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The Danish EPR Observatory. Assessing Organisational Impact from EPR Implementation

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Abstract: The EPR Observatory has studied 13 local Danish electronic patient record (EPR) projects through 2 years. The focus has been on expectations and experiences in relation to organisational changes. The main conclusions are that the healthcare professionals, working with the development, implementation and/or use of EPR, are in a very important and difficult process settling up with old traditions and cultures tied to the healthcare professions. Especially the healthcare professionals, working with EPR, shows interest and readiness to participate in new ways of collaboration and to work with highly structured data in structured frameworks.
EPR is at this point of time only diffused in few relatively small and isolated healthcare organisations, and the preliminary assessment in the study only outlines the perspectives for what will happen on a wider scale when EPR systems get more diffused.

1. Introduction

The Danish Ministry of Health launched in 1996 a national strategy for the development of EPR- in the Danish health care sector [1]. A key element in the strategy was to support a number of regional EPR development projects. In addition to this, the EPR Observatory [2] was launched as a horizontal activity to collect and disseminate experiences from the regional projects.
The Ministry of Health focused on four areas, both in the local projects and in the EPR Observatory. The four areas were 1) Impact on the organisational issues, 2) Benefits of EPR, 3) Integration of EPR with other information systems and 4) Security aspects of EPR.
The EPR Observatory has collected data for 1998 and 1999. In 1998 focus was on the expectations, related to the four areas of interest. In 1999 focus was on the experiences. The results are published in two Annual Reports [3,4]
This paper gives a presentation of the experiences related to the organisational issues.

2. Methods and materials

The 13 local EPR projects are very different in size, patient category and stage of development. 7 projects are using EPR as a routine working tool. Two of the projects entered the observatory recently and were studied by the questionnaire, but did not participate in the interviews. Further two projects did not take part in the study in 1999 due to inactivity and lack of project resources.
Questionnaires were given to 7 persons in each project (a representative of the doctors, the nursing staff and the medical secretary, a representative for the managers of the department,

a representative of the hospital managers, the project manager and the manager of the local department of information technology). As many as possible of the 7 persons who answered the questionnaires took part in the interviews as well. The interviews were carried out as group interviews.

Two main organisational issues are to be considered:

1. The organisational change related to using the new technology (EPR) [5,6]
2. The organisational aspects that are to be managed, while the technological change is going on [7-9].

Data were collected regarding these two directions as follows (Re 1: a-e, and re 2: f-i):

a) The impact of EPR on the co-operation between healthcare professionals
b) The impact of EPR on the daily work procedures
c) EPR and demands for higher efficiency
d) The education related to the application of EPR
e) The super user organisation
f) The project organisation
g) The EPR system developers
h) Analysis of working procedures and work processes
i) Local evaluation of the EPR development project

Data were collected with structured and semi-structured questionnaires and semi-structured follow-up interviews.

Related to the fact that the EPR Observatory primarily does observations, the questions, asked, were related to *how* things are done in contradiction to *why*.

3. Results

The organisational change related to using the new technology (EPR):

a) The impact of EPR on the co-operation between healthcare professionals

Generally all the EPR projects have the goal to develop EPR to be used by all the healthcare professionals as a common tool. This refers to intentions like avoiding redundancy, multitude of professional view more consistency and a broader basis for decision making

The projects indicate, that the interdisciplinary EPR affects the daily co-operative working processes as well as the more long termed professional development, thus moving away from a mono professional function towards a more interdisciplinary function. An example is the establishment of interdisciplinary care teams in several of the project organisations.

b) The impact of EPR on the daily work procedures

None of the project organisations have used EPR more than a few months in daily routine. That is why the organisations still are experimenting with different new ways to improve working procedures.

Two of the most important working procedures EPR have influenced on are the ward rounds and drug administration.

Ward rounds are typically done without EPR. Instead the doctor and the nurse together prepares themselves thoroughly for doing the ward round. The healthcare professionals experience that they now have more focus on the patient than earlier.

The drug administration in EPR is typically tied to more restrictive working procedures, than ever was possible in earlier used paper based patient records. This to ensure, that the correct drugs are given to the correct patients on time. The changes introduced with the EPR in this regard are judged as the highest advantages so far. Also to mention is the movement from working with low structured data toward working with highly structured data.

At last it is worth to mention that the EPR projects expectations of resistance to implementation of EPR, due to loss of professional status or pressure to develop new skills as also mentioned in the literature [9] were not experienced in the project organisations.

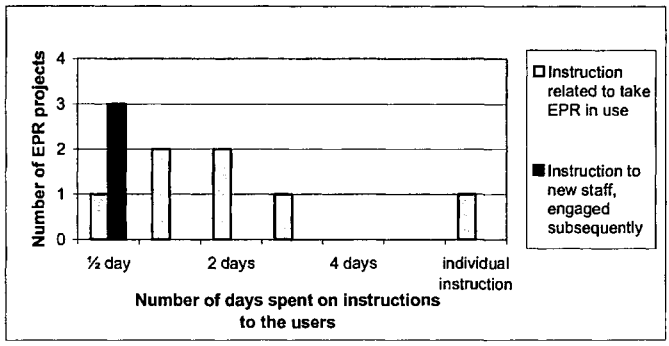

Fig. 1. End user training

c) *EPR and demands for higher efficiency*
Common to the EPR projects is that they are pioneer projects. This is why there were no demands for higher efficiency bound to the implementation of EPR in the project organisations. However there will be demands to prove higher efficiency in the next healthcare organisations taking EPR in use.

d) *The training related to the application of EPR*
Currently 7 EPR projects have EPR in routine use. In fig. 1 the time spent to education is shown.
As seen in Fig.1 an average of 2 days per user are spent on instructions in using the EPR. The time is spent on basic 'Windows' training and in the actual EPR functions. The goal is that the user is able to make use of the EPR system in the daily work procedures. In some of the EPR projects the type of instruction and the time spend are differentiated between various professional groups.

e) *The super user organisation*
The term 'super user' is used ambiguous. In most of the EPR projects the term 'super user' refers to a specific number of health care professionals who have had a little more training in the use of the specific EPR system than the average end user (Fig. 2). Typically there are two different categories of super users. The first category performs various functions related to the daily work routines:
1) Helping the end users with daily use of the EPR
2) Solving uncomplicated software and hardware problems
3) Registration of errors
4) Networking the end users and the EPR project organisation and/or the managers of the organisation

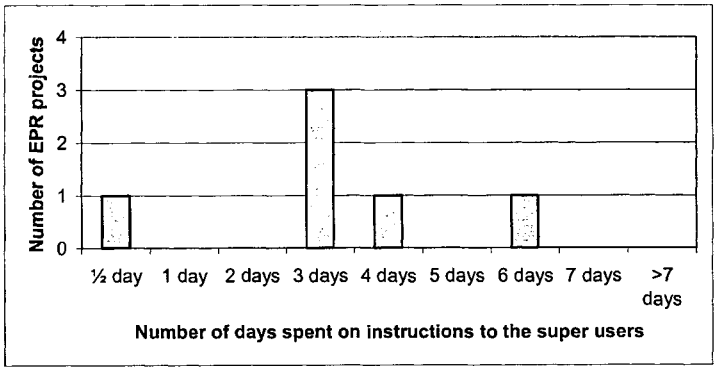

Fig. 2. Super user training

The second category is the technical super users. They are responsible for the more advanced software problem solving and support, and hardware set-up and maintenance operations.
By common consent it is underlined by the advanced user organisations, that it is essential to establish and maintain super users on duty around the clock, especially on the technical side.

The organisational aspects that are to be managed, while the technological change is in progress:

f) The project organisation
Characteristics for the project organisations were that 1) There is a broad representation of health care professionals in the project organisation and management as well as floor staff are represented. 2) The project organisation is not anchored in the hospital management system or health care management system in all the projects. Anchoring the project in the management system results in an active support from the management system. 3) Highly motivated personnel manage most of the projects. A lot of energy is put into the projects on a voluntary basis to make a success of the EPR projects.

g) The EPR systems developers
5 different systems developers are present in the EPR projects. From the data collected in 1999 it is evident that the EPR project organisations often are not satisfied with the systems developers. The main problem is related to delivery of the software at the appointed time. Problems are also related to the accomplishment of integration between different systems and to achieve the required functionality of the EPR.

h) Analysis of work procedures and -processes
Analyses of work procedures and -processes take up a central position in most of the EPJ projects. First to mention is that the analysis of the process helps the project organisation to attain shared understanding of the applications of EPR. It also provides a solid basis for dialogue with the systems developer.
Different methods and tools are used in the analysis of the process. Common is the following three steps: a) Describe the existing work procedures and –processes and their advantages and disadvantages, b) describe the visions, and c) describe the realistic attainable.

i) Local evaluation of the EPR development project
At least 5 of the EPR projects are carrying out formal evaluation. The majority of these evaluations focus on the *effect* of EPR. Most of the EPR systems are in use only in one or a few departments. In addition to this it is clear, that the local evaluations complement the EPR Observatory observations very well.

5. Discussion

Observations to take into account in relation to future EPR projects:

- The use of a common EPR lead to a more interdisciplinary co-operation. This challenges the traditional mono professional cultures.
- To work with highly structured data is also a great challenge to the health care professionals because of the traditional culture, using mostly free texture formulations in (paper) patient records.
- It is an interesting fact that the expectations of resistance to implementation of EPR due to loss of professional status or pressure to develop new skills [3,9], is not experienced in the project organisations. There might be coherence between this and the fact that the EPR projects studied can be characterised as bottom-up projects, with a heavy user influence in the implementation phase.
- The training of the users is generally given as instructions in operation of the programme. This gives the users insight in the EPR for daily use on a very basic level. How the users act in the future to learn more about the EPR to be experts is still not visible. It might lead to other kinds of education/training.
- The super user concept today refers primary to the special trained healthcare professionals, secondary to the technical supporters. There might be a third meaning of the super user concept that refers to the professionals who establish and develops the

interaction between the developments in the society, the healthcare sector and the EPR systems – i.e. health informatics professionals [10]

At present the experiences with Danish EPR in routine use are limited and with that, experiences in relation to the organisational changes following EPR implementation are scarce. Therefore it is of course impossible to assess all the *actual* possible benefits caused by a widespread use of EPR, but it is very important to communicate and promote the sparse experience done so far for others to learn from and take advantage of.

6. Conclusions

It is important to notice that the healthcare professionals working with the development, implementation and/or use of EPR are in a very important and difficult process making up with old traditions and cultures tied to the healthcare professions. The healthcare professionals working with EPR shows interest and readiness

- to participate in new ways of collaboration
- to work with highly structured data in structured frameworks

It is too early to give an adequate assessment of the organisational changes, connected to implementation and use of EPR because EPR is still only in fully operation in very few, relatively small and isolated healthcare organisations.

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