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Ramonamap - An Example of Graphical Groupware

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Abstract

Ramonamap is an interactive map for database and communication services within our workgroup. Resources are represented as icons on the map, which preserves their actual (or implied) physical location and capitalizes on a user's understanding of maps. The map is interactive, giving the user control over the level of detail visible, allowing more information and services to appear than could be placed on a static map. The interactivity also allows users to change the map and add icon annotations. Since the map is continuously derived from an on-line database, changes and annotations are immediately shared by all users. As the database contains a wealth of information about the group, it also serves as a source for static maps for other purposes.

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Table of Contents

1. Introduction **1**
2. Browsing and Annotating **1**
3. Communication **2**
4. Constructing an Interactive Map **2**
5. Producing Static Maps **2**
6. Ramonamap in Action **2**
7. Extending This Work **3**
8. Conclusion **3**
9. Acknowledgments **4**
10. References **4**

1. Introduction

A tremendous amount of information of varying permanence flows within a workgroup. Examples include "out of office" messages, printer up and down notices, conference room schedules, and the latest telephone directory and equipment locations. Before e-mail, this sort of information was conveyed by leaving notes taped to phones or posted on bulletin boards located in that functional area. With e-mail, each user must filter and file this information, resisting the urge to delete information that might not be immediately relevant. A shared text database is an improvement over e-mail, but both have lost an important key to organizing the information: the physical location associated with it.

By representing resources as icons in a building map or floor plan, ramonamap preserves the physical location associated with the resource. Icons also provide a dense representation as a 3"x5" area may contain 60 icons, yet still appear uncluttered.

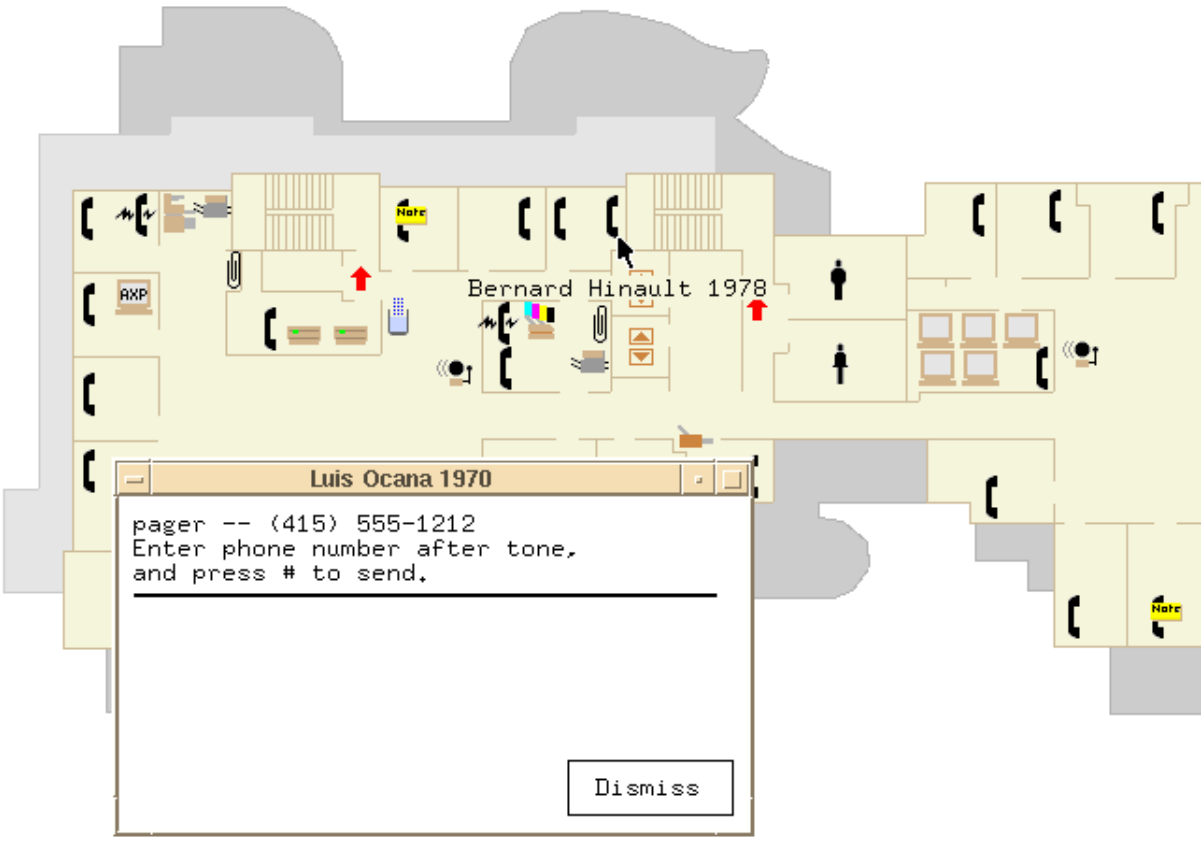

Figure 1: This partial screen image is the result of clicking on Luis Ocana's telephone icon to expose the associated note pad and then moving the cursor to Bernard Hinault's telephone icon to show its label.

2. Browsing and Annotating

Each icon on an interactive map can provide additional information when the user so chooses. As the mouse enters an area or icon, its label is displayed (see Figure 1). Clicking on an icon

exposes more detail in the form of a note pad. The note pad's header in Figure 1 contains instructions on how to page a member of the operations staff. Where appropriate, the header also contains controls to interact with the resource represented by the icon. For example, printer icons have controls to examine the job queue and the printer log, and to delete jobs.

Annotations are made to the map by typing them into the lower portion of the note pad. Recording a printer's current status on its icon's note pad is far less intrusive than broadcasting it via e-mail.

3. Communication

Keeping the map up-to-date is as important as making it interactive. The data displayed by the map is stored in a shared, on-line database. As users make changes, they immediately become visible to other users. In Figure 1, the third telephone icon to the left of the cursor has a yellow rectangular flag indicating that the icon's note has changed since the user last looked at it. Once the user examines the new note, the flag is removed from their map.

4. Constructing an Interactive Map

A simple way to construct the underlying map is to copy another map. Each floor plan in ramonamap was constructed by scanning an existing drawing, scaling it to the desired size, and then defining lines and areas over it. While automatic methods for area finding [5] show promise, manual design input is still required to add emphasis and delete undesired detail as typical building plans are far too detailed for this use. Color schemes and design styles for conventional maps [6] strongly influenced this system's appearance.

Once the underlying map has been constructed, users add the appropriate icons by dragging them into position and labeling them. As each icon is added or changed, the changes are immediately visible to all users.

5. Producing Static Maps

The system is a rich source of information for producing static maps. While the user can easily select the icons they wish to be displayed, placing their labels so that they do not overlap other labels or icons is a difficult problem. Ramonamap used the simulated annealing algorithm described in [2] to produce Figure 2.

6. Ramonamap in Action

The printed page does a poor job of capturing the tool's color and action. It is better demonstrated in the video tape, *ramonamap: Graphical Groupware in Action*, that is available from the author.

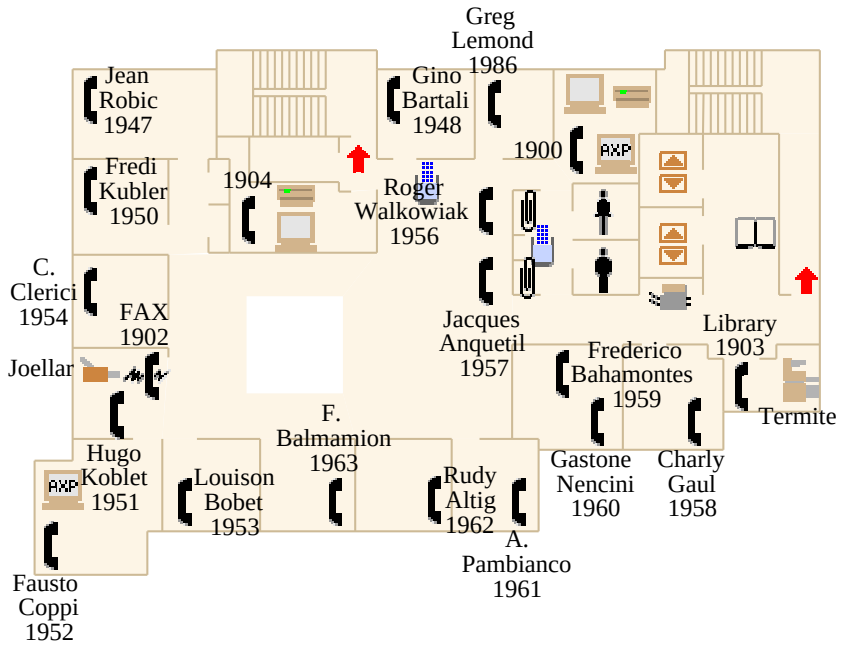

Figure 2: Icon labels placed using simulated annealing to minimize the objective function: *U+3*L*, where *U* is the number of overlapped, unlabeled icons and *L* is the number of overlapped, labeled icons. The vertical spacing of multi-line labels was also compressed to 80% of normal to reduce their size and improve legibility.

7. Extending This Work

While locating items by browsing with the mouse seems to work for us, users in larger organizations might want to explicitly search the map for all icons meeting certain criteria. In addition, they might want more kinds of notes, control over who can access and update the icons, and automatic entry of information from other sources. It is a distinct disadvantage for us that ramonamap is not connected to our group's on-line calendar. These extensions suggest the use of a groupware framework like Digital's LinkWorks™ or Lotus Notes™ in place of the existing simple database that uses ULTRIX™ files and directories. Replacing the existing 2-D structured graphics system, ezd [1], with a system like Pad [3] could allow automatic generalization with the user's zooming controlling the amount of detail displayed. Finally, the map could represent a business process such as purchase order processing instead of an area or building.

8. Conclusion

Maps encourage users to ask questions like "What's next to...?" or "Where's the nearest...?" A number of systems, including [4], have taken advantage of this to inform users via maps. Fewer systems, like this one and General Magic's MagicCap™ have taken the next step of making the map itself the interactive system. Using the simple notions of browsing and annotating maps, we've tried to make ramonamap a workgroup database and communications tool.

9. Acknowledgments

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