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A Management Tool of User's Experiences[1]

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Abstract: The presented work will show how data obtained from work system analysis and user interviews can be organised in an electronically system. Context are hospital's work systems and a project of new building design. Result is an electronically information management system based on a mind map structure using the interview topics. It contain 580 user statements, four architectural layout plans and 28 symbolic representations of work procedure situations. Furthermore the management system shows a visualisation of work flows using the architectural plans and the same symbolic representation used in the interview sessions together with the users. For a better comparison of user statements the management system provides a screen split and a search function for the interview topics in each section of the screen. Functions for future enlargement of the underlying data base are implemented as well as functions for online user participation.
Keywords: Hospital design, Work System Analysis, Knowledge Management.

1. Introduction

Most design projects as well as ergonomic analysis projects deal with the acquisition of user's experiences or knowledge in declarative forms related to the user's work system. Thus both user statements and the characteristics of their system are a matter of documentation. Both can be the basis of design decisions, solution generation, process and work flow changes or similar applications. Therefore it is not surprising that the architect Harrigan propose a "Knowledge Base System…for architects, interior designers, and human factors designer and engineers" (Harrigan 1997, p.946). His idea was to guide a process of question making to achieve design information. It might be also helpful to have a system or a tool to manage and to distribute those information. The work presented in this paper will demonstrate how work system data and user's statements can be organised in an electronically system. Context are hospital's work systems and a project to support the planing of an operating room (OR) facility in a new hospital building.

2. Methods

Four hospital's work systems:
- University Hospital of Berne,
- University Hospital of Zurich,
- University Hospital Gasthuisberg in Leuven/Belgium,
- Mayo-Medical Center in Rochester/USA Minnesota

were visited and their operating room layout situations were documented. All together 32 user interviews with surgeons, anaesthetists, anaesthesia nurses and operating room nurses were performed. Interviews questions were related first to the work procedures and second to 19 aspects of operating room facilities (table 1).

[1] Held, J. (2003) A Management Tool of User's Experiences. In: Tagungsband der 49. Jahrestagung der Gesellschaft für Arbeitswissenschaft, München, ISBN 3-935089-68-6, S. 697-700.

Table 1: *The 19 aspects used as topics for semi-structured user interviews.*

Patient safety	Anaesthesia equipment
Patient care	Ratio between different rooms
Patient comfort	Holding area
Patient's load of anaesthetic drugs	Post anaesthesia care unit
Turn over time	OR's for multiple or parallel surgery
Preparation of the OR	Central area for patient's induction
Organisation of the OR-Staff	Flexible walls in the OR
Team performance	Combinations of different work flow concepts
Training	Other concepts, ideas
Ambulant surgery	

User interviews were supported by using the VALAMO (Held and Krueger 2000) technique. User explications and statements were recorded with a video camera. Video tapes transcription leads to written text of statements. All interviewees reviewed their statements.

An electronically data base system was designed for the management of all the information (architectural layout, work procedures, user statements related to the topics).

3. Results

The information management system's name is MEDINO (abbreviation: Management, Ergonomic and Design Information for Operating room facilities). It shows a main menu to select one of the four hospitals and a mind map structure using the interview topics (figure 1).

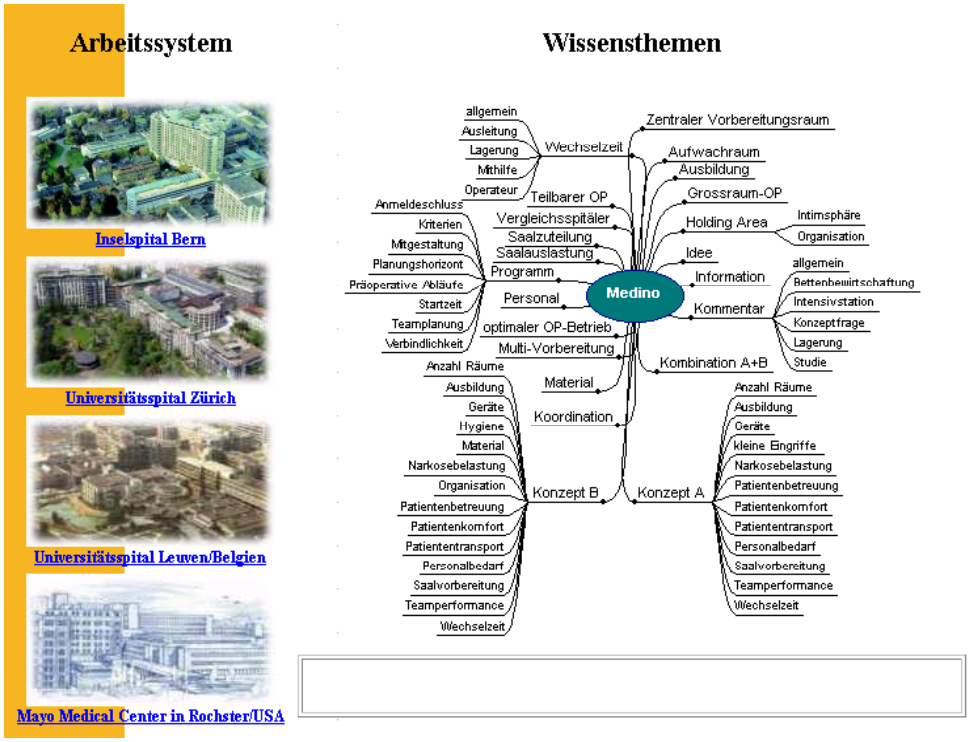

Figure 1*: The main menu of the MEDINO system presents the choice to select one of four hospitals or to select one of the topics of user statements structured in a mind map.*

3.1 Architectural Information

The architectural information about the four hospitals is presented in the MEDINO-System in a layout plan of the operating room facility. One operating room plan is enlarged and the "on mouse over" command was used to present explications related to the position of the mouse pointer. Thus the MEDINO user can study the layout plans and can move the mouse pointer to certain rooms to obtain information about the room functions, size, etc. (figure 2).

Figure 2: *The architectural information about the layout of the operating room facility. When the user moves the mouse over certain rooms the related information about this room will appear on the screen. Consistently all layout plans in the MEDINO database are assigning the colour green to holding areas, the colour grey to preparation rooms, the colour blue to OR-rooms, the colour red to post anaesthesia care rooms, the colour yellow to isolated rooms.*

3.2 Work Procedure Information

Symbolic representation for patient, physicians, nurses and equipment were used to visualise the work procedure for peri- and intraoperative work in a step-by-step sequence of several situations. Every situation is explained in a text field. The size of the symbols is in a scaled relation to the layout plan (figure 3).

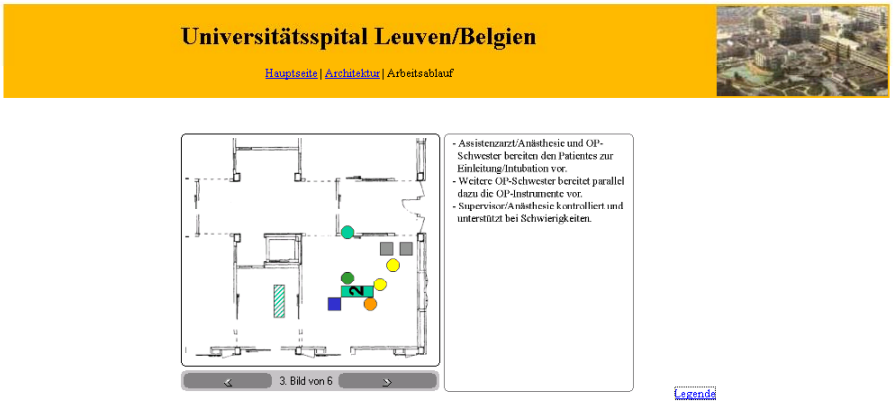

Figure 3: *One of six situations to explain the work procedure in the OR facility. The user can browse through this pictures to obtain an insight about the work flow steps and team member's roles.*

3.1 User Statements

The MEDINO database contain 580 user statements in the form of the originally spoken answers of the interviews and reviewed by the interviewee. The database provides the function to compare two groups (hospitals, professions) of user statements and to navigate by hospital, profession and/or one of the 19 interview themes (figure 4).

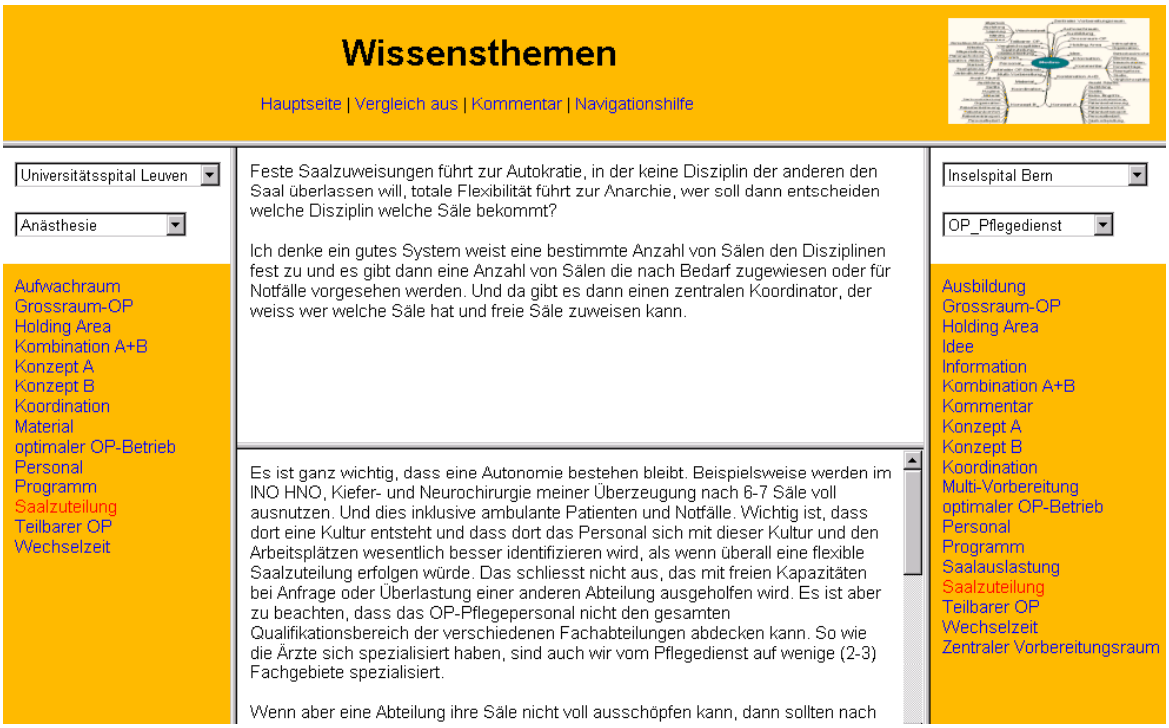

***Figure 4**: The originally user statements presented in a confrontation between two groups. For access or search the user statements can selected by hospital, profession and/or topic item.*

4. Discussion

The easy comparison, search and selection of different statements were the reasons to build an electronically database of user statements and to relate them to systems information. The media of this database is a CD-Rom. One can ask to use internet and allow that users or readers can participate and can contribute to the database with statements. But here first the question is about the method of knowledge acquisition. Because the originally statements were obtained by a user interview technique (Held and Krueger 2000) on the basis of ergonomic work analysis. Second the participation of new users needs to be in relation with information about their work system (layout, work procedures).

Comparing literature in the field of hospital design (for example Dirichlet et al. 1980, Miller 1995) with the work done, one advantage of the MEDINO-System is the content of originally user statements and the description of work procedures. The other is the more flexibility to keep the information up to date.

5. References

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