Trial work: The way to successful information system projects in healthcare

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Abstract: The lack of user knowledge about new health care information system leads to project problems. The project successfullness is usually measured by end user and management satisfaction. The training of the health care personnel about how to use new system is not enough. Trial work is the essential and sometimes missed link between personnel knowledge and successful use of an introduced information system in health care. Trial work should be carefully planned, organized and monitored. For best results, the trial use of the new information system has to be defined by management as a must for the health care employees.

Keywords: trial work, successful information project, health care information system, user knowledge/experience

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1 Introduction

The success of a project can be measured with the efficiency of use of an information solution, which is, to the delight of management, used by the majority of health care staff. Another important issue is the level of managerial support and an acceptable financial framework (Stare, 2003). Research shows that the trial use period is of utmost importance for the success of a project (Leung, 2003), (Ptak, 1997). The majority of problems during implementation and use of a new software solution is due to the lack of user knowledge. (Liebowitz, 2003-2004), (Oldroyd, 2003). Our research thus deals with the influence of trial use on the success of a project in health care. For the purpose of our research, the phase of trial use was defined as the period of partial parallel use of software, as a must for the management, as a verification for the software, as practical training and as a psychological preparation for a new informational solution. These statements were confirmed by research results stemming from the pilot project related to the introduction of software in order to support doctors and nurses, to submit invoices to health insurances and for the sake of national health statistics in the Celje Health Centre at the Store site.

2 Trial work – link between personnel education and successful use of information system in health care

2.1 Testing is not enough

The purpose of testing is to evaluate the information system in health care before it becomes regularly used. A change in software causes a change in management and a change in working procedures (Laudon, 2004), (Vollmann, 1997). Thus trial period should not be equalled with testing period. Testing is carried out on testing data and according to predefined testing situations (Valacich, 2004). During this period we are looking for mistakes and try to remedy shortcomings. All this is carried out in a testing environment, which is often inadequate, on testing databases, usually not carried out in health centres and outside working hours. The results of discovered shortcomings have influence only on project activities. Normal work activities and real data are not endangered. Because of
such project activities, health care staff will only have to carry out a minimum workload (Li, 2004).

2.2 Trial work specification

Trial work is an activity found in almost every project plan (Kibbe, 2004). It usually lasts for one project month. In practice, project delays are the greatest obstacle and the main reason why trial work changes into partial testing. Difficulties connected with a new solution and persistent efforts for the stabilisation of the system were common and expected.

In order to investigate the effects of trial work, which was basically aimed at the verification of the system, risk reduction during the change to a new solution and at increasing project successfulness, the following statements were tested:

- The majority of health care staff should be included in trial work, because each incompetent user can represent a serious obstacle for the whole system.
- Functionality of the system as a whole should be included; all modules should be checked, as well as printouts, queries and procedures of a health care information application.
- It is necessary to test entire computer, communication and system software, because the smallest problem in communication can jeopardise the whole network, whereas team work can lead to problems with authorisation, response time, printers, etc.
- It is necessary to insure appropriate load for the whole health care information system, which would enable serious conclusions about the functioning of the system under full load.
- It is necessary to enter sufficient amount of data which are appropriately chosen, and will enable checking less frequent programme paths. In hindsight, this should amount to at least 10 to 20% of data available during regular use of the system;
- It is necessary to organise long enough data entry, in order to find problems in due time, and in order to improve the system before it is put to regular use. According to our experience, at least a month is needed for that.
- Trial work should be delegated to users by the management and not by the project leader; health care staff should take it as a duty, which has to be appropriately monitored.

2.3 Trial work plan model

Trial work plan for the system defines organisation and tasks during the trial use of a health information system, above all objectives, organisation, work load and adequate monitoring (Barnes, 2005). Trial work plan model has the following objectives:

- detailed testing of computer application on a chosen number of actual visits of patients,
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- testing computer application on atypical examples of visits, which occur rarely during daily health care practice,
- check the working of network and the use of computer application at workplace and not in the classroom where health care staff training and testing of application was carried out,
- monitoring reliability of the computer application and preparing reports, which will represent the basis for a scientifically-based decision about when the computer application will be used after the trial period. Measuring the trial work results increases efficiency and motivates users (Chaffey, 1998),
- increasing the level of competence of health care staff (Demiris, 2004),
- checking communication and response time between reporting and solving problems from the part of the computer application provider,
- lowering risks involved in switching to the normal application use,
- harmonisation of catalogues and adapting the computer application to the user.

It is necessary to define the period of trial work (say, for one month) and precisely determine the period of regular and trial work. It is necessary to specify how data for patients should be entered, mainly after the surgery hours, on the basis of data from the files of chosen patients. Instruction should be available on how to choose cases, so that the trial use comprises a wide variety of trial data. The protocol for reporting problems to the supplier of the new information system should be defined, together with the organisation of periodical one-hour workshops in classrooms. In addition, control, reporting and measures should be described.

2.4 Trial work monitoring and decision making

In order to ensure a wide variety of data and a suitable selection of patient visits - from the administrative and medical point of view – it is necessary to precisely define the minimum working obligations for the data entry.

Within the researched pilot project there were 5 visits – cases per day for each site, which amounted to approximately 20% of average working obligation per individual sites. It is, of course, necessary to adapt the scope of working obligations to the specifics of each project.

Data administrator performed daily monitoring of the trial use by selecting the numbers of visits per units from operational data base. The research project number of visits varied between 0 (holiday, etc.) and 28. Disproportionate daily data entry at various sites usually levelled on a weekly basis. Daily reports were sent by e-mail to the addresses of project leaders and management, thus ensuring taking timely measures.

The purpose of weekly monitoring was to find out if the trial use of the application is according to the plans. It can be seen from the weekly data shown
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in Figure 1 that the obligation of 5 visits per site and per days was reached in different ways. It is seen from the Figure 1 that working obligation was exceeded and that there was competition between sites.

Monthly entered visit data, given in Figure 2, show working obligations for each week. It was most intensive during the second week, when the health care staff, after the first week when they hardly reached their working obligations, keenly increased the speed of data entry. All in all, working obligations were exceeded by as much as 80%. Around 1,800 entered trial visits represent one third of obligated amount, which points towards an encouraging environment and accepting the amount of working obligations by health care staff as a way towards a successful project.

Figure 3 shows the dynamics of problem reporting and their solving. A decrease in the number of new reports can be noticed, which later levelled off, in the second and third week, with a slight increase in the number of unsolved problems, which are, as will be seen from Figure 4, mainly in the category of less important problems.

Unsolved problems were also researched by importance, and it was found out that the project was absolutely under control. Figure 4 shows that in the first week one half of unsolved problems belong to the critical problems category, and a half to less important problems. This ratio deteriorated in the second week, mainly due to the fast pace of data entry and finding out problems, which could hardly be followed by solving problems. During the third week things got back to normal, with the smallest number of unsolved critical problems and an increase in the number of important and less important unsolved problems. Obviously, the project was stabilised, urgent problems were timely solved, and an appropriate system of problem reporting was set up, which differentiated between different reports according to their priority and left solving of less important problems to a time after the beginning of regular office hours.

In order to get additional explanations for research results we tried to find out response time for problem solving. In the research project, urgent mistakes were solved within a couple of hours, and were followed by the necessary installation of new programme versions on the user's server, which was done on the same day in the evening or in the morning on the following day. The average response time for problem solving was between one and two days.

Research shows that, on the basis of such reports, the management can make decisions if the trial period of the new application has been successful. It is evident from the report that urgent mistakes were solved in a timely manner, that the system was manageable, the project group and the supplier of the information system were successful in solving problems.
3 Conclusion

The research on the influence of trial work for the project success, described on the case of the pilot project, showed that efforts put into planning, preparation and successful implementation, together with accurate monitoring of trial use of information system result in a successful move to a new information solution.

When a project is organised in this way, management can expect a high level of user satisfaction (Zviran, 2005), and, even more importantly, less risky move to a new health care information solution.

The research showed that, without a shadow of a doubt, trial work is essential for the success of a project. Researchers in Slovenian health care should face the challenge of researching the influence of e-education for increasing the successfulness of projects (Reif, 2005). Some research activities in Slovenia point towards excellent results reached through such education (Lesjak, 2003). The question remains, however, what is the optimum extent of trial work and education. An increase in the amount of education and trial work certainly leads to the increase in the level of competence, but at the same time necessitates more time for the project and increases project costs. Further research will enable a more accurate definition of optimum size and optimal organisation of education and trial work in projects of implementation of information solutions in Slovenian health care.

References


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Figure 1  Weekly visit data entry

![Bar chart showing weekly visit data entry](image)

- **Working obligation**: 5 5 5 5 5 5 5 5 5 5
- **1. trial working day**: 0 8 9 21 10 21 15 9 5 13
- **2. trial working day**: 0 8 8 28 6 14 14 7 10 16
- **3. trial working day**: 1 7 3 22 7 17 9 0 8 14
- **4. trial working day**: 0 0 7 18 9 8 9 1 6 19
- **5. trial working day**: 1 14 9 23 15 5 10 5 5 13
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**Figure 2** Monthly obligated vs actual visits entered

![Graph showing monthly obligated vs actual visits entered. The table below the graph provides the data.](image)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>1. week</th>
<th>2. week</th>
<th>3. week</th>
<th>4. week</th>
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<tbody>
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<td>1000</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
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<tr>
<td>Visits</td>
<td>1810</td>
<td>349</td>
<td>542</td>
<td>494</td>
<td>425</td>
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Figure 3  Problems solving statistics

![Figure 3: Problems solving statistics]

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>1. week</th>
<th>2. week</th>
<th>3. week</th>
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<tbody>
<tr>
<td>Problems reported</td>
<td>124</td>
<td>50</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>Problems solved</td>
<td>56</td>
<td>32</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>Problems unsolved</td>
<td>68</td>
<td>18</td>
<td>22</td>
<td>28</td>
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</table>
Figure 4  Insolved problems by importance

<table>
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<th>1. week</th>
<th>2. week</th>
<th>3. week</th>
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<tr>
<td>Critical problems</td>
<td>8</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Important problems</td>
<td>0</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Less important problems</td>
<td>10</td>
<td>1</td>
<td>12</td>
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