RESEARCH LESSONS AND PROJECTS

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Aims

To describe current research in order to: draw some lessons. give people an idea of what I am/was interested in. To describe current projects. Early research

Systems software: Operating systems Just-in-time compiling: ideas that have recently found their time again. Macro processors: lightweight structural pattern replacement in documents, e.g.

IF a THEN b ELSE c;

may need systematically mapping into:

(a) ? b : c not easily translatable into graphical interfaces. Theme: regular need for new research directions "It is hard to escape from success". Trick question: what research will you be doing in 5 year's time? Good catalysts: Moving to a new environment.

Sabbaticals: especially a do-something-new sabbatical. Incoming visitors. Contacts with outside departments. 1980-1: sabbatical at Stanford Chip design: the famous Stanford VLSI design course. Ours was the 'misfits' project. Value of cross-fertilisation. Being at the centre of the graphicsworkstation revolution: Xerox PARC. ideas -> projects? At Stanford: Sun, Silicon Graphics, ... Research in hypertext Exploiting the new medium (but not looking exactly like a book). Hypertext concepts date from 1945; in a mature form by 1968; late eighties before their time came. Current work: is a hypertext link a goto? 'Goto considered harmful' by Dijkstra. 'Links considered harmful'. Questions of state. Is a link actually a procedure call, and does it therefore suddenly become a good thing? Although some analogies are superficial, there are huge

potential gains in bringing software engineering and programming disciplines to hypertext. In 1991, the first WWW presentation: "nothing special about it". hypertext features were (and still are) weak. My favourite quote "People do not want hypertext; they want solutions. Hypertext is only likely to be *part* of any solution."

Perhaps the reason for the WWW's success. You can substitute almost any technology for "hypertext" in the above quote. Certainly it applies to context-awareness. A further hobby-horse Collaborative work is likely to be more successful if initiated outside government schemes. MD's comment: government pays 25% of project costs; however all the form-filling, delays and hassle count for *minus* 30%. 1992: high time for a change of direction Sabbatical

at Xerox EuroPARC in Cambridge, working mainly with Mik Lamming's group. Work on a memory prosthesis and its realisation in the Forget-me-not project. A project well ahead of its time; unfortunately not all work is open. Themes: v an aid to human memory. v use of small mobile networked devices. v automatic capture of context. v use of context as a filing/retrieval system. v involved work with psychologists. v issues of personal privacy: problems with active badges; 'very bright' correlates with 'prima donna'. v is leading to a Xerox 'satchel' product. My main current project Context-aware mobile systems; building new software, new data representations and new storage/retrieval algorithms to exploit context. Current work is concentrating on retrieval. Categorising context-aware applications

A database or GIS application. A type

of information retrieval. What we need to do is solve the HCI issues. An area in need of a sound theoretical base. For real applications you need to solve hard AI issues. It is a systems/software engineering problem, e.g. provision of toolkits. A problem requiring the design of new data structures, notations (the equivalent of HTML) and algorithms. The area is waiting for the right hardware at the right price. A particular sort of distributed system. You must solve the social problems first, e.g. privacy. All the above are true. The real key, is bringing them together.