

Analysis and Modelling of the Multi-Professional Treatment Process: Preliminary Results

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Abstract

This paper presents first results of a research project aimed at improving co-operative work initiatives in hospitals. A holistic analysis of the treatment process is presented as a precondition for process reengineering, quality measurements and improvement of multi-professional co-operation. Treatment process modelling attempts within the last years have concentrated on specialised points of views, such as business process modelling or communication modelling. In contrast, we have developed a framework consisting of several views of the treatment process. We tested our framework in a broad system analysis within the Department of Child and Adolescent Psychiatry of the Heidelberg University Hospitals. Our preliminary results support the framework. Weaknesses were described precisely in both the field of organisational procedures and information management.

Keywords:

Information Management; Documentation; Electronic Patient Record; Treatment Process

Introduction

Aims of the research project

The health care system is presently confronted by great demands: costs are exploding, while new medical and technical possibilities are being developed. To cope with these demands, health care institutions must adjust their treatments so that they directly meet the patients' needs and achieve successful co-operation and communication between all professional groups and departments involved (e.g. [1]). A danger that these demands are not met arise especially in hospitals, due to their functional separation into departments and the extreme specialisation of many professional groups involved in the treatment process (e.g. [2]).

Restructuring projects that have previously been carried out in hospitals, most often involved single wards or professional groups. Also, they were specifically orientated

towards single aspects of organisational or technical procedures. In order to gain an integrated optimisation of organisational procedures, technologies and human resources, however, an overall patient-oriented treatment process view is needed (e.g. [3]).

Therefore, we conducted a research project to examine a) how the treatment process could be arranged to meet the patients' needs and support successful co-operation between the professional groups involved; and b) what kind of information-management is needed to support a patient-oriented treatment process. The project was realised in the Department of Child and Adolescent Psychiatry of the Heidelberg University Hospitals. Especially in psychiatric hospitals, close co-operation and communication between the various professional groups is central for ensuring holistic patient care.

Holistic Model of the treatment process

The first question we had to answer in this project was how to describe and model the treatment process and the multi-professional co-operation. There have been various attempts to model the treatment process, but they were mostly limited to specialised aspects such as separate business processes ([5; 6; 7]), documentation ([8; 9; 10]), or communication ([11; 12; 13; 14]). A framework for holistic treatment process modelling, which helps to select and combine different approaches, is still missing. We developed a new model by combining various scientific approaches, e.g. of the fields system analysis, work and organisational psychology, and medical informatics. Details of the methodological procedure have already been presented [15], the main steps were as follows:

First we defined the beginning of treatment process as the first patient contact (e.g. patient's first appointment) and the end as the final patient contact (e.g. follow-up examinations). It showed to be useful to divide the whole process into (sub-)processes, whereby admission, diagnostics, treatment and discharge form the core processes.

The second step was to find the relevant aspects and views of the treatment process in order to find a patient-centred

description.

We propose the following five main views:

- roles and activity profiles involved in the treatment process: description of roles, hierarchies, decision structures, responsibilities, etc.
- documentation and its tools: representation of the documentation activities, information processing tools, etc.
- communication between professionals: representation of the communication processes between the roles, structure of meetings, briefings, postings, etc.
- logical and timely sequence of business activities in form of workflow process models: representation of the sequence of individual activities, information processing tools used, and the responsibilities, etc.
- co-operation within the multi-professional treatment team: representation of team make up, role distribution, decision making processes, etc.

A description of the general structure and tasks of the organisation should be added.

To precisely define the aspects for modelling and analysing within the third step, the organisational levels of the research should be defined. Based on occupational psychology, we propose to use a stepwise approach, including five different organisational levels:

- the overall organisation (e.g. a department);
- an organisational unit (e.g. a ward);
- an individual staff member
- a role (e.g. ward management);
- a task (e.g. patient admission).

These levels can be found in each of the five views (e.g., communication can also be analysed on the role level, as well as on the organisational units level.

So, by combining the views, levels and (sub-)processes, clearly defined areas of analysis can be individually examined and then be evaluated together (Figure 1).

As the main criteria for the evaluation, we measure a) to which extent the organisational and informational procedures focus on patient treatment, b) how much time is needed, and c) whether the procedures fulfil social staff criteria, e.g. physical and mental stress, autonomy to apply skills, and participation in organisational decisions.

Aims of this paper

This paper reviews the preliminary results of the project’s first phase. It encompasses a descriptive analysis of the

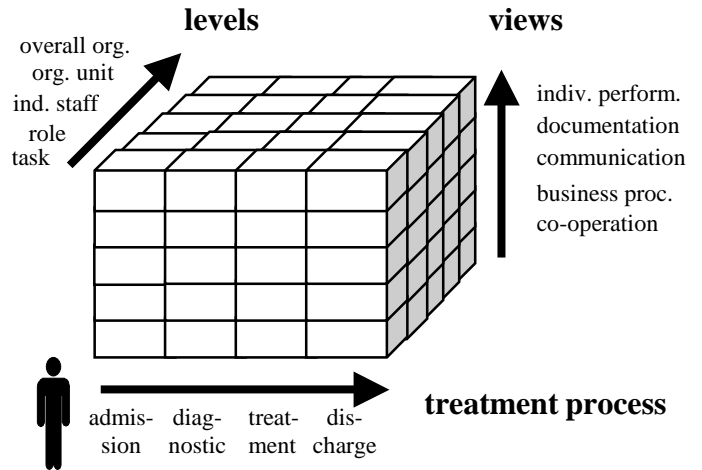


Figure 1- A holistic model of the treatment process

current state of the treatment process and its weaknesses at the Department of Child and Adolescent Psychiatry of the Heidelberg University Hospitals. Special attention is placed on the views “roles and activity profiles”, “documentation and its tools” and “communication”, because the “logical and timely sequence of business processes” and “co-operation” views are not yet fully available.

This paper aims at answering the following questions:

- 1) Which weaknesses exist with regard to the analysed treatment process views?
- 2) How useful is our framework for holistic treatment process modelling?

Materials and Methods

We used a combination of different methods for obtaining information to minimise the methodological restrictions of each method. Furthermore, to receive a complete picture of the current weaknesses of the treatment process, we combined external evaluations, which were carried out by external experts, and self-evaluations, which were carried out by the employees.

Self-evaluations took place in form of standardised questionnaires (LIDO [16]) and, partially, standardised interviews. To avoid accidentally leaving out important aspects, we placed special emphasis on open questions (i.e. "From your point of view, what central problems arise in the area of ..."). External evaluations were primarily based on observation. They included, e.g., a description of how the information is processed, an analysis of typical tasks, as well as the analysis of documents and activities. Beside this, external evaluations also included occupational psychology evaluations of activities focusing on ‘human criteria’ (e.g. information-related difficulties, flexibility of work design, etc.). For the system-analysis, we adapted a tool usually used in bureaucratic organisations (KABA, [17]), because there is still a deficit in tools suitable for health care institutions ([18]).

The overall project began in October 1999. Over a time

period of 8 months, approx. 60 interviews with nearly all of the staff members and observations of 20 meetings have been conducted. 30 questionnaires were answered (return rate was approx. 60%) and around 150 documents were analysed. All measurements were directly taken in the Department of Child and Adolescent Psychiatry of the Heidelberg University Hospitals.

Results

In the next paragraphs, we will present some selected results of each view of the treatment process.

General structure and tasks of the organisation

As a department of a university hospital, the Department of Child and Adolescent Psychiatry must not only fulfil the main task of patient treatment, but also educational and scientific research tasks.

The department consists of 2 wards (18 beds; 120 patients p.a.), a day clinic (6 beds), and an outpatient department (700 patients p.a.). Duration of stay is approx. 30 days in the acute ward, and approx. 50 days overall across the Department of Psychiatry. The treatment is realised by a multi-professional team, composed of physicians, psychologists, nurses and co-therapists. The staff hierarchy is complex: on the one hand, members of the administrative, educational, medical and nursing staff have their own hierarchy with regard to the supervisory responsibility, while on the other hand, the physicians are responsible for the treatment’s process and its outcome. This makes co-ordination along the treatment process difficult and causes some confusion and misunderstandings within the treatment team.

As in most hospitals, the department’s financial resources are exhausted to a large extent. Further resources needed for improving the personnel and rooming-situations are cut. Therefore, occasionally, insufficient number of staff members are available, especially in times of holidays or illnesses.

Staff roles and activity profiles

Because nearly all patients visit the hospital’s school in the morning, the therapeutic treatments take place in the afternoon. This time is reduced further on two days, due to parent visiting days. Therefore, only a small time span remains for treatment causing the therapies to directly follow each other. Time is then missing for preparing the therapy and finishing the documentation directly afterwards. A loss of information is a possible consequence.

A big proportion of the remaining time is spent for intra- and interdisciplinary co-ordination of the treatment. Therapists spend up to 50% of their time for joining meetings. Meeting dates are fixed and distributed across the day, resulting in an enormous fragmentation of the daily structure. For the physicians, the possibility of working on one task at a time is hindered further due to the various roles and tasks. The roles require different and often

contradicting time structures. For example, patient care requires immediate reaction, whereas research tasks require much time and quietness. For this reason physicians often conduct their research in the evenings or on weekends, whereby, they are working 15-20 hours overtime per week.

Table 1 – Proportion of time spent for activities in a week

	physi- cians	co- therap.	psycho- logists	nursing staff
patient treatment	30-40%	40-50%	30-40%	40-50%
internal treatment co-ordination	40-50%	40-50%	40-50%	40-50%
external treatment co-ordination	5-10%	0-5%	5-10%	10-15%
Research and education	10-20%	0-5%	5-10%	0-5%

Documentation and its tools

On the overall level of the University Hospitals, a complete electronic administration of medical patient data is missing, and each department has it’s own specific medical documentation system. Moreover, the information management in Department of Psychiatry is not yet designed for a process-orientated co-ordination of medical, nursing, and administrative tasks. Different professional groups use their own systems, information is spread over several media and even over several records (Table 2).

Table 2 – Records being used for a patient on a ward

type of record	media*	examples of contents
patient record on the ward	conv.	administrative data; findings at admission; reports
nursing record	conv.	therapy planning; nursing measures; curve
therapist’s record	conv.	course of disease and outcome; test results
co-therapist’s record	conv.	course of disease and outcome; test results
electronic patient record	electr.	administrative data laboratory results

*conv.= conventional; electr.= electronic

Most documents are still used in a conventional form, hindering fast access and resulting in high time loss for searching for necessary information.

A detailed documentation of the treatment’s course is often a self-made, hand-written manuscript which makes a representation of the course taken difficult. Medical report writing following patient discharge is often completed too late. Altogether, approximately 150 conventional documents are being used (Table 3), many of which have become obsolete.

Table 3 – Number of conventional documents

	used hospital wide	used only in Dept. of Psychiatry	total NR
patient administration	11	4	15
result requests and documentation	31	5	36
organisational support	4	27	31
clinical documentation	5	48	53
total number	42	84	135

Communication between professionals

All professional groups attach a high value to communication between staff members for their work (visual analogue scale (1-10); mean=8.5; sd=1.3). In some professional groups, up to 50% of the regular working time is spent in meetings, time for informal communication must be added. Treating physicians, psychologists, as well as the nursing staff take part in more than 10 meetings each week alone for co-ordinating the patient's treatment. For discussion of organisational procedures, 4 meetings per week must be added.

Professional groups supporting follow-up patient care, and therefore spending most of their time for outdoor visits, are less involved in regular meetings, suffer information deficits and co-ordination problems. The same weakness was found among the administrative staff, they have no regular meetings at all.

Table 4 – Meetings to co-ordinate the treatment (per week)

	whole team ¹	sub-teams	two professions	same profession	total NR
physicians	6	3	2	-	11
co-therapists	3	0	3	1	7
psychologists	6	3	3	-	12
nursing staff	6	2	0	15 ²	23
social-worker	1	-	-	-	1

¹including physicians, co-therapists, psychologists, nursing staff and social-worker

²all shift changes are included

Beside meetings, the telephone plays an important role as a form of communication media. On a visual analogue scale (1-10), 86% of the questioned staff members marked the telephone's relevance for their work higher than 8.5. It is used most by physicians (20-30 times per day) and psychologists (~10 times per day). This results in very frequent disturbances and interruptions of the work flow and a high dissatisfaction, especially among physicians. Electronic communication media, e.g. sending e-mails, is presently used only by individual staff members and without concept. Electronic notice-boards are also not being used. The technical infrastructure is missing in some

organisational units and many staff-members currently do not have the necessary know-how for using it.

Discussion

We have presented some preliminary results of a holistic analysis and a description of the treatment process in health care, with special attention on the communication and co-operation within multi-professional treatment teams. We developed a framework consisting of several views of the treatment process to receive a complete analysis of the current state of the treatment process and its weaknesses.

Which weaknesses did we find?

Fragmentation, with regard to both organisational procedures and information management were seen: Results emphasised that information is spread over numerous locations and types of media, causing several information interfaces between and within the professional groups. Problems in the field of documentation lead to the necessity to compensate these through oral discussions. Approx. 50% of the time is spent in joining meetings for co-ordinating tasks and exchanging experiences and information. A concept for the use of electronic communication media, e.g. email, is still missing.

How useful was our framework for holistic treatment process modelling?

Up to now, we just analysed the first three views on the treatment process ("roles and activities", "information management and its tools" and "communication"). The summarising overall view of the logical and timely activity sequence, as well as the co-operation view are still missing. For the previous examinations, the framework model showed to be suitable for an application in the hospital: weaknesses with regard to staff's activity profiles, documentation and communication could be worked out meticulously. We presented our results in two meetings with all co-workers. The co-workers agreed with the results. On the basis of the results, we were able to precisely discuss the present weaknesses and also suggestion improvements.

The use of a combination of self- and external evaluations showed to be very successful and particularly helpful in strengthening staff motivation to participate further in the project.

Our previous analyses had one big disadvantage: they required much time. To prepare, conduct and document one interview, we needed between 5-6 hours. Therefore, it is important to stress that our proposed model should be taken as a framework model and not as a general guideline for a system analysis. Dependent on the research aims, separate analysis packages can be defined.

Conclusion

For guaranteeing a high quality of patient care, an overall patient-oriented view of the treatment process is needed. This not only includes all of the professional groups

involved, but also the tight co-operation between them. In this paper, we presented first results of a system analysis using a framework based on such a holistic model of the treatment process. Preliminary results give a good reference for using different views on the treatment process. Weaknesses could be described precisely in both the field of organisational procedures and information management. In the next step, we will implement these results to achieve a detailed analysis of the timely and logical sequence of business processes, and finally, to bring them together to a holistic view of the multi-professional co-operation.

After having completed the analysis of the prior routines, particularly relevant organisational procedures will be restructured and evaluated. One possible intervention is to provide the electronic patient record with process and team-orientated functions.

If the proposed model showed to be useful we will examine how further analyses could be improved by the use of technical support. Our aim is to achieve a more structured way of analysing aspects of the treatment process, resulting in a higher quality of the assessments. This is the foundation for seeing the overall picture of patient care from a medical, care-taking, and administrative perspective and finally for guaranteeing a high quality of patient care.

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