XWeb - Interactive Information Anywhere

Challenge
As computer chip manufacturers continue their relentless increase in speed and memory with its accompanying reductions in cost, size and power for computing capability, the interactive landscape will change radically. The transition from many people per computer to one person per computer was completed over a decade ago. The next big transition will be from one to many computers per person. Such a transition implies that computers will be adapted to a much larger set of interactive contexts than simple desktops. Computers will come in a variety of form factors ranging from phones and pager-sized devices through palmtop and wearable computers. Desktop computers will remain with the addition of wall size computers, fully interactive rooms and buildings. The interactive contexts will be enlarged from knowledge workers at desks to homes, vehicles, lab, shop and factory settings. People will use such technology to connect, communicate, and work with a variety of other people who are themselves in a variety of contexts using a variety of devices.

A Vision
For each interactive situation, an interactive computing and information platform can be constructed. Each platform will have interactive devices adapted to the interactive situation. For work in the field, a wearable computer might be used with a fixed set of easily activated buttons and a head-mounted display. For mobile office use, the device of choice might be a tablet or palmtop device with a pen-based interaction. In a laboratory situation there might be a variety of displays and input devices with cameras watching where the user is currently working and bringing interactive behavior to the closest available resources. Any and all of these platforms must be capable of easily initiated collaboration at any time.

This vision can be accomplished using a client-server architecture similar to the World Wide Web. The difference is that full interaction must be supported with browse, search and edit facilities. Each interactive platform can implement its own interactive behaviors to provide the interaction and adapted to its own devices and target situation. Once the network is imposed between the user interface and the information or service semantics, collaboration becomes a natural next step.

With multiple interactive clients it should be possible to dynamically associate multiple clients to achieve a common task. For example one might be carrying on an interaction over a cell phone client when walking into a room with a wall sized display. It must be possible to integrate the wall display client with the existing interaction to produce a more effective environment than either client could supply individually.

Research Problems
The success of this project is dependent upon the underlying network infrastructure on which the interaction is based. This infrastructure must have

- A uniform protocol for representing interaction that can accommodate most if not all interactive communication between clients and servers.
- A model for managing and communicating about changes to information. This forms the basis for a collaborative environment.
- A simple uniform model for user identity, awareness of the activity of other users and management of access permissions

Based on this networking infrastructure the following interactive software problems must be solved.

- A specification of interaction that is independent of a particular set of interactive techniques. These interfaces must cross the visual/audio boundary and support both styles of interaction.
- New interactive clients and interactive techniques for very large wall, room and building interactions as well as very small minimal device clients that can be worn as jewelry or clothing.
- A model for dynamically interacting clients for a common interactive goal.

ICE – Interactive Computing Everywhere

http://icie.cs.byu.edu/ICE/XWeb

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