An Interactive Urban Database

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This paper describes a development process and mechanism for transmitting academic research and information to the community and the profession, and attempts to examine the effect of the information on the community. It is about my recent work with students on the design and development of a prototype interactive electronic document for archiving and visualizing information on an urban area. The work reflects the initial phase of a three year research grant and is a prototype document of a pilot area. The design and visualization of information for this area will establish the primary organization and graphic user interface, for the entire project. The final document will provide community organizations and city agencies with an interactive tool for visualizing and evaluating neighborhood planning and design proposals.

Purpose and Organization

The project attempts to build a partnership between the community, public and private agencies and a coalition of University researchers, teachers and students. It is intended to be a model for examining the role of universities within an urban neighborhood context. The project has five major components: Social & Economic Development, Education, Physical Planning & Development, Public Safety & Community Networking, and Recreation. The central theme is community empowerment. The focus is limited to the documentation of information from the Physical Planning and Development component. As the other components collect information and develop proposals, the database will accommodate their work with the community.

The intent is to develop an electronic database of urban environmental information, a community resource for reference, as well as, an archive for planning and decision making. It will incorporate methods for the evaluation of existing conditions, new design proposals, applications for educational instruction and historic reference. The focus of Phase I, the first year, is to design a flexible interactive document that can be added to, modified and/or amended over time. The concepts and principles will apply to the entire project.

Project Area Overview

The project area encompasses approximately 200 blocks within a larger urban area. The urban area was developed before 1900, with a typical land-use for its time. Factories were constructed along railroad rights-of-way and homes for the factory workers were built in the immediate surrounding area. Commercial strips on major streets and stores on street corners developed to serve the nearby residents. Figures 1 & 2 are examples of the original density and character. By 1930 the area was a vibrant, dense residential and industrial community on its way to becoming predominately black. The population peaked in 1950 and overcrowding was at a critical level. During the next three decades the

Figure 1: An example of an original dense neighborhood.
population declined by approximately 50 percent. The erosion of the manufacturing and housing in the area has resulted in urban decay, neglected open-space, abandoned housing, high crime areas, and the socioeconomic disintegration of the community. Substance abuse and dependency continue to destroy individual lives, families, and neighborhoods. Figures 3 and 4 show examples of the existing fragmented row-houses and neglected open-space conditions. Recent studies indicate this trend may be reversing.

As the private sector economic base has diminished, the City’s public services have been curtailed. In an era of dwindling resources, new partnerships between community-based organizations and urban institutions might be an alternative for marshaling new and existing resources. The University is committed to coordinating its efforts with those in the community to assist in rebuilding these urban neighborhoods.

Goals and Objectives - Physical Planning and Development

The members of the Physical Planning and Development component are working with community organizations to inventory the physical building and site features, and to develop proposals for improving the physical aspects of the neighborhood. The group will assist the community to define self-help programs, and determine methods for funding, phasing and implementation. They are also training local residents to do community rehabilitation work. The Pilot Area, an initial twelve blocks, is selected to test appropriate strategies, means and methods for application to the larger area.

Another group (Architecture faculty and students) is supporting the research and design team, and will translate the information into a digital database. The initial development of the database will record and archive existing information on streets, curbs, buildings, services, open space, etc. Simultaneously, a prototype interactive graphic user interface (GUI) is being designed for accessing and viewing the information. The work on the interface includes designing and developing a structure and order for collecting, recording and accessing the data. The design incorporates on-screen buttons and icons, as well as, detail appropriate for each level of the database.

The Process

The U. S. Department of Education announced the award of the grant in the fall of 1992. The Center for Public Policy, an organization within the University, is administering the grant. An Advisory Committee, consisting of representatives from all the university components, city agencies and members of the community, was organized to build links between the University, the City and the Community. They meet once a month to review the process and progress of the work. A Physical Planning and Development committee, research faculty from Architecture and Landscape Architecture, meet at two week intervals to coordinate their work.

This project reinforced other design and planning services offered within the University Urban Design Center. The consolidation of these research activities gave Architecture and Landscape Architecture
programs more synergy and drew the faculty and
students into a closer liaison. In the spring semester
a design studio from Landscape Architecture
analyzed patterns of open space within the pilot area.
A joint design studio of Landscape Architecture and
Architecture faculty and students analyzed the
housing patterns and basic needs within the area. The
faculty and students in the studios worked closely
with representatives of the community to understand
the residents’ neighborhood aspirations. The dialog
generated design proposals for open space, housing
and other amenities needed within the
neighborhood. Simultaneously a group of students
began developing the electronic database. This work
began in earnest in January 1993.

The Pilot Area

A small manageable area of twelve city blocks was
chosen to test appropriate working methods and
strategies. The selected area is easily accessed and
contiguous with the University, an area with which
many participants are already familiar. Figure 5. The
Pilot Area borders on a commercial strip and has a
variety of existing uses, such as, an elementary
school, open space, existing row houses and elements
of self-help housing. It also has an active organization
of “Habitat for Humanity,” a not-for-profit housing
development association working in the
neighborhood. A representative of this organization
participates on the Advisory Committee and is a
resource for the work in the design studio.

Figure 4: Existing neglected open-space.

Figure 5: Subdivision of the Pilot Area.

Designing the Database

Members of the team had experience working on
computers. Most had worked with 2D and 3D
modeling software and developed similar pieces of
electronic information used in this project. No one in
the group had experience in designing and compiling
all the issues into one database. However, we
recognized the power and potential that this medium
could bring to a neighborhood organization. We
began by examining several interactive models: 1)
“The Elastic Charles” and “The Elastic Boston” by
G. Davenport with graduate students at the M.I.T.
Media Lab, 2) “The Visual Almanac” by the staff at
Apple, Inc., and 3) Examples of interactive compact
discs such as “From Alice to Ocean” and “Desert
Storm”.

We also collected a variety of city maps on the pilot
area. These maps included information on streets and
curbs, zoning, building foot prints, property lines,
etc. We divided the pilot area into six subsections, as
shown in figure 5, one for each participant in the
group. The above information was incorporated into
several maps for each subsection. A group and color
were assigned to each different type of information.
Figure 6, is representative of the overlaid information
for a typical area. Along with this information several
photographs of significant buildings and open-space
were captured for visual reference and information
within each area. Buttons were located on the map
linking specific locations to the respective images
with descriptions.
Although facile with the computer and several software applications, the students worked with various new applications and learned the craft while mapping the databases for the prototype document. The accuracy of the work on the database improved dramatically as the students became more proficient and skilled in their craft. Periodically the work is reviewed and inconsistencies are corrected.

Designing the Graphic User Interface

Students simultaneously began an individual design project for the GUI. The primary reference for this work was "The Art of Computer Interface Design" edited by Brenda Laurel, as well as, several reference books of exemplary graphic design. The graphic components of the project included the overall visual style and screen layout, the icons, and other graphic elements, including the integration of topography, animation and video. The graphic elements convey information just as they do in more conventional print media. The icons, windows, and other devices for interactivity act as essential components of the user interface and define the structure and the function of the user's computing environment.

The primary considerations in evolving the design of the document were the selection and composition of the graphics and the text for the computer screen, as well as, the use of the graphics to construct an easy-to-use and informative user interface. The primary goal of the design for the computer screen was to establish a strong visual hierarchy, in which the important information is immediately obvious, and where everything else is clearly subordinate. Through the design process an effort was made to keep the design of the screen simple and uncluttered, and avoid highly stylized graphics and typefaces that depend on fine details not readily visible on the computer screen. We approached the project assuming the users of this information would have no previous computer experience, or at best, limited exposure to the use of electronic media. The method

Figure 6: Map of Subsection showing streets, property lines, and building footprints.

- Streets Button: To go to a subsection map on streets.
- Quicktime Movie Button: To go to a map for photographs of buildings.
- Main Menu Button: To go back to the beginning.
- Building Footprint Button: To go to a map showing the buildings on the blocks.
- Property Button: To go to a subsection map showing the property subdivisions.
- Zoning Button: To go to a map indicating the zoning classifications.
- Streets Button: To go to a subsection map on defining the streets.
- Step Ahead Button: To move ahead one step.
- Building and Streets Button: To go to a map on buildings and streets.

Figure 7: Examples of buttons from first phase of work.
of interactivity had, by necessity, to be extremely simple and direct. The project had to achieve a high level of consistency and regularity.

We assumed the type of graphics to be two and three dimensional, and include maps of layered information, models, text, computer graphics, images, video and audio. See figure 7 for examples of the students' initial work on the GUI designs. Finally, after reviewing the individual projects, a basic organization, graphic composition and icons were selected. We chose to place the icons on the left-hand side and not to have more than ten (currently there are eleven) available at any time. If more choices were necessary they would be broken into nested categories. The icons were selected from an evaluation of the various alternatives generated in the individual student projects. They were then composed into one vertical GUI as shown in figure 8, as the layout and button design for the document. Through a hierarchy, the files are linked to buttons programmed to permit the user to move freely from one type of information to another simply by clicking on a button. Standards evolved as the work progressed.

Expanding the Interest

As the mapping of the Pilot Area and the GUI evolved, it became evident that an Introduction and a Help section were necessary for the first-time user. We were also intrigued with making the prototype document as compelling as possible in the hope that other components within the University would also want to integrate their information. There was also discussion of making a mini-almanac. Why not an electronic almanac? This intensified our interest. We decided to expand the information of the database and incorporate a human interest series about the participants, their views and aspirations for this endeavor. The topics for the prototype document expanded and were organized as shown in figure 9 and as outlined: 1) Introduction - a description to give the first-time user a global view of the document and a general understanding of the GUI, 2) The Grant - interviews with key participants and their view of the intentions of the grant, 3) The Community - interviews with community leaders and their aspirations for their neighborhood, 4) Temple University - an overview of the five components and a focus on the joint Landscape Architecture and Architecture design studio and the Landscape Architecture design studio, with a view of the issues including examples of planning and design proposals, 5) The Project and Pilot Area - mapping of the pilot area to show existing conditions for streets, curbs, properties lines, building footprints, open space and zoning, along with representative digitized photographic and video examples of existing neighborhood and building conditions, including proposals for improvements.

Design proposals from the design studios and summer research will be modeled, rendered and merged into site photographs in the fall semester to show their impact on the neighborhood. This will be reviewed by representatives from "Habitat for
Humanity” and the residents. The work has received the support of the advisory committee. This visual information will be used to increase neighborhood awareness and may be used for fund raising for neighborhood projects.

Expansion and further development of the database will incorporate information from the following components: Social & Economic Development, Education, Public Safety and Community Networking, and Recreation. The Physical Planning and Development component will expand mapping the existing conditions within the project area and begin to demonstrate new proposals and show improvements. The grant is for three years. The expanded work will document and record the community outreach activities of the respective groups and their assistance in the neighborhood. See figure 9 for an example of the introductory buttons to the interactive document.

Collaboration in Preparing for the Next Phase

This summer the Physical Planning and Development component organized a group of faculty and students to: 1) consolidate and record the work from the spring semester, 2) plan for the next academic year, 3) continue mapping and recording existing conditions of the entire project area. This mapping will become the base information for Architecture and Landscape Architecture design studios that will be working with neighborhood groups in the fall to develop design proposals. Other university components will participate where their interests and issues engage and overlap.

Community Use and Potential:

The electronic document is a collection of urban and environmental information, a community resource for reference, as well as, an archive for planning and decision making. It is intended for evaluating existing conditions, presenting and testing design proposals, educational instruction and historic reference. As the database grows, it is our hope that it will be a vital planning document and an archive to assist and empower the residents and the community organizations within the neighborhoods. When completed, it is the potential to become a useful tool for communicating and testing alternatives for change to the existing neighborhood.

Conclusions

As our work progresses, my hope is that the other University components are able to incorporate their information into the document in an integrated meaningful way. For example, the Community Networking component has arranged community meetings and workshops on specific topics; the Education component is offering adult literacy programs in a local public school; the Recreation component is looking at ways to provide programs for the young and old. The people in the neighborhood expressed interest in the basic needs of shelter, food and jobs. The aspiration is for everyone, Community, City and University to work together and form a true sense of neighborhood for this area of the City. My hope is that this document can become the vehicle for testing, recording and visualizing the process and the opportunities, along with offering tangible courses of action for the people in the community. The grant should provide the threshold for community-based leadership and confidence building for the residents to understand how to overcome what appears at first as obstacles and turn these into opportunities for a successful urban neighborhood. The electronic document can record the process and contribute toward enhancing the life of the people in their communities. Some aspects of this document may be beyond the scope of this grant and may be supported by additional funding in the future.

Figure 9: Main Menu and starting point.

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edited by Brenda Laurel
Computers as Theater
by Brenda Laurel
CD-I Designers Guide
by Signe Hoffes
The Desktop Media Bible
by Jeff Berger
Digital Design Media
by W. J. Mitchell and M. McCullough
The Reconfigured Eye
by William J. Mitchell

Hardware

Macintosh II type network of computers
8 - 20 MB Ram
TrueVision Nuvista+ 2MB NuBus Card
Microtech Color Scanner
Canon A1 Digital Camcorder

Software

Adobe Illustrator
Adobe PhotoShop
Adobe Premiere
Aldus SuperPaint
Macromedia Director
Video Spigot