

Mobile Agents: Providing Control to the Consumer

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“Agent” has become a widely used — and abused — term in the software industry. The term typically refers to a program (sometimes AI-based though usually just a template or smart form) which tracks someone’s behavior and “learns” from it — for example, a word processor which monitors keystrokes and tries to predict the next letter or word, or an interest profile program that notes the articles selected by a subscriber to a news feed and refines the profile accordingly.

Agents like the one cited in the latter example are the basis for the profile-based advertising that on-line services want to sell. Such advertising promises the efficiency of intelligent narrowcasting, dramatically lowering the cost per thousand of getting the message out and increasing the chance of the targeted consumer getting useful information and actually buying something.

Profile-based advertising raises significant privacy concerns. Consumers often do not know if data about them is being collected for profiles. They rarely have access to the profiles developed about them, and they cannot control the release of their profiles to advertisers. Finally, consumers do not have any control over what solicitations they get from merchants.

Mobile agent technology like General Magic’s Telescript software can address these privacy concerns by turning the idea of profile-based advertising on its head. Mobile agents allow the consumer to project his or her needs and desires into the network in a way that permits far more personal control over both what information is made available to merchants and advertisers as well as how that information can be used.

Telescript is based on the remote programming paradigm, which lets a user create software objects — mobile programs containing both procedures and data— and send them into a network to execute tasks on the user’s behalf. Unlike the stationary agents described above, which reside in a PC or network server, Telescript agents can execute at various locations within a network and can respond to information and conditions they encounter. Hence the term “mobile agents,” which highlights the ability of these objects to both navigate through a network as well as to perform tasks on the user’s behalf. Their talents include finding, notifying, and orchestrating.

Consider the following possible scenarios in the electronic marketplace:

Finding

- "I want tickets to the Dead concert on June 10th. What's available?"
- "I want abstracts of articles published in the last year that quote Bill Gates on computer privacy issues."
- "I want information about Hawaiian vacation packages."
- "I want X's email addresses."

Notifying

- "Notify me when there's a sale on VCRs."
- "Notify me when any of the following people post comments in the following newsgroups."
- "Notify me when the hot list on X's web page changes."
- "Notify me when any stock in my portfolio drops by more than 5%."

Orchestrating:

- "Find out what seats I can get for a Warriors game in the next month for \$25 or less and book two if I'm in town that day."
- "Get me directions to Calistoga from Sunnyvale and post a watcher agent to notify me about traffic conditions en route."

By enabling consumers to project their needs and desires into the electronic marketplace through the sort of "reverse requests for proposals" outlined above, mobile agent technology can turn the idea of profile-based advertising inside out. Instead of having their interests assessed and characterized by others, consumers can declare their interests, and do so in a way that democratizes the availability and economic value of timely information (something ordinarily not possible for consumers, since, the value of time required to find the best price is usually greater than any savings achieved by such searching).

In a similar way, mobile agent technology can address the privacy concerns cited earlier. Consider the concern that consumers don't know if data about them is being collected for profiles. Since mobile agents will certainly be tracked and logged by on-line service providers (for billing and customer service purposes, if not for more nefarious purposes) a user could instruct his or her electronic agents to keep a log of wherever they go and drop records. That way a user can at least know who has what information about the user. Or, users might instruct their agents to refuse to interact with certain kinds of agents or respond to certain kinds of queries. Of course, certain service providers might bar such agents from their region of the network, but the bottom line is the sender of the agent maintains control over dissemination of information.

There are other possibilities for addressing privacy concerns. One can envision agents that watch user profile databases and notify their owner if the information about the owner changes, or agents dispatched by a user to update the database. The user could designate what information was alright to disclose, and to whom — instructing an agent to release a home phone number only to specified individuals but no one else. As with the hypothetical “reverse RFPs” listed above, the consumer is able to exercise control over the information being disclosed.

Mobile agents even allow for consumers to wrestle back control over the information they receive from merchants and advertisers. To continue the reverse RFP scenario, imagine a Telescript agent living in your mailbox instructed to toss out all solicitations except ones containing information about VCRs and Hawaiian vacations. AT&T’s Personalink Services has implemented smart mailboxes with rules of this sort using Telescript technology.

Ultimately, trusted network operators are necessary for agents to succeed in protecting privacy interests. In the case of smart mailboxes, for example, the operator has to implement a policy of requiring solicitations to identify themselves as such, so they can be filtered. Similarly, “listed” and “unlisted” information must be properly handled by a commercial operator, and so forth. Security regimes, permit policies and other infrastructure features only work if the guardians behave. Nevertheless, mobile agent technology provides consumers with a means for securing more control over the collection and dissemination of information about them.