Collaboration Technology for Stakeholder Engagement in Urban Planning

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Abstract

Collaboration technology can play an important role in enabling stakeholders to engage in urban planning processes. We describe a work-in-progress, interactive multi-display collaborative platform to support complex urban design exercises. The main research goal is to engage diverse stakeholder groups in simulations of the social, economic and, environmental tradeoffs associated with a range of potential urban futures. To achieve this we developed an intuitive multi-touch tabletop tool that provides immediate feedback through direct manipulation of planning options. We focused on providing familiar visualization and intuitive interactions as opposed to complex visualization and interaction techniques. The system has been deployed to support engagement in community planning processes. We plan to extend the system by optimizing visualization, interaction techniques and, display configurations to better facilitate rich stakeholder collaboration and, to instrument the system to capture the decision-making process so we can develop formal models of stakeholder engagement.

Author Keywords

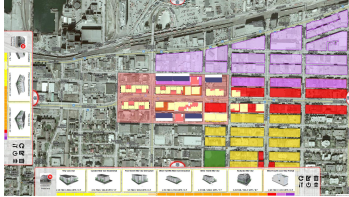Public engagement,urban planning, collaboration, visualization.

Figure 1: Tabletop pattern designer

Figure 2: 3D pattern viewer

Figure 3: Collaboration around horizontal and vertical displays

Figure 4: Projection onto the wall for larger audience

ACM Classification Keywords

H.5.2 [User Interfaces]: evaluation; H.5.3 [Group and Organization Interfaces]: CSCW.

System Design, Motivation and Evaluation

Our work-in-progress is a tabletop urban design visualization and engagement tool developed and iteratively improved over 4 years. In the first iteration a single-display, interactive, tabletop application for neighborhood planning was designed and evaluated [1]. This was augmented with additional displays and functionality, including a live connection to a building database. The system is used to engage diverse stakeholders such as planners, designers and the public in the task of generating and testing urban planning and design options. The primary design objectives were accessibility, interactivity and transparency.

The system has two displays: a large multi-touch tabletop and one or more projected wall displays. Software links four independent applications: Google Maps, *elementsdb* (the building database) [3, 4], Google Earth and a custom-programmed indicators dashboard. Up to four active users gather around the tabletop interface that displays a map or site plan (Figure 1). Each edge has a case (building types) and tool palette. Any user can drag, rotate and scale cases and associated data from *elementsdb* onto the pattern (spatial layout of cases). An updated 3D display is immediately shown on the wall display with customizable graphic performance indicators such as occupancy or energy density (Figure 2). Visual, spatial and quantitative records of every planning step can be captured for later reference. The current prototype was tested and refined in a series of 5 community based workshops with over eighty participants during a 27-month period (Figures 3 & 4), yielding rich data and

lessons learned about the system design, collaborative interactivity and, the value of immediate live feedback [2].

Discussion and Future Work

The system received positive stakeholder responses for being fun, encouraging and intuitive, and instructive of the consequences of planning decisions. Lessons learned about limitations of the design and possible improvements include refinement of visualization and interaction techniques and, better means for capturing design process events in order to help a collaborative team compare alternatives and document the history of planning decisions, archive valuable discussions and, inform further tool design requirements.

Acknowledgements

References

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