

Magical Maps

Introduction

Travelers are always trying to figure out how to get somewhere, what things are available to do, and what places are located close to one another. As a tourist or a businessman visiting a city, you often don't have much time to absorb all the possible activities available to you.

Travel books help somewhat, but they don't have up-to-date information. They also don't allow filtering of activities nor customizing for peoples tastes. Because they aren't electronic, the information has to be retrieved sequentially, which can be frustrating if you're trying to decide whether to get on the subway that's about ready to leave.

Of course, these problems aren't limited to travelers. Businessmen might need to know a good place to take a client for shellfish, an art lover might want a map of all the modern art exhibits in the area, and a rock fan might want to know where the Grateful Dead are playing next.

These scenarios all have something in common - they involve different places. Restaurants, hotels, museums, theaters and people's homes are all places that have a specific location. Streets, bus lines, airplane routes, bike trails, and ski runs are all paths that connect different places together. A map represents places spatially, and shows the paths connecting the represented places. An intelligent electronic map can provide filtering of places and paths depending on the interests of the map user.

Product

People love machines that are fun, make everyday tasks easier, and give them a strategic advantage in business. Motorola does this with cellular phones and Sony does this with portable CD players. We believe that General Magic will do

this with the communicator.

Having a General Magic machine is somewhat like having an infinitely deep pocket. Likely candidates for the contents of this pocket are: an address book, calender, today's newspaper, credit cards, pictures, a dictionary, and maps.

Our goal is to support the creation and use of places in a General Magic world by using intelligent electronic maps as a user interface. These maps will provide data filtering capabilities, such as "the restaurants open after 2 am", that will help people find the places they are interested in.

Eventually, we would like to produce electronic travel guides for popular cities such as San Francisco and New York City. These travel guides could include broadcasted information about activities that are interesting in the area. A server could be set up to download place information about rock concerts, movies, and plays. This place information could automatically map itself onto a General Magic device.

In the short term, we will develop a guide to Silicon Valley, a product that should be compelling to a variety of professionals in the computer field. For example, a search of Fortune 500 computer companies would produce a mapping of several companies in the valley, including Apple Computer, Sun Microsystems, and IBM.

People visiting these companies could find out how to contact that company by telephone or fax, officer information, such as the CEO, and the quickest way to get to the company from the San Francisco airport. Other information that might be interesting includes the hotels and restaurants in the area, and what entertainment is available after 7 pm.

Customer

Our customer in the short term will be the mobile professional, such as salesmen, real estate agents, and executives. We will focus our initial energy on the bay area and the companies located here, for this is likely to be the largest installed base for the near future.

In the long term, we hope to address the needs of the mass market, including travelers, high school and college students, mothers and fathers, grandparents, and others.

Maps are interesting because unlike calendars and address books, it is common to have many different maps. For example, you might have a bike trail book, a map of downtown San Francisco, and a map telling you how to get from Bill's house to Andy's party. We will create the necessary framework for building, using, and communicating map and place information. However, we fully expect others to participate in the building of mapware.

Our goal is to make peoples lives simpler and fun. To do this we need a product that is both exciting and useful. Realizing, as with any significant product that one company can not do it all, we need to work with both General Magic and information providers to create a distribution channel and the necessary content for map-based information.

Where is it?

Electronic map information can come in a variety of forms. Travel books could be published that are stored on a ROM card. People could buy a city per card, or they might be bundled together in a group, such as Europe's Romantic Cities courtesy of General Magic.

Another way to get map information would be to dial a service that provides a database of places. For example, all the businesses in Silicon Valley might be represented in a database, which can be queried by using a telephone line. The software on the General Magic machine would provide an interface for locating interesting place information, and downloading it to be displayed on the map of Silicon Valley.

A third way of getting map information is for the user to enter the information themselves. This is useful for representing business contacts, personal friends, or favorite restaurants. Annotations over existing entries, such as "Good beer, but too busy on Friday night" should also be possible.

There are still other ways of exchanging map in-

formation. A friend could use infrared or cellular to provide the location of a birthday party for example. Assuming televisions know about General Magic protocols, a television commercial could send place information using infrared that could be grabbed and stored by a General Magic device.

Technology

We plan to use the General Magic object manager to represent people, places, paths, and maps. A place will contain a location, whose coordinates might vary depending on the map used to display the place. Subclasses of a place that are interesting to us include hotel, restaurant, company, and home.

Complicated maps, such as an overview of the bay area, will probably contain a bitmap as a background. Streets can either be presented by line segments, or blocks in the case of a zoomed-in view of an area. Streets can also contain a name, and a block might contain a range of addresses.

Because a large number of streets are possible, the names will be hashed to provide fast lookup. Other data structures may be required to provide fast cross-street recognition and address to location translation.

Conclusion

We are very excited about the doors that are being opened by the General Magic technology. Unlike many computer products of the past, this has the potential to change the way people communicate and improve the way people live.

The map technology and products we offer will help business professionals be more efficient and enjoy their work more. Eventually, the technology we are developing will produce fun and exciting travel guides, helping visitors to find the activities that interest them, thus enhancing vacations, business trips, and weekend outings.