

## BIOGRAPHICAL INFORMATION

John A. Middlestead  
Manager, Data Integrity & Technology  
DTE Energy Gas / MichCon

### Specific Responsibilities

Joined MichCon in 1974. MichCon is now part of the DTE Energy family. Responsible for managing data integrity and technology for DTE Energy Gas - Engineering & Construction in addition to business unit strategic review, analysis and planning of technology across the enterprise as it relates to geospatial information and technology. Also responsible for the process ownership of MichCon's AM/FM/GIS system known as MARS (Mapping & Automated Recordkeeping System) and the three project teams involved in maintaining it. Technical (non-programming) support of CADD, MARS and interfacing application analysis, design, testing, conversion, QA/QC and training across the gas enterprise is also a responsibility.

### Past Experience

Began employment at MichCon as a Drafter in the Engineering Department, 1974-1975; Staff/Planning Analyst, Gas Operations 1976-1979; Systems Specialist, Gas Operations, 1980-1981; Project Analyst, Information Systems, 1981-1984; General Supervisor, MARS Operations, Distribution Operations, 1985-1990; Manager, MARS Operations, Distribution Operations 1990-1992; Manager, Distribution Drafting & Resource Planning, Gas Delivery, 1992-1995; Manager, Distribution Drafting & MARS Technical Services, Engineering & Construction, 1996-2001; Manager, Data Integrity & Technology, Engineering & Construction DTE Energy Gas, 2002 to present.

### Educational Information

BFA - Industrial Design, Michigan State University  
MBA - Managerial Accounting, Wayne State University

### Professional Memberships

Geospatial Information & Technology Association (GITA) formerly, AM/FM International

- Past Membership Chair (1986-1988)
- Annual Conference Principal (1991-1992)
- Annual Conference Chair (1993)
- AM/FM International Board - Secretary (1995-1996)
- Education Chair (1993-1996)
- AM/FM International Board - President Elect (1997)

- GITA Board - President (1998)
- GITA Board – Past President (1999)
- UtiliComms - Intergraph Utilities & Communications User Group
  - Chair (2003 - 2004)
- GITA Great Lakes Chapter - Treasurer
- IMAGIN (GIS association in Michigan)

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## Picking the Right Tool from the GeoStuff Holster Set

### ABSTRACT

In many respects the users of geospatial information have an abundance of technology on their GeoStuff holster set. Using the American “Western” gun holster as an analogy we have expanded the number of slots we can put our technology into. Today we have cell phones with cameras and maps, MDT’s, PDA’s, handhelds, laptops, tablets, workstations, GPS, GIS, Web, document management, digital images / video, navigation systems, location-based services, laser surveying, etc. The question is what are the guidelines for the use of all of these tools and are we using the right tool at the right time? How do we help our organizations with setting up guidelines on when to use what tool? Have we thought it through ourselves so that we do not end up with lots of GeoStuff without improved information and knowledge to make good business decisions? After all, we are using geospatial information to improve the enterprise as we face the “do more with less” competitive world. This paper outlines the different technologies available and what to reach for from your GeoStuff Holster Set for the efficient handling of business processes and tasks that your Company / Agency is faced with.

### INTRODUCTION

My staff can attest to the fact that I have a motto that sums up this paper i.e. “Use the right tool at the right time!” I attended a conference recently where the Keynote Speaker was Daniel Burrus. Mr. Burrus is a futurist who amongst other things writes a newsletter: *Technotrends* ? . He predicts into the future with amazing accuracy and many of the things he projected in the 1980’s have come true in the early 21<sup>st</sup> Century. One of the things Mr. Burrus discussed was how we have given various technologies to our employees without helping them understand what tool to use at what time. Sounds familiar! We in the geospatial information and technology (GIT) world have lots of tools for our GeoStuff Holster Sets. The question is do we, let alone our employees, know which tool to pull from our holster set at the proper time along the project life cycle. Or do we give them “stuff” and assume they will figure out which tool to use on their own. The chances are they will not utilize the tool to its optimal level nor will the data being entered or received be what they need.

“You don’t want to automate inaccuracy; it will only hurt you faster.”

- Daniel Burrus 1984

I have been fortunate to see geospatial information and technology advance tremendously in the past 30 years. Miniaturization of the various hardware devices, storage capacity, graphic user interfaces, ease

of use functions, wireless communication, voice recognition, use of graphics and pictures instead of all text, etc., are all advances we have witnessed. The data contained with these devices is still the key. Wrong is still wrong. With all these advances can come the feeling of being overwhelmed by our employees. Some of them adapt very well to new technology “stuff” while others are waiting for the world to slow down. We all know, however, that the world is going slow by tomorrows’ standard.

“When planning for the future, remember that the present is obsolete”

- Daniel Burrus 1985

Lost in the translation has been our ability to decipher which of our many tools is best for what task and hopefully we can do multiple tasks with one tool. Otherwise our holster will be very full of GeoStuff and we will not be quick on the “draw”. Since the “present is obsolete” managers and leaders of today are confronted with having to weigh the use of future technology efficiencies that “may” be gained verses better utilizing the tools already there. Users of this technology will always be chasing the next gadget and gizmo. The question becomes how do we integrate GeoStuff Technology into our workflows and maximize the value of that technology into the various processes throughout the enterprise.

“In times of great uncertainty, we must ask ourselves what we *are* certain about.”

- Daniel Burrus 2001

## **GEOSTUFF TECHNOLOGY**

When thinking about all the tools available for your holster set it may be worthwhile to reacquaint oneself with the purpose of each tool and the work processes they are intended to support. Now is the time to put away unnecessary tools since they will do nothing but weigh down the holster and cause bottlenecks in the training classrooms. It may also be a time to revisit the tools you may already have and exploit them, especially if they are underutilized. Daniel Burrus discusses many different Communication Strategies for the 21<sup>st</sup> Century. Here are a couple of his strategies that I think are appropriate to this paper:

### **Creatively Apply Technology**

(Use Technology Not as Originally Intended)

**Ask yourself:** Could we creatively apply our current technology in a way that would yield a bigger advantage?

### **Develop Guidelines To Maximize The Use Of New Tools**

(Use 21<sup>st</sup> Century Tools in a 21<sup>st</sup> Century Way)

**Ask yourself:** Does everyone in our organization know the best time to use a letter vs. a FAX, vs. e-mail, vs. groupware, vs. voice mail, vs. audio conference, vs. a videoconference?

One could take Burrus’ one step further and ask:

Does everyone in our organization know the best time to use different pieces of hardware and different enterprise / department applications?

With so many choices it is no wonder that Process Owners let alone front line employees get confused about which hardware / software tool they should be using and where precious training dollars should be spent. Noted below are but a few of the choices we have, their primary purpose and some pros and cons of each device, technology and application. Also of importance is the display screen size, especially for those who need to see visual applications.

### **Cell Phones - Hardware**

**Purpose:** Communication device. Send / receive calls almost from anywhere; take photo and transmit / receive from another cell phone; receive text messages, mail including voice mail, net mail, etc.; access *Mapquest*™ type maps on the cell phone display; some have walkie-talkie feature. GPS, games and other PDA functionality are being added to the high-end Cell Phones.

**Pros and Cons for Employees / Company:** Field and office personnel are being issued cell phones on a much more routine basis. Existing technology is great for general communication regarding safety, jobs for the day, general navigation, limited general and detailed GIS information, limited asset and resource management information or any other software applications where a large viewing area is needed or data / graphics are extensive. Monthly costs can add up, especially if not monitored.

**Viewing display:** very small

### **Personal Digital Assistants (PDA) - Hardware**

**Purpose:** Personal organization. Similar to a Daytimer™ or Franklin Planner™ except electronic with capabilities to upload and download with a computer.

**Pros and Cons for Employees / Company:** Office personnel are being issued or have their own PDA. These are much more popular although not as much as cell phones. Existing technology is great for calendars, address books, small Microsoft® applications, general navigation, notes, etc. Uploading and downloading of compatible applications is possible. Memory / RAM chip, at this time, is still limited so large datasets will be hard to use. Entering large amounts of text is difficult unless optional keyboard used. Easy to lose stylus.

**Viewing display:** small

### **Handhelds / Portable PC's - Hardware**

**Purpose:** One or two application device. PC that involves a limited set of entries or retrieval of information. Examples include electric pole testing, leak survey, corrosion survey, etc. Small subsets of a GIS are possible for use in conjunction with interfacing applications.

**Pros and Cons for Employees / Company:** Uploading and downloading of compatible applications is possible. Memory / RAM chip is limited so large datasets may be hard to use. This stated limitation is changing with the technology improvements of today e.g. think iPod with multi-gigabyte data storage.

**Viewing display:** small

### **Mobile Data Terminal (MDT) / Tablets - Hardware**

**Purpose:** Multi-purpose field tool. Send job completion information to WMS / receive jobs from a Dispatch Center via radio frequency (RF); have full GIS available for viewing; field / equipment standards and other documents available via document management application, access street maps type maps for looking up next job; add GPS for intelligent “you are here” locating; dock MDT at night for incremental updates or use wireless updates from a hub.

**Pros and Cons for Employees / Company:** Field personnel have been use to ruggedized in-truck devices for a while now. Some companies are on their third or fourth generation. Original MDT’s were for text only and had limited applications available such as job queue. Existing technology is great for receiving jobs for the day, emergency calls, full and detailed GIS information, forwarding job completion information to the WMS / AMS; generally ruggedized for field use; detachable / dockable; job / equipment standards available for viewing. Limited redlining capabilities; screen still small for some uses / needs; may not be detachable for out-of-truck use if concerned about theft; price is higher than a workstation or laptop.

**Viewing display:** Mid-size; 12” – 14” diagonal

### **Laptop Computer - Hardware**

**Purpose:** Multi-purpose office and field tool. Can connect into the Enterprises’ network for access to application servers, the Internet and Web-based applications including email; off-site access to the network.

**Pros and Cons for Employees / Company:** Laptops have been used for a while now. In many cases they are quickly replacing workstations due to their portability. Given the processor speeds of today and hard disk storage any number of applications can be run from a laptop. A full GIS can be loaded with full viewing and redlining capabilities. Screen still small for some uses / needs; is portable for out-of-truck use; unless mounted in some way in vehicle or stored in a case a laptop can be damaged with hard use and the potential for theft can be a problem.

**Viewing display:** Mid-size; 12” – 17” diagonal

### **Workstations - Hardware**

**Purpose:** Multi-purpose office tool. Can work on all enterprise systems tied to a wide area network including GIS, CADD, operation and maintenance systems, customer care, finance, WMS, SCADA, etc.; CPU intensive engineering modeling is ideal for a dual processor environment. Thin client workstations / monitors connected over the network are making inroads into Corporate environments where shared applications can reduce licensing costs.

**Pros and Cons for Employees / Company:** Ability to connect and use internal applications, the Internet and Web-based applications. Easily share files via email. Workstations have availability to current and up-to-date information off of application servers. Cons include lack of portability, not usable in a field situation and space consuming monitors (although LCD monitors are taking care of that at an added cost).

**Viewing display:** Large 19” – 22” single or dual monitors; LCD displays making significant inroads because of less space requirements although more expensive.

### **Global Positioning System (GPS) – Software & Data Provider**

**Purpose:** Location provider. Can provide the location of where someone or something is on the face of the earth. It is based on latitude / longitude / elevation (XYZ) whereby it can be converted to a 2D GIS type application. Used extensively in the non-military defense public sector for vehicle tracking, surveying, navigation and location of facilities / assets.

**Pros and Cons for Employees / Company:** Ability to use in conjunction with many of the hardware tools listed above. Generally GPS works best with a mapping system whereby the location (XYZ) is matched to a picture (map) that one can associate to “physical” piece of geography. Coordinate system for GPS may have to be translated e.g. State Plane Coordinates. Employee distrust of GPS as “Big Brother” may have to be overcome.

### **Geographic Information System (GIS) - Software**

**Purpose:** Repository of geographically linked elements that deal with both the graphic picture of where something is and the information about a distinct feature and its attributes associated with other features e.g. utility assets, right-of-way, demographic information.

**Pros and Cons for Employees / Company:** Provides employees with a visual tool that takes existing records and attributes about an asset and geographically positions it so one can “picture” where it is. Being able to associate one piece of plant with other plant (connectivity) is important when doing engineering modeling from a GIS is a benefit. Provide the geographic “picture” and location of a variety of enterprise information e.g. operations and maintenance processes, engineering, customer care, new customer, finance, etc. A downside is the normal long conversion cycle to get the information into a GIS and once there, the maintenance of all record and feature types.

### **Document Management (DM) - Software**

**Purpose:** A “digital raster” set of images of records, drawings, technical manuals, legal documents, etc. Besides the “digital” picture is “index” information that allows the “picture” to be tied to a means to find it. In addition, attribute data about a record type can be used as sort mechanism for grouping them for reporting.

**Pros and Cons for Employees / Company:** When the original record, drawing, document, etc., is required it allows for a method to efficiently retrieve it verses maintaining hard copies. Significantly reduces storage requirements and off-site storage costs. Downside to DM is that it is a duplicate source of information e.g. facility information, technical manuals, drawings which employees may revert back to instead of using the appropriate tool / system. An additional downside can be the generation management of all the various types of drawings, records and documents.

### **Digital Images / Video – Hardware / Software**

**Purpose:** Digital images of facilities, job sites, investigations, maintenance candidates, new customer investigation, public improvements, etc. Video is becoming very popular with governmental agencies as a way to insure restoration to original condition e.g. a shoulder to a road where equipment was used and/or an open trench was required.

**Pros and Cons for Employees / Company:** A great means of documenting “before” and “after” pictures / video, as well as what occurred as part of a job, investigation, analysis, etc. A con may be that someone must collect and “file” the images / video with the job. While this can be a computer digital process it still takes time and follow-up.

### Navigation Systems - Software

**Purpose:** Provides the location of where you and/or your vehicle are geographically. It is based two main components ... a mapping system and GPS. This allows one to know where they are in relation to a geographic area (streets, cities, etc.). The systems help individuals from getting lost, can calculate shortest distance (great in emergency situations), and give “yellow pages” listing of near by businesses.

**Pros and Cons for Employees / Company:** Great for its primary purpose – getting to a location. Not intended as a detailed facilities management system. Can be used in a dispatch setting as a way to track the location of vehicles / crews and who can most efficiently respond to an emergency.

## WHAT IS THE RIGHT TOOL AT THE RIGHT TIME?

People tend to have many opinions regarding the adoption of hardware and software tool(s). There tends to be those who try to make one tool do everything. For example, trying to make a work management system (WMS) do what a GIS system is good at. How about trying to make a Customer Care system a WMS. This can quickly turn into the “Center of the Universe” hardware / software system with those individuals thumping their chests. This stretches the original design of the tool into areas where the tool was never intended to go. More often than not, the tool may be good for one process but not for the enterprise and the common good.

Then there are those individuals who grab onto too many tools and use only a tenth of the capabilities of each. These are the “Gadget Guys”. This is a waste in efficiency and by the way it costs more. Then there are those employees who will do everything they can to avoid using whatever tool comes to the workplace. You probably know individuals that fall into these camps, both professionally and personally.

So how do we as process owners, managers, supervisors, senior staff and change managers handle getting our employees to use the right tool at the right time? First of all, we need to understand the “whole” process ourselves. In my travels I am still amazed at the number of leaders that do not have the full picture of their entire process. While we all have transformed in differing degrees from functional organizations to process driven organizations we still are creatures of habit and we tend to have our specialties. In order to select the right tool at the right time we must:

1. Have involvement up-front with employees who will be using the tool(s).
2. Analyze the functionality and use of each tool(s) against the process(es).
3. Ask, “How can we creatively leverage this tool(s) to do things we have never been able to do before?” In other words, think beyond the “as – is” process(es) state.



Engineering	Step 1	2	3	4	5	6	7
Maintenance Planning	Step 1	2	3	4	5	6	7
Construction	Step 1	2	3	4	5	6	7
New Customer	Step 1	2	3	4	5	6	7

### Multiple Processes at Organization “X”

When you develop the process matrix and look for the steps or tasks that must be performed by the various processes you can ask whether the process needs a Pocket PC or a PDA to perform data entry for that step or is it better suited for a high end workstation as is the case for engineering modeling. As indicated earlier, a tool that is intended for a task or two is better to utilize over a tool that one only utilizes for 10% of its capabilities.

By showing process flows an employee can get a better idea of where do they fit in and also why other groups may have the same tool or a different one. Obviously, in some cases we must also understand the economies of scale. If I buy one hundred Pocket PC’s I will get a better price over buying one to ten units. However, it is not a bargain if the tool does not meet the need.

The process flows from the “to be state” will act as referral diagram to reinforce the learning that will go on as part of the overall training environment. Coaching the employees as to what tool to use at what time will help their understanding as well as those that are more computers savvy.

### CONCLUSION

We have many choices today when it comes to hardware and software. Like other choices we all have we must plan for implementation, not just acquisition. Making intelligent choices in hardware and software can save millions of dollars in investment while wise investments can also result in more employee and customer satisfaction. Having collaborative discussions about tools that are about to enter the workforce are key to the success of the organization. If we cannot get end user support we have the potential of less desirable results. Costs of all new technology far outweigh what is practical. As Burrus stated: “Could we creatively apply our current technology in a way that would yield a bigger advantage?” Running to the technology store every six months will never be acceptable since you cannot keep up with it. Making technology work for you is the key. By using the tools we have available to do our jobs, accept new ones that we have an agreed to and exploit the capabilities of our software and hardware we will continue to do well while change becomes evermore rapid. By sticking to how new tools are used within processes and reinforcing that learning as well as explaining the tools we currently have and their respective purpose we will maximize the use of the tools we have and the value they bring to the organization. Employees will understand when to use what and frustrations should decrease with that understanding.

