Using GIS in Emergency Response and Asset Control in IT at the City of Fort Worth

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Geog 4550, Dr. Ji
Greg Webb
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Introduction

On August 17, 2003 the City of Fort Worth and other major corporations were attacked by the NACHI virus. This attack forced the IT Department for the city to shut down the complete computer network and bringing the day-to-day services of the city to a halt. Emergency services were not affected. The City's IT department responded to the emergency by sending teams of employees to clean each of the 4400 plus computers throughout the city. These teams had to touch each pc and scan for the virus, update the operating system if necessary, and install a patch to keep each pc from being re-infected. The process was successful in that all the pc's had been cleaned and normal operations were reinstated by the following Monday, but a number of problems were identified. In the aftermath of the whole episode, a number of issues were identified that would have made the process more efficient. GIS was suggested as a tool to answer a majority of these questions. This paper will attempt to show the role GIS can take in emergency response in an IT environment. The other part of this project will be developing an asset tracking tool using GIS.

This is an initial list of concerns brought up by the IT staff on identifying weaknesses and concentrating on improving the process. A number of the problems below can be corrected using GIS.

Review of NACHI WORM VIRUS Cleaning Project

1. Was the organizing of what needs to be done and by whom done in an orderly manner?
2. Was the signup of teams and what the team's responsibilities would be made clear?
3. Was the proper software and instruction sheet on what to do given out with sufficient information to go perform the PC cleaning task?
4. Were you told or given a format to keep track of the PC's you worked on?
5. Were you told that once the administrator sign on was used that the person normally using the PC would need to know that their username and Domain name would need to be reentered the next time they used the PC?
6. Were your assigned locations given to you with an explanation of the priority assigned to this location?
7. Was a location map or instructions on how to get to the location provided?
8. Was a point of contact provided for that location?
9. Were any considerations provided as to what to do if the PC encountered was an old PC and would not be affected?
10. Was an instruction provided as to what to do when you completed your tasks at the assigned

location?

11. If you were given another assignment over the phone, were you using your own cell phone, the phone at the location you just finished, or a two-way radio given to you before you left?
12. Was the IT Command Center keeping track of what PC's you completed or was just the location the primary concern?
13. If you had problems with a given PC (could not get into PC due to security, the PC did not have a CD drive, the PC or Laptop had a different version of Windows then what the list had on your CD?
14. When will the cell phone repeaters be installed in the lower level particularly in IT so that when a crisis like this hits and our primary phone trunk is non-functioning, we can communicate via cell phones?
15. Do we have the capability to create GIS maps showing all City owned facilities that have PC's?
16. Can we create a list of PC's by location to distribute to the assigned team for positive identification and check off for accurate count reporting?
17. As problems arise at a location that were not expected, are these recorded by the IT command center on a separate list to deal with later?
18. When new information about the situation everyone is working on changes, is there a process whereby the new information gets distributed to all teams in all locations?

Issues needing attention

1. To create a city owned facilities map
2. Be able to identify the PC's connected to each facility
3. To add IT identifying and tracking information to the pc database
4. This database (GIS) will have to be run without being connected to the city's network
5. Have the ability to assign cleaning teams to each facility and track the each cleaning teams progress
6. Assist the cleaning teams by using GIS network routing analysis to direct the cleaning teams to their locations

1. Creating a Facilities Map

The creation of the facilities map started with gathering data from all departments that had facilities that used PC's. A number of departments are using GIS such as the Police and Fire departments, and this data was easily obtained from these sources. Other departments do not use GIS and therefore their data had to be entered by hand. Once this information was gathered and arranged in a database form, it was brought into an existing database that had the Fire and Police facilities information already geocoded. This new database was addressed geocoded using the City of Fort Worth's SDE standard geocoding service. This first round of geocoding yielded a little more than 90% match, which could be improved with further cleaning of the database. Certain mistakes and duplications were identified and another round of geocoding was performed with a high 90% result. The records not matched were not used. By further investigation they turned out to be wrong addresses or non-existent buildings. There were 172 facilities around the City of Fort Worth that have pc's that need to be placed in a GIS. This facilities map process is the beginning of this project and will have many uses throughout the

city. This map will be added as a layer to the city's SDE and available to all departments that use GIS.

City of Fort Worth Facilities
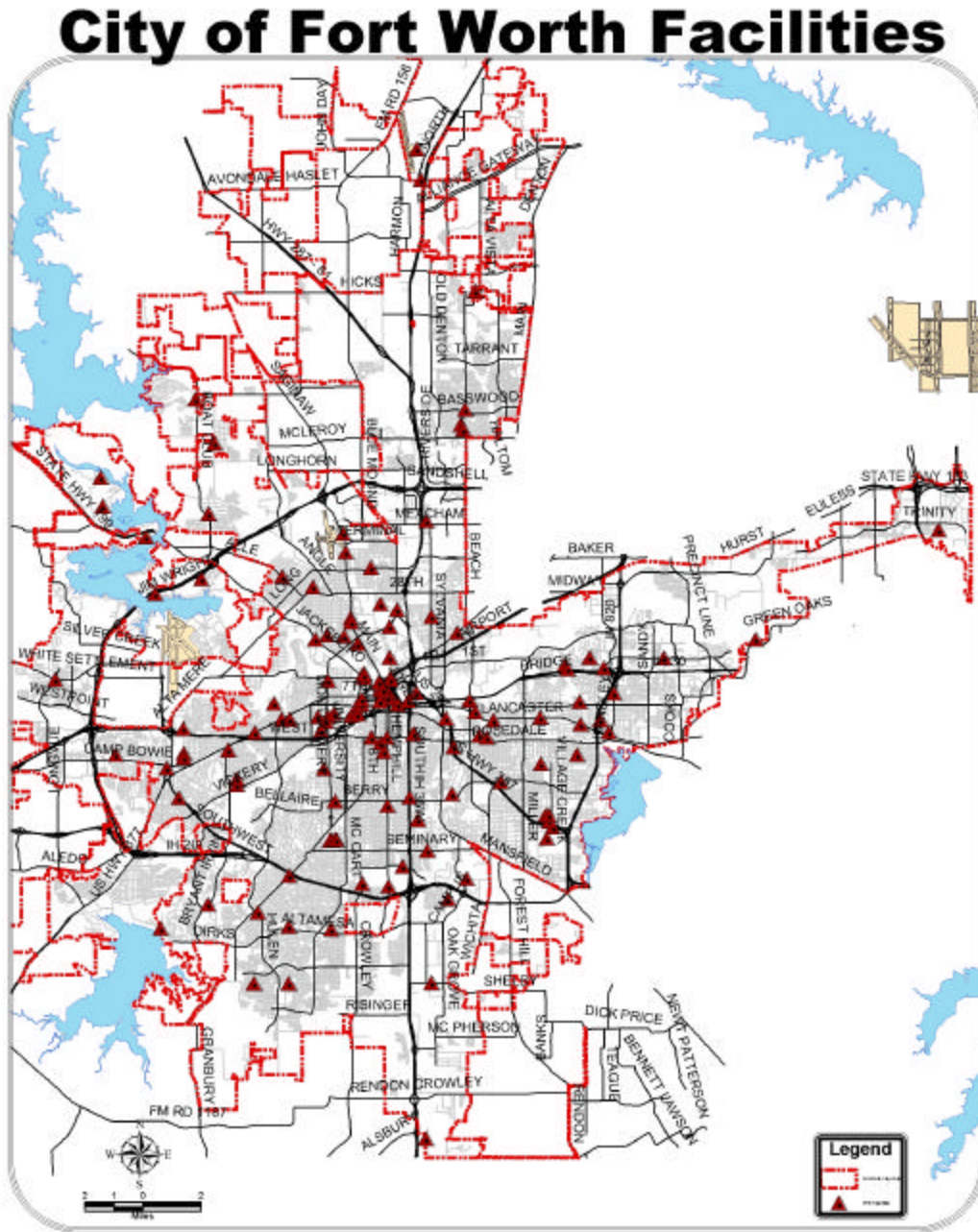
2. *Create a database that identifies pc's with their location*

The next phase of the project was building a database that will identify the location of each pc, pc number; kind of pc, lease expiration date, operating system with service pack, and other IT

related features. The city uses a third party company to handle the lease information for each pc and it was decided that this database had the necessary information to form the initial database for the facilities map. Using Microsoft SQL Server 2000 the data was cleaned and made ready to incorporate into the facilities table. The two tables were merged and a new facilities layer was created.
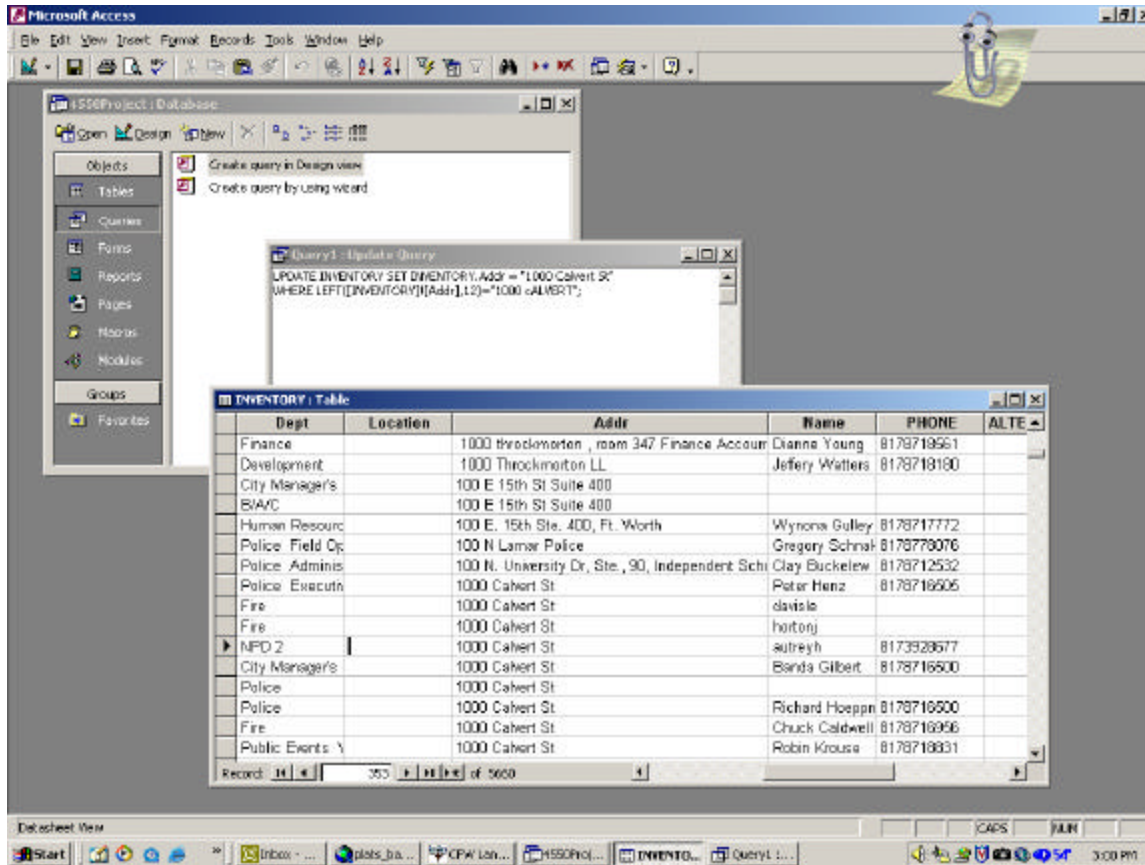
3. *Add IT features to the database that track the location and maintenance of each pc*

Each facility was given a unique identifier, which related each pc to its facility. For the emergency response portion of this project it was necessary to add features to the facilities table allowing the IT Department flexibility in coordinating an emergency response. Therefore an assumption was made on the number of IT people it would take to clean the pc's at each facility. This feature was also expanded to accommodate our help desk section to track day-to-day maintenance for each pc.

4. *Running this application in an emergency environment without being connected to the network*

In the event of a situation where the network will have to be shut down this tracking procedure will have to run outside the network. This means the application will have to be able to run on a single pc or laptop and the GIS features will have to work without the benefit of the SDE. The GIS section has a laptop designated as an emergency pc with data and programs already installed

to work outside the network. A personal geodatabase will be created and stored to use on this pc for tracking the pc cleaning process and direct the IT staff in recovering from an emergency. This database will be updated at least quarterly with the pc data.

In the command center the pc running the tracking program and the GIS will also be connected to a projector and the facilities map will be projected on a screen showing real time progress. This would have been invaluable in August to see all of the teams progress.

5. *Have the ability to assign cleaning teams to each facility and track each teams progress*

One of the parts of this process was making an assumption of how many people it would take to clean each facility. The other part of this process is tracking each teams progress in the geodatabase and visually seeing this progress. This eliminates cleaning teams being sent to the same location and wasting time.

6. *Assist the cleaning teams by using GIS network routing analysis to direct personnel to their locations*

Fort Worth is a large city and not everyone knows where all of these facilities are located. Without having to use a paper map, GIS network analysis can be used to quickly direct crews to their locations.

Direct benefits resulting from this project

1. Facilities map used by all departments
2. Ability to track various stages of emergency maintenance
3. Efficient management of IT personnel
4. Structured database that tracks maintenance of computers

Indirect benefits resulting from this project

1. Generated a lot of interest in GIS in the IT department, but Risk Management, TPW, Telecom, and others that have to track assets.
2. Risk Management department has gone so far as to place a formal request for initiating a GIS for tracking assets.
3. In gathering the data necessary for this project, new contacts were made in other departments that did not have GIS and this has created interest in the advantages of using GIS in their daily business.

Conclusions

This project was a perfect example of GIS providing solutions to problems in a unique way and benefiting a number of outside users directly. This project allowed a department to use GIS to improve processes that were identified as inadequate and provide this benefit in an economical and visual manner. Data integrity was increased and the amount of data provided was increased as well.