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Build a Pace GIS Community Center

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<u>**Final Report**</u>

Build a Pace GIS Community Center

(Thinkfinity **Cornerstone 2 Community Outreach and Empowerment)**

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A) Project Original Goals

The project was to use information technology to develop a *GIS Hub* at Pace University. The Hub is intended to show the larger community the work done at Pace and that students and faculty are using GIS to solve geographically-based problems for communities and organizations. It also is intended to serve as a site from which users can download data to customize their own maps and as a place where the larger community can find examples of maps and have the ability to manipulate maps.

In order to accomplish the above goals, we have listed the following tasks to be completed during the funding period.

- Analyze the GIS hub requirements and finalize a plan for ground work.
- Design and implement the technology hub.
- Deploy the system for community use but with invited groups to test its capability.
- Release for general community use, track usages and publish usages and feedback online.

B) Progress Made

- ***Analyze the GIS hub requirements and finalize a plan for ground work.***

  In June 2009, Minnis went to an ArcServer training course in Danvers, Mass, where ESRI was highlighting the capabilities of their server with examples of how different cities were implementing this server. It seemed that most of the attendees were from municipalities that were trying to put property maps on their servers for residents to look from home to determine whether their property taxes were fair compared to other residents.

The ESRI service representative suggested purchasing and implementing ESRI's ArcServer on an existing Pace computer and allowing a gatekeeper to upload the data and maps for the larger community. This concept required that we learn more about how the ArcGIS server worked and the compatibility with Pace's existing computing capabilities.

We worked with the ESRI office in California to develop a list of Pace licensed users and determined that only two instructors had active licenses. Therefore, most of the CSIS instructors who are using GIS as a service-learning component of their CIS102 course are using temporary licenses that come with the workbook, usually featuring ArcExplorer. That meant that it would require contacting each instructor of this course individually to determine what service learning component was being used in their classes and to get copies of their maps to use on the website.

- **Design and implement the technology hub.**

   A graduate student was interviewed and lined up to do some of the work during the fall of 2009 with regard to gathering the maps that have been created in the past by instructors and their students.

   We learned that there are few GIS hubs at universities. There are called different things, but there are few, if any, universities that have a one-stop website for showcasing their GIS projects, hosting instructional videos and making data available to users.

   The idea of server virtualization was explored with the DoIT managers. We learned that ArcServer needs a quad core processor and about a maximum of 5 GB of disk space, 1 GB maximum for the program and 4 GB for the data at maximum. The main Pace computers in Briarcliff have the space and the computing power, but DoIT wanted to charge us $4,000 to host our ArcServer software and to devote 5 GB of space to our project. That cost, combined with the cost of ArcServer($1,500, educational price) would exceed our budget in a grand way.

   Based on that, we decided to ask the CSIS IT Director Matt Poli if we could use their CSIS computer to host our ArcServer and data. If a way to either use our ArcServer and make it visible and useable by the community was available on the CSIS server, we would prefer to use it. He said that Dan Farkas had ArcServer, but it was only available *within the Pace intranet* and could not be available to the public.

When the possibility of using ArcServer diminished due to costs and availability, the possibility of using ArcPublisher (available to students with their temporary licenses), the free ArcReader for community users and some aspects of the free ArcExplorer for users of our student/faculty created maps became a viable alternative. Minnis had one individual license for ArcPublisher and has found that the data/map packages can be offered to Internet users and the website to download the free ArcReader and ArcExplorer can be included on the webpage, the users will have the power to create their own maps easily by downloading the map packages.

Making the data/published maps available for download from a GIS hub accomplishes the purpose of faculty and students preparing maps for community projects and making flexible and adjustable maps available for these groups without having to implement a complex and maintenance-intensive ArcServer installation.

The new director of DOIT, now ITS, had a conversation with Minnis and promised to make available a site gis.pace.edu for the use of our hub and not to charge us for the use. They have made 5 GB available for the project and it is available to both Winkler and Minnis for editing.

- ***Deploy the system for community use but with invited groups to test its capability.***

The system has been deployed to http://gis.pace.edu It is accessible from within the Pace community. Our student assistant collected feedback from other students and the site was adjusted to reflect those suggestions for improvement.

- ***Release for general community use, track usages and publish usages and feedback online.***

The Hub has been edited and the data has been linked and is visible to Pace system users and will be made available to the world once the report has been submitted. Adjustments will be made on an ad-hoc basis, since the videos for instruction have to be changed this summer to reflect the new version of ArcGIS, which is being shipped to users this summer.

C) Activities Completed

In June 2009, Winkler attended the **1st Summit on Incorporating Social Justice and Service-Learning into the STEM Curriculum**, a conference held at Ithaca College, NY. She presented a paper *'GIS for Leaning Community'* describing her teaching experiences use GIS in service learning course here at Pace.

In May 2009, Minnis attended the **Northeast Arc Users Group** meeting at Smith College, where she gave a presentation on *Hyperlinking photos and GPS Tracklog Points* and met with the ESRI sales/service people to initiate the data collection for the project. She learned what was required and the costs of the ArcServer.

Minnis gave a presentation at the Northeast ARC Users Conference (NEARC) in Nashua, NH in October 2009 on *Creating the GIS Hub at Pace* and the challenges and process to accomplish this task.

Minnis wrote an article for the summer 2009 Connecticut Geospatial Newsletter http://www.ct.gov/gis/lib/gis/CT_Geospatial_Newsletter_Summer09.pdf. This was about the use of videos to teach GIS. When the Hub is developed, a link to these instructional videos will be a featured part of the site. The videos are constantly updated and new videos for ArcGIS 10 will be prepared when that release is received in summer 2010.

Minnis gave a talk at NEARC spring 2010 meeting at Smith College on May 11, 2010 on using ArcPublisher to deliver maps in a more economical way than using ArcServer.

Minnis attended a User-to-User Connecticut meeting to discuss economical ways to provide GIS services. She spoke to users on *GIS on the Cheap*.

D) Activities Planned but not Completed

Although the initial idea was to install and use ArcGIS Server, no GIS server is installed. It has been replaced, for reasons discussed above, with ArcPublisher's capability to provide free and downloadable publishing software that a user can simply work and publish with. We have purchased software extensions for ArcGIS: ArcPublisher, 3D and Spatial Analyst and installed them in three

computers in Willcox computer labs for student and faculty use instead. This has proven to be a better use of the Thinkfinity grant money.

E) Outcomes

Students and faculty are now able to go to **gis.pace.edu** to find all the links to downloadable data for GIS projects. Users of the created maps will be able to access their prepared (zipped) maps at the site. Videos to show how to do GIS operations are available to students and others who are learning GIS. Student and faculty projects are visible from links on the site.

The outcome has far surpassed what we anticipated. In the beginning, it seemed that all we were concerned with was implementing an ArcServer to show how various maps looked and delivering data. We learned to do much more than we anticipated and are able to deliver a better product. Also, the student who worked with us found the work valuable and it enhanced her thinking about webpages and how they work and how they serve an audience.

The unintended outcome was probably that we learned that the ArcServer is quite interesting, but not quite ready for prime time. It is slow and not particularly user friendly and it is expensive.   We learned that workarounds are useful and may deliver a more useful and user-friendly method of delivering maps that can be customized and printed out in a variety of ways for a variety of uses.

F) Impacts to Students and Faculty

The students in Minnis' GIS class in spring 2010 were required to learn how to create the kinds of maps that will be available for community clients as zipped packages. The students had to learn how to prepare the data so that it could be used in this data-delivery way. They also had to have "test" clients, usually their family members, who received the data/map packages via email, instructed on how to download and use ArcReader and commented on the work and how user friendly the map delivery system was for them. This resulted in the students' families becoming aware of the service learning projects their student was involved in and the skills their student possessed. In most cases, the family member emailed Minnis to comment upon the map and the delivery method. It was, in all cases, easy and informative for the reader. It also convinced the family member (especially if it was a parent) that their student/child was learning a really interesting and useful skill.

Winkler is designing a two-week GIS course contents in the summer of 2010 for educational professional to be integrated into her course in System Design. This will allow DPS students (about 60 graduate students) to learn the basic mapping skills in applying K12 educational data.

Winkler also plans to use GIS How-To site to apply environmental monitoring data from the Hudson River in anticipation for the River Semester Course, which may begin either the fall of 2010 or the spring of 2011 semester. We expect to have about 15 undergraduate students to attend the cohort study.

Other faculty members who are seeking data or want to become aware of the capacity the GIS students/faculty have in solving geographically-based questions now have a one-stop place to go to have their questions answered. They can contact the faculty who deals with GIS and inquire whether the service learning course will help them. The Honors College now wants to have the GIS class become one of their offered courses, since it incorporates technology and service learning with a definable skill set for their students to master.

G) Thinkfinity Cornerstone and Future Plans

We have built a GIS hub that will encourage using location technology to teach and to deliver information to Pace and its communities. It is now a lot more effective for us to spread the GIS technology and apply it in various applications; we can point to the site for instructions and project demonstrations.

We will continue our efforts in teaching GIS community-oriented courses for students. The established GIS Hub will be monitored and updated for students, faculty and community users.   Videos for the new ArcGIS 10 will be developed and put online from time to time.

We thank everyone who made this Thinkfinity grant possible to support our work and to improve Pace's visibility as a place where communities can go for help with their geographically-based questions.