

Artificial worlds

Computer sciences and technologies have never been so active as in these days. Industrial and research laboratories seem to produce new ideas at an increased rate. Shows and shops are full of new companies and new products. Competition forces the decreasing of computer prices. The technicians as well as the users are frustrated in trying to understand an overall behaviour of the technology evolution. The software designer relies only on intuition in order to define products and methodologies. In the market old phenomena are appearing, confirming that, when it is difficult to make a choice, the status symbol can be used with success.

In spite of this tremendous complexity, something can be perceived quite clearly while looking at the best promises of our time. The human interface is certainly improving in various directions: mice, better displays, graphical interfaces, windows, buttons or links and hypermedial interfaces all are spreading over and now are not proposed only by a limited subset of companies. Moreover, large storage read only optical discs are spreading for new reasons: data transport and reliability. A read only storage device is reliable: it has not to be backed up; software virus can do nothing against it; it is quite cheap to ask for copies from the master. And it is not difficult to organize the work to prepare the master itself. The workstation with his read only optical disc (actually a CD ROM) becomes similar to a living biological cell where DNA is the read only information controlling the whole cell behaviour.

The art of writing programs is changing too: finally everybody understands that object oriented technology can be extended to our programming languages: some LISPs, C++, and other languages have incorporated the methodology ideas. Others will do the same. Meanwhile many are experiencing the advantages of using object oriented programming in the development of complex systems using available languages.

Unfortunately, the news in interfaces, optical storage devices, and programming are not enough to understand what is going on and what to do. We need a paradigm suitable to drive the technologist as well as the user in designing or using solutions. The paradigm can be perceived from the real world or can be detected from the history of computing. In the real world it is seriously evident that humans act on computer as they act in the reality.

Someone has seriously considered the evidence that men are in front of an artificial reality. To show such a choice, they have created on the video iconic symbols of pieces of the world. Xerox, Apple, and others have used such a solution for a limited set of artificial objects. If we understand what is going on, we can abandon these limitations and extend our metaphor to the other pieces of the world. Buttons and hypermedial interfaces can help us: using a button is like doing something in the world. Representing the physical world on the display is a great cognitive help: everybody is largely acquainted with reality and has not difficulty in recognizing representations and using them.

Representing pieces of the physical world as interacting objects is made easy by object oriented programming. Browsing in a system based on a well known metaphor is easy. Testing, debugging, criticizing or improving such a system can be done easily. Starting from a predefined archetype, to every object graphically represented on the display a small piece of software will be associated. Taking into account the various pieces of the artificial world, to verify the entire system will be a simple approach.

An example will help. Let us consider the design of an information system for a Computer Science Department. The department will appear on a map as a button. By means of other buttons it will be possible to enter into offices, for example to verify the computers available in that place, the people working, and other entities (software, books, data, procedures, etc. The network connecting the computers will be visible on request as well as all the available details.

To make the system useful, some perception has to be given: it will mean that we will see on the display a printer in some office if and only if the printer is effectively available in that office. This requires to add some perception to the models as a consequence of the correspondence of data elements with the related real world entities. Such an information system will be probably easy to use for everybody, while the expert user will follow shortcuts.

Artificial reality as a paradigm suitable to design information systems supports strongly the underlying ideas of packages like HypercardTM, HP-New Wave, and others. These packages can be seen as metaphor generators, as software integrators, or as general purpose interfaces. It is not difficult to introduce some artificial intelligence techniques into the picture: just as intelligence is used to solve problems in the real world, artificial intelligence will be required to solve problems in the artificial reality. Agents (programs) will be required: on the display they will be represented like entities. Some activity will be delegated to them. The human user will finally decide if the agents have done the task correctly or not.

Now the picture should be clear: every workstation in a network has its own read only data bank corresponding to slowly varying (structural) information well integrated with every day data on volatile storage devices. In front of each display, actions can be taken about the artificial as well as about the real world. Interaction of the real world with the user is through perception as due to networks and sensors. Hypermedial interfaces are ideal for such a picture. To implement the suggested model object-oriented programming is certainly the best approach. World archetypes or metaworlds are requested in order to implement our artificial worlds just as a CAD system is used to make drawings.

It is not difficult to recognize, in today computer technology, fragments of the suggested picture: what matters is that such a picture is (consciously or not) driving technology in new directions suitable to put all pieces of the computer world together in a single technology with a degree of realism related to the application field.