The WebPolis Consortium

Presented to Joint Conference of
Association of European Schools of Planning and
Association of Collegiate Schools of Planning

Presented by Norman Tyler
Director, Urban and Regional Planning Program
Eastern Michigan University
(ntyler@emich.edu)

11 July 2003

“Any technology tends to create a new human environment.”
(Marshall McLuhan, 1964)

Introduction

The Information Technology revolution has become a significant and ubiquitous factor in our 21st century societies. In a recent U.S. government report, *A Nation Online: How Americans Are Expanding Their Use of the Internet*, it was reported that over half of the American population is now online, with approximately two million new users every month. Interestingly, those who traditionally have used it the least—people of lower income, the less educated, the elderly—recently have become the fastest adopters. With these basic findings, it is clear the U.S. is becoming “a nation online.”

As a result of the increasing use of the Internet, it is important, even critical, for communities to become more reliant on online resources for local government functions. Many such resources are available, and most communities now have web sites with descriptive information. However, there are many resources available in the online environment not be utilized by local officials and residents. Part of the reluctance of relying on the Internet for local government functions is the fact there are many disparate formats, sometimes requiring a lengthy learning curve. To fully take advantage of the many resources available online, there is a great need to create a network for providing applications with interfaces that are more standardized, interactive, linked, and user-friendly.

This paper describes the development of the WebPolis Consortium, a series of online applications useful to local governments that fill this need. Developed at Eastern Michigan University and funded primarily by a grant from the U.S. Department of Commerce's Technologies Opportunity Program, WebPolis is designed to encourage greater community involvement in local decision-making using enhanced Internet and

---

and GIS technologies. WebPolis offers a common interface for users (both citizens and officials) to access a “toolbox,” or series of application modules useful to local governments. Applications include online community newsletters, online discussion conferences, online surveys, decision support applications for economic development and financial analysis, a loan/grant search engine, online consultants, community and external databases, Geographic Information Systems (GIS) databases and spatial analysis functions, and links to other web sources. Meta-linking and “meta-data harvesting” within WebPolis enables communities and local governments to share resources and information with each other in an efficient, effective and user-friendly way.

**How decisions are made in local government**

The process of decision-making in local government is a complex process. It would be presumptuous to assume such a many-faceted and largely heuristic process could be duplicated with a series of computer algorithms.

Some aspects of local government decision-making, such as surveys, regulatory standards, financial analysis, and the like can be understood in a straightforward manner. Other aspects of decision-making, such as public input, policy development, even political allegiances, are less clearly defined and more intuitive. As described by Jonassen (1997), such problem solving can described in one of two categories, as either well-structured or ill-structured, requiring completely different resources and skill sets. Well-structured problems have defined constraints and can be solved through use of logical operators. Ill-structured problems are more open-ended, and some of the constraints are only vaguely stated. This means their solution is not immediately apparent, and solutions may vary depending on the perspective of the problem-solver. Many of the decisions in community development are based on ill-structured problems.

Local government decision-making is done at two distinct levels. One is more conceptual and policy oriented, (e.g., What are our community's economic development goals?) the other is project oriented. (e.g., What are the legal requirements to establish a tax increment financing district?) Decision-making at the local level floats back and forth freely between these two realms. Useful resources intending to aid this process must be flexible enough to float back and forth with it as well.

The question becomes: What is the purpose of trying to recreate the process of local government decision-making in an online environment? Isn't it an exercise in frustration and futility? The answer to these questions lies in the concept behind the applications being developed. To be effective, an online decision support system for local governments must be designed to function at both the conceptual and the project-oriented levels.

An example will help clarify the issue. Assume a local official attended a regional conference for municipal government officials and was impressed by a presentation given by a consultant for a community where there had been the successful development of an industrial park. Because of the presentation, this official becomes enthusiastic about the development of an industrial park for his own community. He feels a similar industrial park would be an economic development panacea for his community, and pushes hard for the establishment of one, even though such a project involves considerable front-end costs and a long time frame. It is not that industrial parks are bad projects per se, it is simply that this solution did not develop from a comprehensive look at his community’s
goals and strategies, it is just that this was the limited information available to the official from which the proposal was formed. Decisions on proposed economic development projects, and other important local government decisions, are often based on knowledge and experience too limited in scope.

In this example, the perspective of the local official was narrowed by limited access to information and resources. The process did not begin by looking at the overall economic development needs and potential of the community, but originated with a project proposal, putting the metaphorical “cart before the horse.” A project proposal should represent the end of a process, rather than the beginning of one. Until decision makers have tools to approach a project in a meaningful and appropriate sequence, decisions will continue to be made for the wrong reasons based on incomplete information.

Problem solving by local officials generally is based on two knowledge types—explicit knowledge and tacit knowledge. Explicit knowledge is information available in the form of books, databases or other documents. This has been referred to as "hard knowledge." In contrast, tacit knowledge is based on the experiences and heuristic approach of participants. It is difficult to document and catalog, transitory and largely uncodified, and can be called "soft knowledge." Both types of knowledge are critical to good decision-making in local government, and both must be accommodated in any attempt to deliver decision support services to local officials.

Turban and Aronson (1998) describe a decision-support system as including:

- Citizens involved in all kinds of real life problems
- Different kinds of managerial levels
- Individuals as well as groups, specifically co-operative systems
- Sequential or interdependent decisions.
- All phases of the decision-making process: intelligence, design, choice, implementation
- A variety of decision-making processes and styles
- Flexibility and adaptability over time
- Friendliness for all kinds of users
- Effectiveness (accuracy, timeliness, quality) rather than efficiency
- Easy construction of new models
- Modeling and analyzing problems
- Accessing all kinds of data

E-Government and local government

Local, regional and national governments more and more are adopting online technologies for providing services to the public. These uses are sometimes referred to as "e-government." E-government recognizes the growing need to provide, for the convenience of constituents, government services online in a variety of formats. As more and more citizens have access to Internet browsers on a daily basis, the demand for such services grows.

---

E-government services can be grouped into four general categories:

1. "E-services" refers to the delivery of information, programs and services through the Internet. Generally the information provided is descriptive in nature and may include agency calendars and minutes, local ordinances and codes, public safety information and other commonly available public information.

2. "E-management" uses information technology to improve the management of local government. Data resources and data management enable governments to have easy and updated access to data resources. Online conferencing allows officials to communicate with each other in an online environment, as well as with constituents.

3. "E-commerce" encourages the use of the online environment for exchange of goods and services, and may include activities such as paying taxes and utility bills, renewing registrations and licenses, and paying user fees for services.

4. "E-democracy" attempts to utilize electronic technologies for public decision-making. This is the most interactive of the four approaches to e-government, and may include applications such as online polls and surveys, online town meetings, resident-controlled online community bulletin boards and newsgroups.

E-government represents an increased recognition of the usefulness and power of the online environment and the need for government at all levels to utilize its potential. But as local governments venture into the world of the Internet and online applications, it is easy for officials and residents alike to be overwhelmed with its breadth and complexity.

The WebPolis Consortium

The above discussion represents some of the long-standing issues inherent in local government decision-making and efforts to deal with them in this era of online technologies. What is needed, and what is now possible in this era of new online resources, is a way to provide resources for decision-making on a continuing and as-needed basis in a way that allows decision makers to float freely between conceptual (policy) and project level approaches. What is also needed is a way for one community to share information and resources freely with other communities. These are the goals of the WebPolis Consortium project.

The WebPolis Consortium provides a multi-tiered structure for citizens and local officials in member communities to share decision support services in an integrated, interactive and user-friendly online environment. It provides the facility and convenience of the Internet to local communities and promises to make resources available to local governments that they could not otherwise afford. It also encourages collaboration and sharing of information among user communities. WebPolis provides a number of innovations, both in terms of technology and user interactivity. It utilizes an innovative decision support system, based both on collaboration tools shared by user communities and tools and data available through a host server. Local officials have ready access to information and resources through this integrated online group decision support system.

The objectives of the project are to 1) develop a computing-services utility allowing local citizens remote access to data, computational resources and online discussion conferencing, 2) develop a common easy-to-use access interface appropriate for all communities, 3) develop a means of mediating queries from multiple community information sources, 4) develop remote collaboration tools for network information systems among local citizens and their governments, other levels of government, and
universities, 5) develop a trained staff to administer the program and serve as community consultants, and 6) have the project be self-supportive within five years.

The initial thrust of the Consortium is to serve poorer communities, smaller cities, and rural areas; these areas typically are underserved by new online technologies. An important 2002 federal report\(^3\) clearly showed there are four major groups making up the "unconnected" population; they include households with low family income, adults with low levels of education, Hispanics, and African-Americans. WebPolis, through its user-friendly programs and interactivity, creates ways for rural and resource-lacking communities to build and provide information-based services and for disenfranchised citizens on the wrong side of the "digital divide" to become active participants in local government activities and decisions. The goal of this project is to encourage social inclusion of all groups in their local communities through use of the Internet.

The Consortium aspect of the project consists of a network of user communities. Initial demonstration projects in two communities are being used to test various elements of the project, including determination of priority applications within the portal and evaluation of the WebPolis user interface as it is being developed.

Supported with grants from the U.S. Department of Commerce, the U.S. Department of Housing and Urban Development, and Eastern Michigan University, various local governments in Michigan were selected as WebPolis demonstration communities. One

county government, one regional organization and two smaller cities\(^4\) were charter members of the WebPolis Consortium. Local officials in these agencies and communities identified issues of greatest priority to their local governments to demonstrate the effectiveness of the project model in promoting effective decision-making using online resources. Both Albion and Ypsilanti are smaller cities with a relatively large lower income, minority population with significant needs for services from local government.

The project also serves an important educational function. Because of its interactive online format, it serves well as a tool for teaching city planning and local government to secondary school and college-level students. WebPolis is an outgrowth of the “Rivertown Simulation,” a classroom simulation based in the fictional city of Rivertown and used in urban planning/historic preservation courses at Eastern Michigan University over the past 14 years. The Rivertown Simulation has evolved over these years, from a classroom paper format to an online format to an interactive decision-making format. During that time, students have served as “guinea pigs” for many of its interactive functions. The classroom simulation currently includes eight types of online interactivity, from an online community newspaper to a discussion forum to a financial real estate model incorporated with property purchases.\(^5\)

The Rivertown Simulation served as the experimental petrie dish for many of the concepts eventually utilized in WebPolis. After years of experimenting in the classroom setting, many of the functions tested in the classroom were ready to be adapted for use in real communities.

**Intrinsic merit of the project**

The WebPolis Consortium project relies on the use of "virtual collaboration." As described in a white paper by Caucus, Inc.,\(^6\) the company that marketed Web Caucus online conferencing software, "Virtual collaboration must map the four-phase process of collaboration into the virtual environment. It should allow for customized design of the collaboration; facilitate sharing content about which the collaboration occurs; enable people to process that content and make decisions; and structure the resulting actions to be taken."

This level of online interaction represents the third generation of online communication technology. The first generation of "shared ideas" used technologies such as e-mail, bulletin boards, and Intranets for basic communication. The second generation allowed for "shared creation," using application sharing, screen sharing, electronic meeting systems and whiteboards for coordination. The third generation, which the virtual world is now entering and which forms the basis for the WebPolis project, uses "shared space." It utilizes networked virtual work environments in which participants interact in a mode of collaboration. This new generation of applications must utilize a thorough understanding of the processes by which real human beings collaborate in a

---

\(^4\) Washtenaw County, the Forks Initiative of the greater Albion community, and the Cities of Albion and Ypsilanti—all in Michigan.  
\(^5\) An Appendix to this paper includes a full description of the Rivertown Simulation.  
virtual environment. The processes include a number of points addressed in the WebPolis project and serve to illustrate the significance of the project's cutting-edge approach.

- "Create a true environment for collaboration, rather that a "web site," "portal," or a "message stream" or a "filing cabinet."

WebPolis is a tool for communities, including both residents and officials, to share information with each other in a user-friendly and coordinated online environment. This inter-city collaboration happens both through shared applications, resources and databases on the WebPolis main server and through online discussion conferences. It is more than communication; it is more than shared creation; it is true collaboration in a way not possible before the general availability of these new technologies.

- Support complex webs of interconnected people, processes, and information.

The WebPolis infrastructure is, by its very nature, complex, since it will support diverse applications in varying user environments with varying interfaces. However, the complexity is contained within the WebPolis "Toolbox"—software contained on the main server. On the user side of the portal, the interface is simple, coordinated and user-friendly, using a query format for many interactions between the user and the server. The demonstration model tests various query systems and survey users regarding ease-of-use, clarity and compatibility of various formats.

- Provide a sense of shared presence and support the building of ongoing relationships in the online environment.

Over time, many resources will be made available through the WebPolis portal. Perhaps the most significant will be those applications that encourage local officials and residents to build relationships through the online environment. Also, the asynchronous aspect of going online—having access at any time, from any place—gives more flexibility to users to participate according to their own schedule, rather than according to a schedule defined by others. Initial studies have shown this may be the most important advantage of the online environment because residents and others are able to participate when they want, from wherever they are located. Studies have shown participation is greatest later in the evening, with the typical log-on time being 9 p.m., which is especially important to parents who have schedules for jobs and families to accommodate.

- Be a "blur offering" of technology, consulting, and training.

The WebPolis Consortium will allow a blurring between what traditionally has been discrete functions and activities. Technology, consulting and training will not be seen separate and apart as community services, but will be integrated through a common portal.

- And finally, it must put human interaction at the center of the collaborative experience."

The WebPolis project, first and foremost, is based on the concept of being user friendly. Potential user groups typically have little technological sophistication. The technology, although significant and state-of-the-art, must appear simple and clear on a user's screen. The information can be "mined" at various depths, with basic surface information easily and readily accessible. More detailed information will be available for users who wish to dig deeper. The user defines what level of technology he or she wishes to use, with the introductory level serving as the default condition.
The WebPolis portal

The human-computer interface (HCI) component of the project will be especially emphasized. The WebPolis portal platform offers a common interface for users (both citizens and officials) to access a series of application modules. Metadata within the portal links information from user databases located both in user communities and on a common host server. The WebPolis portal allows user access to computer discussion conferences, a suite of applications, online consultants, community and external databases, and links to other web sources. Interaction is primarily through a query system, with two to three levels of query based on the technical level of the user (introductory query, detailed query, interactive query). Access privileges to these databases would be as set by each community.

The portal, as seen on the WebPolis home page, has two entry points. On the left side is the “Take a look” link that allows viewers to review most of the WebPolis functions in an observer role. It is important to allow first-timers to become familiar with the site and its usefulness before registering their name and email address. In this area they can explore the WebPolis interface, services and applications. To become a participant, however, one must “Sign In” with his or her real name and email address. Registered users can participate in the interactive functions and, based on their level of permission (e.g., public at large, resident of a member community, local official), they can contribute to interactive applications. These include their community’s online newsletter, partaking in online discussion forums, voting in online polls on local issues, participating in creating local economic development scenarios, etc. Registration is necessary for validating the identities of individual participants to these public forums, and anonymous participation defeats the basic concept of an open and honest interchange.

As is apparent in the recognized success of products like Apple Computer’s Graphic User Interface (GUI) and Microsoft Office suite of software (Word, Excel, PowerPoint), it is very important to have a standard interface for various applications. A user becomes familiar with how commands work, and as a result feels comfortable using new products because of their similarity of functions.

The WebPolis portal utilizes the same approach. In WebPolis, tabs at the top of each page provide a reassuring return to the basic interface from any point, and with literally hundreds of web pages accessible in the WebPolis applications, this orientation is critical to acceptance by users. As is shown below, the hierarchy of finder tabs is never more than two levels deep before entering an application.

The portal serves another important function. Within the portal, online resources from one WebPolis member community can be linked with resources in another member community, allowing local officials to share information with each other with “24/7”

---

7 The home page is found at: http://webpolis.info.
8 It will be up to each member community’s “Community Manager” to either validate or invalidate each registrant’s identification and establish the correct permissions category.
access. WebPolis also allows for meta-linking of applications, so information from one application (e.g., a financial database) can be accessed while in another application (e.g., discussion forum, or GIS analysis). Archiving of files of member communities, meta-linked within the portal, give one of the major strengths of the WebPolis concept, for it recognizes that communities can learn much from each other if given an appropriate environment for sharing.

**The WebPolis System**

The WebPolis system brings many innovations to online communications for local communities. This project utilizes existing applications and technologies in new ways to create this virtual collaboration environment. Described below are some of these innovations.

**Knowledge base:** The knowledge base aims to improve the performance of community decision-making through knowledge and information based on successful professional experience. It has two components—an expert system and a case study system. The expert system is a series of approximately 200 web pages of information on issues of community planning. It allows decision makers and the public to utilize expert knowledge by following a few simple steps. In this way, it can provide sophisticated solutions with users raising a few simple questions directed to the knowledge base.

The case study system accumulates successful and unsuccessful planning cases into a common database. A well-maintained and organized case study system will help citizens and local officials by comparing similar cases in the WebPolis archives. Doing this will provide a relevant perspective on the problem and allow decision makers to make appropriate modifications.

**Consensus Builder Process:** WebPolis includes a “Consensus Builder App (CBA)” to aid local officials and residents in developing consensus on local decisions. The process is initiated by a local official who has a need for input on a public issue. Using WebPolis conferencing software, the process begins by listing both the question needing a decision and a list of alternative solutions. The official also designates the individuals or groups eligible for participation.

Participants weigh the advantages and disadvantages of each of the alternatives. Preliminary decisions are formulated by a “self-weighted iterative voting (SWIV)” process, a consensus building process adapted from the more common Delphi format. As opinions are polled, the results of this poll are displayed graphically for all participants to view. Based on the current poll and online discussion, participants may revise their vote and/or the weighting of that vote, indicating how strongly they feel about their opinion.

When the initiator of the process feels a consensus has been reached, or that opinions have settled in and are unlikely to change further, the Consensus Builder App is shut down and the official can act on this information in the way most appropriate.

The advantages of the CBA process are that 1) opinions can be expressed openly after deliberation, 2) participants are not penalized for changing their opinion, 3) the process is adapted as appropriate by its initiator and 4) the process is archived and available for review at another time and by other groups and communities. It is truly a collaborative process as described earlier in the section of “virtual collaboration.”
Reference Digital Libraries: Over two hundred topic web pages have been created exclusively for WebPolis. These topics form a valuable and growing digital reference libraries on the WebPolis server to provide citizens and local officials with a pertinent reference base. The libraries integrate with WebPolis applications for communication, coordination, documentation, and technical support and assistance, and include such topics as:

- Local government organizations
- Downtown revitalization
- Local city planning
- Zoning
- Transportation
- Historic preservation
- Case studies
Application Tier:

**WebPolis Decision Support Toolbox:** The WebPolis analytical tools are categorized into three groups: 1) components of spatial analysis and interactive Internet mapping, 2) components of financial analysis and functions and 3) components of conducting online surveys and evaluations.

The Toolbox consists of four types of projection models integrated with a geographic information system (GIS):

- **Land-use models** take land use categories as inputs and project different sub-classifications of urban and non-urban land use such as commercial, industrial, and agricultural, and even more detailed sub-classification.
- **Environmental impact models** assess the environmental impacts caused by both natural and anthropogenic changes. They can incorporate many environmental issues, such as surface water quality, ground water recharge and pollution, habitat fragmentation, wildlife loss, floral and faunal community composition, impaired ecosystem function, etc.
- **Transportation models** study trip generation, trip distribution, model split and traffic assignment and project future travel patterns.
- **Economic models** project employment, population, wage rates, rents, incomes, and prices, among other variables, for different geographic areas and are especially useful for projecting economic growth.

With the aid of geographic information systems (GIS), it is possible to pull together modeling capabilities found in various models into one integrated modeling system. For example, an integrated system could combine travel demand, urban economic, and fiscal and environmental analysis into one powerful modeling system and provide visual depictions of model results.\(^9\)

**Online Discussion and Conference:** A discussion and conference component provides online communication, coordination and collaboration. By providing an online discussion conference, WebPolis will not only save time but also increase the speed and efficiency of information exchange, which will result in solving problems with less time and more efficient use of resources. It is a basic assumption of the WebPolis system that online discussion conferencing will encourage citizens to be much more involved in the decision-making process.

Database Tier:

The Database Tier acts as a manager for both community and WebPolis databases. WebPolis applications are generally stored at the WebPolis server at Eastern Michigan University, but some data is community-based and can be utilized from community servers.

---

\(^9\) The GIS capabilities of the WebPolis project are supported by Eastern Michigan University’s Institute for Geospatial Research and Education, a nationally recognized institute providing GIS services and training to communities throughout Michigan and the Midwest.
Presentation Tier:

Human-Computer Interface (HCI): Technology alone does not bring about a collaborative environment; it is critical to understand and solve problems of human-computer interface (HCI). Current applications use an XHTML interface for use by computer browsers to provide intuitive, interactive, and seamless graphic user interfaces (GUI) to access various components of the WebPolis for public users. An XML-based HCI is being developed to allow access from other devices, such as personal information managers/cell phones. By using XML, WebPolis could have a very user-friendly interface in spite of a client’s type of device, platform, operating system, and browser.

An example of a WebPolis application:

The Local Economic Development App

One of the most important aspects of local government decision-making concerns the economic development of a community. Through local economic development activities, jobs are created, tax revenues are enhanced, and a community improves its overall quality of life. However, economic development is also one of the most misunderstood and poorly administered aspects of community policy. Developing goals and strategies for economic improvement is often a hit or miss proposition, with emphasis based on limited perspectives or personal or political agendas more than rational analysis. Economic development projects are often selected by officials based on the experiences and “stories
of success” of other communities, rather than a careful review of their community’s own strengths and weaknesses.

One of the problems is the confusion between the functional terms “economic growth” and “economic development.” Economic growth simply means encouraging growth in size of the existing economy, based on its current characteristics. In other words, expanding existing industries, expanding retail and commercial. This is the common approach taken by many communities. In contrast, economic development involves improving the community in general through a more inclusive look at the impacts to the local economy. These may include new types of industry or commerce more in line with community resources, but may also include improvement of the community’s quality of life, including improved schools, parks and cultural amenities, as an appropriate outcome of its economic development. As shown by Segedy (1997), “The role of quality of life in location decision-making and in local economic and community development…is only now becoming recognized as a key determinant in the process. Amenities, aesthetics, quality and diversity of educational and cultural opportunities, equity and citizen empowerment, and perceptions of safety and environmental quality—these are all factors that need to be added to land, labor and capital in the new economic development paradigm.”

Another problem with economic development as it is practiced is the reliance on ineffective mathematical modeling. Both classic and recent economic models, such as Economic Base Theory or REMI (Regional Economic Models, Inc.), have practical applicability only on a regional level. Other models, such as Location Quotient or Shift-Share Analysis, may have some use for local purposes, but only if results are properly interpreted and recognized as limited in scope. To rely on mathematical models to lead a local economic development effort is being lead by the tool, rather than by the concept. Local economic development must begin by having decision makers in a community look at their community as it exists and derive what they would like it to be in the future, establishing appropriate goals and strategies. A SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) can begin to define this perspective, but leaders must take a wholistic view of their community and utilize a more-or-less open-ended, open-minded and iterative process to define their Goals and Strategies. Local economic development should not be led by process, but by vision based on information and reflection.

WebPolis has created such an environment for reflection in an online environment through its Local Economic Development App (LEDA). The LEDA opens with a page gently presenting some of the key factors to consider in local economic development. It then takes users to a series of queries asking them to consider their community’s primary economic development goal and sub-goals based on selections. Each selection has an information web page linked to it presenting ideas associated with that goal. For instance, the goal to “Create jobs” has a web site discussing the trade-offs in creating entry level jobs to reduce unemployment versus professional level jobs tied more closely with community quality of life factors. One approach is focused on solving a problem, the

---

other on creating an opportunity. Based on the selection of a primary goal and its sub-goals, various appropriate strategies are presented.

With this easy procedure, participants have taken an initial broad perspective of the field of local economic development. They have begun by considering a variety of economic goals and become initially informed about some of the relevant factors involved with each. Then they have been advised on some strategies that are appropriate. The process has been user-friendly and introductory.

Users are now ready to consider the list of strategies presented and decide which are best suited for their community. For each strategy, additional informative web pages are linked that provide background information and perspective. After the informed selection of a strategy or multiple strategies, users see links to relevant implementation resource links. For example, if the strategy is to encourage downtown retail, the resource link may go to a financial real estate application that gives a financial analysis for a given property. If the strategy is for a tax abatement program, the resource link will go to a spreadsheet that is used to determine the cost/benefit of such an abatement, based on financial factors input by the user.

Not all resource links will be to traditional “models.” Sometimes the best resource for a selected strategy will be a list of questions the community should consider before committing to that strategy. In other cases, the strategy may be too complex to be dealt with in an online environment, and the resource link may simply state, “It is time to bring in an expert to help you achieve this goal using this strategy.”

Whether expert advice is needed or not, the community and its leaders benefit from the objective and broad approach inherent in use of the WebPolis LEDA. The purpose of this application is to inform and educate local officials and residents on local economic development and assist in making good decisions. The fact that this advice comes in an online environment means that it can utilize all the resources of the web, it can be

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>telecommunications</td>
<td></td>
</tr>
<tr>
<td>Land use suitability</td>
<td>Impl. Link</td>
</tr>
<tr>
<td>public transit</td>
<td></td>
</tr>
<tr>
<td>Accessibility analysis</td>
<td>Impl. Link</td>
</tr>
<tr>
<td>Financial budgeting</td>
<td>Impl. Link</td>
</tr>
<tr>
<td>Transportation Modeling System</td>
<td>Impl. Link</td>
</tr>
<tr>
<td>Tax abatements</td>
<td></td>
</tr>
</tbody>
</table>

You have now completed selection of your economic development strategies.
available whenever needed, it can be archived and shared with other WebPolis communities, and it can be linked and meta-linked to other applications in the WebPolis Toolbox.

**Interface levels using the Real Estate Financial App (REFA)**

WebPolis applications are designed to be used at both introductory and advanced levels, with the introductory level the default. This multi-level interface is virtually transparent to users, but allows them to interact with the applications at a level they find most useful.

Utilizing applications at the introductory level provides the simplest and most user-friendly interface. By not involving the user in as much complexity, it relies more on a “rule of thumb” approach to the use of data and its interpretation. At the introductory level, programs often interact with users through a query format, asking simple questions of users that lead to useful responses. Advanced levels of interaction give users fuller access to an application’s variables. They are designed to be as user-friendly as possible, but are more complex in their interactions and can provide more detailed and precise responses. Users are able to shift between the introductory and advanced levels at will, depending on their needs with any particular application.

The WebPolis Real Estate Financial App (REFA) utilizes both the introductory and advanced levels for its interface, and serves as a good example of this WebPolis feature. As an example, assume a user is considering the purchase of an existing commercial building in the community. The user wishes to know whether the property can give a sufficient return on investment (ROI). The user is queried by the WebPolis REFA on a few basic details of the property—the cost of the property, how many floors, the square footage of each floor, the assumed construction costs per square foot, and expected rental or lease income per square foot annually. All these figures are readily available from a realtor/developer in any commercial district.
After this data is input by the user, the WebPolis financial database draws data for the designated community on lending rates, hard and soft costs for typical properties, property tax rates, appreciation, etc., with this data based on previous user inputs. Using the figures from both the user and the WebPolis archived database, the user is presented a web page indicating a total expected return on investment based on three factors: cash return (ROI#1), return from taxes (ROI#2), and return based on property appreciation (ROI#3). Although the results are only a crude “ballpark” analysis, this information may be sufficient for the user to decide whether the property has enough economic potential to warrant further analysis.

This analysis at the introductory level serves a number of purposes. First, it encourages a user to become familiar with some of the primary considerations in looking at a commercial real estate property. In addition, the output gives a rough, but realistic, portrayal of the economic viability of the property. It also provides the first step to a more
complete analysis using the WebPolis REFA and helps overcome initial reluctance to conduct such an analysis.

From the introductory level analysis, users may click boxes to look at various aspects of the financial analysis in more detail and consider “What if?” scenarios. They could ask REFA to recalculate the overall ROI based on a higher lease rate, or a lower construction cost, or even a better mortgage interest rate. This more detailed analysis is only revealed in pieces as the user asks for it.

Finally, the advanced level presents the entire spreadsheet for the complete analysis of ROI—a spreadsheet with 80 numerical data boxes, some from input, some from assumptions and some the result of calculations. Now the user has full access to all elements of the financial analysis, and can interact with it in as much detail as desired. However, even at this level the user interface is as accessible as possible. For example, definitions of all terms used can be called up with a simple mouse click.

The Real Estate Financial App (REFA) is a good example of the WebPolis approach to user interface for its applications. “Apps” are typically first accessed via an introductory level, providing useful general information or analysis, but can also be accessed at an advanced level appropriate for users who need to use the full resources available in this online environment.

Linking and meta-linking of applications

One of the most significant contributions of the WebPolis online environment to decision support services is the linking of its applications with each other. Through linking and meta-linking (i.e., linking to links), WebPolis is designed to allow utilization of one application while in another. This interactivity allows users to have ready access to all of its online resources as needed.

For example, assume a local official wants to consider the development of a new parking lot in the downtown district. He or she can utilize a number of WebPolis applications to support the decision on whether, where and how to proceed. A topic area is first set up in the WebPolis discussion forum; this is where discussion begins. To supplement this, the user can initiate the Consensus Builder App (CBA) described earlier to poll a selected set of individuals or groups to offer their polled opinion on a set of alternatives defined by the official. This poll is continually updated for viewing by the CBA group, and each is allowed to change his or her vote in this reiterative process.

Other applications can be utilized to bring in additional resources and input. WebPolis’ GIS capability can evaluate parcels through its Site Suitability Analysis App (SSAA) and set parameters for satisfactory sites, as well as determine how many parking spaces would fit on a given site. The Construction Expense Database App (CEDA) would utilize currently available cost data to derive a rough estimate of the cost of the project. The WebPolis Topic Information web pages can be reviewed to read general information on parking and transportation/pedestrian issues, and the Loan/Grant Search Engine can utilize keywords such as “Parking” or “Transportation” to find available funding sources.

These are not individual applications that must be run one at a time. Rather, they are linked applications with a common portal, a common interface, and meta-linked databases. As this proposal for a parking lot develops, resources used and input from participants—the information and the process itself—are archived on the WebPolis server. This allows other WebPolis member communities who may have the same
questions to review the first community’s process, resources used, and the determinants for the final decision. Such is the power of linking and meta-linking in the WebPolis online environment.

Other considerations.

The WebPolis Consortium is a complex project involving many elements inherent in building an online environment. WebPolis must be sophisticated enough to provide real assistance to local officials and residents in community decision-making, yet simple enough to be used by all citizens. In the above sections, a series of significant aspects of the development of WebPolis have been described. However, there are other aspects of the project that are also significant. Following are brief descriptions of some of these other considerations.

Permissions

Communities may not want to make all the archived information on WebPolis available to all users. Therefore, a system of permissions is part of each application. WebPolis users are categorized as follows, each with increasing levels of permission: general public at large; registered WebPolis users; registered residents for a member community; designated officials for a member community; WebPolis Community Manager; WebPolis staff; WebPolis directors. For example, WebPolis directors have full access to all files, applications and databases for all communities; Community Managers have full access only to their own community; while registered residents have access only to those files that the Community Manager for their community has allowed access.

Some communities, and their Community Managers, may give relatively few permissions to the applications, while other communities may give relatively free access. This is a decision made locally by the Community Manager, in consultation with community leaders. As a result, in some instances residents may have freer access to applications and files in another member community than in their own. The principle behind the use of WebPolis, however, is that information should be shared freely between communities, and from that better decision-making will result in all member communities.

User fees

WebPolis is currently supported through two federal grants and one university grant to support its development. The project schedule, now in the middle of its second year, anticipates WebPolis becoming self-supportive at the end of its fourth year. As the project shifts from development to maintenance and enhancement, the annual costs will be significantly reduced and primary support will come from member user fees, rather than external funding.

Member fees will be based on the type of user agencies and size. Minimal fees will be charged to smaller local governments, its target user category. Fees will be charged increasingly to other user categories—larger municipalities (based on population size), non-profit organizations, and profit-based companies.
Open Meetings Act

Concern has been raised about the use of the WebPollis online discussion forum for conducting city business, and whether this could constitute a violation of the Open Meetings Act common to many jurisdictions. If elected officials use the WebPolis online discussion forum to discuss city business subject to action, this could be construed as a closed meeting, and illegal under Open Meetings Act legislation. However, there should be no problem if officials use the online forum to discuss issues with residents and others.

Research component

The WebPolis Consortium includes an important research mission behind the development of its applications. Extensive review of Internet sites by staff has revealed no other web sites comparable in scope to the conceptual design of WebPolis as a decision support service. Many sites utilize similar individual elements, such as online discussion conferencing, online surveys, local government financial templates, GIS mapping and analysis, and descriptive information pages, but none fully integrates these functions throughout its structural framework as does this project.

The technical foundation of the WebPolis Consortium project is the “Distributed Group Decision Support System (DGDSS).” Over the last decade, IS (information systems) and OR (operation research) researchers have developed an impressive set of tools for helping face-to-face groups make better decisions (Bostrom, et al., 1992), referred to as “Group Decision Support” (GDS). One of the urgent challenges, however, identified for GDS research has been the need for “Distributed GDS,” i.e., developing tools that can improve decision-making by groups who for one reason or another cannot meet face-to-face on a regular basis, or ever (Nunamaker, 1997). Conceptually, the interests for Distributed Group Decision Support Services seem promising for simple reasons: 1) the technologies of the Internet are rapidly advancing and make remote and real-time communication feasible; 2) the world economy is becoming more globally integrated, making it necessary for people to work with colleagues and partners who are physically remote, and DGDSS provides a mechanism for asynchronous collaboration that is critical to successful decision-making for large organizations or broad communities. Based on research and the lessons learned through the WebPolis project, the missing piece, and the most challenging task, is to create "effective storage and retrieval of decision-making experiences/ legacies in organizations."

Human subjects research guidelines

Because the WebPollis Consortium project uses human subjects during its development, it is required to get approval for human subjects research. There are various ways individuals can participate in the WebPolis project. An individual may participate anonymously as an observer on the WebPollis site and can 1) review information found on the site, 2) download information and 3) observe proceedings. However, to fully

---

participate an individual must register through an informed consent process. After registering, individuals can participate more fully in 4) online discussions, 5) forums, 6) interactive applications and other online activities. Because the conceptual base for the WebPolis project encourages local officials and residents to discuss issues openly online, as in a public hearing, identification of all participants is necessary. (However, individual identification will not be used when evaluating the project or publishing records of WebPolis online activities.)

Human subjects research approval was granted based on the following rationales:

“Participant involvement is voluntary. Participants self-register, identifying themselves by name and email address. The identification is checked through an email notification procedure to prevent misrepresentation. All registrations are password protected.

“The goal of the WebPolis project is to encourage communication between local officials and residents. A number of applications are used to enhance this communication. When using the online discussion conference application, it is necessary for all participants to identify themselves by name. For use of other applications, individual identification is not necessary and may be defined by either a community representative or by individual participants.

“Reports of research findings will be from general information categories only, and will not be linked in any way to individual participants. All data entry for research purposes will be entered without reference to individuals. Evaluators will have no access to individual records, except as they are generally available to the public on the project web site.

“The project includes no involvement with individuals in vulnerable classes, except as they may be members of the general public. There are no special provisions for these individuals.”

Conclusion

With its utilization of the many resources of the online environment, the WebPolis Consortium project provides new potential for changing and improving the way decisions are made in local government. Through its suite of integrated online applications, both local officials and residents can be more fully involved in the process of local government. By making resources and data needed for good decision-making more readily available to all citizens, WebPolis can change the perspectives of community residents and their leaders in significant ways.

---

13 Statement used on WebPolis registration web page:

By agreeing to be a participant in this online discussion forum, your comments are viewable by the general public. However, any data collected and used for evaluation will have no participant identification.

___ I accept ___ I refuse

14 From a letter sent from the WebPolis project director to the Technologies Opportunity Program officer, Department of Commerce, Washington, D.C.
The WebPolis Consortium represents a full-scale experiment in creating virtual communities—communities that have partnered together to share resources and information to the betterment of all. Through its consortium of member communities, these can be considered re-formed virtual communities without physical boundaries. Whether the experiment in online decision-making and governance is successful only time will tell, but the first steps clearly illustrate its promise.

Keywords:
Public Decision Support Systems, Group Decision-making, GIS, Digital Governments, Human-Computer Interface


Ritter H., Webber, M., (1973). Dilemmas in a general theory of Planning Policy. *Reprint no.86, the Institute of Urban and Regional Development*, University of California, Berkley


Appendix:
The Rivertown Simulation

Introduction

We all recognize that new computer technologies have become integrated into
university teaching and learning. This includes the many offshoots of the computer
generation. One of the most significant innovations has been the use of Internet for
expanding the scope of the college "classroom." In many ways, the Internet has replaced
libraries as a primary information source. Many course syllabi now include Internet
sources as references, and instructors regularly refer students to web pages for the most
current information on various topics.

On-line courses represent an even greater potential for changing the very nature of
the traditional classroom. In Fall of 1997 I was selected to offer the first completely on-
line course, "Issues of Historic Preservation," at Eastern Michigan University. It was an
experiment supported by university administrators who wanted to better understand the
potentials and pitfalls of such offerings. Although based on an existing classroom course,
this web-based course was different, and required rethinking some important assumptions
about teaching and learning.

Two questions took on a primary role during the course's development period. First,
had technology developed to the point where both instructor and students could readily
function in a totally on-line environment? Second, how were issues of teaching and
learning affected by this method of communication? The answers to these questions are
discussed in the following sections.

The impact of technology

The first question, dealing with the readiness of technology at this point in time, has
been the easier to answer. Current technology is more than adequate to make on-line
courses available to most students. The expertise needed by both faculty and students
does not need to rely on "leading edge" technology, but can be easily learned and adapted
as needed. Indeed, it has been satisfactory to offer on-line courses with technology one
or two steps removed from the leading edge. For example, developing web pages for the
early versions of Netscape (2.0) or Internet Explorer (2.0), rather than later versions
provides sufficient bells and whistles and does not shut out students with slower modems
or older computers.

Internet web page browsers provide one type of resource for on-line courses. Another
is the use of computer conferencing for discussion and dialog. Computer
conferencing has become widely available and is able to be used in ways only envisioned
a few years ago. Research has shown computer conferencing to be an excellent
educational tool, for it encourages participation among students. In a campus classroom
setting students may have a physical presence, but this does but not ensure their
participation. Using computer conferencing, however, a student does not "exist" until he
or she speaks up by submitting a message on-line. Also, student comments tend to be
more coherent and well thought out than the typical token responses made by students
during classroom "discussion." McInerney has compared on-line discussion to a chess
game—one played by Email. Participants are able to review previous comments, or "moves," and then develop their own responses, or "counter-moves." By reviewing the conference postings, "...one gets the feeling that one is following a typical, but very well thought out, class discussion."

As found during one course, however, students felt uncomfortable posting thoughts too early in the semester, for fear they would be found wanting later. In comparison, classroom discussions are not recorded and subject to such later review, so thoughts are explored in a freer atmosphere. However, this concern was overcome by allowing students to revise their earlier messages as often as they wished. As described by one instructor, "...we came to an agreement that every comment posted would be understood to be a work in progress, always subject to revision in a later posting. We agreed that it was all right to float trial balloons, to think aloud, and to otherwise try on ideas and points of view." (McInerney)

Computer conferencing has also been found to promote diversity. It can empower students who might not readily participate in classroom discussions, including women and minorities. As described by a student who just had completed an on-line course:

"It has definitely made me think more critically. Sometimes when talking in small groups it is hard to get your opinion stated... because your thoughts just get stirred up in your head and you cannot verbally say what you are thinking. It is much easier to write down my thoughts because I can type as I think....It helps to have it right there in front of you because I can always go back and refer to someone else's statement as well as my own." (Pugh)

The other noted advantage of on-line classrooms is the concept of asynchronous learning—that is, learning outside the strictures of time and place. Initial evidence indicates this may be, for students, the most important advantage of on-line courses, for they are able complete their work when they want, from wherever they are located. Studies have shown on-line students tend to work later in the evening, with the typical log-on time being 9 p.m., which is especially important to older students who have schedules for jobs and families to accommodate. This is one of the reasons some instructors have found the average age for on-line students to be in their 40s. (Major and Levenburg)

**The problem with technology**

Solving the technology issue is not sufficient, for there is a tendency to have efforts which rely on new technologies, such as on-line courses, be technology-driven. Many instructors have found the satisfaction of solving the technology issues of teaching beguiling in and of themselves. This is found with the many courses now available which have sophisticated web usage, but primitive teaching methods. As faculty, we can fall into the trap of developing sophisticated means of communicating, and still have little to say. Neil Postman, in a talk given to the German Informatics Society, gave the warning in this way:

"Through the computer, the heralds say, we will make education better, religion better, politics better, our minds better—best of all, ourselves better. This is, of course, nonsense, and only the young or the ignorant or the foolish could believe it."
"As things stand now, the geniuses of computer technology will give us... instantaneous global communication, and tell us this is the way to mutual understanding. They will give us Virtual Reality and tell us this is the answer to spiritual poverty. But that is only the way of the technician, the fact-mongerer, the information junkie, and the technological idiot... Here is what Henry David Thoreau told us: 'All our inventions are but improved means to an unimproved end.'" (Postman)

To be successful, on-line courses must go beyond technological issues to important pedagogical issues. We must look at and better understand how learning is happening at the other end of the modem link, and create teaching methods which lend themselves to this new reality.

**Pedagogical issues**

As shown above, there are a number of important new issues relating to on-line courses. On-line courses are more than simply traditional classroom courses with an Internet component—that is, giving assignments using the Internet, or communicating through Email. On-line courses are non-classroom courses, and can include students from around the world. They use the web as their very soul, and as a result recognize a very different type of learning process.

Traditional classroom courses are linear in format, with learning happening according to a defined schedule in a progressive manner over fifteen weeks. As one topic builds on another, there is the assumption that knowledge is gained in a step-by-step logical manner. This approach is a result of information coming from books, which ask the reader to proceed from one page to the next until the end, when all knowledge on a topic has been more or less assimilated. Brown University professor George Landow challenged this approach in a 1997 article: “The linear habits of thought associated with print technology often force us to think in particular way that require narrowness, decontextualization, and intellectual attenuation, if not downright impoverishment.”

By contrast, on-line courses tend to be non-linear. Because the information is all there and in web format, rather than in the form of a hard copy textbook, students may jump into topics in the middle, and "web their way" backwards and forwards. They may begin with a topic in which they have a particular interest and branch out in various ways—by jumping to related pages on the course's web pages, exploring posted course materials, finding related external Internet sites, and joining the course's on-line discussion conference.

It is difficult for an on-line instructor to restrict this more random approach, nor is it necessarily a good thing to try. The on-line environment, it can be argued, better represents the way we naturally learn. When young children learn, they find something about which we are curious, and in wanting to find out more about it, they soon become curious about related topics. For instance, a child may initially have an interest in big animals. This may lead to a study of dinosaurs, and eventually to an interest in history, geology or biology. This learning when one is most receptive is a principle that is well understood but little accommodated in the traditional college classroom, where a student

---

is more likely to hear, "It is now time to learn about biology. Open up your Biology textbook and we will begin with Chapter 1."

The on-line environment can build on the advantages of that earlier method of learning. It can allow students to learn information as they need it and have an interest in it. It can allow non-linear learning, when one begins understanding a subject from its middle, and expanding out from that point in all directions. It means releasing control and responsibility from the teacher to teach, and endowing it on the learner to learn. Does this seem heretical? Or does it simply seem different?

Use of on-line simulations

On-line courses tend to promote more interaction than traditional classroom courses, both student-to-instructor and student-to-student. As described above, students and faculty learn the art of communication in the on-line environment, and because of the nature of the medium that communication is typically more thoughtful and on-going.

On-line courses can promote "classroom" interaction in other ways as well. One is through the use of on-line simulations. Simulations and active learning techniques offer an invigorating way for students to practice "social imagination," a hallmark of human social intelligence that allows us to grasp other points of view, explore different ways to respond or behave in a situation and apply information to realistic scenarios. Richard B. Powers, a psychology professor with extensive experience designing and facilitating simulations, observes that playing a role in a good simulation generates empathy in most players. Consequently, players develop insights about a problem because they see it through the eyes of others. This is especially important in the training of planning students. Good simulation games are slices of life presented in a "safe" environment within a compressed time frame. They create experiential "hooks" upon which to hang cognitive information and encourage multidisciplinary thinking. They accomplish a number of learning goals, including—promote long-term retention; demand team work, compromise and negotiation skills; expose students to many points of view; help bridge the gap between knowledge and experience.

The Rivertown Simulation

The Rivertown Simulation was developed for a graduate course in Downtown Revitalization and Planning. Its purpose was to promote discussion of downtown issues by having students engage as members of the community of Rivertown, a fictitious smaller city located "somewhere between Ohio and Michigan."

The Rivertown Simulation was developed as a reaction to other popular urban simulations, including SimCity and the the Community Land Use Game (CLUG). SimCity is a popular computer software exercise in which participants are challenged to create a growing and healthy city by making decisions which best fit the programmer's algorithm. It is an exercise which is basically the participant against the computer. CLUG, an early simulation exercise, dealt primarily with the allocation of land use based on economic factors, and was created by planning professors for group play. Although based on interaction between participants, CLUG was largely based on economic criteria for success.
In contrast, the Rivertown Simulation has as its primary goal simply the promotion of discussion among participants of planning issues. It has no "winners" or losers," but bases its relative success upon the depth of discussion and understanding.

Students first experience Rivertown through a large birds-eye perspective drawing. 

![Sketch of Rivertown](image)

Sketch of Rivertown

The simulation is introduced to planning students in the following way:

"The Rivertown Simulation is not intended as a traditional board game, with absolute winners and losers. Rather, its purpose is to create a simulated setting—in this case a section of a city with older downtown buildings—and getting students involved in making decisions to encourage its revitalization. The simulation represents the process one would go through in deciding, for example, whether a historic district should be established in the downtown, or how to best cope with an adult book store, or whether additional parking should be created. It looks at these decisions from various perspectives, including that of merchants, city officials and residents.

"As in real life, not all the rules and strategies for involvement are apparent immediately. However, a player can see the results of decisions over a span of time and can also see how decisions of others can impact their involvement, both directly and indirectly. The balance of competition versus cooperation among participants must continually be assessed. The element of chance plays a minimal role in the simulation. There are some risk factors, but essentially the larger "risks" are inherent...
in how well development decisions are made in Rivertown's continuously changing economic micro-environment." (taken from Tyler course syllabus)

The Rivertown Simulation attempts, in simplified form, to represent the process community leaders go through in deciding on various revitalization strategies for their city and to show the outcome in a condensed time period. Players can see the results of the decisions over a span of "years" (each week represents about one year). Students make individual decisions, such as investing in individual buildings by buying and renovating them, but also take on community roles such as serving as city council members, city planners, merchants, or residents.

The initial runs of Rivertown on the Internet have been more successful than anticipated. Perhaps the best way to illustrate the effectiveness of this form of interaction is by including a portion of the discussion on one of the more controversial issues in Rivertown, the opening of an "Adult World Book Store" in an underutilized downtown building. First names and affiliations of the participants are shown.

**Bryan** (a historic preservation student at the University of Missouri): Does the owner of this new adult book store have any information on his clientele?

**Norm** (simulation developer and author of this paper): The Adult World Book Store seems to be attracting primarily men, coming in from all sections of the city. They are a diverse group, some wearing grubby clothes and some wearing suits. Little else is known of the store's clientele.

**George** (an urban planner from New York City): Bryan, I'll tell you about the people going to this place, they're sick, perverted souls. If the city council doesn't do something to shut down this house of sin, we residents of Rivertown will mobilize to shut it down ourselves!

**Chris** (an Internet consultant in Cambridge, England): Other than George, have any Rivertown residents protested? Certainly the presence of this book store will increase pedestrian traffic through the area, but it will lower property values as well. How does the city council feel about it?

**Dan** (a student at the University of Toledo): I, for one, feel that until some adverse effects begin to arise which can be said to be a direct result of the Adult World or its clientele, then the business which Rivertown needs immediately in order to provide its citizens with better services deserves the same cooperation from the city as any other enterprise. I'll be the first to admit that I'd much rather see a pro football stadium in that spot, but let's face it, we are, at this time, capital poor. I'm not willing to sacrifice the town just for money, but the Adult World store simply has done nothing outside the law to warrant anything other than caution and concern, which I also share.

**Regina** (a planning student at Ohio State University): The proprietors of this establishment should be aware they are being watched to ensure detrimental effects upon our community do not occur. I pretty much agree with Dan.

**George again:** TO THE OWNER OF THE ADULT WORLD BOOKSTORE: Please understand that you have made an error moving into this town. Starting Friday, July 26th, outraged members of the community will start a DAILY picket of your establishment. We will be armed with cameras and will not stop until you have left town. Move now to avoid any conflict.
And Bryan again: As an entrepreneur I cannot sit back while particular residents attempt to close a business just because they happen to disagree with its products and/or clientele. Will my deli be the next victim? Will some group decide that selling bratwurst will corrupt children? This Friday I will "proudly" patronize Adult World, and I urge others to join me. We need to show that businesses in the downtown are encouraged to grow, no matter who they are, or what they sell.

And so it went. Over a seven week period almost 300 similar messages went back and forth between participants, each illustrating the development of a viewpoint on an issue of downtown revitalization.

**Interaction between courses**

Opportunities for interactivity abound in the on-line environment. This was explored further during the Winter 1998 semester, when the Rivertown Simulation was used concurrently in three separate courses. The students in each of the three courses brought varying perspectives to the exercise. Students in the graduate Downtown Revitalization and Planning course took on the role of merchants and property investors, and were primarily concerned with the economic development of Rivertown's downtown. Students in an undergraduate Historic Preservation course became members of Rivertown's Historic District Commission, whose goal was to protect Rivertown's historic heritage. Students in an on-line graduate course in Historic Preservation assumed the role of residents, who were concerned about quality-of-life issues. Although the students never saw each other in reality, they met in the cyberspace world of Rivertown and dealt with a number of planning issues shared in common. Student comments were grouped by topic on the conference software, and their discussion gradually built toward resolution of various issues.

Issues were brought into the simulation through articles in the Rivertown BUGLE, the local on-line newspaper, and topics being presented in the various courses. As instructor for all three courses, I took on the role of Game Operating Director (G.O.D.) and represented the world external to their roles. In addition, professionals were invited to join the discussion at strategic times and they presented important additional perspectives.

The dynamic resulting from this blending of traditional classroom students with on-line students went well beyond the typical classroom seminar discussion. Many things were happening. Students interacted with other students, both in their classroom and via the web. Graduate students interacted with undergraduate students. Students at a distance (Missouri, Louisiana, etc.) interacted with campus students in Michigan. Professionals interacted with students from the convenience of their own office. The learning went on in many forums. As shown by Gilbert, "This medium lends itself to student-focused rather than instructor-focused discussion. I see this as a strength and would recommend any instructor take full advantage of this."

**On-line textbook**

A problem with on-line courses is the dichotomous learning modes between the use of on-line resources and traditional hard copy textbooks. To be successful, an on-line environment should be complete in itself. Unity of method is lost when a "linear-format" textbook is coupled with the non-linear, asynchronous format of the on-line course. For the first on-line course, Issues of Historic Preservation, an attempt was made to deal with
this dichotomy by making the course textbook, for which I was the author, available in
text form through the Internet. Dumping the text from disk, each of its fifteen chapters
were reformatted for the Internet language of HTML, and graphics were integrated on
these web pages. Assignments and discussions linked to appropriate pages, and the
textbook was used throughout the course.

This attempt at integration of discussion and on-line textbook was an almost total
failure. Most students ignored it, and some felt it necessary to buy a hard copy version.
When surveyed, students said it was just too difficult to read a textbook on the computer
screen. It took too long to download, and was an uncomfortable and unfamiliar process.

It was obvious a change needed to be made before teaching the second on-line
course, Downtown Planning and Revitalization. For this course there was no existing
textbook—only a loosely organized course pack. Using the course pack materials as a
base, work began on creation of an "on-line textbook." This new textbook would be
written exclusively for on-line use; it would not be available in hard copy, but only on
compact disk. In other words, students would buy a CD as their course textbook.

Putting the new "book" in web format allowed it to be used in a way appropriate to
the Internet. A topic could be found anywhere simply by following links from either
other topics or from course discussions or assignments. Since the book had no beginning
(no Chapter 1) or end, students could enter at any page and follow internal links to other
related topics. This method of learning and exploring followed much more closely the
natural, rather than academic, learning process discussed earlier.

With this on-line textbook, students could freely float between links—links which
connected descriptive information, conference discussions, assignments, external links,
and connections with other students, the instructor, and professionals. It became a new
way of both teaching and learning which required a rethinking of both the use of
technology in the "classroom" and pedagogical implications.

The on-line book was constructed of a series of short, punchy, informative and
enticing web pages, none with more than a few paragraphs of text and most with multiple
links to other pages. To prevent a morass of links, order needed to be brought to the 200
plus web pages to prevent a frustrating circling of links. This was designed on a large
storyboard, using Post-it notes to represent each web page. As shown below, this board
would not be available to users, but its underlying logic of the links needed to be intuitive
for them.
Storyboard for on-line textbook

The textbook is now nearing completion, and will be used in the graduate downtown planning course in January 1999. During its development it also has been used in an experimental run of the Rivertown Simulation and has been modified based on that experience.

Will on-line textbooks based on the web page format replace hard copy textbooks? It is not likely—it is no more likely than "Amazon.com," the popular on-line book ordering service, replacing local book stores. There is a place for both, and they serve different needs and audiences. But on-line textbooks are a viable teaching and learning tool, and have potential that is yet to be tapped.

Critique

On-line courses and computer simulations are not the going to replace the classroom and instructor-student relationship. That is not their mission. However, they can enhance education by expanding it beyond traditional boundaries. Through on-line conferencing students from across the world are able to participate interactively with students in the classroom. Through the use of simulations like the Rivertown Simulation students are able to experience the impact of decisions before facing them in the cold reality of the outside world. Through the development of on-line textbooks students will be able to learn in a more intuitive manner.

The advantages of the new technologies and delivery systems must be evaluated objectively. But the pedagogical implications are even more important and significant. In 1995, Andriole reported on Drexel University’s early experience with Asynchronous Learning Networks. Student reactions were extremely positive. 90 percent felt they had
more access to the instructor than in "conventional" course delivery. 85 percent would take another ALN course. 80 percent did NOT miss class lectures. 75 percent felt they had more communication with fellow students than in conventional courses. 75 percent felt they learned MORE in the ALN-based course than they expected to learn in a conventional course. Andriole concluded that an individual, self-paced learning model in an "open" environment is a powerful learning medium.

As presented by Chickering and Ganson, a good educational approach should include seven things—student/faculty contact, cooperation among students, active learning, prompt feedback, emphasis of time on task, communication of high expectations, and respect for diverse talents and ways of learning. The on-line method of instruction incorporates all seven factors, and can result in new rewards for on-line faculty who are able to adjust to both the problems and the potential of this medium. As described by one instructor, "I have found teaching a course in this format to be astounding and, initially, unsettling. I have never felt the emotional connection to my students in other classes that I feel in this one." (Gilbert)
Bibliography


Postman, Neil (1990) "Informing Ourselves to Death," a talk given to the German Informatics Society.


Endnotes