Protocols for WayMaker v.1 Prototype Usage Trials

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Abstract

This paper describes usage trials for the initial implementation of the WayMaker prototype. Six students from the Harvard University Graduate School of Design participated. Findings from the trials are influencing development of the second version of the prototype.

As has been described in (Strohecker & Barros 1997, 1998; Strohecker, Barros, & Slaughter 1998, Strohecker & Slaughter 1999), WayMaker is a tool for designing the structure of virtual environments.

These usage sessions were conducted in April 1998 using the initial implementation of the WayMaker prototype. Six students from the Harvard University Graduate School of Design participated. These students are well versed in the realms of architecture, landscape architecture, city and regional planning, and urban design. The latter are especially relevant to the context for WayMaker. Indeed, in explanations of moves and in their thinking aloud, the subjects used appropriate specialized terms such as "navigation" and "mental map." Not surprisingly, they also demonstrated sensitivity to representations and made suggestions relevant to the interface and interaction designs. Some of these comments reflected expectations stemming from experience with other drawing and design tools.

The initial version of the prototype was an incomplete implementation, which nevertheless demonstrated the concept and allowed the constructive capabilities basic to the application. The goal of the usage trials described here was to observe how this set of pertinently skilled users employed the constructive capabilities. Many of the users' actions and comments fueled the rationale for a second instantiation of the prototype, which we are currently implementing.

Because of a bug in the clear function, each user worked with the same set of districts in creating map-like layouts for their urban designs. Some of these layouts are illustrated below.

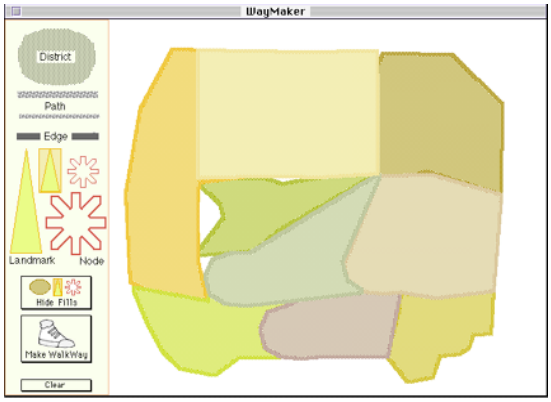
User #1

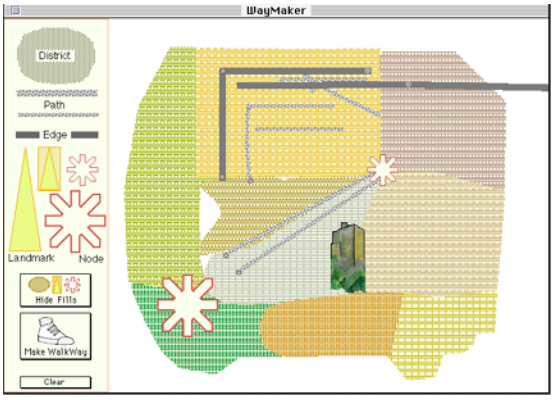
Approaching the tool, User #1 wondered whether there was a prescribed sequence of steps and whether his first step should be to fill a district. He laid a walkway along a path (possibly by my prompt). His road faced toward a node, a move he saw as a cue for the mental map of "where you are and where you're going." He noted that no positions are absolute and that junctions should occur at important moments within a designed environment. He cited the text, *Navigation in Architecture,* and noted that finding one's way back to a starting point depends on the construction of a mental map.

User #1 also cited Pansolm's notion of the historic city as being configured with a node at the center and landmarks situated around it. "I'm obviously European," he said, explaining his tendency to create a layout for an historic city (though he pointed out that the pre-existence of the districts may have influenced his moves). "Next time I'll design a modern city," he declared. He elaborated on this distinction from his urban development perspective: in an historic city, nodes are mostly at the center, where there is also a higher concentration of landmarks. Paths lead to (and from) the center, emerging over time as inhabitants address basic necessities. The people gather in marketplaces and churches along the way, engaging in various social and public acts. Historic cities tend to begin small and develop outward.

User #1 wondered whether he'd created a small version of Vienna. At one point in the course of his construction, he wanted to specify a railroad or river as an edge. Commenting on the representations used in the interface, he thought that the paths and edges were OK but the nodes and landmarks needed to be shown smaller in the map. He approved of the capability for the user to designate element sizes. He appreciated the representations being "sensitive to detail" and wanted even more variegation: he thought a broader range of thicker and thinner lines could be meaningful, for example, as could different line styles for paths and edges. He thought landmarks should be represented more like a point than a triangle (so they would look more like the node representations).

User #2



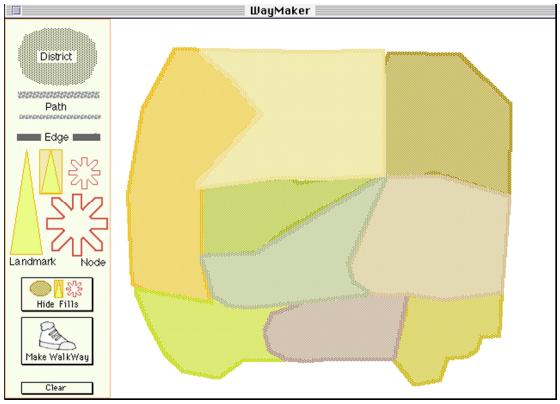


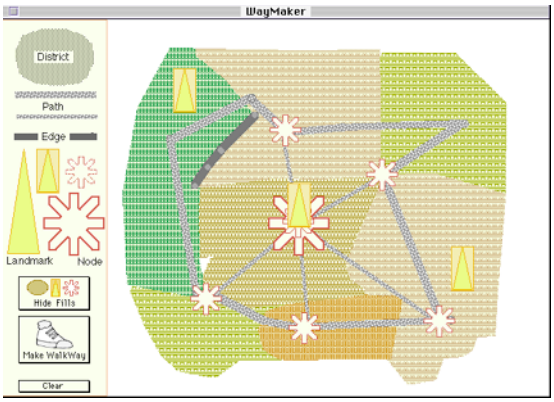
User #2 began by changing the layout of the existing districts. He laid an orthogonal grid of paths, explaining that he did so because he is from New York City. Boston is more suitable to idea of nodes, he declared. He wanted greater flexibility to scale landmarks, as well as a representation of a "Bebox" commercial style landmark. User #2 also wanted the capability of bringing objects to the front.

He laid out another city to the right of the first, within the same mapping area. Then he experimented with a third layout, noting that after a while one gets used to the prototype's quirks of manipulability. Working back and forth between his first and second layouts, he tried to indicate different urban densities with the district fill patterns. (In the first prototype these patterns served as specifications of Cézanne paintings that were excerpted for automatically constructed views in the walkthrough mode. The patterns did correspond roughly to building density, though Jutiki was after a more social sense of density.) He interpreted the most dense fill pattern to be like a Manhattan grid of streets.

In the course of his constructions, User #2 wanted keyboard functions (such as the use of directional arrow keys) and suggested including a panning device to enable viewing one's work in more detail. He also wanted more refined scaling functions for the elements and the overall map.

User #3





User #3 was comfortable with the interface and liked the use of Cézanne paintings to simulate districts in the walkthrough mode. He thought that the icons worked pretty well as interface representations of the Lynch elements, but that the fill patterns did not help in remembering paintings associated with district patches. A designer himself, he referred to a paper chart posted near the workstation, which showed correspondences between the fill patterns and the paintings. User #3 spent some time deciding whether he thought the designated patterns and paintings "worked" together. Noting his own need for this chart, he wondered whether the application should have a menu available all the time which would show the correspondences.

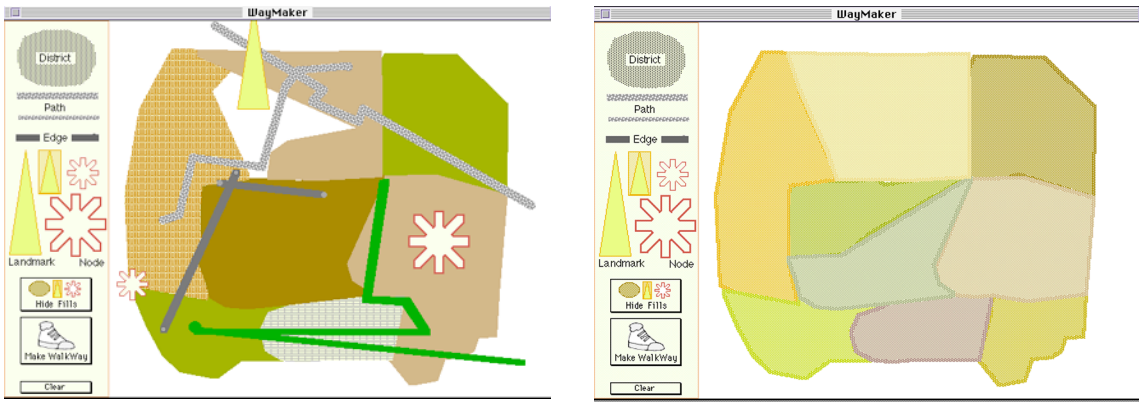
In general User #3 noted details of representation. He wanted the boundary of a district to appear even when the district was filled with a pattern; he liked the artifact of the little circle at end of path lines. He wanted to add water as an edge and to show kids populating his environment.

User #3 made the interesting and unusual move of putting a small node within a larger one. He spent some time playing with nodes while describing a project on which he was currently working, to deal with an area of Cleveland that is devoid of nodes (the "Forgotten Triangle"). As he placed one node, he dubbed it an "activity bomb," then called it a "seed" for activity, which he thought would start in center and then move outward. Eventually he used all of the nodes that the prototype made available.
User #3 preferred the symbol for smaller landmarks and wanted keyboard functions (such as delete).

User #4

User #4 created a negative space between districts and saw it as a lake. He then encountered a bug as he tried to lay a closed-polygon walkway. It filled (inappropriately), blocking other aspects of the map. (Unfortunately this device was by now quite out of control; the new version of the prototype reinterprets and corrects this functionality.)

User #4 noted the need for an Undo function and questioned whether the palette of elements is needed at all. He suggested opening the application with the elements already in the mapping area, so the user's interactions would consist of "playing around," discovering and repositioning them. He went further to suggest that one could open an existing layout to see someone else's design for a city.



User #4 experimented with edges, first placing one within a district, then placing two together, with just a narrow space between them. He imagined tight and large spaces, considering what each might contain. Later he placed a path between the edges, noting the need for greater control over the width of path. He placed a small node symbol and a large landmark, and wanted a way to align or engage elements.

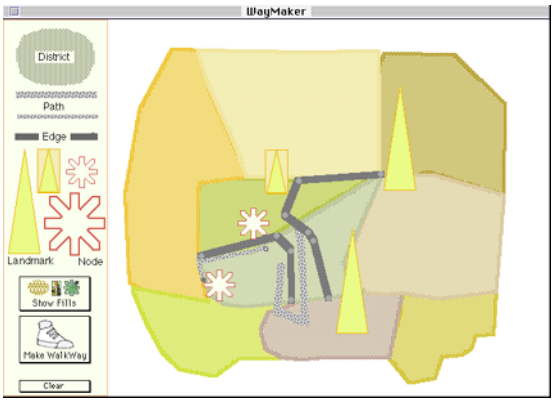
Noting that the prototype limited the number of available districts (and other elements), User #4 considered this strategy without passing judgment on the merit of the design decision. He approved of the use of suggestive qualities for some of the specification options, so that the representations were not all abstract.

He wondered how one's work could be recorded at an associative level, by clustering similar maps, perhaps, rather than relying on naming schemes. User #4 wanted to work with an overlay, or some way to achieve a combination image. He thought that one could create meaning through juxtaposition of such coupled images. He also wanted sectional possibilities, or a topographic map strategy to represent hills, etc.

User #4 considered how one could get a better sense of scale (for example, to perceive an edge as a row of houses). He noted the conflict between the map being imaged at large scale while the specifications are at more detailed scale ("hand scale"). One has to "go back and forth conceptually." He also considered collective vs. single-person experiences in using the tool.

User #5

User #5 thought that his construction resembled uptown Geneva, near the lake.



He considered Lynch's scheme as being good for representing mental models of the city, but not a good formula for fabricating the city. An abstract mental process is different from a generative system that has to deal with constraints like zoning. Such rules don't anymore make sense with respect to the original ideas, he complained.

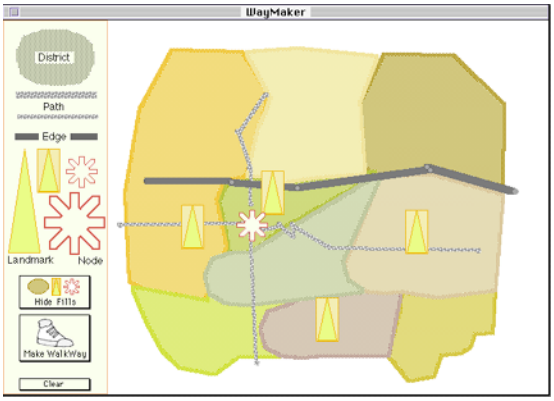
User #5 saw the districts as zones, but worried that we don't understand their scale or know what they really mean.

He expressed the need for some "resistance." He thought that the design problem is too open-ended. He suggested that the context could help shape the activity: perhaps the system could offer suggestions, counter-moves, etc. Perhaps objects could be modified depending on user-specified properties or situations. Perhaps the system could create maps or import existing ones according to user-specified situations.

Again User #5 noted that Lynch's model is reflective more than generative – and, it is just a model. The elements are interconnected, but still too simplistic. He said that people who have used them in a generative fashion have failed, such as those involved in the "New Urbanism," with DPZ (outside of Washington, DC), and the Seaside planned community in Florida.

User #6

User #6 easily created a simple layout.



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