



## Just a Note to Say . . .

### Bloggers Find Location Enabling

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GPS World



A lonely wildflower may have launched this location tech trend. Growing peacefully near Mount Shasta in a Northern Californian forest, it drew the attention of a passing hiker. Jim Spohrer wanted to know the beautiful plant's name. He imagined using a laptop and wireless modem to search the Web for a similar picture with which to identify it. Fine. But then the next hiker who came along and wondered what the plant was would be in the same position.

Ruminatory pause. Then, an idea that gradually became the WorldBoard concept: Spohrer would geocode a digital picture of the plant, along with its name and other pertinent information, and affix it to a "spot" on a Web server corresponding to its physical location — by its GPS coordinates. As he wrote in a 1998 white paper:

Map interface (Above) from WaveMarket allows mobile handset users to find and open location-based posted messages or "blogs."

"WorldBoard is a proposed planetary augmented reality system that facilitates innovative ways of associating information with places. Short-term, the goal is to allow users to post messages on any of the six faces of every cubic meter (a hundred billion billion cubic meters) of space humans might go on this planet (see personal web pages when you look at someone's office door; label interesting plants and rocks on nature trails). Long-term WorldBoard allows users to experience any information in any place, co-registered with reality."

At a rudimentary level, this resembles the outdoor game of geocaching. But in geocaching, the only information associated with a place are its coordinates. Players use Web-posted position data to find the place, then retrieve or leave a physical object. No other data is written or read. On the WorldBoard, position coordinates are the peg, or pushpin, that ties data to a location. A user can travel, physically or virtually, to that location to retrieve information of interest.

Spohrer notes that humans are not the only species that associate information with places. Ants leave "molecular messages" at points to coordinate foodgathering, building, and defense. Cats, dogs, and other animals mark locales for perhaps less sophisticated territorial purposes.

He proposes WorldBoard as "special paper that you can write on and place any where — floating in the air, on a wall, ceiling, floor, tree, rock, or surface of a lake. The paper stays put anywhere it's placed. and only authorized people who want to see it can see it. This [ . . . ] sounds a bit like virtual post-it notes, and to some degree it is. However, a WorldBoard stretches over the entire planet so it's also like a planetary chalkboard for the 21st century. Furthermore, WorldBoard supports not only handwritten messages, but also dynamic media-rich Web pages, audio messages, and stereoscopic 3D images. A WorldBoard is in some sense bigger than the World Wide Web because it allows cyberspace (the digital world of bits) to overlay and appropriately register with real space (the physical world of atoms)."

### comMotion

Developed by Natalia Marmasse at the Massachusetts Institute of Technology (MIT) Media Laboratory, the comMotion system is more of a "personal board," though it does envision location-based exchange of information between multiple users. With emphasis on user mobility, comMotion seeks to filter the user's self-accumulated information and deliver it only in the relevant context. A 1998 hardware prototype included a portable personal computer, a GPS receiver, a wireless modem, and an earphone speaker with microphone .

Software features a location-learning agent that observes the user's frequented locations over time and allows labelling them. Once defined, a location can have a to-do list associated with it. When the user reaches the relevant location, be it store, school, or home, the system delivers an auditory or text reminder of items to obtain or tasks to perform — or any other information the user wishes to associate with it.



COMOTION prototype portable unit: personal computer, GPS receiver, wireless modem, earphone, and microphone

**Signal Loss Advantage.** Faced with perennial GPS urban obstacles — indoor positioning and obstructed canyons — Marmasse turned them to her advantage. She designed comMotion to recognize precisely those locations where GPS signal was lost. "After losing signal within a given radius on three different occasions, the agent infers that this must be a building and marks it as a salient location. The user is prompted for a location name, which he can either designate or tag at a later stage by seeing the location on a map." The virtual location can then have a list associated with it, or, if it is of no interest (such as a regular subway stop), it can be ignored.



(COMOTION backpack unit for mobile user)

With location defined and to-do list attached, the user can encode items or tasks, either by typing in a graphic interface, or by recorded speech. When the GPS unit determines user location at or near a defined location, the system plays back a reminder, in text display or with auditory cue. Other associated clients ("friends") can also send context-(that is, location-)aware reminders via e-mail by specifying the location name in the subject line — similar to tacking a note on someone's front door: "hey, we're at Mike's — come over when you get home." These reminders are posted to the designated location, and can be constrained to a date and time range. When the user arrives in the relevant context, he hears an auditory cue indicating he has content waiting, and a visual component resembling a post-it note appears on the display.

The comMotion system provides a "port" for location-based services, with a map showing current location (GPS-provided) along with stores/banks/restaurant data from a commercial database such as MapBlast. The user can subscribe to information services based on location or day of week, for instance, requesting a list of local movies when leaving work on Friday. Finally, it contains a query module similar to "friend-finders" starting to appear through commercial wireless carriers, whereby authorized co-clients can request user's whereabouts.

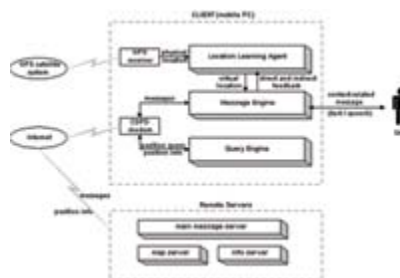


FIGURE 1 (System architecture for comMotion, showing three main modules of client application and server connection. From "Location-aware information delivery with comMotion," Natalia Marmasse and Chris Schmandt, Handheld and Ubiquitous Computing, Second International Symposium, HUC 2000, (c) Springer-Verlag.)

## GeoNotes

Researchers at the Swedish Institute of Computer Sciences developed a Java application called GeoNotes and deployed it in 2000 on a Stockholm open-access network. Downloaded to a personal computer or PDA connected to the Internet and to a Lucent base station, it detects user position with wireless local area network (WLAN) technology and allows the user to write "tags" and graffiti at that place, as well as browse, read, search, and comment on the GeoNotes of other users. Requiring a WLAN card, the system could be reconfigured to use GPS, although the GeoNotes group designed it "exclusively for WLAN."

**Location Blogging.** The GeoNotes application brings a bit closer to realization the notion of "location blogging," also known as "street blogging," a location-enabled or location-derived version of the popular "blogging" phenomenon. A blog — contraction of "web log" — is a personal journal, publicly accessible via the Web, typically updated daily and reflecting the author's personality, preferences, and peevs. Some bloggers have added text entries of the GPS coordinates where they took a photo or e-jotted an observation. But to date they have not made the move to true location blogging, whereby an interactive map linked to the browsing user's position would call up previously posted notes from others as the user entered or neared that location — as in the comMotion model. This would require some kind of centrally shared server.

## WaveMarket

An Emeryville, California company has launched the first commercial service seeking to drive that transition. WaveMarket's WaveIQ suite comprises three software blocs: WaveSpotter, a map interface for cell phone displays; WaveBlog, a hosted "superblog" that serves as a "multiple-channel informational clearinghouse;" and WaveAlert, an infrastructure that lets wireless operators notify positioning-enabled customers when "friends" enter or leave a defined area.

WaveMarket states that it can use any location platform provided by a wireless carrier — cell-ID, time difference of arrival (TDOA), GPS, or other — adding that GPS gives the best positioning of these options.

The company will supply Korean wireless provider SK Telecomm and its 2.7 million GPS handset users with a friend-finder service that WaveMarket calls a "converging" application, bundleable in future with WaveBlog. It has also partnered with gaming company Superdudes to launch Decay Watch, reportedly the first location-based gaming concept, this fall. Finally, WaveMarket will create an extension for Qualcomm's binary run-time environment for wireless (BREW) technology to enable developers to build interactive mapping-based applications - specifically, location-based blogging and gaming.

### Future L-Blog

Location blogging could be viewed as a primitive, developing form of Spohrer's WorldBoard. Whether WaveMarket and other coming commercial ventures will succeed in launching the trend into market orbit remains to be seen. Regular blogging, once the user has established a personal web page, is free; thus vanity can drive it without distraction. L-blogging will bring some costs, starting at the envisioned rate of 25 cents per location-download on wireless networks and going from there.

The question, as it has been and continues to be for the still-stalled location-based services market, is: "Sounds great — will anybody pay for it?"

### Manufacturers

comMotion used an **Ashtech** (Thales, Santa Clara, California) G8 and a **Garmin** (Olathe, Kansas) *II Plus* GPS receiver in two versions. SK Telecom handsets carry **Qualcomm** (San Diego, California) GPS chips.