

Fig. 7: Shows the iconic display of the work space in terms of a multi faceted classification scheme based on an empirical analysis of users' search questions in libraries. When the user selects an icon, keywords are displayed and the user can specify need by clicking on one or more keywords and a subsequent search is performed. See Figure 9 for an example of an open book with display of selectable keywords.

ure 6). The user can thus select one of four different search strategies based on the results of the empirical studies mentioned previously. The direct manipulation feature allows the user to click directly on the figure executing the same strategy that he/she is interested in. A selection here leads the user to a new area where the required set of "tools" for carrying out the chosen search strategy are made available. Each of the four strategies will be described briefly below in terms of the metaphor.

### Analytical Subject Searches

The analytical search is a rational problem solving approach where the dimensions of the user's needs can be explored systematically, need aspects can be compared with document aspects. Figure 7 is one of four work rooms and is designed to support an analytic search. The user enters this room and takes the place of the figure standing at the table in the previous picture in figure 6. On and around the table are icons representing the different dimensions of the means ends hierarchy of the work domain. There are thirteen of them. For example, the world globe represents the geographical setting of the book, the clock icon denotes the time dimension and the theatre mask refers to the emotional experience provided by the books. The author using the type writer in the right corner refers to the highest level of the means ends hierarchy, e.g. the author's intention of communication of cognition/information to the reader. The user can select one of these at a time so as to get access to an open book display with the textual listing of the particular set of search terms which belong to the selected dimension (figure 8). The user can also combine search terms from the same or different dimensions. The Boolean operators are automatically inserted, generally with AND between dimensions and OR and AND within dimensions. This set of selected terms is the user's current search profile which he/she can revise by deleting terms with the rubber at the upper level of the

screen, adding terms or make a NOT operation. Then the user can see descriptions of the books which are found. These appear in an open book format (figure 9) and are structured according to the classification system

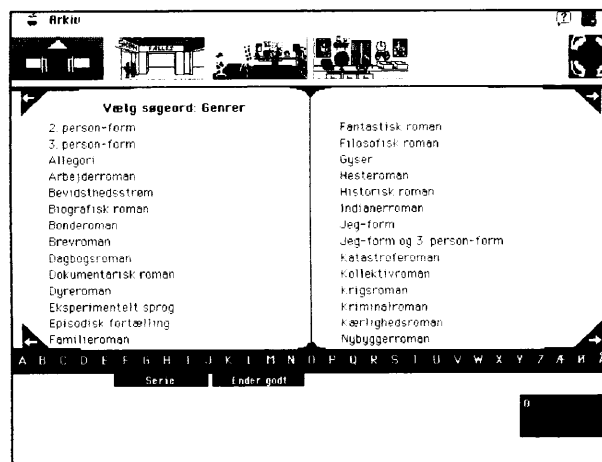


Fig. 8: Shows the list of controlled keywords displayed in an open book format. When the user selects an icon from the table or wall in the work room during an analytical search, keywords will be displayed and the user can then specify need by clicking at one or more keywords with the mouse. A Boolean search is automatically performed. The result of the search can be seen as "books in the book case" in the right corner at the bottom as well as the appearance of the selected term along the bottom starting at the left. If the user regrets a choice of keyword, the rubber can be used to delete the term and thus undo the former search and start a new search without that term.

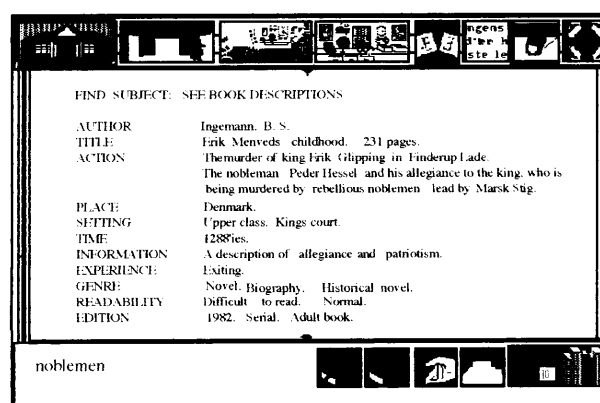


Fig. 9: When the strategy of browsing through books is chosen, the system displays randomly chosen books from the total database, one at a time, and the user's options are the same as mentioned below. The open book display with information about content is the final stage of each strategy and from here the user can perform an unlimited number of "positive" relevance feedback taking relevant terms from documents, "negative" relevance feedback taking irrelevant terms from documents and mixed positive and negative relevance feedback – all by means of iconic tools and the mouse.