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"Where in the world: a study of user preferences as to virtual environments for information access".

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This paper deals with the examination of user preferences relating to 3-dimensional "virtual worlds" as an interface for accessing information. The study on which the paper is based came about when it was decided that an initial attempt to establish user preferences amongst three "world" models was flawed, insofar as there was no good rationale for the selection of the three models offered. An examination of the literature felt to be relevant to the topic revealed that very little, if any, user-centred testing had been done in regard to the design of this type of interface, user input generally having been limited to performance-related issues subsequent to the implementation of the interfaces. There is a wealth of literature on Information Visualisation (e.g. the work of Card, Mackinlay and Robertson, and Chen) and on Virtual Reality design (e.g. the work of McCahill, and Ingram). However there appears to be little which examines user preferences as a factor in the design of such interfaces, or even looks much beyond task performance issues, when users are involved. Despite the wide acceptance of the principles of User-centred design (advanced by Donald Norman) and place-centred design of the type advocated by Pejtersen, whose Book House was an early inspiration for this study, it was felt that neither UCD nor CWA (Cognitive Work Analysis) precisely met the need for design focused on user requirements. UCD considers design from a usability perspective, which has much to offer after the initial design is decided. CWA takes a more process-oriented approach, but since it examines both the work and the environment, would be more appropriately used after an initial user-centred development of the environment. Once an environment is designed, it becomes useful to ask questions about its usability, or how it might facilitate or impede work processes, but asking these questions in a void is much more difficult.

The aim of the research was to discover user preferences for the design of a "virtual world" for accessing information, and the factors influencing those preferences.

The objectives of the research were:

- To conduct user interviews, using a "grounded theory" approach, to elicit user preferences for designs for 3-dimensional "virtual realities" for accessing information.
- To draw from these interviews conclusions as to common elements and recurrent designs.
- To construct "worlds", used to demonstrate different designs as vehicles to develop further depth of understanding of user requirements and preferences.
- To draw conclusions as to possible factors influencing user preferences.

Three "rounds" of interviews were conducted, each interview being tape recorded and later transcribed. The first round of interviews was conducted with postgraduate students of Information Management courses at Robert Gordon University, Aberdeen. The principal reason for this is that it gave a "constituency" who were already familiar with the concept and practice of accessing information, and thereby rendered unnecessary the "scene setting" and preparatory orientation which, in the case of this

sample, had already been accomplished through experience of practical retrieval problems.

This round of interviews was on a completely hypothetical level, the interviewees being asked simply what type of “world” they would favour as a means of accessing information

It comprised 53 interviews, and revealed preferences which could be considered as falling into four main groups, with a number of others which did not conform particularly closely with any of the larger groupings. For the purposes of the study, the groups were identified as:

- Realistic/formal (typified by a world based on a library)
- Realistic/informal (typified by a world based on a town)
- Abstract/formal (typified by a planetary system or galaxy)
- Abstract/informal (typified by a forest)

Four “virtual worlds” based on these models were constructed, using Virtual Reality Modelling Language (VRML).

The second round of interviews was conducted with students who had an opportunity to try out the four worlds (library, town, galaxy and forest) and experiment with using them to access a limited number of information resources. The first group of interviewees in this round provided feedback which led to immediate revisions in the way the worlds were presented, and the second group confirmed the success of these changes, as well as providing valuable input to the next stage in the research.

The third round of interviews was conducted with staff at the Aberdeen Business School, Robert Gordon University. The rationale for using staff in this stage was again that they were familiar with the concepts of information access, and that they were also experienced communicators. This round of interviews allowed the interviewees to explore the demonstration worlds, and select their preferred ones, but also asked them, with this experience, to nominate an ideal world. This therefore echoed the first round of interviews, but added the experiential element.

On analysis, the third round of interviews revealed a greater preference for the library world than had been expressed in the first or second rounds, and further analysis of the transcripts shows that the influencing factor would appear to be that of familiarity. Not all interviewees selected the library as their favourite world (the one they preferred of those they used), but when prompted for their ideal (what they would like to have as a world, if offered the choice of any world imaginable), they predominantly chose a concept or setting with which they were familiar. It would seem that in an age when we regularly have to deal with very large numbers of information sources, this may best be accomplished by recasting them into a familiar metaphor, whether this takes the shape of shops, a garden, or indeed a library.

It is not necessary for worlds to be photo-realistic, as has been shown by Andrews, for example, but a certain level of detail is desirable.

Many users want to be able to “customise” their worlds, and it is possible that provision of such a feature would be a factor influencing users in favour of a world which they might initially feel less comfortable with.

There is a requirement for worlds which can express existing relationships amongst documents in a way other than the conventional hierarchical file structures.

These findings provide a theoretical underpinning for the development of “virtual world” interfaces to information resources. It is interesting to make a comparison with the online community Second Life, whose dramatically-increasing membership includes a very active corps of librarians, staffing virtual information resources which bear a close resemblance to “real life” libraries.

It is believed that this is the first piece of research of this type which has been carried out, and that the findings can make a small, but valuable, contribution to virtual worlds design.