

Kim H. Veltman

A Front-end for Multi-valent, Multi-cultural Searching

ALT News 04, Applied Learning Technologies in Europe, (February 1994), pp. 8-9, 14.

Those concerned with the emerging electronic highway are rightly concerned with establishing standards for interoperability among systems such that information from different sources can be pipelined. This important process rightly emphasizes authority lists with standard names of authors, places etc. However it carries within it dangers evidenced in the realm of international hotel chains which in their quest for standards independent of changes of space, have also led to an homogenization whereby the diversity and richness of experience through travel is undermined. In the case of databases, how can we create standards without removing the diversity and richness of conceptual navigation and thus keep alive multi-valent, multi-cultural approaches? One solution is offered by the System for Universal Media Searching (SUMS, Copyright 1992) being developed in the Perspective Unit of the McLuhan Program at the University of Toronto.¹

A prototype of SUMS uses off the shelf software including Toolbook and Windows for Multimedia, drawing on DBase and FoxPro and graphics packages such as AutoCAD, and Animator Pro and 3-D Studio.² A working demonstration of 1.3 gigabytes includes text, pictures, diagrams, animations, video and sound. The programme is being translated into C++ in order to be hardware and software independent. In the short term SUMS will function as a shell or container with which individuals can produce their own knowledge packages that can be recorded on CD-ROMS. In the longer term it is foreseen that SUMS will serve as a front end to the emerging electronic highway.

Windows interfaces often have many overlapping menus which are visually overwhelming and render choices difficult. In SUMS choices are limited to small lists in the form of meters. Eight basic meters (listed alphabetically) are used for conceptual navigation: access, goals, levels, media, questions, space, time, tools. Access entails different levels of access to knowledge. A child in the first grade needs very different information than the research scholar. Goals entail curriculum guidelines and linking these with assigned texts. Levels entail three domains: pointers, objects and interpretations. Pointers are subdivided into classification systems, definitions, explanations, titles, partial contents; interpretations are subdivided into internal and external analyses, restorations and reconstructions. Media entail ten basic types including photographs and video. Questions are initially: who, what where, when, how and why? Space and time entail references to various spatial and temporal co-ordinates, including different time scales (Arabic, Babylonian, Chinese, Hebrew, Mayan). Tools include basic functions such as add, edit, present, and publish. Each of these in turn has further subdivisions. At present SUMS is being developed to work with six languages simultaneously. For instance at the definitions or dictionary level English, French, German, Italian, Dutch, and Latin are being used. Other languages such as Spanish can easily be substituted or added.

The opening screen of SUMS shows six basic questions. If one chooses *who*, one gets a list of persons which can be further defined through a limit by function. If one chooses an individual such as Leonardo one has various choices. By pressing the map icon one can find the location of his birthplace on a map of Tuscany. By pressing levels one can choose titles and be offered lists of his art, books and instruments. From the first of these lists one can choose the *Last Supper* and then under external analyses one can call up related drawings or paintings of the same theme. Where appropriate one can also call up literature, lectures which incorporate this painting and reconstructions, animations and even video clips. If one chooses *what* one is given a list of subjects based on a combination of eight standard classification systems (Art and Architectural Thesaurus, Bliss, Dewey, Gottingen, Iconclass, Library of Congress, Ranganathan and Riders International). On choosing a term one is shown which of these systems include the term such that one can see precisely how they cubbyhole this concept relative to other ones. Using the levels meter one can then choose a definition, explanation or a bibliography concerning that subject. In addition to classifications from major libraries, classifications in specific subjects (e.g. in botany) and by domain experts will be included. Hence one will be able to see how the same term is classed differently in various systems. This will show users clusters of neighbouring terms, one of which frequently turns out to be the term for which one is actually searching.

If one chooses *where* one gets a list of continents which can be further defined through a limit by function to arrive at lists of countries or cities. For instance, if one chooses Florence a map of that city appears. The originality of SUMS lies in the combinations of these meters in the form of matrices. Hence, one can at this point call up the questions meter anew to request *who* for the period 1400-1500 with respect to the keyword, perspective, and receive a list of individuals active in Florence on that topic at the time. Choosing *when* leads to a list of periods. If one chooses say, Early Christian, then one is taken to a chronological list wherein the appropriate dates are highlighted. If persons wish alternative calendars then equivalents in the Arabic, Chinese, Hebraic traditions are made available. Choosing *how* leads training and instruction materials and literature with choices between how to pre-construct (design), construct and reconstruct (restore). Choosing *why* leads to different kinds of explanations and links between prediction (what if?), observation and experiment.

Templates are being developed for the various levels such that students and teachers alike can use the software as a container into which they can enter their knowledge, and as the constructivists would say, become individual knowledge builders. Initially these knowledge packages will serve as a new kind of electronic notebook with the great advantage that they offer a framework that distinguishes between various domains and levels of knowledge systematically. It is foreseen that both guidelines and contents of standard curricula can be published on CD-ROMs using this framework. Only basic knowledge can reasonably be stored locally in this fashion. Further resources will probably be stored in libraries and centralized databases and made accessible through systems such as Internet. Offline links with world experts in various fields could give access to work at the frontiers of research. A built in testing system determining a

person's expertise in a field could be used to protect experts from being swamped by curious beginners. Student assignments can also be collected to form a repository of excellent examples of solutions by persons at each level of education. These collections can also be made available on line such that students in one country can compare how persons at their stage in other countries solve the same problems. This will introduce new dimensions for multi-cultural understanding.

At present SUMS has different levels of access. In the longer term it is will also have special templates to accomodate different types of learner and kinds of learning. Connected with this are cultural differences which go far deeper than discovering that the word for butter in Italy means donkey in Spanish or that the formal word for a pub, a public house, in England means something very different in France. Much more elusive than looking up the proper term for a translation are questions of which things are discussed in one culture and not discussed in another. An American who asks a member of an old family in Holland about what their father does may think that they are being polite and showing interest, while the person being asked may dismiss them for being unspeakably nose. Besides translations we need filters that show these cultural areas of silence to improve communication and learning. It would make eminent sense if the DELTA group could work with the SUMS project at the McLuhan in making this a reality.

Toronto 1 December 1993.

Notes

¹ We are grateful for support from BSO/Origin , the Canadian Heritage Information Network (CHIN), the Faculty of Education and the Social Sciences and Humanities Research Council of Canada.

² We are grateful to be a test site for products from Autodesk, Softdesk, GTE, Vectar and CAT Benelux..