TECHNIQUES OF IMPROVING COMMUNICATION IN URBAN PUBLIC PARTICIPATION THROUGH COMPUTER TECHNOLOGY

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ABSTRACT

Communication especially interactive communication is a major goal of public involvement. This paper discusses the ways of Enhancing Urban Public Participation via Computer Technology. It specifically discusses such issues as the importance of the network in urban participatory planning, computer technologies used in urban public participation, interactive video displays and kiosks, computer presentations and simulations, mapping through geographic information systems (GIS), plan or text mark-up software and remote sensing applications. The study concludes that Public participation has been a central tenet of planning discourse for many years, with each generation trying to improve access and interactivity to hard-to-reach people. The study recommends among others that the use of social media cannot be over emphasized in facilitating public participation due to its ability to engender greater numbers of participants.

Keywords: *Computer Technology, Urban public participation, ICT, interactive communication*

INTRODUCTION

Communication especially interactive communication is a major goal of public involvement. Face-to-face meetings are a traditional method of providing such contact, but changing technologies offer many new options for people to get

information and provide input, comment, or support. New technologies largely based on electronics are accelerating and enhancing the communication process. Interactive technology does not replace traditional direct contact techniques. Rather, it needs to be well integrated with them in an overall public involvement program.

People feel excluded or unable to participate if they have no ready access, and many find computers or televisions more impersonal and distancing than traditional means of communication. Some minority, ethnic, low income, or poorly educated individuals feel particularly uncomfortable with new technology.

Yet as new communication technologies become more and more prevalent, their potential for public involvement blossoms. People can participate in large meetings without leaving their living rooms via phone, special modem connections, the Internet, or satellite transmissions. They save travel time and cost because electronic communications are able to span long distances. Interactive techniques can also be used in conjunction with traditional meetings by incorporating interactive displays, for instance, that show the steps in a process or describe a project.

Several techniques can help improve communication in public involvement, as follows:

• Interactive television;
• Teleconferencing;
• Interactive displays and kiosks;
• Computer presentations and simulations;
• Mapping through Geographic Information Systems;
• 3D Visualization;
• Visual Preference Surveys;
• Handheld Instant Voting;
• Plan or Text Markup Software; and
• Remote Sensing Applications

THE IMPORTANCE OF THE NETWORK IN URBAN PARTICIPATORY PLANNING

The web is an interface for information about and the promotion of planning in progress. This is often a necessary tool for the sharing of experiences,

coordination and organisation of activities and events. There is a vast amount of literature about citizen participation through the internet. Weber believes, for example that the inclusive actions on the web exert positive influences on participation policies, independent of the civic participation (Weber et al., 2003). Conroy and Gordon found that technological approaches in public meetings increased the level of satisfaction compared to traditional public meetings (Conroy et al. 2004). But there are also those who argue the opposite: it becomes a problem accepting the validity of the interface technology which the citizen might not know how to manage. To this point the citizen may feel manipulated (Innes 2005).

Today, an active participatory environment that uses internet has great potential to engage the public. Just consider how the latest generation technology allows you to raise the public debate even to young people through new participatory forms and practices. This occurs, for example, with virtual communities and social networks which, more and more, interact asynchronously with each other, creating a multitude of interactive environments in which people socialize (Facebook, Twitter), share content (Flickr, YouTube, Stumble upon, Digg, blogs) and skills (Wikipedia, Linkedin).

The use of these tools allows integrated forms of communication, encouraging the expressive dynamics of mobilisation; individual and collective spheres converge transforming the lack of transparency of individual relationships, making them transparent, potentially able to activate civic actions in different public areas (Boccia Artieri, 2011).

Furthermore, it is important to note that also on the web, the instruments used in an inclusive process depend largely on the level of participation that wants to be attained. The International Association for Public Participation (IAP2), relying on the scale of participation proposed by Arnstein (1969), has articulated five levels of public participation (inform, consult, involve, collaborate, empower) each successive level allows a greater impact on the overall process. Low levels of participation (inform, consult) involve the use of information tools such as interactive websites, public meetings or focus groups. Higher levels of participation (involve, collaborate, empower) allow feedback and the consequent practical implementation of community projects, through tools which go beyond a mere expression of willingness by those involved.

In order to understand which participatory process might be more suitable, Schlossberg and Shuford, suggested a matrix with various types of "users" along one axis and various levels of "participation" along the other. According to the authors, the understanding of the place in which the participation occurs is essential for its greater credibility and effectiveness. In their model, for example, the web pages are only sufficient to inform and consult the public. Consequently, the choice of tools to facilitate effective participation should be dictated also by the constraints of the web and by the characteristics of the actors involved in the participatory process (Schlossberg et al. 2003).

The new online communications and in particular social networks allow three main actions that enable participation: educational or informative action; relational action and finally organised action.

It starts from an initial approach in which the actors involved use the virtual spaces to create and disseminate information about the phenomena in question (the interaction in this phase is conversational and the degree of participation is emphasised by, for example, the “likes” on facebook or on blogs and by the sharing of this information with other parties involved), and then use the technology as an active part in the creation of connections between many individuals, developing a sense of gathering and community (the interaction in this phase is marked by the individual will to express their opinions, inputting skills, experience and personal opinions). It can also arrive at a level in which the virtual space can influence forms of participation for collective mobilisation (the interaction in this phase reaches the most advanced levels and is designed to eliminate digital borders, i.e. the dynamics constructed on the web become real, through heterogeneous participatory actions which can be carried out in practice because they are put into the daily life.

COMPUTER TECHNOLOGIES USED IN URBAN PUBLIC PARTICIPATION.

INTERACTIVE TELEVISION

Interactive television is a person-to-person technique that allows two-way communication. Unlike conventional one-way television (TV) or radio broadcasts, most interactive TV enables viewers to respond by voice telephone or computer connected to an appropriate hosting service (Internet Service Provider, special online bulletin board, chat room, etc.). A further refinement of

the technology uses sophisticated equipment, TV cameras, and special connections at both ends so that participants can see and hear one another. This kind of interactive TV is usually limited to small groups for long-distance conferences.

Interactive television is characterized as follows:

• A television broadcast includes telephone numbers or computer addresses to use in responding;

• Participants use telephones or computers to comment or ask questions; and

• Staff is available to record comments or respond to questions. Electronic town meetings are a good example, because large numbers of people participate directly from their homes or other designated locations.

A meeting, presentation, or panel discussion is held in a central location with an audience, while a TV crew records and broadcasts the proceedings over local cable. Home viewers phone in questions for discussion leaders to answer—a format similar to a talk radio call-in program. The Southern California Association of Governments uses interactive television to reduce the distance the public has to travel to participate in meetings. Conferencing equipment is placed at central locations in each of the six counties it serves.

TELECONFERENCING

A teleconference is a telephone or video meeting between participants in two or more locations. Teleconferences are similar to telephone calls, but they can expand discussion to more than two people. Using teleconferencing in a planning process, members of a group can all participate in a conference with agency staff people.

Teleconferencing uses communications network technology to connect participants' voices. In many cases, speaker telephones are used for conference calls among the participants. A two-way radio system can also be used. In some remote areas, satellite enhancement of connections is desirable.

Radio can also be a component of teleconferencing, especially in areas where there may be impediments to other methods of public involvement. For example, to address the need to involve the largest number of citizens possible when updating the STIP, the Alaska Department of Transportation often uses radio call-ins. This method helps gather input from areas in which no public meeting is held and from people in remote areas of the state that may not even

have electricity. Video conferencing can transmit pictures as well as voices through video cameras and computer modems.

Video conferencing technology is developing rapidly, capitalizing on the increasingly powerful capabilities of computers and telecommunications networks. Video conferencing centers and equipment are available for rent in many locations.

INTERACTIVE VIDEO DISPLAYS AND KIOSKS

Interactive video displays and kiosks are similar to automatic teller machines, offering menus for interaction between a person and a computer. Information is provided through a presentation that invites viewers to ask questions or direct the flow of information. Viewers activate programs by using a touch screen, keys, a mouse, or a trackball. Software used in interactive video displays and kiosks is highly specialized, storing information on hardware that allows retrieval of specific information based on directions from the viewer.

Interactive displays and kiosks:

• Deliver information to the user;
• Offer a variety of issues to explore, images to view, and topics to consider;
• Elicit specific responses, acting as a survey instrument;
• Enable the user to enter a special request to the sponsoring agency or join a mailing list;
• Are used in a variety of locations and may be either stationary or mobile; and
• Receive and store user input.

Interactive displays take advantage of evolving video and communications technologies. The kiosks have a constantly-running video designed to attract passers-by. During the loop presentation, viewers touch the screen to activate certain modules of information such as museums or other attractions by region or for any part of the Commonwealth.

COMPUTER PRESENTATIONS AND SIMULATIONS

Computer presentations and simulations are electronic displays of information. Their power derives from a computer's ability to provide quick access to enormous stores of data and its capacity to display and rearrange images on demand. A variety of computer media and methods are available for use in interacting with the public with computer-based information:

•Computer graphics aid public understanding through simplification of data or alteration of images. Computer-generated graphics show tables, graphs, diagrams, or charts in dramatic and understandable ways. They become part of printed reports and are shown on computer screens or television monitors. They can incorporate videos or video simulations of proposals, programs, or projects.

• Digitized photographic stills are photos that have been converted into computer data so they can be readily modified. They can portray the "before-and-after" of a proposed project from a single vantage point. This enables agencies or community members to consider a number of alternatives or fine nuances of detail when discussing a particular site and how a transportation project or program affects it.

• Photo mosaics use a computer to combine photographs. Individual photos of a site are scanned into a computer, then digitized and assembled into a single image as a basis for portraying existing or potential sites. As digitized photographs, mosaics are used in preparing video simulations.

• Geographic information systems (GIS) store data about sites at many different levels of detail. The data can be combined and presented in a great variety of maps, tables, or graphs to aid in understanding a proposal or project. (See Mapping Though Geographic Information Systems.)

• Video brochures are videotapes that explain specific projects or outline long-range plans. Tables, charts, and images are often incorporated into video brochures. They are designed and distributed to community members, and agencies deposit copies in local libraries for people to borrow and view at home on television.

• Visualizations are applications of three- and four-dimensional computer graphics technologies. A number of agencies use this relatively new technology to facilitate public involvement and environmental analysis. Usage is expected to grow rapidly as transportation departments seek more effective ways to design and communicate information about transportation to the public.

MAPPING THROUGH GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Geographic Information Systems (GIS) combine traditional maps with layers of related information in an electronic format. A GIS assembles, stores,

manipulates, and displays data that is identified by location and can relate information from different sources.

A GIS stores maps and files layers of information in a way that makes it possible to perform complex analyses. A GIS can also recognize and analyze the spatial relationships among mapped phenomena to determine adjacency (what is next to what), containment (what is enclosed by what), and proximity (how close something is to something else). It is also possible to assign values such as direction and speed to simulate movement through a network (Google Maps).

Some of the many broad uses of GIS include:

• Mapmaking – Incorporating the mapmaking experience of traditional cartographers into GIS technology for the automated production of maps.

• Site Selection – Analysis of multiple physical factors when they must be considered and integrated over a large area.

• Emergency Response Planning – Analysis of the impacts of natural disasters on surface structures, size of affected populations, and emergency response time and available routes.

• Simulating Environmental Effects – Realistic, three-dimensional "before and after" perspective views of the environmental impacts of a given project.

3-D VISUALIZATION

Three-Dimensional (3-D) Visualization is a process in which flat images are enhanced or manipulated by an artist to impart the illusion of depth. The most effective form of presentation of planning solutions is animated 3D graphics showing building development from passer bys point of view and from a bird's point of view. Users choose what to see and from which direction, thus such presentation remains interactive.

It should be noted that its usage seems to be more impacted on the ordinary participants than the planning and design professionals. This could relate to the fact that most professions can understand the proposal through other kinds of material such as Maps and Plans.

Also, visually informed participants are able to meaningfully contribute to discussions and debate since they spent less time talking about the physical. It also attracts more attention of community participants. 3D computer modelling as well as computer aided photo manipulation offers attractive visual communication.

VISUAL PREFERENCE SURVEYS

A visual preference survey is a technique that assists the community in determining which components of a plan or project environment contributes positively to a community's overall image or features. As the name implies, the technique is based on the development of one or more visual concepts of a proposed plan or project. Once the visual concepts are developed, they are used in a public forum or other specialized public gathering to provide the public with an opportunity to review, study, and comment on their preferences for the features depicted by the visual representations. Typical uses of visual preference surveys include helping the community define the preferences for architectural style, signs, building setbacks, landscaping, parking areas, size/scope of transportation facilities, surfaces finishes, and other design elements.

The format for the preference survey can be a written ballot, a structured set of self-administered questions, a facilitated discussion, a focus group format, an open semi-structured forum, or used as part of another preference collection approach, e.g., handheld/instant voting techniques.

HANDHELD/INSTANT VOTING

Handheld/instant voting is a means by which participants may express a preference for an issue or idea under consideration and have their preferences recorded, usually anonymously and instantaneously. In typical public involvement practice for example, participants are provided a paper feedback form or ballot to indicate a preference for one or more alternatives of a plan or project. These paper ballots are collected and tallied at a later time with the summary results usually shared with the public through a newsletter, report, website posting, or other means. Improvements in technology allow for more advanced tally techniques, such as an optical scanner, to automate and reduce tabulation errors. More recent technical advances have allowed participants the opportunity to cast their preferences via handheld devices, sometimes using wireless communication systems at a specially arranged location. Some companies are beginning to develop Internet-based instantaneous voting approaches, which allow for a decentralized collection of votes. Wireless companies with their cellular phones or PDAs now allow mobile users to connect to the Internet or e-mail providers and cast preferences for products and services. (Example, Election Votings)

The handheld/instant voting technique is not widespread, primarily due to cost, but may offer a dramatic improvement in the ability of agencies to collect public preference, especially if electronic voting systems are employed in other forms of democratic processes, such as local, state, or federal elections.

PLAN OR TEXT MARK-UP SOFTWARE

Plan or text mark-up software is a computer application that allows the user to provide comments, notes, hyperlinks, or other text or graphical modifications to an existing drawing, plan, document, graphic, or other form of electronic media. As visual renderings become more computer-based, a software application that allows for easy mark-up of visual concepts or text is desirable as a public involvement technique. Such a software tool would enable the public to directly comment on plans and ideas without detailed knowledge of the underlying visualization or text generation software. With advances in telecommunications, the mark-up software can be done remotely and through individual feedback or through structured group activities.

REMOTE SENSING APPLICATIONS

Remote Sensing Applications (RSA) refer to the combination of hardware and software that allows for the processing of information about land, water, or an object, without requiring any physical contact between the sensor and the subject of analysis. The term remote sensing most often refers to the collection of data by instruments carried aboard aircraft or satellites. However, remote sensing is also conducted through a land-based network of environmental sensing stations maintained by a variety of federal, state, and local agencies. Such remote sensing may track weather conditions, measurements of air and water conditions and quality, or other specialty data. Remote sensing applications are commonly used to survey, map, and monitor the resources and environment. Examples of images taken from remote sensing, organized by categories such as agriculture, human dimensions (e.g., environmental impact, population), land surface, and oceans, can be found at NASA's Visible Earth site.

RSAs are varied and include archeological research, geologic investigations, mapmaking, meteorology, mining, volcanic activity, oceanography, and atmospheric and aquatic studies. Once data has been collected, verified, and

stored, RSAs may be able to develop summaries and trends for the subject of analysis or topic of interest. For example, information about air quality for a metropolitan area could be collected and summarized by specialized RSAs. The analysis could provide information about compliance with federal air quality standards and the range of feasible transportation projects for that area. Another common use of RSA is photogrammetry or the science of taking measurements from photographs or other types of images to make physical maps, including topographic maps. The maps are generally developed from photographs taken by a special camera on an airplane.

CONCLUSION

Public participation has been a central tenet of planning discourse for many years, with each generation trying to improve access and interactivity to hard-to-reach people (Evans-Cowley and Hollander, 2010). As we progress into the second decade of the twenty-first century, the growing availability of high-speed Internet access and the propagation of social networking tools have ensured that new forms and processes of public participation have the potential to connect to a 'localised' planning system where a great emphasis is being placed on participatory democracy.

Whilst there has been some discussion as to what constitutes 'successful participation' (Renn *et al.*, 1993; Beirle and Konisky, 1999; Rowe and Frewer 2000), consensus over the way in which participation mechanisms should be evaluated is yet to be reached in academic research (Frewer and Rowe, 2004). Drawing on the 'output' and 'process' model designed by Beierle and Cayford (2002), this paper has explored the effectiveness of web technologies as a participative tool set within the context of a more locally-focused planning system. In terms of 'process', these technologies have been identified by some as having the capability to cleave open new spaces for public engagement, particularly amongst those which are considered 'hard to reach' due to their cost-effectiveness and simplicity and, interpreted in this way, they can be seen as a potential solution to revitalising participation and mobilising an unprecedented amount of people who would have views on particular neighbourhood issues. With regard to 'outcomes', the use of web platforms does have the potential for capacity building: by providing a platform to incorporate public values, the opinions of developers and the views of local elected

members in a more discursive fashion may improve the quality of decisions, whilst also resolving conflict and restoring public faith in planning processes.
Though computer technologies may offer an innovative way for planners and designers to communicate, but of itself it does not guarantee the sucess of sustainable planning. Truly public participation requires debate, negotiation and grouping of opinions to develop consensus or voting power to settle on an ultimate outcome.
In the light of this concern computer technology should be used in the way that structures but does not inhibit the participant creativity and input.

RECOMMENDATIONS

The following are various ways Urban public participation can enhance via technologies discussed above.

- ESTABLISH ONGOING PARTICIPATORY PROCESSES. The institutionalization of official periodic citizen deliberations according to these principles maximizes collective intelligence. For examples, see "Citizen Deliberative Councils" and, especially, Wisdom Councils
- HELP PEOPLE FEEL FULLY HEARD. To the extent people feel fully heard, they will be able to hear others and, ultimately, join in collaborative deliberation and co-creative problem-solving. Among the approaches to helping people feel fully heard are Active Listening, Nonviolent Communication, and Dynamic Facilitation.
- SOCIAL MEDIA. Social media cannot be disregarded as a facilitator of public participation due to its ability to engender greater numbers of participants (Westling, 2007; Chadwick, 2009). Facebook alone has 500 million active users, of which 50% log in on any given day; and, according to Westling (2007), its size and reach make it an ideal platform to encourage participation in a way that connects members of real-world communities (geographic, ideological, or otherwise).
  Whilst there are discussions surrounding the extent to which social media platforms can engender quality deliberation, Facebook and other similar applications do provide an invaluable tool to increase political mobilisation. Recent high-profile examples of such mobilisation shaped, at least in part, by internet debates includes the political events in Egypt whereby a revolution was sparked by young urban, middleclass intellectuals who used social media to aid the championing of their cause (Tapscott, 2011). Although the internet has been widely credited for contributing to the political upheaval in Egypt, Gerodimos (2008) also

warns that there is still a dependence on 'old' mass media as a way of organising political protest particularly amongst young citizens.

When considering why people participate, the motivational factor which compels people to do so is usually a particular grievance or conflict over a contentious planning or environmental issue: as demonstrated by residents of Brayton, North Yorkshire who have used an online petition website to mobilise against the siting of travellers sites in their village (Evans-Cowley, 2010).

- EMPOWER THE PEOPLE'S ENGAGEMENT. To the extent people feel involved in the creation or ratification of decisions, either directly or by recognized representatives, they will support the implementation of those decisions. This is especially true to the extent they feel their agency and power in the process - i.e., that they clearly see the impact of their diverse contributions in the final outcome.
- INTERNET ACCESS. By enhancing the public's access to information and facilitating public participation in decision-making. The Internet has dramatically expanded the ability of Stakeholders to solicit and collect input from the public to inform their decision-making. The notion of e-government now has broad appeal, and has led to a myriad of structures and platforms for citizen access to government information, services, and participation in the governing process. (United Nations, 2007) This participation provides the accountability that goes along with the transparency that the Internet has so enhanced.

  The Internet and its accompanying information explosion have revolutionized the way our institutions, private and public, religious and secular, commercial and charitable, conduct their affairs. Yet there are countries and regions where the impact of the Internet is barely felt and the benefits and problems associated with it have barely intruded on the rhythms of their lives.
- SIMPLICITY. Whatever the device the simpler it is to use, the more people are likely to use it, as long as it still fulfils the core user needs. Example, the internet search engine Google has become a multi-million pounds operation by offering a fast download front page, simple interface and effective responses to user requests. The early success of the Apple Macintosh was partly due to the geographical user interface, which was more easier to understand than command based interfaces.
- SPEED OF RESPONSE. This is particularly relevant to Interactive Television because screens often have to be downloaded or processed by the set-top box, and viewers have to wait for them to appear on screen.

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