

## CHAPTER 5

### SOFTWARE AND WEB-SITE APPLICATIONS

This chapter will investigate the possibility of *Software programmes or web-site type menus* as computer-based applications to become a suitable delivery system with which to compile a design tool.

#### 5.1 BACKGROUND; THE INTERNET AND WORLD- WIDE-WEB :

In the late 1970's the Internet as we now know it was already a powerful communications system, but only the elite could use it. One man changed this in a way that is probably equal to the way Gutenberg's press revolutionised the world centuries ago.

Berners-Lee, a British software engineer, developed a user friendly system (1980) that made the Internet open-ended and infinite by allowing personal computers to communicate with one another on a global network. According to *Time Magazine*<sup>1</sup> he should have received the Nobel Prize for Science for his discovery.

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<sup>1</sup> *Time Magazine* March 29, 1999 : 113 'The Century's Greatest Minds'  
 (see Bibliography: Quitter, J. 1999.

The following innovations brought about by Berners-Lee revolutionised the Internet (and the world):

- An easy to learn coding system called HTML ( HyperText Mark-up Language) that has become the web language,
- Designing an addressing scheme that gave each web-page a unique location or URL (Universal Resource Locator) and setting up rules and protocols by which the documents can be linked together on computers across the Internet,
- The rules are called HTTP (HyperText Transfer Protocol),
- The HTML software programming became used worldwide by everybody using the Internet, being the language of all web browsers.

The World Wide Web (www) as we know it today debuted in 1991; within 5 years users jumped from 600 000 to 40 million. At one point the number of users were doubling every 53 days. Today the Internet and World Wide Web is used by the mass media and numerous Internet companies have been created that trade in various fields on the Web. Internet companies, known as 'dotcom' companies, have seen rapid growth but recently also some decline on the world markets and stock exchanges. The Internet has globalized the world financing systems and information systems, it has changed the way business is done and the way professionals operate. It has given the world an infinite information and trading system and is growing

and developing daily. It is possible for any person or organisation to form its own web-site that has pages on the World Wide Web and it is accessible to anyone with a computer, a modem and a telephone line.

Berners-Lee (2001), author of a recent book, *The Web Weaver*<sup>2</sup>, noted the following in an interview about his book:

*'He meant to create an electronic information system that worked like a brain where one neuron can link to any other neuron without any central point of control to hamper the system. He is first to admit that the web doesn't live up to his dream in its present incarnation. He didn't want to create a new form of mass media, but a 'social engine' in which lots of people communicate with each other. The World Wide Web though, is still a work in progress, and its inventor intends to fix shortcomings with new technology. He is currently involved in the W3C (World Wide Web consortium) at the Massachusetts Institute of Technology ( MIT), which decide on protocols and policy for the Web. His aim was not to profit from the www, but to revolutionise society. The revolution he initiated has already caused upheavals, for instance by creating a free market, one which has no central control. Anyone can trade anywhere without having to apply to an authority for permission.'*

<sup>2</sup>

Recorded in a *M Web Information Technology* web-site-( see Bibliography)

The World Wide Web is constantly developing and new technology is developed weekly to extend and simplify its use. There are those who exploit it for profit and those who make it a life task to establish it as a communication, information and social system.

## 5.2 MENUS AND WEB-PAGE LINKS

In the previous chapter it was shown how computer graphics provide the possibilities of graphic illustration as well as interaction and flexibility to the user of design patterns, especially with regard to dynamic graphics and animations.

A computer software programme has the following additional advantages for the purpose of developing a data base of design patterns:

- Intelligent retrieval and links capabilities,
- Capacity for large data-base storage,
- Memory of tasks done and history of search process,
- Internet and web-page possibilities and networking on a large scale,
- The information collected in a data-base can be sorted, indexed, grouped and printed to hard-copy 'manuals' for designers not familiar with computers.



# DESIGN PATTERNS contained in a WEB SITE/SOFTWARE PROGRAMME

WEB-SITE OR SOFTWARE PROGRAMME WITH MENUS

THE MAIN MENU PROPOSED WILL GIVE LINKS TO THE FOLLOWING PATTERNS SUB-MENUS:

DESIGN PRINCIPLES

SOCIAL PREFERENCES

AND

ARCHITECTURAL LANGUAGE

The chapters that describe these proposed menus or web-pages are chapters 7, 8 & 9. The constraints-section could be checklists that may assist the designer to accurately access the limits of the design requirements.

The advantages of a website are described on the next page.

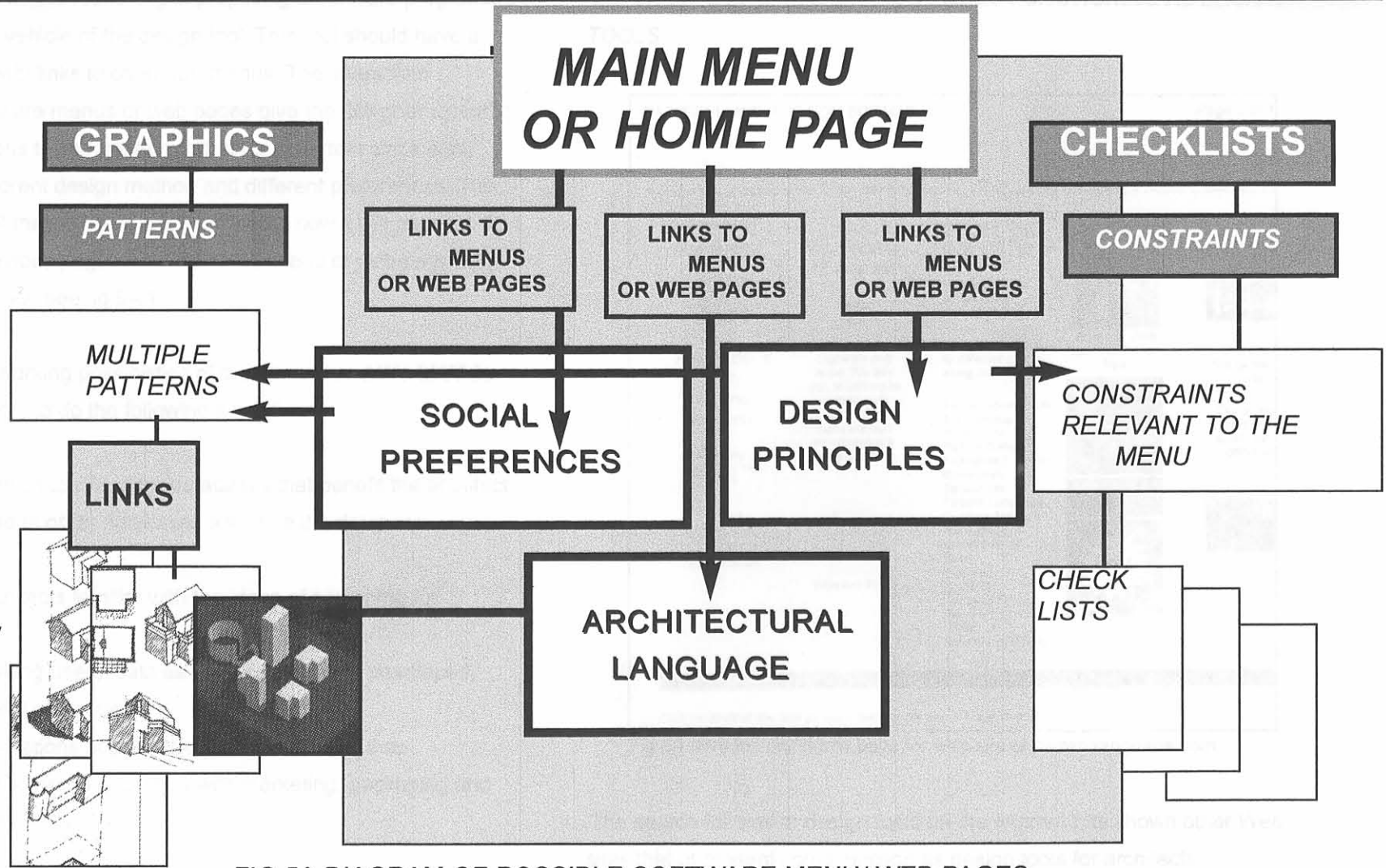


FIG 5A DIAGRAM OF POSSIBLE SOFTWARE MENU/ WEB PAGES

The above augments the reasoning in proposing a software programme or web-site as the vehicle of the design tool. This tool should have a variety of menus with links to other sub-menus. The interactive possibilities of software menus or web pages give the designer dynamic feedback and options to choose from, which is important since each designer has a different design method and different preferences. The open-endedness of the assisting tool is crucial to how it will be used. The diagram on the previous page indicates how a menu or web page can impart form to the tool (see fig 5A.)

The additional networking possibilities of the Internet and World Wide Web make it possible to do the following as well:

- Link the design tool to other databases that benefit the architect, Being linked to other databases also give the database exposure,
- Getting architects familiar with the ideas of searching for patterns,
- Easily updating users' data as more patterns are developed, analysed and categorised,
- Starting operations at a relatively low cost rather than developing software packages with marketing, packaging and shipping costs.

### 5.3 EXAMPLES OF OTHER WEB-PAGES FUNCTIONING AS DESIGN TOOLS

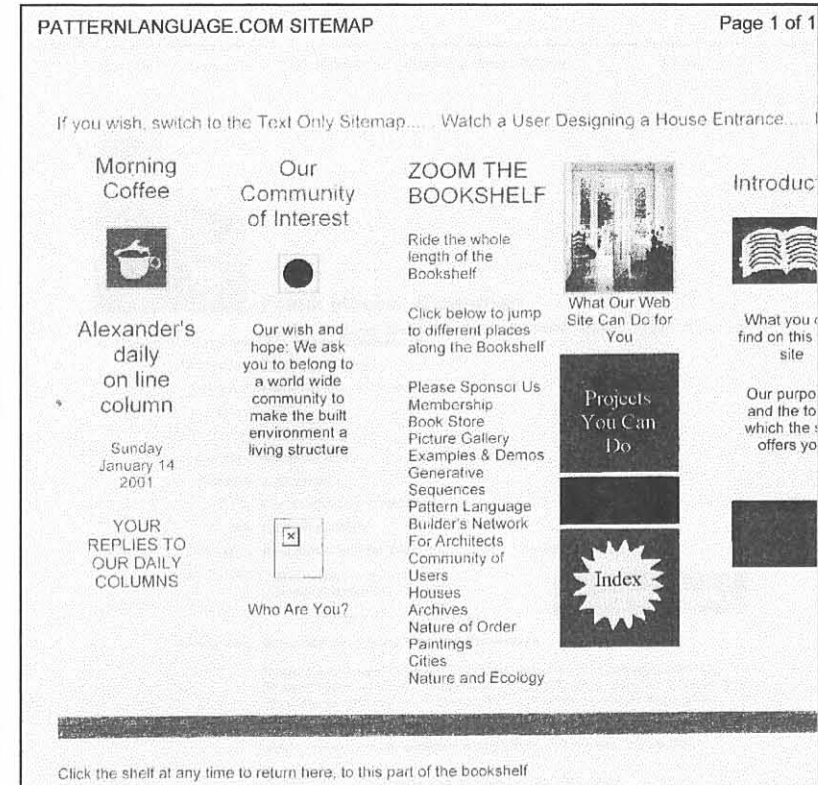


Fig 5B Introductory Home page for web-site of *patternlanguage.com*

The search for similar design tools on the Internet has shown other Web-sites that at present could function as design tools for architects.

The site *PatternLanguage.com*, (fig 5B), was developed by Christopher Alexander as recently as the year 2000, and has several features to assist



designers. Membership is required to access the patterns and the book *A Pattern Language* is also available online to members for viewing. Christopher Alexander has a daily on-line column that expresses concepts of his philosophy on patterns and sequences. The

web site is designed as a bookshelf with different 'books' giving links to specific sections with pages on the web-site. The other web-based design tool which lists buildings and architects is

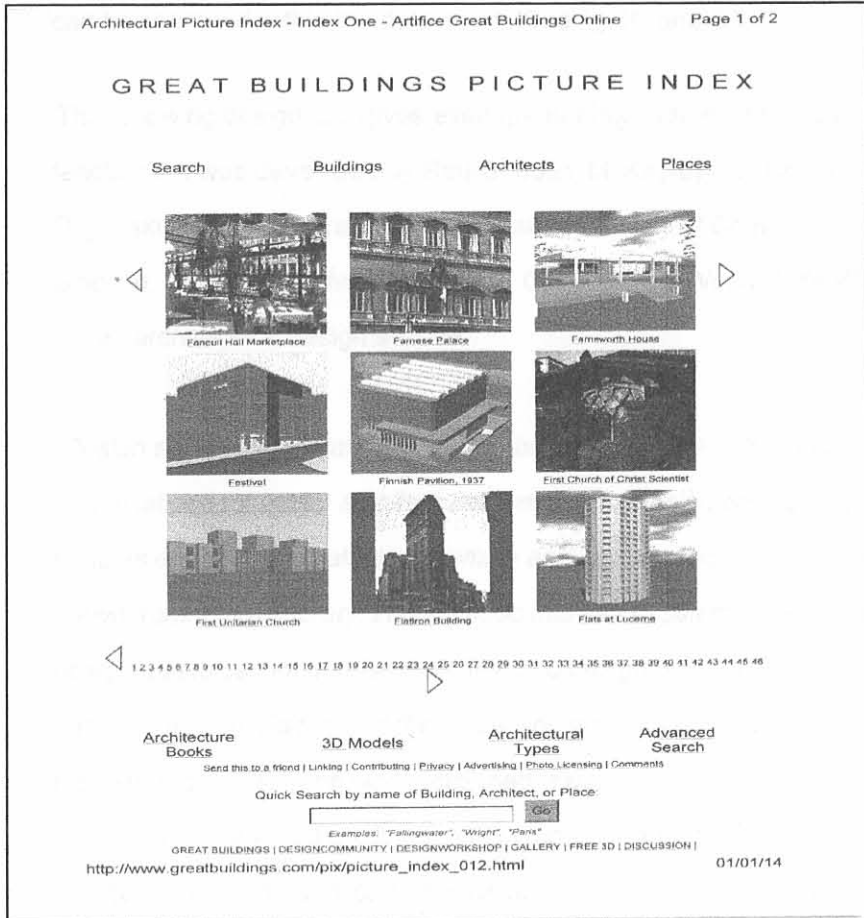


Fig 5C Web site of *greatbuildings.com* showing buildings index under the letter 'f'

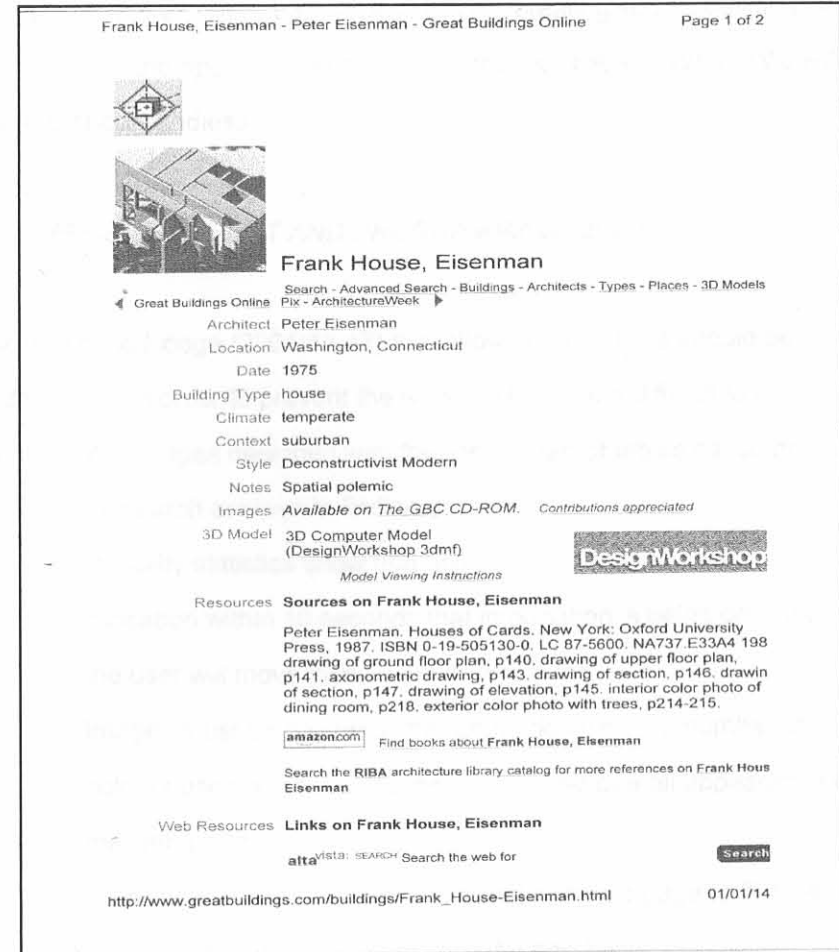


Fig 5D A *greatbuildings.com* web page showing a 3D of a design of a house by Peter Eisenman

*Great Buildings Online*, a web site which is frequented by architects. It is linked to several other institutions such as the web site of the Royal Institute for British Architects, amongst others. The web site has 3D models in CAD format illustrating some of the buildings. Some are illustrated by photographs. Buildings are listed alphabetically and names can be searched within the data-base. (See fig 5C and 5D)

The following design tool gives even greater interaction and dynamic feedback. It was developed by Rau-Chaplin, McKay-Lyons, Doucette, Gajewski, Hu and Spierenburg (1998) at the *Faculty of Computer Science, Dalhousie University, Halifax, Canada* for a World Wide Web based architectural design service:

*'Design and implementation of a Web-based graphical editor and visualisation tool for 3D architectural forms: This design development tool enables end-users to select, customise and visualize house designs drawn from a large library. Having used this tool to select a base house design, users can customise their selected design using a constraint-based Graphical Editor, and then view and walk through a 3D model of the resulting house. The work described is part of the larger LaHave Housing Project which explores the creation of an automated architectural design service based on an industrial design approach to architecture in which Architects design families of similarly structured*

*objects, rather than individual ones. The houses in the library have been generated in terms of a modular kit of over 1400 3D parts.'*

Having a modular kit with which to design a building is perhaps taking design to the extreme, but the possibility of creating such a design tool shows that the opportunities created by the Internet and World-Wide-Web are probably endless.

#### 5.4 WEB-SITE FORMAT AND PROGRAMMING REQUIRED:

According to Hodge (2001:42-47) the following guidelines should be adhered to, in order to prevent the web-site becoming difficult to use :

- Web pages designed with frames instead of tables cause problems for search engines in finding data.
- Usability statistics show that unless the user is given a clear indication within 10 seconds that information is being downloaded, the user will move away to other web-sites.
- Images must be optimised by cutting down on the number of colours used without compromising on the overall appearance of the web-page.
- Scrolling is to be avoided, aim to put one web page to fit on a screen space (approximately one A4 size.)
- The following navigational aids should also be implemented:



- a. Divide the web-site into categories,
- b. Make all navigational options clear in the first proper page of the web-site,
- c. Keep a consistent navigational presence throughout the site so that the user knows where to move between web pages by including links and allowing links to the top of the web page hierarchy,
- d. Make sure that all navigational options are clearly visible wherever the user finds him/herself on the web page.

To create a web-site in HTML language is quite simple and the tools to create it can even be downloaded from Internet Web Sites. To create a web-site that will have possibilities of creating CAD, vector-based graphics, it should be written partly in *JavaScript*, which provides more powerful programming possibilities. This is also the recent programming language of CAD software such as *Microstations Triforma*. For this type of application, specialist programmers will have to be commissioned.

The development of a design- tool can be done in co-operation with software companies, such as *Microstations* or *Micro-GDS* and there should be interactive use of software programme capabilities and web-site data to optimise the tool. (see *Appendix C: Preliminary Cost Plan*)

## 5.5 CURRENT RESEARCH: WORLD WIDE WEB

### 5.5.1 LIVE-MAP

The research project *Live-Web* investigates '*Visualizing Web Presence for interaction*'. This research is currently being done by Rebecca Xiong in collaboration with Eric Brittain and Ramesh Raskar at the Massachusetts Institute of Technology (M.I.T.).

The Live Web Project seeks to enrich Web user's experience by visualizing the real-time activities of other users and enabling the user to interact with others. Currently, Web users have very little knowledge about the activities of fellow users. They cannot see the flow of on-line crowds or identify centres of on-line activity.

The World Wide Web contains much information for discussion and is not limited by physical constraints on the number of users or their location. By allowing users to exchange information easily, the Web can become an ideal interaction environment for education, work, or entertainment.

The first field in this research is called '*Live-Map*' (see Fig 5E.) Live-Map overlays user activities over a simple 2D site map. For example, a research

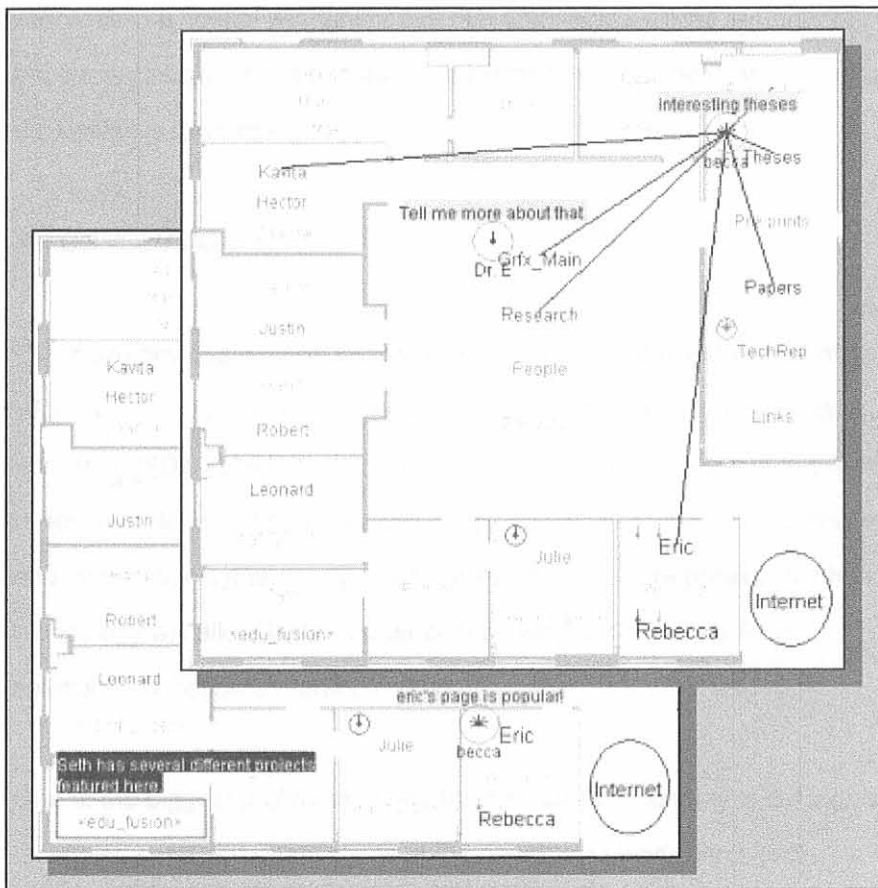


Fig 5E 'Live Map' illustration

group Web site can be represented using a site map created from the floor plan . Each office contains one or more names that represent individual member's home pages. As Web visitors move from page to page, the corresponding icons will also move from room to room

This technology can be utilised with designers working in groups analysing patterns online, user-groups working together on a series of patterns and developing alternatives. Workshops can be held with student groups online. The lecturer or leader can be shown what is being developed and interaction and dynamic feedback can be achieved.

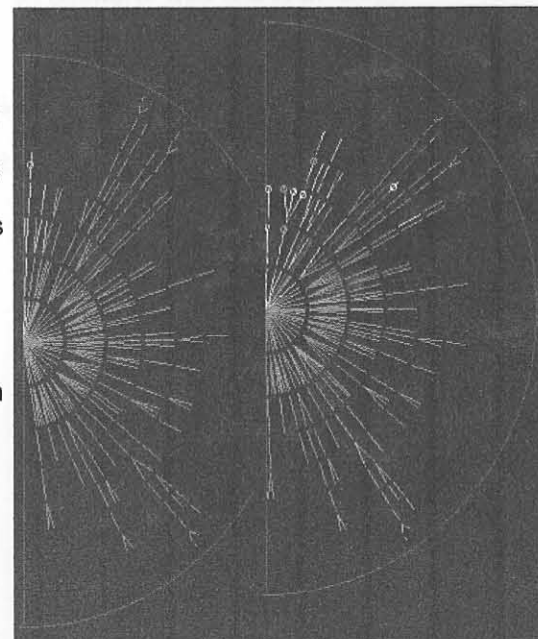


Fig 5F 'Live fan' illustrated

### 5.5.2 LIVE-FAN:

The second field is called 'Live-Fan' and it visualizes real-time user activity at 'Web-Boards', which are Web-based message boards. It uses the thread structure of the *Web-Board* to layout the messages in a fan-like fashion. It then overlays instantaneous and cumulative message accesses. Using this system, users can perceive broad activity patterns and individual behaviours of other Web users. This future web feature could be used by



practices in a design workshop, different architects working together on the same design project and allowing perception in online viewing of what the design is developing into.

## 5.6 CONCLUSION

There are obviously some disadvantages to the current technology of the World Wide Web. For most users, the web is too slow, and not all have access to ISDN cables or satellite dish receivers. Technology in this field is however developing rapidly and the globalization of the world economy and information systems is probably irreversible. Future breakthroughs in technology will allow faster, better connections and whoever finds solutions will become market-leaders.

One of the biggest problems facing the new global economy is the lack of technology and communications in the developing world. Architects however, have always had greater roles to play in the first world economies where the need for sophisticated buildings as artifacts is greater than the need for infrastructure only.

A new generation of architects, familiar with computer technology and the World Wide Web, should be able to utilize a delivery system that provides

an online design tool based on software/ web-site technology.

The next chapter will investigate what type of input will be needed from such a design tool by analysing the design process.