Imagination* – No one imagined that a commercial jet would be used as a terrorist weapon.
◊ *Management* – The FAA maintained a small terrorist watch list while the State Department had a lengthy list. The FAA was unaware of the longer list. This is an example where agencies failed to pool their intelligence data.
◊ *Capabilities* - The CIA, NORAD, DoD and the FBI tried to solve the al Qaeda problem with the capabilities it had used in the last stages of the Cold War and its immediate aftermath. These capabilities were insufficient.
◊ *Policy* – Terrorism was not the overriding national security concern for the U.S. government under either the Clinton or the pre-9/11 Bush administration.

She presented the following recommendations:

◊ Name the enemy correctly.
◊ Separate out the enemy from the larger Moslem population.
◊ Use all of the tools in the toolbox – for example, show America's hopes and values to the rest of the world.
◊ Look at technical solutions such as biometric screening, data integration and covert capabilities.

She suggested the following strategies:

◊ Unify the intelligence community with a new National Intelligence Director.
◊ Establish a National Counterintelligence Center that supports multilevel analysis, joint planning and fosters a partnership between the public and private sector.
◊ Replace the current system of "need to know" by a system of "need to share."

George Tenet, Former Director, Central Intelligence Agency

Telecommunications is the lifeblood of intelligence. It is transformational but it can be an Achilles heel if the network is not protected from intrusion. Computers and phones are converging making information more accessible but less controllable.

Networks are built on a poor foundation of security. Trust is needed in these systems but new attacks (such as spam, phishing and viruses) against the networks require new protection and improved management. Networks are the weakest link in the customer supply chain. A new level of security needs to be built into the network and the telecommunications industry must lead the way. The Internet needs to evolve from the Wild West environment to one of governance and control.

Mr. Tenet stated that he was part of the revitalization of the CIA. After the downfall the Soviet bloc, the CIA decayed, but, under his watch, capabilities were rebuilt and there was growth in the agency.

Regarding 9/11, he stated that "the fight is a lot bigger." The West must recognize that many young men in Muslim countries have low incomes, are mostly unemployed and growing in numbers but have no place to go. There are beleaguered countries with weak borders that are terrorist breeding grounds. There are malnourished people, AIDS and other social ills that need to be addressed. Expect a new generation of terrorists if no action is taken.

Collected intelligence data needs to be shared. State and local police and local Homeland Security directors are "equals" when it comes to data. Washington D.C. is the fusion center of data. We need to:

◊ Support speedy, agile, lean management among the intelligence agencies,
◊ Avoid bureaucracy, and
◊ Be willing to take risks.

As part of the intelligence workforce, many unidentified men and women are taking risks every day to protect America.

On the Intelligence reform act, he said "I don't think you

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Notes from the E-Gov Homeland Security and Information Assurance Conference (Cont.)

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should separate the leader of this country's intelligence from a line agency. This person has to be leading men and women every day and taking risks."

He commented that the decline of foreign students in universities is "not good." The United States needs to establish long term relationships with these students to ensure a better future.

Amit Yoran, former Director, National Cyber Security Division, U.S. Dept. of Homeland Security (HLS)

In February 2003, the President approved the National Strategy to Secure Cyberspace which listed five priorities:

- ◊ A National Cyberspace Security Response System
- ◊ A National Cyberspace Security Threat and Vulnerability Reduction Program
- ◊ A National Security Awareness and Training Program
- ◊ Securing Governments' Cyberspace
- ◊ National Security and International Cyberspace Security Cooperation

Weak software computing systems and platforms lead to security vulnerability. We need to apply rigor to our platform to get away from the patch management cycle -- we should to implement "technology assurance" since we lack academic discipline on software. It takes 19 programming mistakes to produce 90% of the vulnerabilities.

Automated processes and techniques will force developers not to make flaws in the software. The HLS invested in research and development in software assurance and promoted the adoption of methods and codified tools to produce higher quality software. This is a strategic initiative since it will years to implement.

To improve the nation's response to security events, a national security response group needs to be formed. It will have operational authority and technical expertise (e.g. to decompile code). It will address events such as the recent blackout in the Northeast, Midwest and Canada where a computer failure caused the cascading outage.

In the next two to four years, there will be radical changes in the information assurance area due to emerging technologies such as XML, web services, and RFID. Also, it will be difficult to define the perimeter of enterprise network due to the use of PDA's and cell phones. The question is "where does our data come from?"

David Wennergren, Chief Information Officer, Department of the Navy – Transformation and Security in a Networked World

Mr. Wennergren discussed the origin of standards over time and the incredible pace of technology. He discussed the impact of RFID technology will have on supply systems and for inventory control. He defined the enterprise as consisting of networked people, organizations and technology.

He focused on network centric warfare and stated that NMCI is more than a network – it provides needed accessibility to everyone. Its advantages include backup capabilities, training opportunities and the chance to work with major vendors.

Knowledge management is needed since 70 percent of knowledge is found on people's C: drive. He quoted a line from a John Wayne movies: "Life is tough...it's tougher if you are stupid."

Portfolio management is necessary to reduce the number of applications to a manageable level.

The next big things are web services and enterprise portals. Web services will allow the greater sharing of data, the integration of common business practices and hands-off application-to-application integration. Portals will allow greater access to web-based application.

His office developed a self-assessment CD to identify system vulnerabilities in critical infrastructures.

Robert Housman, Fleishman-Hillard Government Relations

Mr. Housman cited four priority issues that need to be addressed:

- ◊ The U.S. is fighting "yesterday's war" today.
- ◊ Funding is based on formula block grants rather than on security risk (as a result, rural location may be getting a disproportionate amount of security funds).
- ◊ Infrastructure needs to be maintained in the support of security initiatives (e.g., must provide adjacent parking area to support border screening).
- ◊ Complacency at the upper management level.

He identified and discussed "hot sectors" that need more se-

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curity attention:

- ◊ Chemical plants
- ◊ Cybersecurity
- ◊ Supply chain
- ◊ Energy
- ◊ Bridges and tunnels
- ◊ Air travel and rail
- ◊ Food
- ◊ Insurance industry
- ◊ Government interoperability
- ◊ Communication systems
- ◊ Ports of entry
- ◊ Public health / disease monitoring
- ◊ Maritime
- ◊ Medical countermeasures

Luis Kun, Professor, IRMC and Chair, IEEE-USA Bioterrorism and Homeland Security Workgroup

Dr. Kun focused on the recent controversy regarding the lack of flu vaccine supplies in the United States. He noted a disconnect between policy/strategy and actual implementation. For example, he cited that the recent GAO report addressing the flu vaccine debacle has "the right words" but its recommendations have yet to be implemented.

Kun stated during his presentation: "Nobody is looking at the vaccines as a key asset within the Public Health Critical Infrastructure". "The flu is a cyclic/yearly event. We know when it happens, who is the population at risk and what is the solution, compared to a bioterrorist attack which can happen anywhere, at any time and with no idea of what the threat agent may be." "Through a risk analysis methodology public health officials could determine, the threats and the vulnerabilities of all key assets (including vaccines) and establish a plan that identifies, prioritizes and protects each asset as specified in HSPD 7."

The security community needs to have a proactive strategy and maintain global cooperation. A risk analysis is required as well as accountability in carrying out the necessary tasks.

He recommended the following strategies:

- ◊ Integrate the different sectors
- ◊ Reuse successful solutions in other sectors
- ◊ Foster international cooperation
- ◊ Support local connectivity with interoperability

Mary Ann Davidson, Chief Security Officer, Oracle

Ms. Davidson described a new meaning for "IT" – "infrastructure technology." This represents the backbone of multiple critical infrastructure sectors -- government, transportation, financial services, and telecommunications.

The network is now the battlefield. The Defense Department is shifting form "need to know" to "need to share."

It is difficult to quantify the ROI for security. Justification for security measures often are based on regulatory requirements.

Vendors consider "time to market" as the major objective. This results in customers having less-than-secure products. Developers lack the will and tools to do a good job.

Social costs of bad code are not reflected in the pricing of the software products. The damage can be 18 times the original cost of the software. Customers cannot re-bill the vendor for poor security.

Government can have an impact by providing regulations and by being a major market force.

We need a cultural change. Start with the vendor community:

- ◊ Provide improved accountability
- ◊ Build security into the software development life cycle
- ◊ Validate through the use of third parties
- ◊ Deliver secure products by default
- ◊ Work together (i.e., use constructive collusion)

She recommended that government:

- ◊ Leverage its significant market presence
- ◊ Specify reasonable security configurations
- ◊ Provide proven use cases
- ◊ Act as a star to steer by

Overall, the conference provided valuable insight both on the current status and direction of homeland security and information assurance.

Manager's Guide to RFID Technology (Part 2)

By Professor Les Pang

In the Fall 2004 issue, Part 1 covered the background of the technology, how it works, and applications. This part examines the pros and cons of the technology and closes with recommendations and conclusions.

Pro's and Cons

Advantages of RFID technology is summarized below:

- ◊ *Convenient* – tags are very small and can be easily placed on an item
- ◊ *Fast response time* – very high reading speed, typically less than a second
- ◊ *Resistant to harsh environment* – tags use a protective housing and are not susceptible to dirt or dampness
- ◊ *Many possible applications* – as shown in the previous article

Disadvantages include the following:

Cost – RFID tagging is much more expensive than bar coding. The present cost of a typical RFID tag is about $0.50 or higher. Most companies are not even close to deploying RFID on individual items because of cost constraints. For RFID to gain acceptance on a wider scale, the cost of an RFID tag will need to drop to about $0.05 experts say.

Security – Since RFID tags use radio waves, it is still subject to eavesdropping and jamming. However, because of its relatively short range, it is not a major "showstopper."

Privacy – As opposed to supply chain applications, the issue of privacy centers around the consumer and RFID technology. There is concern that RFID tags attached to consumer products remain operational after the purchase of the product. Although intended for short-distance use, these tags can be interrogated from great distances by someone with a high-gain antenna. Some claim that the contents of a house to be scanned at a distance. There is concern that the consumer may not being aware of a tag attached to a purchase, the consumer not being able to deactivate the tag, and the possibility of scanning the tag at a distance without the knowledge of the consumer. If the item was paid by credit card, theoretically it would be possible to link the items purchased to the consumer's identity.

Interoperability - Based interviews with senior executives from retailers, manufacturers and technology providers in the U.K., Europe, U.S. and Japan, infrastructure presented by the diverse and competing RFID vendors is often incompatible. From a global standpoint, many countries have not agreed on common standards, frequencies and power levels for RFID tags and readers.

For example, the industrial consortium for RFID technology, EPCglobal, envisioned the use a single Electronic Product Code (EPC) numbering scheme. However, the U.S. Department of Defense, one of the largest customers migrating to RFID technology, prefers using its "Unique ID" numbering system. Other industries are also seeking to use their own unique numbering systems to avoid changing their software systems.

Recommendations and Conclusions

RFID, as with many other technologies, proceeds through a maturation cycle. Currently, it is now being over-hyped as the solution to many problems but buyer beware! It may not prove to have a place within an organization's infrastructure, culture, or financial budget. Also, sufficient attention must be made toward the potential RFID issues identified in this article, namely, cost, security, privacy and interoperability.

Nonetheless, it is exciting to see the number of actual and potential ways this technology can help in improving and streamlining business processes. For example, RFID promises to bring a new level of usability and functionality to cell phones. By inserting an RFID reader into the unit, it will allow mobile services, ticketing, payment transactions, and exchanging business cards by simply touching two cell phones together. Employees can send real-time attendance logs and automate routine reporting tasks over the cellular network. It should be interesting times ahead for RFID technology!

The U.S. Department of Defense (DOD) has placed a strong mandate for its partners. The agency is requiring its approximately 40,000 suppliers to put passive RFID tags on pallets and cases, as well as on single items costing $5,000 or more, delivered to the DOD beginning Jan. 1, 2005.

The Conflict (cont.)

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gram contracts delineate what is to be accomplished for a set number of dollars during a period of performance. This in effect establishes 'burn rates' that reflect execution-year funding. Program changes, in the form of 'taxes,' can greatly upset this delicate balance. Despite what others may argue, it has always been my experience that less gets you less. In other words, almost any unilateral contract change costs the government the same or more. Norm Augustine has published many of his "Laws" in his book Augustine's Laws which takes humorous look into the acquisition process. The law that applies here states that the only thing more costly than stretching out a program is accelerating it and that is the mostly costly thing on earth (Augustine, 1997). As is the case with a 'tax', a contract may have to be "de-scoped" or have tasks (functionality) dropped. When that occurs, the contractor is allowed to charge a reasonable fee to comply with the Government's request (a unilateral change or adjustment.) Thus, when the government acts unilaterally to compensate for a levied 'tax', we often see less functionality delivered while the expenditure of dollars remains the same or nearly so.

But for the sake of argument, let's say the program was able to survive the taxation and continue on. What are the long-term effects? Most certainly, the functionality anticipated to be delivered this year may slip to the next. Contractor personnel who were scheduled to develop that functionality may be let go or diverted to other projects. This includes contractors who possessed hard-to-find skills and may be difficult to replace the following year. Another concern is the loss of corporate knowledge from the program. Depending upon the complexity of the project, it may take months of spin-up time to get new development team members up to speed. The literature supports that the addition new team members has the effect of slowing the project down because current members must divert precious development time to bring new members up to speed. This results in less functionality delivered in the year the tax was enacted and even less the following year, even if original funding is restored. According to Frederick Brooks, in his book the Mythical Man Month, "Adding manpower to a late software project makes it later" (Brooks, 1995).

Further, if a portion of the program is already in the sustainment phase, 'taxation' can impact current operations. As an example, consider the many software systems that employ a Help Desk. Cuts in sustainment funding result in fewer personnel responding to users' calls. Wait times increase. Customers become frustrated. Really frustrated customers get fed-up and find their own work-arounds. This results in more sustainment dollars being spent -- though out of someone else's budget. Drops in service level also result in reduced performance. When response times go up, less work is accomplished in a given period of time. What is the eventual cost of the additional time many users must spend to accomplish the same job? If this involves hundreds or thousands of users, costs can escalate quickly. We need to ask ourselves if the cost of the taxation has actually resulted in a higher overall cost to the government. The resultant cost in dollars is frustrating enough, but if we're talking about a real-time weapon targeting system, 'degraded performance' takes on more ominous implications.

Finally, another way to fund new starts is to kill an existing program and redirect its funds. No doubt there will be costs associated in closing out existing contracts and the ultimate customer/user may be forced to use an existing legacy system or resort to other means to accomplish their mission. Thus, we may need to accept a costlier means of accomplishing the mission under these circumstances. Though seemingly a drastic step, the overall result is that fewer programs are impacted versus the 'taxation' model and therefore, limits collateral effects. I have seldom seen this option used. It's a leadership decision that can affect careers and perceptions held by the end-users. That said, on 22 March 2004, the Department promulgated a policy letter on IT Portfolio Management, which may help address the scenario above. Simply put, any execution year budget cuts result in second and third order effects that that may not be readily obvious but deserve thoughtful consideration before action is taken. As an aside, in class, we encourage students to make use of firm fixed price (FFP), performance-based contracts (PBC) whenever feasible. This contracting vehicle has enjoyed strong support from a variety of organizations and experts (OFPP, 1998). Among other positive outcomes, FFP PBC contracting promotes contractor innovation and results in the government and the contractor sharing risk. Unfortunately, changing these types of contracts unilaterally is very costly. Time and materials contracts would be more change-friendly, but have fallen out of favor for a variety of reasons including many past abuses. Perhaps the most agile circumstance is where the development team is in-house, a 'government-only' development team perhaps. However, this is not the current trend and might well be the genesis of an article on its own.

I would proffer that if execution year 'taxes' are anticipated, the ultimate cost of using them to fund new starts results in more total dollars being spent and directly contributes to reduced program performance across the entire Department. So if we're taxing other programs to support a 'new start,' are we actually aware of and prepared to live with the consequences? Remember, the effects we're discussing here are the direct result of 'work-arounds' to the PPBE process.

What's needed is a resourcing system that's as agile as our software development model. Drawing from Joint Vision

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Leveraging Taxonomy Architectures (cont.)

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Conclusion

Taxonomies allow for the organization of content in a structured format for the purpose of browsing or searching. Without the use of taxonomies, searching for information in databases such as Gartner Research, EBSCOhost, ProQuest, etc, would be much like searching the web using a simple search. The result would be a combination of too much information and false drops. To be able to find the right information at the right time, the use of a mature taxonomy building product in conjunction with a content management product should allow for effective and efficient search and retrieval of enterprise data. These tools can be leveraged to organize and retrieve the information that is stored in databases, servers, and desktop machines that are used throughout an organization, if integrated with an enterprise wide portal.

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The Conflict (cont.)

(Continued from page 9)

2020 terminology, the software resourcing capability must get 'inside the decision loop' for new software starts. As one of my students posited, a one-year version of the PPBE process would begin to address the issue. Since we can't always anticipate the need for a new software start (which we can't) a better solution would be a resourcing system that is instantly available. Therefore, another possibility would be a standing fund that is fenced to protect it from poaching. A few of my students' organizations actually do maintain a separate reserve to fund unanticipated new starts. While not perfect, it deals with the reality that we don't know what we don't know. For now, establishing such funding has the potential to resource new software starts until they are included in the POM; thus causing the least amount of impact to existing programs. While some may choose to handle this issue by placing it in the 'too hard to do box' others may realize there has to be some alternative to PPBE process for software. It would certainly be an improvement over the current situation.

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