

Designing Information Awareness Applications in Tcl/Tk

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Information awareness applications such as stock tickers enable a desktop user to monitor changing information without actively attending to it. Stock quotes, sport scores, weather conditions, and breaking news are examples of the information that can be monitored. While such information may be useful in certain ways, it is often of secondary value compared to work-related tasks that need to be done on the desktop at the moment. This *peripheral* nature of information awareness has several implications on application design and Tcl/Tk is an attractive implementation choice in this area.

First, as a practical measure, an information awareness application must be relatively economical compared to the software systems and tools supporting user's primary tasks. Tcl/Tk has many advantages in this respect. Applications can be quickly implemented by "gluing" existing information gathering mechanisms together. The HTTP and networking packages allow easy expansion to include other information sources. The regular expression facility allows easy information extraction and easy adaptation in respond to structural changes within those information sources. And most important, true cross-platform support in Tcl/Tk greatly reduces maintenance costs.

A more complicated implication is that an information awareness application needs to be non-obtrusive and non-distracting because it must not cause visual disruption to user's primary tasks. Using small screen real-estate helps the information display avoid being undesirably conspicuous. Using slow-changing, smooth animation helps fit a large amount of information into a small space, without being excessively attention-grabbing. We have developed a set of animated widgets for this purpose (see our paper titled "Supporting Information Awareness Using Animated Widgets" in this conference).

And lastly, an information awareness application ought to be conservative when using computing resources including CPU utilization and memory allocation because it must not cause the computing environment to deny services to user's primary tasks. Tcl/Tk is arguably much smaller and faster than other cross-platform software environments.

We are developing applications that exercise these design principles of information awareness. Most prominent among these is an application designed to keep members of a local community updated on what is happening in the community, and to support lightweight chat-room-style interactions among the users. This application is conveniently named "*What's Happening*" and it consists of two parts. The server component continuously collects information such as scheduled community events, latest weather forecasts, and recent additions to chat-room discussions. The client component receives the updated information from the server via a socket connection and presents the information to the user.

Three techniques to reduce user's attentional load have been implemented. First, the screen space occupied by the user interface is very small. Second, an image is shown alongside the information displayed to describe the general topic of the information. It allows the user to get a sense of what is currently shown with a quick glance. The third technique is that when the user is not actively interacting with the client, the program cycles through all the available information using a sweeping animated transition style to avoid distracting the user.

We are starting to deploy "What's Happening" in the local community. As of November, 1999, there are approximately 25 dedicated users continuously running the client program. More details about this application and its availability can be found at the Web site.