ENGEN

ENVISIONING THE NEXT GENERATION OF ELECTRONIC PATIENT JOURNALS

PROJECT REPORT

ABSTRACT

The purpose of this paper is to give the reader insight into the problems that may arise when implementing a large-scale electronic patient journal system. In 2001, the UPPSALA COUNTY COUNCIL purchased a design for such a system. After the design stage, the Council collaborated with the designers in order to develop the system, enhance the overall design, and evaluate the created system. The purpose of this paper is also to report thoughts on the overall efficiency of this process and to provide ideas to facilitate improvements to the system and development process. We decided upon 3 areas of interest: user education, referral system implementation, and methods of handling user feedback and communications.

During the implementation phase many of the users have felt that they are not listened to and cared for. We are here giving hands on suggestions of how to improve user feedback and communication in order to get the users to feel like they are part of the development. Another aspect of the process of enhancing the user experience of the system is to develop the user education. We decided to evaluate what education the users are currently given and give some pointers on how to improve this further. One main advantage of the COSMIC system is the referral module being completely electronic. This has yet to be deployed in the clinics; therefore, the team decided to evaluate the current state of the referral module and make a prototype of the new system.

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1 INTRODUCTION

At the end of 2001, UPPSALA COUNTY COUNCIL purchased a new electronic patient journal system, known as COSMIC, from Cambio, a software developer. After the design and development stages, the first installation of COSMIC was performed at a primary care unit during beginning of 2005. The use of the system has continued to spread to other locations, and its introduction into health care facilities has been covered by numerous media organizations. Unfortunately, media coverage often reported the problems with the COSMIC system and problem with receiving responses to feedback.

In 2006, Mats Daniels, a professor at UPPSALA UNIVERSITY in Uppsala, Sweden, spoke to individuals responsible for the introduction of the COSMIC system in the hopes of allowing a group of students to evaluate the COSMIC system. The County Council decided that a group of independent students would bring a fresh new perspective to the situation and agreed to let the students from Mats Daniels' "IT in Society" course focus on the COSMIC system for their term project. Along with the Swedish students, a group of students from ROSE-HULMAN INSTITUTE OF TECHNOLOGY in Terre Haute, Indiana, United States joined in the project as well.

1.1 PURPOSE

The purpose of this report is to present the accomplishments that were made during the project led by Mats Daniels and Cary Laxer. The first goal was to provide proposals for improvements to the UPPSALA COUNTY COUNCIL, and the second goal was to learn as much as possible about Information Technology projects in the real world.

The project team agreed with Brita Winsla and Benny Eklund from the County Council that the focus of the project should be on three separate areas:

- Education of COSMIC Users
- Organization of COSMIC Project
- COSMIC Referral System (RoS)

In all three of these areas our goal was to evaluate the current situation, limitations, and the possibilities for improvements. After investigation and evaluating these circumstances the next step was to come up with real improvement proposals.

From the beginning of the project, the team was aware that the objectives for the project may change throughout the project as new knowledge was gained. Due to the fact that COSMIC is an every changing system, the team was prepared to be flexible with their work and adapt to information.

1.2 PROJECT STRUCTURE

1.2.1 ORGANIZATIONAL STRUCTURE

This project was organized in such a manner as to give the team experience similar to real life company-customer relations. In this case, the key people responsible for the introduction of COSMIC in Uppsala acted as the customers while the students from UPPSALA UNIVERSITY and ROSE-HULMAN INSTITUTE OF TECHNOLOGY made up the company. Within the "company" different groups and a hierarchy were formed. The customer communicated overall wishes and goals to the project managers who in turn spread information to the rest of the groups.

 The team broke down into five separate groups with the "company":

- Education
- Workplace Analysis Education
- Workplace Analysis
- Workplace Analysis Prototype
- Prototype

Each of the workplace analysis groups focused on study and research at the primary care units and the hospital. Information gathered by these teams was used to form recommendations for the Education and Prototype teams as well as for the entire COSMIC system. Each group contained a mix of students from Uppsala and student from Rose-Hulman, making long distance communication a necessity. Most of the communication between group members and teams was done through VoIP (Voice over Internet Protocol), IM (Instant Messaging) and E-mail.
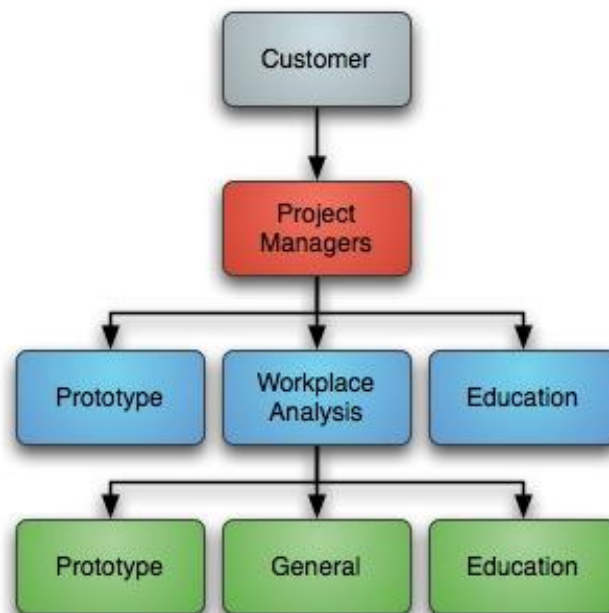
FIGURE 1: PROJECT STRUCTURE

The beginning of the project consisted of many studies and interviews in the hopes of gather information to provide a better understand of the status of COSMIC. Following this period of information gathering, each team analyzed the data relative to their part of the project to determine a good direction for the project. By the end of November, a mid-project report and presentation were provided to the clients to make sure that every one was still on the same page. After feedback from the clients, some changes were made to the project's goals, and these changes were carried through to the end of the project.
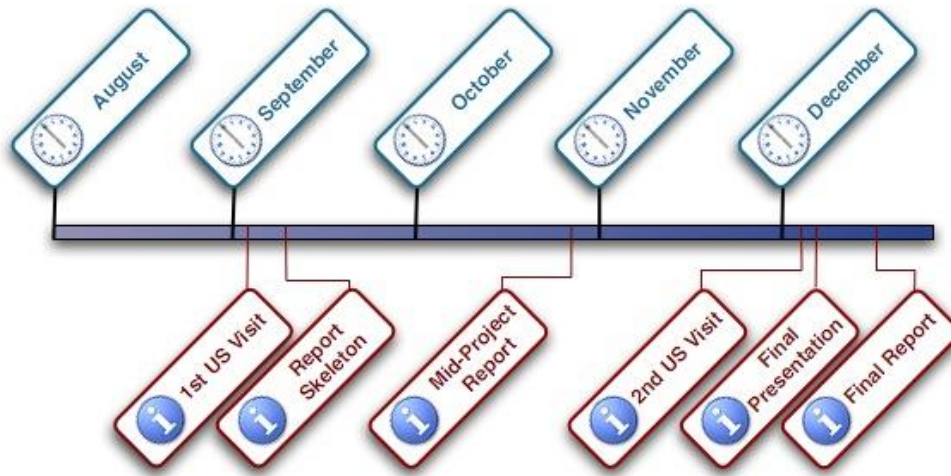
FIGURE 2: PROJECT TIMELINE

1.3 SUMMARY

1.3.1 EDUCATION

The current education system for COSMIC is divided into three parts. First, there is a three day course attended by most of the users of the system. With the help of an instructor, participants use an educational version of the system that is not connected to actual patient journals and learn how to accomplish different tasks. The next step is to have the user perform tasks at their work place with the current version of the system.   During the first two days of this time, an experienced instructor is present to further help the new users. The final step is simply continued use and experience from using the system during every day of work, with help only being available from the system support team.

The current education system was evaluated with the help of a workplace analysis and a survey. For the survey, users were divided into groups based on their previous experience with COSMIC. The previous experience ranged from no experience at all to users who had completed the entire educational process. The results revealed that the computer skills of the users affected their ability to learn COSMIC.   A higher level of computer skill correlated to a quicker learning time. As well, the profession of the participant mattered: secretaries found it easier to learn. The average learning time was six to seven days, meaning that most users are able to master the system in a week. When asked to grade the education on a scale of one to ten, an average of 4.9 was received.

Suggestions and improvements for the educational system of Cosmic included the need for constant feedback from users to developers. It was also suggested that the Cosmic course should end with an evaluation that would provide feedback on the course effectiveness and ideas to facilitate improvement. Additionally, the availability of a "stand alone" version for practicing at home and allowing the users to take a more active role in the educational process can also improve the training system.

1.3.2 PROJECT COMMUNICATION AND FEEDBACK HANDLING

In order to get a greater understanding of how the development of Cosmic is organized, the team tried to gain insight into how communication between users and management is handled. Even with limited exposure to the project, the team is hopeful that this report will be useful to those dealing with Cosmic in any manner.

It is understood that there have been many unhappy users working with Cosmic. It was initially thought that their unhappiness may stem from unmet needs within Cosmic, but initial research showed otherwise. The team saw that much of the unhappiness experienced by the users came from problems with information flow.

In every large IT project there is a need for users to feel involved in the process. In order to achieve this feeling of participation information needs to flow freely to all parties involved with the system. Users should know the status of the system as well as some overall details about new releases and major changes.

When users are kept informed of new releases and major changes, they can see that the system is being refined and made better, even if their individual requests are not being immediately handled. The users are made aware of priority issues and upcoming goals. While it is important to evaluate how much information users should have, generally the more informed users also tend to be more patient and forgiving as well.

It is also important for the users' voices to be heard at the management level. There are many ways to achieve this but the main focus should be that channels are created where users know that the opinions of the entire user base are heard and considered. Users who are unable to give feedback due to a lack of a well known and functional channel tend to feel put aside and ignored.

It is highly desirable for both a means for users to provide feedback and a method for management to relay information out to users to be made possible. A minimal amount of effort could make a significant impact. Distributing a little official information would do well to quell some of the worst rumors that users may be perpetuating due to misunderstanding about the system. Managers at Cosmic will benefit from knowing what users desire.

1.3.3 PROTOTYPE

The goal for this portion of the project was to make a prototype of a user interface for the RoS (Referral and Answers) in Cosmic (Electronic Patient Journals). At the beginning of our project, the team was not aware that Cosmic already had a referral system built in.   As such, the focus shifted more towards researching possible improvements to the RoS. The team was divided into two subgroups, one group focused on building the actual prototype and one group focused on gathering information to be used in the implementation of the improvement ideas. At the beginning of the project, the team set out to gather the most accurate information possible about the current Cosmic referral system. Unfortunately, much of the literature that was provided shed a negative light on the Cosmic system. It was decided that the best course of action would be to go out and see exactly how the users were working with the current system, and/or why they were not using the

current system at all. Using this information, the team started a requirements specification for the actual prototype implementation.

Using scanned referrals and the requirements specification, the prototype group was able to get started. The referral forms were kept as close to the original forms as possible, with the intention of creating a system that would be intuitive and easy to learn for all involved. There were several types of referral forms, but each one of them had specific information in common. This information was placed on a general form to save space and keep the screen from being cluttered and confusing. The final product was a prototype user interface that was modeled so that users familiar with the paper system would be able to easily recognize the different sections of the electronic version.   Hopefully, this will reduce the amount of learning time and will encourage people to use the new system.

2 EDUCATION

2.1 THE CURRENT STATUS OF EDUCATION IN COSMIC

The basic process of educating new users in COSMIC can be divided into three steps. The first one is a crash course which most users attend for three days. During this course each user gets a computer with COSMIC installed that is not connected to the real database. While sitting in front of the computer a teacher goes through the general work process and users can follow on their individual computers. A few basic tasks are also handed out for the user to do without instructions from the tutor. These tasks and their instructions are also given to users for them to take home after the course.

A few people from each medical unit are also asked to act as a local power user and receive an extra day of education. These people are asked in advance because they have good computer skills or have an extra interest in the use of COSMIC. The ones who accept the position receive a small increase in salary.

The next step in the education process occurs when using the sharp version of COSMIC at the different units. During the first two days of use a trained person from the County Council is always present and available for questions and general help.

The third and last step is the help that users are able to get while using the system in their every day work. Every user is able to send an e-mail with screenshots of questions or problems to the help desk and get answers within a few hours.

The general opinion from project managers and regular COSMIC users seem to be that the amount of education is sufficient. This does not mean that more education would not improve the user experience, but rather that the introduction usually works without any major deficiencies. There also seems to be a shared opinion that the part of the process where users learn the most is during the two days they are using COSMIC in their work and have access to trained personnel.

An opinion also shared by many is that users hear negative comments about COSMIC from other users before they start using it themselves. This gives them a negative view on the system and has a negative impact on the learning process. A deeper discussion on this subject can be found under *2.2 Feedback and Survey Discussion.*

2.2 FEEDBACK AND SURVEY DISCUSSION

One of the main goals of the education team is to evaluate and suggest improvements for the current training system. In order to achieve this goal the team gave a survey to COSMIC users. The goal of the survey was to allow users to report on the problems they were experiencing and generate ideas on how to deal with them.

An important area of our work is to find the portions of the system the users find most difficult. These are obvious areas to focus additional training. More difficult tasks may need a more in depth representation within the educational system. The team also wanted to get suggestions for possible alterations and improvements in the educational system. If a trained user can perform tasks within COSMIC quickly it would be useful to be able to quantify how much money the health care system is saving by sending personnel to training.

The survey was distributed through the CAMBIUS survey system to have an efficient process, which would allow a variety of users to fill out the survey without major impact to their usual workflow.

The surveys were intended not only for the personnel using COSMIC, but also for people who have never used the system. The team wanted to know what people who have not used the system think about it and try to distinguish negative preconceptions about the system and if these have impeded the learning process.

The surveys were given to individual users with a guarantee of confidentiality. The users were told the data would not be used for other purposes.

In order to aide interpretation of the answers, the team has divided the users into several categories that were then analyzed and classified. One of the major differences between users is their role within the health care system. Each kind of user will use only a limited part of the system so the length of education may change between different groups. As well, the content delivered to different roles should vary according to their most common uses for the training to be most effective.

Another user classification that is interesting is the difference in user educational experience and COSMIC use. In order to analyze this situation we have separated the survey groups in to the following divisions:

- Personnel who have never used COSMIC.
- Personnel who have used COSMIC but without any education about it.
- Personnel who have received the "classic" COSMIC education.
- Personnel who have received the "group meetings" COSMIC education.

The survey questioned the users about how much learning time they need to be able to use the system to accomplish basic tasks.

The first approach is to see how many days the user needs. The average learning time is 6.7 days, meaning that users need more than a week to start using COSMIC effectively. The data shows that more than half of the users were able to use the system within the first week, and the most populous group is the one that is composed of users who spend more than two weeks learning to use the system.

FIGURE 3: DAYS OF TRAINING NEEDED

The chart above shows how many days the users need to master the basic system options necessary to accomplish their common work tasks. In the horizontal axis is the number of days spent in training and the vertical axis is the number of users who feel they have learned the system in this amount of time.

If users are sorted by workplace it can be seen that the users from primary care units need slightly more time than the users from the hospital. The averages show that hospital users need approximately 6.6 days to learn, and primary care users need almost 7 days. This difference is expected because primary care users need to know a larger portion of the system. This also explains why none of the primary care users have mastered the system in the first day.
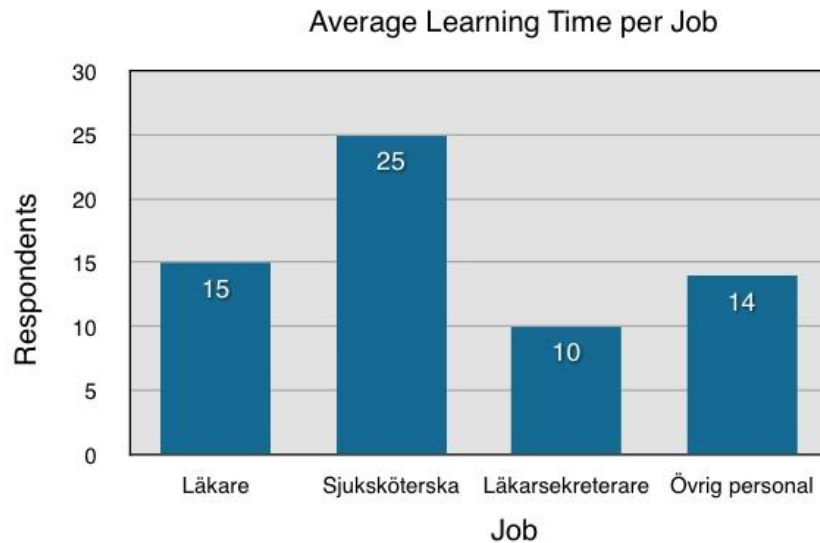
FIGURE 4: LEARNING PERIOD PER SITE

More interesting conclusions appear when we sort the users by their role. The secretarial staff picks up COSMIC the fastest, which makes sense because this user group is often asked to learn new computer systems. Below is a chart of the groups and their approximate learning times.
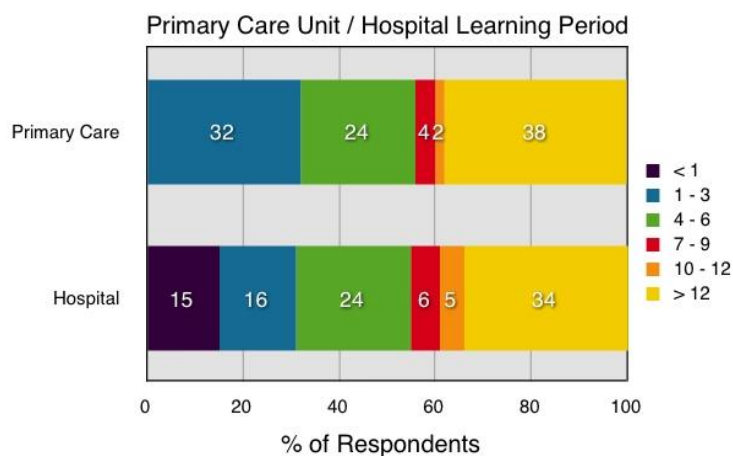
FIGURE 5: LEARNING TIME PER JOB

It should also be taken into consideration that users with lower computer skills are content with less knowledge about the system and will not strive to master the system. Less experienced computer users are more content with knowing less about the system than more experienced users. The following chart should be interpreted with the understanding that education quality is not a constant among all users.

2.2.1 EDUCATION QUALITY AND USER FEEDBACK
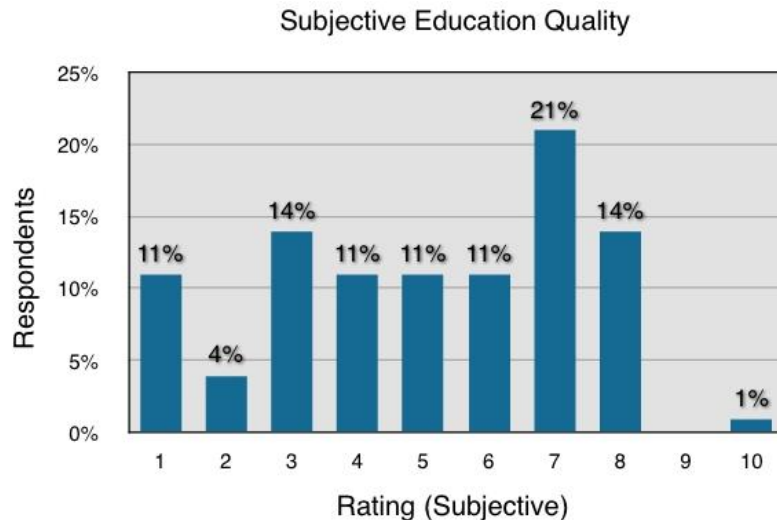
FIGURE 6: RATING 1-10 OF THE QUALITY OF COSMIC EDUCATION

The above diagram illustrates how users rated their quality of education in the COSMIC system. Users were asked to evaluate their learning on a scale from 1 to 10, 10 being a high quality educational experience. There was a bit of a variation in the results, but the average score reported by the survey participants was 4.91, which is reasonably good as it is only slightly lower than the middle score of five which represents neither good nor bad quality.

Nearly all of the employees (93%) that participated in the survey had some formal education in COSMIC. The main question that arose was how the users who did not have any formal education were able to handle the system. In field studies and interviews the team learned that in the beginning these users were slightly uncomfortable with the system because of the lack of information.   However, after some self training with the system using trial and error and assistance from colleagues and friends, these users were able to understand the system and improve their ability to use COSMIC.

The method and structure of the hospital provided education changes rapidly over time.   This is mostly done to improve the effectiveness of the education process and is intended to give the users a better educational experience with the system.

Survey results show that 72% of all the employees had their first educational experience with COSMIC more than 1 year ago, 12% had it between 6 and 12 months ago, and 16% of them had it less than 6 months ago. These three groups had different forms of education because the course was given to them at different times. The group which had the course less than 6 months ago should have had a better course due to changes made from feedback provided by earlier students in the course.

In the survey, 31% of all the users think the education they received was too short. They believe a follow up course would serve to give them a wider perspective or viewpoint of how the system works and give them an additional opportunity for follow up questions regarding the system.

Here is some feedback from the employees about good aspects of the education:

- Good teachers with medical background
- Clear and understandable material
- Experimenting with the system and trying it out
- Working with patient cases
- Practical usage
- Separate exercise database
- Sitting in small groups and trying out everything

Some feedback from the employees about items that were not as beneficial with the education:

- Too little training on common problems and how to handle them
- Would rather have trained teachers who were specialized in the system
- Difficult to learn everything during the short education period
- No follow-up education
- Stressful, learned mostly by myself and got help from my colleagues
- Too much information at once

Some items that the users thought were missing during the education or that they would like to add:

- How to solve problems that occur during data entry
- The education should be separated in different parts. e.g. general education followed with more thorough and detailed education
- Some kind of follow up course/education that is close to the first class
- Have an experienced Cosmic user present during the course
- Some kind of compendium or course literature instead of many loose papers

2.3 DIFFERENT ASPECTS OF LEARNING

When looking at educational materials, it is often beneficial to discuss various aspects of learning. The methods in which the learners acquire and process information can have major impacts on the apparent success of educational material. Recent educational theories have pointed towards the development of interactive and constructive learning. Interactive education can be described as materials that require input from the learners and encourage thought about the subject matter. The practices of using web-based quizzes or computer aided assessment are generally interactive teaching methods. Constructive learning is a more specific form of interactive education. When using constructive teaching methods, the students guide their own educational experience. The students are given several methods of acquiring information, but are given free reign to organize data and explore topics in a manner that they see fit.

For many years, it has been difficult for various institutions to incorporate constructive learning in the educational process due to technological constraints. With the recent proliferation of personal computers and Internet use, these limitations are fading away. Now, software developers and IT professionals can aid in the construction of tools that are conducive to constructive learning. Common constructive teaching methods are

highly adaptable to uses outside of a traditional classroom, and IT development is making it easier to access constructive learning tools.

While designing an educational system made for training users of Cosmic, concepts taken from constructive teaching methods can help. Studies suggest that constructive learning helps people to retain information and have faster recollection of data. This would be highly useful in using Cosmic; if health care professionals can enter information quickly they will like the system more and be more efficient. This efficiency could improve the quality of health care more than Cosmic use alone.

2.4 SUGGESTIONS AND IMPROVEMENTS

While looking at the Cosmic education system and evaluating the learning processes that are currently in use the team noticed different aspects of learning patterns through the entire hospital chain. These patterns differ from each other depending on what kind of learning situation one is focusing on.

The Cosmic crash course is one of the steps taken for learning Cosmic. This process is based on interaction with the system which focuses on pure practice. Here the employee is learning Cosmic with the help of a teacher which is basically the old fashioned way of learning. The learning process is rather basic and lets the employee browse through the functionality of Cosmic which the teacher has put up in different practice scenarios that they are going to go through. The employee will also be able to ask questions and take help from other colleagues to get started with the system.

2.4.1 LAYOUT

If we look at the Cosmic layout we can see flaws in different areas such as the structure on data-sheets positions and the coloring of the layouts. This part is really difficult to make improvements in without the interaction feedback from the users of Cosmic. Different users from different areas in health care will most likely have different ideas on improvements.

These problems can be addressed with the help of constant feedback from the users of Cosmic. The feedback can be given by constant survey handouts or possibly by a weekly summary of user interaction when logging out of Cosmic. In this manner,   the system will provide a mechanism to improve itself and also take the most important factor into consideration: the user.

2.4.2 CRASH COURSE

The team came up with some suggestions on making the learning process easier and more effective for the new users of Cosmic after attending the "crash course." The suggestions were based on different classes the team has attended in years of studying, such as human-computer interaction and cognitive psychology.

Here are the suggestions concerning the crash course:

- Introducing an end-evaluation paper so that the users could give positive and negative feedback to the teacher/teachers. So they can optimize their tutoring and focus on different parts that are harder for the users as the end-evaluation papers have shown.

- The teacher could have taken notes of the most common problems the users had on their first interaction with Cosmic. Based on these notes the teachers can be more focused in different parts. This will lead to a more effective learning process.
- A "stand alone" online Cosmic dummy for practicing at home. As every new user to a computer system can find it difficult to comprehend all the new information in just 3 days. Making it available for at home studies will greatly improve the quality of learning over the entire employee sector.
- Introducing a summary paper with tips and tricks for Cosmic in the break room at every ward. These summaries could include for example, hotkey shortcuts for Cosmic. They could also include basic functions like sorting and filtering the patient lists.

"Learning by doing" is the best way the user can gain more skill in the use of the system. If one looks at the Cosmic help desk solution as an educational system one can see that this is almost the only tool the user will be able to get answers from on a daily basis after attending the short introductory course. Although there is a FAQ in development, there is not much information provided there.

2.4.3 FAQ

There is a FAQ in development and the team has examined it. At the moment, there is not much use of it as an educational tool, but the idea has potential. The education group discussed this matter and came up with some suggestions and improvements that the developers may put additional focus on regarding the structure, topics and layout.

Remember that these thoughts concerning the FAQ are based on internal discussions and on a small glance at the current status of the system. These suggestions are not based on more than the teams thoughts and experiences. However, the team hopes these suggestions on improvements can be a help in the development of the FAQ.

Things to think of while creating the FAQ:

- Make the headlines clear about what they cover so the user can navigate quickly
- Make a usable search engine for the entire FAQ so the user can get relevant information without having to search under a specific headline.
- Make the most clicked topic under a certain headline visible for the user. This added feature can speed up the search for common problems
- Make a question template for the input to the FAQ so all data will have same structure. This will minimize the search engines complexity.
- Make a recommended topic-list for the user which is relevant to their role in the healthcare system. This would make it easier to search through data because the user does not have to search through data which does not apply to their usage of the system.

2.5 EXAMPLE: EDUCATION FOR THE PROTOTYPE REFERRAL SYSTEM

A web-based educational system or a system that behaves in a similar manner is recommended for use with Cosmic. Users would be able to navigate the system in a nonlinear order by having available links placed on the side of the screen. This helps users make personal associations and learn material in a way that is easier to remember later. Also, users can look at specific sections of the materials for reference if they need to quickly

find out how to do something. A major suggestion for the educational system is the idea of personal notes. After logging in, a user can write notes for themselves in the system. This way, users can create their own reminders of shorthand, hints on use, or contact information for someone who knows Cosmic. The personal notes can help make the system keep a standard format and terminology while allowing users to "translate" into local terminology. This will aid in cross-unit communication as well.

3 COMMUNICATION & FEEDBACK HANDLING

3.1 CURRENT ORGANIZATION

The organization around the introduction of COSMIC is split up into two parts: administration and project[1]. The first deals with maintaining and supporting the modules in COSMIC that are considered fully functional. They may need some small bug and usability fixes but nothing major. The other segment of COSMIC deals with modules that have extensive problems and need to be given specific attention. The projects part becomes smaller with time as projects are considered to be finished and become the responsibility of the administration.

3.1.1 ADMINISTRATION

The organization is built up in a hierarchical manner. At the top there is the management and at the bottom all the users (see figure below). Immediately below the management there are the division groups. Each division group contains representatives from all user groups such as nurses, doctors and secretaries. There is also someone representing the management at each meeting. There are a total of 10 division groups, one for each of neurology, surgery, emergency care, etc.
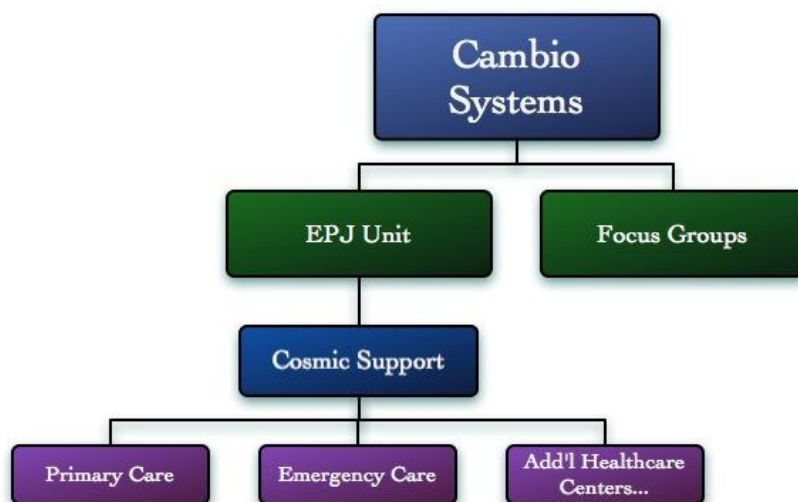
FIGURE 7: CAMBIO EPJ HIERARCHY

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[1] Fördelning EPJ-projekt/Förvaltning EPJ

Many units at the hospital have a working Cosmic group. This group usually consists of one person per user group. The group meets on a regular basis to discuss usability, bugs, errors, preferences, etc in regards to the Cosmic system. This group reports to their respective division group, which meets once a month. They have similar discussions to the Cosmic groups at the wards and units. Each of these groups consist of representatives from each user group, testers, and a representative from the management. These groups have a total of around 10 people and discuss requests, complaints, and feedback they have received from users and Cosmic groups out at the units and wards. The requests are processed and those which the groups feel are the highest priority are then reported to the management.

The division groups report to the management by using an internal system called "Cosmic Support". This is the main interface for the division groups to report to the management. Cosmic Support is a web based system where each group reports requests they believe the management should report to Cambio. In Cosmic Support it is possible to see the status of the requests that make it through to Cambio. There are around 100 users with access to the Cosmic Support system (those that are part of the division groups have access).

After the management and testers have filtered through the requests, there are some that are sent to Cambio to be worked on. The first thing is to decide the priority of the request; this is done by weighing the requests severity, danger, and usability on a scale from 1 to 3. In the Focal Point database, there are several items to be reported such as the actual request/problem and the priority; this database is the official database Cambio uses for the Cosmic system.

3.1.2 PROJECT

The project team plays a part in the implementation of Cosmic. It is a group consisting of users, testers, and management. The main reason of the group is to develop the parts of Cosmic that are not yet completed. They are working with the functionality of the software that needs to be implemented or improved. It is not about maintenance but more about redoing or improving parts of the software.

Some reasons for th could be that entire parts of the needed software are missing, it has too many bugs, or functionality is not yet created. The project team is working within these areas: Lakemedel, RoS, Konsultremiss, PAS, Primärvardens inforande, av PAS+Journal, HoH:s, inforande av PAS+Journal, Bild och Utdata[2].

The project team is currently working with at least four or five of these areas and meetings are held approximately every three months. Two representatives of the users, Cosmic management and representatives of Cambio, participate in these meetings. Here the users can talk straight to Cambio and management makes sure that there is no work redundancy in the sub-groups of the project. Together they decide what part of Cosmic is in the greatest need of improvement and they agree on what parts Cambio shall focus on. This improvement is then supposed to be implemented within three months[3].

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[2] Interview with Anita Lakström

[3] Interview with Österbybruks Primary Care unit

3.2 USER INFORMATION

3.2.1 MANAGEMENT

Finally, the company must establish what methods it will use to communicate with customers and then determine what things they should or should not say.

Large software projects often involve some unpopular decisions; there is no way every feature request or odd bug can be fixed on a project with a limited staff and timeline. This can often lead to users feeling isolated and ignored. It is important that management makes a concerted effort to engage users and keep them informed of what is happening.

Many companies utilize beta tests as a way to get people excited about what is coming, as a bonus, they find out what needs to be fixed before it is released. This can stir up good feedback and gives users an idea of the things that the company has been working on.

Still, large companies have trouble with providing useful information to users. Since the developers are concerned with small features, and managers are concerned with the financial picture, there needs to be someone in the middle who is concentrating on keeping users involved. Middle management can be useful in this role since they oversee parts of the project, they can contribute exciting tidbit of information about the new things on the way and skip over the boring sensitive parts.

One major benefit of an open communication pipeline is that users will be able to better understand how the system works. This increased transparency means that they will understand that the system will not be perfect immediately and they will see (and be able to provide feedback) about the most important features. If a company is not honest about why things do not work, users are more likely to be reasonable about it.

3.2.2 INFORMATION PATHS

Usually there are plenty of options for information paths. All have their advantages and disadvantages so it can be very helpful to choose the right method of communication for a certain type of information.

E-MAIL can be used for newsletters as well as for urgent information if the user base is entirely reachable by e-mail. An advantage of e-mail is that the information is *pushed* without any action taken by the user. However, the problem with e-mails is that users tend not to read them, especially when they receive e-mails regularly and they are not directly concerned with the information at the time the email is received. For urgent information e-mail can only be used as an additional information path because there is no control on when the information will be received. All in all e-mail is a good choice for spreading information within a user group that has heterogeneous needs and preferences regarding the type and amount of information.

WEBSITES are especially well suited for information that is static either in content or type. Since the user has to take action and *pull* the information, the location of the information has to be previously known. Frequently asked questions, manuals, organizational charts and contact data are examples for information that can easily be put on a centralized website or web portal - as long as the user knows how to access the information.

POSTERS AND INFO CHARTS are used to communicate static information. The advantage is that no computer is needed for access and that this kind of media "comes to the user". Disadvantages are the limited amount of recipients and information that can be provided.

HANDOUTS AND FLYERS reach mostly out into public relations and can be used to ensure or encourage users to take action, e.g. when a new function or structure is introduced and shall be advertised to the user.

MEMOS AND INDIRECT DISSEMINATION OF INFORMATION can give the management an opportunity to distribute information that plays on the existing social hierarchy. In an attempt to strengthen this hierarchy, it is important to publish guidelines about how to talk about the latest developments and when. Everyone needs to be willing and able to talk knowledgably about the new things that are coming. Often, this technique is used to quell other naturally occurring rumors, but alternatively, it can allow a local "expert" to be the go-to person about issues in the program. By keeping this person informed and encouraging them to talk about exciting developments, users will, in turn, be more informed about the positive progress which is about to happen.

3.2.3 INFORMATION FILTERING

The decision of what information is to be sent to the user is important to balance between the need of spreading everything that can be helpful and the problem of overburdening. Of course, the users are not in need of knowing everything that is going on in the top management and surely they do not even want to know about it. In general, the information that is helpful to the user can be divided into three categories:

INFORMATION THAT CONSIDERABLY CHANGES THE WORKFLOW OF THE USER. The release of new modules is an example of this kind of information. The more the workflow is affected by the change in the system, the more the user should get to know about what is going to be changed.

INFORMATION THAT AFFECTS THE EVERYDAY USE OF THE SYSTEM. This kind of information could often be described as "Tips & Tricks": the information is not indispensable for the every day work with the system but could save time or improve the usability on the long run. A collection of tips could be released one after another along with current information.

META-INFORMATION ABOUT THE PROJECT. Although the user is not directly affected by this kind of information, it can help to keep the user updated on current developments and increase the motivation to be part of the project. If the users know about current hotspots and achieved goals it is more likely that they will have a positive attitude towards the project even if their own workflow is still not perfectly integrated into the system.

3.3 USER FEEDBACK MANAGEMENT

3.3.1 INFORMATION TECHNOLOGY PROJECT

In large IT projects such as this one, it can be difficult to get feedback from users. It is difficult to filter and sort out the needs from the wants of a vast amount of users. The fear from management is of being overwhelmed with user input. However, if users feel they participate in evolving the system into something approved of and liked, users will be much happier as well as much more efficient. This leads to users spending energy for work instead of for blaming the system.

It is important to understand that it is typically impossible to meet the requests of all users. It is entirely possible that users ask for features that are impossible to implement or in direct opposition of another user. This is ok, it is just important to appeal to the average user with features that are accessible to all.

Some companies try to avoid creating false expectations and just tell users that they are not accepting feedback. This is simple but seldom acceptable to users. They feel they have no say about a system they are to use day in and day out. Thus, new features are not nearly as welcome or embraced as they could be. This causes efficiency problems. Some users may even prefer not to use the system.

To avoid this, a small subset of the users could be given the chance to voice their concerns for the entire user group. This leads to some users who are very involved in and updated on the process. For more information about this, please read about focus groups in section 3.4.1.3.

In this situation it is important to get users involved. Users who know where and how to voice concerns feel like part of the project and feel that their voice is important. It is important to open up communication channels for them to raise their concerns. Otherwise the evolution of the project may get out of hand and go astray from the user perspective. The communication channels may be of technical and/or human nature. A technical channel, such as a web based request system, where the user can see the status of a given request would be the preferred system by most users. The user could input the request into a database and always keep track of it. With clear information on how to use this system there are many advantages. Both users and management can gain a clear picture of what users feel is most pressing and important at a given time.

A danger in having such system is the system being overloaded by requests from the users. It may be hard to sort through and organize all the requests. A way to handle this, similar to what is done now, is having local groups of users sorting through requests from their local users. Many requests may be the same or very similar, which have to be handled in some way, e.g. linking similar requests together in order for the users to still being able to see status of their requests. An advantage with this system is that requests are filtered by local users which means changes to the system are directly affected by people close to the end users.

Another way to deal with the feedback and request flow towards the top of the organization is through human communication and interaction. If users know exactly who to turn to in order to voice their concerns they may still be able to get their requests through. It is important that every step in the communication channel knows exactly who the information should be relayed to.

Because of the human nature of the information channel, information will get filtered in every step of the way towards the management. It is hard to control what and how the filtering is being done. It is also hard to know in which extent the filtering is done. Different persons have different perspectives of the system and thus filter differently from others. This makes it difficult for management to know whether the requests they receive are representative of the actual requests from the end users.

3.3.2 COSMIC SPECIFIC

About the project: We have spoken to some users that know about the project that started this autumn concerning the primary care units, but most of the users are still not aware of its existence. The end users who know of this project are pleased that representatives of the end users finally have the possibility of speaking straight to representatives of Cambio and being heard. Now they feel their requests are taken seriously and expect much from this development. Before they got to know about this project, they thought that the information flow between users and Cambio was almost non-existent. Thus, the question is why the users that now are aware of the project did not know of it before.

About the administration: During our field studies and interviews the staff didn't seem to be aware of where to submit suggestions in order to have them addressed. For example, a simple hierarchy graph, published on a

website, would be helpful. Every end user could then see who is in charge of his or her concerns. At that time it was not clear who was the division manager that could carry on their reported issues.

An advanced suggestion is to have some kind of user friendly web based feedback system where all users can add suggestions, improvements, or complaints. This system can use the same structure of today's administration structure, dividing the users into 10 groups. The difference would be that this is an electronic system which would allow the users to easily follow up on their submissions.

A suggestion or complaint could be added through an easy to use web based interface. When a suggestion or complaint has been added by a user, the user will receive a "receipt" of some kind with a unique number that the user can use later to look up their suggestion. They will then know whether or not it has been looked at, addressed or dismissed and hopefully be provided with a reason for the action   that has been taken, or the lack of action.

This system type would require some kind of filtering. As it is likely that suggestions and complaints occur more than once, similar suggestions or complaints should be linked together. This means that user complaint or suggestions should not be deleted if they have already been fixed, but they should be linked to another suggestion or complaint that has an existing status so that the user may see that something is being done.

By linking similar complaints, management will receive fewer requests. To avoid extra work at the management layer, filtering should be done at several levels in the organization: unit level, division level and also at management level. This would be similar to the current structure where filtering is performed at several layers; however, the difference here is that requests are still kept in the system and users would know what happened to a given request.

3.4 REQUIREMENTS HANDLING

Requirements engineering is one of the biggest concerns on any large project. Without clear goals and classification of those goals, most projects will fall far short of expected quality. Similarly, maintenance requirements are very important in software evolution. However, unlike most initial requirements, maintenance requirements are written by users of the existing system. Thus, they are social and emotional in nature. Neither of these properties makes them easy to objectively quantify.

3.4.1 RETRIEVAL

Companies must make a systematic effort to address the concerns of users. Their experience with the system as a user (not a developer or tester) is difficult to simulate. Feedback can be elicited from users in a number of ways, some of these are detailed below.

3.4.1.1 SUPPORT LINE

One major way to obtain feedback about a product is through a troubleshooting or support line. Many users will call a support line because they cannot figure out why a feature is not working correctly or why they cannot find a particular feature. Some of the time, this exposes a bug in the software. In this case, the support staff can directly gather information necessary to help the technical staff solve the problem. Other times, support calls expose needed features that are not in the software. In this case, the feature request can be

logged and forwarded on to the technical staff or a change control board. Finally, there are always going to be calls to the support line that are genuinely issues of education or documentation. These issues will not typically lead to a change in the functionality or presentation of the software, but can expose issues with the overall usability of the program.

3.4.1.2 SUPPORT FORUMS

In addition to a dedicated support staff, many companies may offer a web portal that allows users to log issues into an entirely digital support system. Today, many of these include a peer support forum where users may go for more minor issues and seek the help of experienced users. These groups tend to generate a number of free experts and power users to solve many of the non-bug issues and pool around significant feature requests. Support forums can have a similar effect to focus groups, except that support forums will also help provide help to confused users.

3.4.1.3 FOCUS GROUPS

Focus groups are a good means for getting feedback from users that might be too busy to report usage data through more self selecting means. These may not identify bugs or feature requests, but are effective in determining large issues for users in terms of usability and functionality.

3.4.2 CLASSIFICATION

One of the most important things a company can do to with maintenance requirements is classify them as objectively as possible so that all actors in the problem definition and the solution are aware of the value of this issue.

3.4.2.1 PRIORITY

Priority is a user concept. It is the user's way of representing the level of pain and importance behind this request. As such, it is important that the user define this value explicitly. By defining the priority directly, the user is indicating how much they care about a particular request. This allows feature teams a better idea of what will give the greatest gain in user satisfaction.

Priority should have several pre-defined values with explanations. An example set of values and meanings follows:

0 = Critical; this request is critical to the user. It will address a fundamental flaw that needs to be addressed immediately. Requests of this priority require personal follow up if the feature team will not be fixing this problem.

1 = Must have; this request is important to the user. It will dramatically improve user experience or provide important functionality that is not currently available.

2 = Nice to have; this request is not particularly important to the user. It would improve the user experience or provide needed functionality that is not currently available.

3 = No Priority; this request should be evaluated later by another individual

3.4.2.2 SEVERITY

Severity is a concept that describes the difference between a feature request and a crashing bug. This could be set by an in-house liaison for the company, but should be guided primarily by the text of the user request. It is important that severity be objective, as it usually is one of the biggest filters on determining what must be fixed.

Severity should have pre-defined values with explanations. An example set of values and meanings follows:

0 = Critical; this should be used for reporting issues that include data loss, system stability, and risk to patients. This is the highest severity and must be discussed with the feature team. If a solution other than fixing the issue is chosen, it requires review from the reporting user.

1 = Flaw; this should be used for reporting issues that are less severe than severity 0, but include application failure, functionality problems and performance issues.

2 = Minor functionality issue/usability issue; this should be used for reporting issues with functionality that include user interface problems, usability problems and minor functionality issues. This is the lowest severity for issues.

3 = Feature request; this should be used for reporting missing features. The importance of the request derives mainly from the Priority field.

3.4.2.3 RISK

Risk is a concept that should primarily be determined by a change control board (CCB). This represents the risks involved in fixing the issue. If the module the issue was reported on is highly sensitive to regressions, the risk may outweigh a low severity, high priority issue. High risk fixes will likely be complemented by high cost, so these should only be undertaken on the most substantial issues.

Risk should have predefined values with explanations. An example set of values and meanings follows:

0 = Minimal; this is unlikely to cause any further problems.

1 = Slight; this may cause small regressions, but those should not be severe.

2 = Substantial; this has a high risk of regressions, some of which could be severe.

3 = Severe; this has a very high risk of severe regressions.

3.4.2.4 COST

Cost is a concept that should primarily be determined by a CCB or a feature team. This should represent the implementation and testing time as well as other resources that may be needed to implement this change. High cost changes should not be undertaken on low priority/severity items.

Cost should have predefined values with explanations. An example set of values and meanings follows:

0 = Minimal; this is not likely to take very long or be costly.

1 = Slight; this will likely have a heavy testing cost, but implementation is expected to be straight forward.

2 = Substantial; this may prove difficult to implement or test.

3 = Severe; this will take a very long time relative to other features.

3.4.2.5 EVALUATION OF FACTORS

A common language of evaluation is a good place to start, but in order for the system to work objectively, it needs rules governing how these enhancement requests are handled.

When issues are first reported to the company, they should already have priority and severity information attached. Cost and risk will take some time to evaluate which may be excessive for the marked priority and severity. This level of acceptability will be governed by the amount of higher priority issues that are currently available and the resources available. If this is a maintenance release without many high priority/severity issues, then this level will be lower. This level will tighten up as release time approaches and lower priority/severity issues may be postponed for later evaluation. Issues that are not pertinent at this level can be moved to a wish list or resolved with a justification.

3.4.2.6 WISH LIST

The wish list is a place for issues that are lower priority and severity that the development team or CCB feels should not be fixed at this time, but if larger issues are taken care of before the product is released, these issues should be re-evaluated and fixed. Issues cannot remain on a wish list across releases. They can either be moved to the next release, or logged as issues that the team does not intend to fix. These should be accompanied by an explanation that is sent to the reporting party. If the reporting party is particularly displeased with that resolution, they should have the opportunity to argue the issue before the CCB.

Expensive or risky items that have high priority/severity must be evaluated with the greatest of care. On some issues, the risks may outweigh the benefits of fixing the issue. It is important that any solution other than fixing the issue be justified extensively in these cases. If the filer is unhappy with this resolution, they should have the opportunity to argue it before the CCB.

If an issue remains an active or wish listed issue for more than a certain amount of time (perhaps a year), it should be forced to go before the CCB for re-evaluation. If no one would like to argue for the issue, it is automatically closed. No justification need be provided, but the filer may still request that this issue be revisited if they are very passionate about it. They should change the priority to match this assertion.

3.4.2.7 CCB

The CCB can be a development team or more of a focus group of many stakeholders including developers or testers. This group is responsible for deciding what requests should be fixed. It is important that this group be weighted in such a way that stakeholders see their value to the project and are not imbalanced (say, 1 doctor on a board of developers, or 1 developer on a board of doctors).

3.5 PROCESS
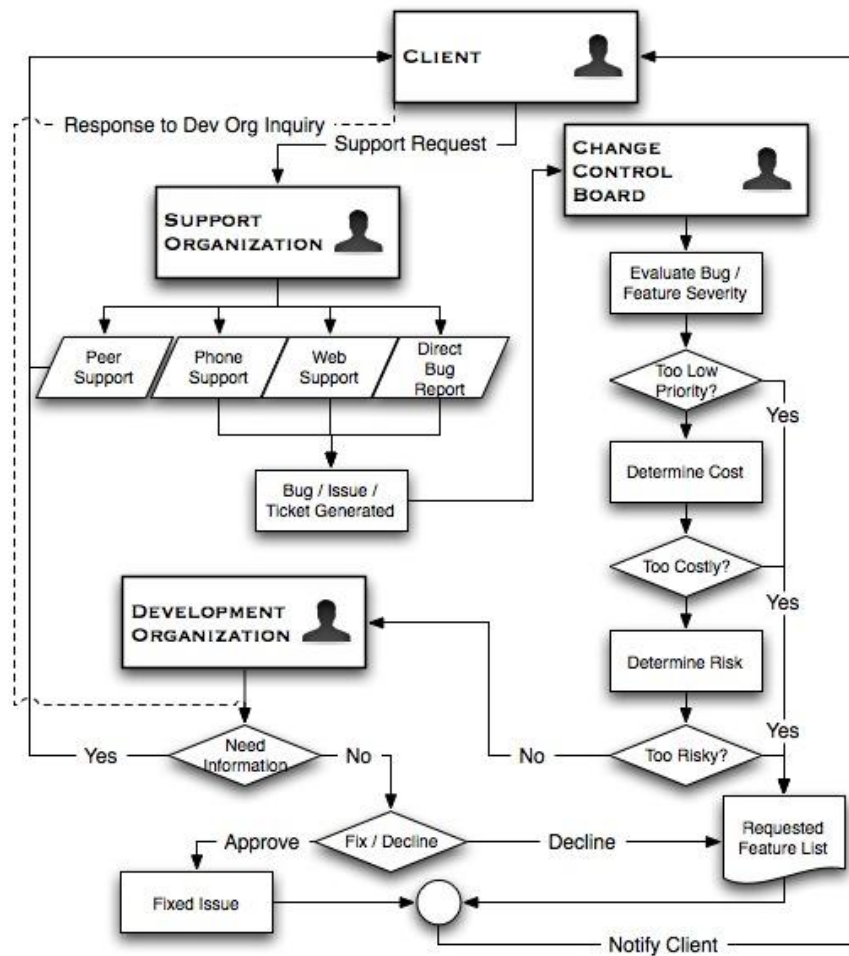
FIGURE 8: PROCESS

3.6 SUMMARY

Open and formalized communication will contribute to the success of a project. Failure to meet this goal inevitably leads to unhappy users. Communication to users helps keep them involved and aware of the ever changing nature of COSMIC. Communication from users keeps developers involved in the ever changing problems they are solving and helps them focus their attention.

4 PROTOTYPE

The COSMIC referral system (RoS) is a module in COSMIC that handles referrals and their responses. At the beginning of the course, this module was not fully developed and consultation referrals were not implemented at all. RoS was one of the modules that had most room for improvement according to the information provided by the client.

The purpose of the prototype was to demonstrate new possibilities for graphical user interface design. Functionality was not important in this case for a few reasons; the first, and most important, was that the focus of the class taught by Mats Daniels was on human-computer interaction more than programming and functionality. Second of all, the team was working mainly for the hospital, rather than the actual COSMIC developers, so there was no access to source code which made adding functionality to the system impossible.

No-one on the prototype team had more than common knowledge about a referral system, so there was a large learning curve in figuring out what exactly was required of the system before design and implementation could begin. The ideas showcased in the prototype are based off of the information gathered and analyzed from several field studies. Information was gathered from both users of the current RoS and people who were still using the paper referral system. As engineers, the team hoped to provide a different point of view of the situation.

4.1 GOALS

The group divided into two teams with two different tasks. One group was to define requirements, which were used as a basis for design decisions while the other group was responsible for creating a prototype that was met these requirements.

The prototype requirements were derived from analysis of the current workflow and documents. The goal was to get an overview of both the electronic referrals in RoS and the traditional paper referrals. Advantages and disadvantages of both approaches were investigated and evaluated, the results analyzed with the restrictions provided by the technical environment and Swedish law. All of this came together to create the requirements specification that was the basis of the prototype.

4.1.1 SCOPE

Information about referral system workflow in the both the Sweden and the United States was analyzed and combined to get a good idea of how the system needed to function; however, as the system was being developed for use specifically in Sweden, much more emphasis was placed on the results found on the Swedish side.

Together with the education group, the prototype team was to find a good way to support the education of referrals in COSMIC. The prototype was built to be an external application, in which the code for the forms could be easily edited by the developers of COSMIC if they wished to integrate the new design into their current RoS.   The only functionality required of the referral system to be developed was basic navigation so that a user could see what would be required of them if they were to use the new referral system.

4.2 FIELD STUDIES

4.2.1 FIELD STUDY IN AN ORTHOPEDIC UNIT

Place: Uppsala Akademiska Sjukhuset, Orthopedic Unit

Date: 2006-10-02

Participants: David Halbik, Josefin Zetterlund, Peter Malmqvist

The first field study of our group took place in an Orthopedic Unit in the Uppsala Akademiska Sjukhuset. We wanted to investigate the general work flow of nurses and doctors and how they use Cosmic.

We followed two nurses a few hours and, later in the day, a doctor to see how they where interacting with Cosmic.

Every morning the nurses at the orthopedic unit have a meeting to make sure that everyone is up to date with the patients present in the unit. After the big morning meeting, the unit is divided into four groups or "mini-departments" with about six patients and two nurses each. The two nurses will go through Cosmic individually, checking the need of each patient in that mini-department. Everything is written into Cosmic but most things are also taken down manually with pen and paper into a file. There is one file per patient.

The two nurses we followed write the daily information about each patient on a paper in their mini-department. This information could be name, syndromes and restrictions but is mainly a way to take some notes and write down what they have to remember. This paper is carried with them all day and thrown away before they go home.

In each mini-department, the medicine carriage provides a portable, wireless computer but is seldom used. It is slow, either because of the network or the processor, we are not sure at this time. It is not very popular to use it, since unauthorized people passing behind have the possibility to see what is written. Also, the log in and out of Cosmic takes time, and it is easier to write it all on a paper and add it into Cosmic in a private room where they will not be disturbed.

Currently, the list of medicine a patient must take is not implemented in Cosmic. When patients are given medicines, this is written in a separate file. When this is implemented the portable computer should be used. This is probably going to happen soon.

Missing medicines will be written down by the nurses on a paper; this paper is given to specialized nurses who will get hold of the medicine after checking its availability, costs etc.

The list of medicines was missing in one patient's file. The patient had to remember what medicine she was on. Those were only painkillers in this case, so it was not so serious, but this could lead to serious problems. To get a new list, one has to be printed by the secretary, filled in by the nurse and signed by the responsible doctor.

JOURNAL

They use care plans for each patient, where they document every detail about what they do with the patient and observations about the patient.

In the patient card there is information about the patient, name, personal number, sex, information about relatives. It is possibilities to change all this information.

There is a possibility to listen to the dictation a doctor has recorded before and if the secretary did not write a report yet. This was not used often by our nurses because it takes too long (a few minutes) to listen to it.

They have a menu with referrals and answers, but they were not authorized to use send any referrals. This menu was not used, even if they can receive referrals from some other unit.

4.2.2 COSMIC USER EDUCATION

Place: Primary Care Unit

Date: 2006-10-03 until 2006-10-05

Participants: David Halbik, Erik Näslund, Magnus Myren, Mattias Keva

We got the opportunity to sit in on an education course held for users of the COSMIC system. It was held during three full days where each user had his own computer to work on and play around with. The users were educated in the basic functionality of the COSMIC system.

4.2.3 FIELD STUDY IN ÖSTERBYBRUK BCU

Place: Primary Care Unit Österbybruk

Date: 2006-10-18

Participants: Abid Hussain, David Halbik, Johannes Krugel, Peter Malmqvist

The second largest field study of our group took place in a PCU in Österbybruk. We followed the work flow of the secretaries and in the laboratory with special focus on the use of referrals. Our contact there was Marlene Lundin.

The Österbybruk Primary Care Center has 18 employees and COSMIC was introduced 18 month ago.

SECRETARY

SENDING REFERRALS

Referrals from this PCU are mostly sent to UAS as letters. They also send referrals to the Elisabeth hospital, "Samariter hemmet" and the X-ray unit at Gimo Primary Care Centre.

RECEIVING REFERRALS

- Secretary receives a paper referral.
- Secretary documents the referral into COSMIC.
- Secretary gives the responsible/suitable doctor the paper referral.
- Doctor writes a paper referral answer and gives it to the nurse or directly to the secretary, the nurse gives it to the secretary in the first case.
- Secretary documents the referral answer into COSMIC. (double work)

- Get the patient.
- Put in consultation answer
- Fill in "judgement", status for referral changes to received.
- Scan the referral into KoVis with a cover sheet.

LABORATORY

They only receive referrals and do not send them. All referrals they get are requests for either a sugar, hemoglobin or urine test. The answer is the result of the respective test. They normally use COSMIC, but in some cases they use FlexLab, especially when they receive paper referrals. FlexLab is somehow integrated into COSMIC but is a separate application.

They got primarily internal referrals, but also some external e. g. from UAS.

RECEIVING REFERRALS

- Patient sometimes books a time for the lab in advance, status 'booked'
- Patient arrives and pays, status is set to 'arrived'
- Patient goes to the doctor
- Doctor enters referral for the lab into COSMIC
- Patient picks a number for the queue
- Lab nurse meanwhile prints out the "Provtagningsunderlag" and some labels e.g. for the blood samples
- Lab nurse calls patient to the lab
- Lab nurse takes blood samples
- Lab nurse sets status to 'tested'
- Patient can go home
- Lab nurse tests samples
- Lab nurse enters the results in COSMIC/FlexLab

Everyone of the above steps takes some minutes. The tests the PCU cannot take are transferred to UAS. Some nurses also go to take visit the patient at home and take the samples there. The work flow in this case is different.

4.2.4 INTERVIEW IN ÖRSUNDSBRO PCU

Place: Primary Care Unit Örsundsbro

Date: 2006-10-25

Participants: Bettina Selig, Josefin Zetterlund, Tilman Walther

We also visited a PCU in Öresundsbro and had an interview with a general practitioner. We wanted to get an overview about how COSMIC was introduced in the Primary Care Units. Details about this visit can be found in the Workplace Analysis Section.

4.2.5 FIELD STUDY COMMUNITY HEALTH NORTH (INDIANA, USA)

Place: Community Health North, Indianapolis Hospital, USA

Date: 2006-10-27

Participants: Curtis Barnard, Joshua Cottrill

We also had a field study in the Hospital of Indianapolis. Through this we have the chance to compare the Swedish use of technology in administration of medical care with the system in the USA.

The focus of this field study was to note the way hospital staff interact with computer systems in American hospitals. Several different units were visited, and several staff members were asked questions related to computer systems in their daily work.

NETWORK CONFIGURATION

The underlying network structure of the Community Health hospitals is very complicated. In total, there are four main hospitals, and hundreds of related physician offices. The main computer systems and their function are as follows:

- Sovera – This is the computer system that holds a patient's "official" medical record. There are many interfaces to this system.
- Centricity – This is the main interface to the Sovera system. Most of the hospital staff goes through Centricity when examining or modifying patient information.
- Softmed – Dictation and transcription software for creating patient reports.
- Logician – Scheduling, documentation, and billing software for physician offices. This system will not interface with Sovera.
- MUSE – Stores EKG information, and data from other kinds of patient readings.
- IDX Stentor PACS – Manages the Radiology images.
- STAR – Patient registration system. Gives a lifetime Medical Record Number, and a per-visit Accession Number.
- QS – Labor and delivery system. Used in the Neonatal ward.
- Premise – System for determining which beds are available for patients, and which beds need to be cleaned. Janitorial staff also interacts with this system through the phone system.

There are several other computer systems that are not listed. These are just some of the most important. Also, it is important to note that an entirely separate network is created as a test environment.

REGISTRATION

The woman we interviewed from Registration said that she felt very comfortable using the computer systems. She said that when she started her job, she had two weeks where she shadowed someone on the job just to learn how registration works. They spent the next two weeks training, eight hours each day. The course was a mix of lecture and hands on experience. At the end of the training session, they were given a one hundred question test that they had to pass before being considered qualified to complete their training.

At registration, it is their job to get new patients signed into the system, and to find beds for them while they stay. They find open beds with a system called Premise. This system seems to be a very valuable (and very new) piece of software that greatly increases efficiency with the bed turnover rate. There were problems sometimes when other nurses do not know how to use the Premise system, and there is incorrect information about the status of beds. Registration believes that this is due to insufficient training for the nurses on the Premise system.

She also stated that any time she had a problem with the computers, she always was comfortable calling the help desk, which is available 24/7. It was a common theme that the help desk is a great asset to the hospital staff, and that they could almost always answer any question that they might have.

NEONATAL

The Neonatal ward uses the QS system for monitoring the status of the infants in the unit. It is a relatively new system, so they had recent training. Before the system was implemented, all staff had to go through a four hour training session, and also had extra time to explore the system on their own with dummy patients. They felt the training they received was sufficient, but the continued support of the IT team was also appreciated. After QS was deployed, IT staff remained on call 24/7 for the next week to answer any questions the nurses may have. They offered to extend the period of additional IT support for another week, but they decided it was unnecessary. After that time, all questions could be directed towards the help desk. The nurses in the ward also mentioned that it was helpful that many of the IT staff had clinical background, so they were better suited to help them with their problems.

They also described a special position called "Superuser" which exists in all wards for each computer system. A few employees in each department receive additional training on the computer systems, in an effort to assist other employees in their department who have problems with the systems. The goal is to have at least one Superuser available during every shift, so the staff are trained accordingly. These Superusers attend monthly meetings with the IT staff to discuss possible new enhancements to the software used in their department. One problem with the current method of implementing Superusers is that there is no incentive for someone to become one, other than that it is expected of some people, mainly managers.

One thing that was considered to be very valuable in this department was the use of digitized lists to guide the nurses step by step as to the procedures for various tasks. The lists contained links to forms inside the computer systems that most commonly needed to be filled out during a patient's visit. These lists could be changed through the standard enhancement method.

Some of the nurses complained that in some of the systems they used, you would often have to scroll through pages of options before finding the one you were searching for. They also said that when examining past medical records, it was often difficult to find the exact data you were searching for. They claimed that when records were paper, it was easy to just lay out the entire record and look at it all at once, but when you search a digital record, you have to search through each page one at a time. They also noted some dissatisfaction with some biometric authentication systems and voice recognition programs that were used. These sometimes caused delays when actions needed to be preformed quickly.

They also mentioned their "COW"s (Computers On Wheels). These are laptops on carts that could be moved around the unit. They stated that these were very valuable tools, and often used in their unit, however nurses generally prefer to work at an actual workstation. In the future, every room will have a computer inside, or right outside.

Finally, in case of a system failure, each unit is required to keep a "code white" box which contains all the paper forms needed to continue operation, and instructions on how to fill them out.

GENERAL CARE UNIT

Computers compose a large portion of the workflow in this unit. All patient information is in the computers, with the exception of medication information and physician notes. This includes patient assessment, planned care, vitals, and lab results. The nurses generally think that the computer systems make their work faster, although they say that they make fewer notes about the patients because they cannot simply write on a patient chart while walking to their stations. Communication between nurses is improved because there is less

confusion due to handwriting and work can progress faster. Physician handwriting still causes problems in communicating with the nurses.

The nurses in this unit thought that they received good training on the original systems, and appreciated the help desk and their around the clock support. Much of the training here, though, occurred on the job by asking coworkers questions. Some nurses disliked that orientation was longer because of the computer systems, but they were not required to take any kind of test before using the computers.

IT SITE DIRECTOR

When IT implements a new computer system, they attempt to hold the training systems off as long as possible, so the last training session happens immediately before the go-live of the new software. This is to make sure that the training is fresh in the employees' minds when they make the change.

The referral system between physician offices and the hospital is still completely done on paper, often by fax. However, scheduling exams within the hospital can be done electronically, however you must know which doctor can perform the exam you need.

One major issue with the computer systems at Community Health is the vendor response time. Often issues are brought to the vendor, and are not corrected for extended period of time. The most beneficial aspect of the software is its ability to be configured by the local IT department.

4.2.6 MEETING WITH BRITT EHRS

Place: Uppsala Akademiska Sjukhuset, IT department

Date: 2006-11-23

Participants: David Halbik, Johannes Krugel, Josefin Zetterlund, Magnus Myren, Peter Malmqvist

Britt Ehrs is the head of the COSMIC project in the County Council. She is responsible for the modules, that are under construction, not stable or under implementation. The referral system (RoS) is one module in the project.

In this meeting we were able to answer many of our questions, especially concerning referrals and how they are used.

LAB AND RADIOLOGY REFERRALS

An answer for a lab test or a radiology test is a real file, which is sent from the receiver to the unit that should receive the answer.

The comment boxes in the lab referral are used for informing the receiver with important information about the patient. This could be information that the patient is afraid of needles.

CONSULTATION REFERRALS

When a consultations referral is sent, no data is really sent between the sender and the receiver. A referral is added to the database and a message is sent to the receiver.

There are three kinds of consultation referrals:

- Primary Care unit sends a patient to a specialist - care take over
- A patient at the hospital is sent to another unit at the hospital - care take over
- Consultation, a specialist comes to the patient – no care take over

Consultation referrals do not use preliminary answers.

BOOKING

The project will in the long run implement the functionality to schedule patients in other unit's time books. Right now many units would like to schedule times in other units, but no units is willing to let others to book in their own time book. Britt thinks that this is an attitude that can be changed with education and younger personnel are more willing to accept this, but it will take quite long time.

4.2.7 MEETING WITH EWA LUNDGREN

Place: Uppsala Akademiska Sjukhuset, Surgery department

Date: 2006-11-24

Participants: David Halbik, Peter Malmqvist

Ewa Lundgren is the head of the surgery department. We interviewed her with special focus on how this department receives referrals.

The department has between 30 to 40 incoming referrals each day.

The referral system (RoS) in COSMIC is not used at the surgery because they do not think that the system if totally reliable and because consultation referrals in RoS are not fully developed and implemented.

One person is responsible for checking for incoming referrals each day. The inbox is checked almost every day. Ewa personally checks the inbox for the surgery department, because she wants to get an overview of how many referrals of each syndrome comes in. This is something that the secretary could do instead.

When a treatment is fulfilled a patient is sent home and an epicrisis is sent to the patient's primary care unit. If further care is requested this is included within the epikrisis.

4.3 COSMIC ROS

DISADVANTAGES

- Overview
  The overview of RoS that is implemented in the COSMIC system still needs some definite improvements. The description of how to sort is a bit vague, there are things that can be done that a non computer-skilled user never will figure out. A fast sort of the list, like to sort by name, is done with a click at the name of the column.

- Consultation
  This part has been complicated to get accepted among the staff of the County Council, therefore it has

yet to be implemented. February is the preliminary month for the implementation in UAS. This was looked at simply to get a better idea of the big picture.

- Reliability
  The reliability of the system is good in that nothing is deleted from the servers. Many users are weary of relying on the system due to the lack of feedback. When something is sent, there is nothing that says it has arrived, and this makes users wonder if it actually got to the receiver or not. Also, items sent with errors do not send feedback, they just do not send properly. Users of the system see this as just losing a document in cyberspace and are much less likely to find this type of system reliable.

<div align="center">ADVANTAGES</div>

- Sending
  Sending of referrals works well, disregarding the trust issues mentioned in 3.1.3. This is a good example in which each piece is brought to the right place for the user to easily understand how to work through making a referral. The users have expressed dissatisfaction with the search function and are also unhappy with the wait time between letters.

- Status
  Instead of having four types of subcategories where the status number means different things in each of these categories and are not in sequence, the team recommends standardization of the status numbers in a single sequenced table for all different status types, and let the four colors have their significance.

4.4 REQUIREMENTS

The team developed prototype requirements based on the field studies performed and on personal experience regarding software systems. The goal of these requirements is to provide a high-level set of guidelines that the prototype will follow while providing flexibility for the development team. These requirements were created as a guide to describe what the prototype must contain, but not to force any particular implementation. This section will only review the primary aspects of the requirements document, full text of the requirements is available in the Appendix B.

4.4.1 FOCUS AREAS

The requirements from the team focus on areas that are critical to the creation of a workable referral system. These areas include:

Required Information - information that is required for the referral to be of benefit to all parties. This includes, but it not limited to: patient information, doctor information, case history, reason for referral, and patient history.

Work flow with States - a description of the states a referral goes through during its lifetime. The explanation of these states is required such that the prototype will be suited to all conditions and states in the referral path.

Operational Scenarios - a description of additional scenarios that could be encountered during a referral. These scenarios are not a part of all referrals, but are still important to account for if the system is to be successful for use in all hospital areas.

4.4.2 ROOM FOR IMPROVEMENT

The requirements list is primarily based on the use cases observed during field studies, but also from the team's experience using COSMIC and input from professionals. In retrospect more detailed requirements with information about priority, source and basic design decisions would have improved the usability and decreased the development time of the final prototype.

One of the major hurdles encountered during the authoring of the requirements list was that of communicating between the development team and the requirements team, in large part due to being separated physically by an ocean. This made it unclear where certain responsibilities lie, such as graphical design and content layout, which thereby fell between the two teams.

The other major problem that has somewhat hindered the development has been the lack of a clear goal for the prototype project. Many of the field studies and much of the time in the beginning of the project were spent understanding the general structure of the system in place, referrals and the health care in general, something which could have been avoided if more effort was put into defining the problem at hand during the beginning of the project.

4.5 PROTOTYPE

As seen in Section 3, the COSMIC Referral System (RoS) is cumbersome to use and is a source of difficulty for many users. Aside from the difficulty required to open the current referral engine (in some cases, as many as 38 clicks to reach the main page of the RoS engine), navigation within the system and the data entry has proven to be difficult. With these scenarios in mind, the Prototype team set out to simplify this complex problem. These are the initial reactions to the screen captures by classmates when showed Cambio's first attempt at the integrated RoS.

4.5.1 CONTENT DECISIONS

There should be three major types of referrals:
- General referral / Consultation
- Radiology examination/referral
- MRT/MRS

General referral / Consultation
- Patient History
- Procedure to be performed

- Appointment Date/Time

Radiology

- Patient history
- Body Part to be Examined
- Appointment Date/Time

MRT/MRS

- Test to be performed
- Blood contagions of the patient

4.5.2 CONTENT DECISIONS - SENDER

A referral shall contain the following information about the sender:

- Unit
- Ward
- Name of the responsible doctor (the doctor currently logged in is the default)
- Profession

A referral shall contain the following information about the doctor to send the answer to:

- Unit
- Ward
- Name of the responsible doctor
- Profession

A referral shall contain the following information about the receiver:

- Unit
- Ward

A referral shall contain the following information about the patient:

- Name
- SSN

A referral shall contain the following information about the paying unit, selectable from a list of units where the physician is employed:

- Unit
- County
- Address

A referral shall contain an option of whether it's an emergency.

A referral shall contain an option of whether a preliminary response is desired.

A referral shall contain the patient's case history.

A referral shall contain the type of analysis that should be performed by the receiving ward.

4.5.3 CONTENT DECISIONS - RECEIVER

The receiver shall be able to see the date and time the referral was sent.

A referral shall contain the following information about the doctor to send the answer to and include their:

- Name
- Profession
- Unit
- Ward

A referral shall contain information about the patient

- Name
- SSN

There should be a link to the patient's journal.

- A referral shall indicate whether it is an emergency.
- A referral shall indicate whether a preliminary response is desired.
- A referral should contain a mandatory choice of accept or refuse or hold decision. If the decision is put on hold the status of the referral should not be changed.

4.5.4 DESIGN DECISIONS

The design decisions are made from the scanned referrals which look similar to the COSMIC Referral System.

The team noticed that the scanned referrals were somewhat hard to understand, so a few changes were made.

- There were many input fields which could be replaced with a dropdown menu instead.
- The user should be able to fill in the forms without problems and it should be easy to navigate.
- The referrals should be easy to follow step by step and easy to navigate between steps.

The overall graphical user interface is also important; the user should have a good overview of the system. For instance the user should be able to switch easily between different referral forms.

4.6 SUGGESTIONS

The biggest problem is that not all units within the County Council's border are connected to the referral system. The referral system would be better if all PCUs and hospital wards used it. Some units still send paper referrals, one primary reason is that they are not sure which units use RoS, and it is easier to use paper than to look that up.

Besides the actual referral system some other small issues were discovered:

- It would be good to have the ability to create to your own shortcuts on the "Desktop" of COSMIC to access frequent screens.
- It should be possible to change the text size.
- All buttons and menu items that cannot be used should be inactivated.
- Sometimes it is not easy to use the overview because many information screens open in a separate window. In addition you cannot switch between the different opened windows.

- When a doctor, nurse or secretary opens a patient's file, the work space is empty. To get the patient journal, two extra clicks are necessary. It would be better if the journal would directly open when the patient is chosen.
- It is not possible to see who wrote a note in a patient's journal, only who signed the note. It would be good to see which secretary wrote the note.
- Some doctors did not sign their notes or often forgot to sign. One doctor had hundreds of unsigned notes. He asked for a way to sign them all at once, but this is currently impossible.
- Currently it is easy to change a patient's birth date. This type of functionality should be better restricted.
- The "medicine-trolley" in some units would be used more often if a personal electronic login card existed so the login is faster.

5 CONCLUSIONS

During this project, the team have encountered some difficulties, but nothing too major. From the start no-one was familiar with the technical language, and that held the team back for the first few weeks, but after that they were able to get a deeper understanding of the situation and how to approach upcoming difficulties.

It took a while to get a good feeling for what the client wanted and how to do it. The best thing to do was to get out and look how the staff was using RoS, both in COSMIC and in paper form. This led to a deeper understanding of what difficulties the team was up against. Since there is no exact explanation of what a referral is, the team tried to get as much information as possible about what the staff looked upon as a referral and what they saw as a consultation.

There were also difficulties in sorting the information retrieved and who to talk to next. Gathering information is not a difficult thing but gathering the right information, and accurate information at that, was the hard part. In order to decide what was the right information, the team had too keep a constant dialogue with each other of how things were said and who was saying it, so we did not mix up facts and personal thoughts about RoS in COSMIC.

There were many documents about COSMIC provided to the team before the project actually started that they feel may have biased them against COSMIC before they even started working with it. The team thinks it may have been better to have gone into the project without this information rather than with bias.

5.1 EDUCATION

If we look at the COSMIC layout we can see flaws in different areas such as the structure on data-sheets positions and the coloring of the layouts. This part is really difficult to make improvements in without the interaction feedback from the users of COSMIC. Different users from different areas in health care will most likely have different ideas on improvements. These problems can be addressed with the help of constant feedback from the users of COSMIC.

Here are the most important suggestions concerning the crash course:

- Introducing an end-evaluation paper so that the users could give positive and negative feedback to the teacher/teachers. So they can optimize their tutoring and focus on different parts that are harder for the users as the end-evaluation papers have shown.
- The teacher could have taken notes of the most common problems the users had on their first interaction with COSMIC. Based on these notes the teachers can be more focused in different parts. This will lead to a more effective learning process.
- A "stand alone" online COSMIC dummy for practicing at home. As every new user to a computer system can find it difficult to comprehend all the new information in just 3 days. Making it available for at home studies will greatly improve the quality of learning over the entire employee sector.

5.2 COMMUNICATION & FEEDBACK HANDLING

During our visits and field studies the need for directed information was pretty obvious. An improvement on the communications structure is needed since many facts seem to get lost. In fact, the end users did not seem to be well informed even about current changes which affected them directly. A part of the user base did not even seem to know that their part of the system is undergoing improvement. Some users stated that even if they are not interested to know exactly what is going on, they are interested to know that something is going on. Despite a general lack on communication towards the user, one possible reason is that information gets stuck because the information holder does not know what to do with it.

Of course users are not capable of handling an unlimited amount of information about the project. The selection of information content, amount and path is indeed a sensitive procedure that has to be managed constantly.

5.3 PROTOTYPE

The biggest problem is that not all units within the County Council's border are connected to the referral system. Besides the actual referral system some other small issues were discovered, some of them are:

- It would be good to have the ability to create to your own shortcuts on the "Desktop" of Cosmic to access frequent screens.
- All buttons and menu items that cannot be used should be inactivated.
- Sometimes it is not easy to use the overview because many information screens open in a separate window. In addition you cannot switch between the different opened windows.
- When a doctor, nurse or secretary opens a patient's file, the work space is empty. To get the patient journal, two extra clicks are necessary. It would be better if the journal would directly open when the patient is chosen.
- Some doctors did not sign their notes or often forgot to sign. One doctor had hundreds of unsigned notes. He asked for a way to sign them all at once, but this is currently impossible.

6 LIST OF REFERENCES

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7 ACKNOWLEDGEMENTS

- Brita Winsa — Responsible for the EPJ in UPPSALA COUNTY COUNCIL
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- Kim Jansson — Orthopedic unit at UAS
- Marlene Lundin — Österbybruk Primary Care unit
- Ewa Lundgren — Chief of Surgery at UAS

APPENDIX A: SURVEY DATA – COSMIC ANVÄNDARUNDERSÖKNING

VID VILKEN FÖRVALTNING ARBETAR DU?

Akademiska sjukhuset	60 (77%)
Primärvården	18 (23%)
Skipped	2 (-1%)

MARKERA DEN YRKESKATEGORI DU TILLHÖR.

Administrativ personal	7 (9%)
Arbetsterapeut	0 (0%)
Barnmorska	2 (3%)
Biomedicinsk analytiker	0 (0%)
Kurator	1 (1%)
Läkare	16 (20%)
Läkarsekreterare	11 (14%)
Sjukgymnast	4 (5%)
Sjuksköterska	25 (31%)
Skötare	3 (4%)
Psykolog	0 (0%)
Undersköterska	4 (5%)
Övrig personal	7 (9%)

HUR UPPFATTAR DU DIN ERFARENHET AV DATORER?

Fyll i den siffra som passar bäst. 1 = liten erfarenhet, 10 = stor erfarenhet

1	2 (3%)
2	0 (0%)
3	3 (4%)
4	4 (5%)
5	9 (12%)
6	6 (8%)
7	12 (16%)

8	12 (16%)
9	13 (17%)
10	15 (20%)
Not finished	4 (-1%)

HUR LÄNGE HAR DU ANVÄNT COSMIC?

>12 månader	50 (66%)
6-12 månader	8 (11%)
3-6 månader	2 (3%)
1-3 månader	3 (4%)
0-1 månad	13 (17%)
Not finished	4 (-1%)

HAR DU ANVÄNT NÅGOT ANNAT JOURNALSYSTEM TIDIGARE?

Ja	30 (40%)
Nej	45 (60%)
Skipped	1 (-1%)
Not finished	4 (-1%)

HAR DU ANVÄNT NÅGOT ANNAT JOURNALSYSTEM TIDIGARE?

Om "Ja", vilket/vilka?

- Profdoc, VAS
- Profdoc
- Pappersjournal (den gamla hederliga)
- Pappersjournaler
- Profdoc 1
- Profdoc Kataraktjournal OMNIS
- ProfDoc Journal III
- Asynja, MIA, Team..?(kommer ej ihåg om det var TEAM FHV?)
- ProfDoc journalIII
- pro doc
- Kliniken, Profdoc, BMS, Conrad
- Melior
- Melior, vanja, profdoc
- Cambio Qdagis Qvagis, Boka(Previa)
- Imx
- profdoc marginellt
- Profdoc, Medex, Profdoc vision, Q-adis.
- proffdoc
- Profdoc(journal III), melior, sympathy, Medos
- profdoc journal 3
- Cambio, minns ej det andra namnet

- ProfDoc + minst tre övriga, minns inte namnen. (Stockholms län)
- No comment (51)

VAD TYCKTE DU OM DETTA/DESSA SYSTEM I FÖRHÅLLANDE TILL COSMIC?

- Cosmic är bättre
- Jag tycker bra om Cosmic. Cosmic har fördelar som inte profdoc hade öppen--slutenvård. Vissa bra saker som meddelandefunktion saknas i Cosmic...
- Enklare , lättare och mindre tidskrävande.
- Mycket bättre med Cosmic.
- Mycket lättare
- Cosmic mer lätthanterligt, mer logisk miljö.
- ProfDoc är bra och lätt att använda, men Cosmic vinner i längden.
- Cosmic är bättre än dessa system , kanske lite svårare att hitta i men det har absolut flera bra funktioner.
- Mycket snabbare, enklare, mer lättillgängligt. Definitivt mycket mer överskådligt. Kunde lätt svara på frågor som gällde både personal och patienter och ge snabba svar. I Cosmic går det lång tid åt att leta fram uppgifter. Extremt mycket onödiga "knapp-klickanden" jmf med JournalIII. Har bl a varit tvungen att införskaffa en roller mouse för att kunna jobba något sånär smidigt. Finns för få kortkommandon i Cosmic, det finns en del men som jag upplever det inte på "rätt" ställen, d v s kortkommandon till vyer et c som jag anv ofta. Cosmic känns "fragmenterat", ex v så finns det flera olika ställen att skriva remisser ifrån beroende på vilken sorts remiss det är eller vilken i ordningen (du kan inte skriva fler remisser av samma typ i ett o samma diktat, det klarar inte programmet av utan man får då välja en "blankettvariant" vilket gör att två remisser av samma typ ex v extern remiss till olika adressater hamnar på olika ställen och får olika bevakningsmöjligheter fastän de är jämställda prioritetsmässigt). Patientsäkerheten känns emellanåt bedrövlig, har fått upp "fel pat" till "fel diktat" några gånger. Alltsom oftast väljer programmet en annan vårdgivare än den av mig valda (oftast fått välja/klicka i aktivt ett par gånger innan jag kommit vidare). Har bevittnat hur en läkare suttit med en pats journal och en annan pats labresultat i en o samma skärmbild!!! Visserligen var vår gamla system JournalIII pressat till maxgräns och var ålderstiget men ändå fungerade det trots allt bättre än det nya Cosmic, vilket känns som ett "hopkok av en massa program". Jag skulle kunna bedöma Cosmic som "okej att anv men ingen höjdare" om alla barnsjukdomar kunde bli åtgärdade någon gång!
- Bättre
- Profdoc snabbare och mindre antal fel. Osmidigare med tanke på att sjukhusjournaler och andra vårdcentralers journal ej kunde läsas.
- Kliniken klart användarvänligast! Gjord av två läkare (företaget hetet Go4It) i samråd med vårdpersonal.
- Ofantligt mycket lättare
- Enklare men ej sa fullstandigt
- Cosmic är det mest "kompletta", men profdoc är det mest lättanvända och logiska. Vanja och melior är ju rena skämtet båda.
- Ungefär likvärdigt. Lite enklare.
- inget spec
- Svårt att säga, har jobbat för lite i Cosmic.
- Mycket enklare, mindre tryckningar.
- snabbare, mer lättarbetat och tydligt
- Profdoc var mer lättarbetat och utgick mer från verksamheten. Cosmic innebär fler "onödiga" klickningar. Om någon gör ett misstag är det besvärligt att rätta till. Sökfunktionen i Cosmic tungarbetad (tex planerad vårdåtgärd) Besökslistan ej praktisk för daglig verksamhet. Det är en nackdel att remisserna kommer separat, ytterligare en plats att kolla av (ovidimerat, osignerat, inkommande vårdbegäran (redan tidigare prator, lotus notes, Det blir väldigt många olika ställen att komma ihåg att

kolla.)) Sympathy och Medos var avsedda för enskilda kliniker, inte jämförbart. Melior var ännu sämre än COSMIC.

- Enklare,snabbare
- mycket bra   och enkelt
- bra
- COSMIC är sämre, ingen bra överblick. Mkt klickande. För lite info i t ex läkarnas journaltext, t ex sända remisser och recept.
- Enklare, mindre utbyggda.
- No comment (53)

VAD TYCKER DU FUNGERAR BRA MED COSMIC?

- Journalen är alltid tillgänglig
- Jag tycker det mesta fungerar bra av det som jag jobbar med i COSMIC. Det finns ju alltid saker som man kan förbättra, särskilt i skrivfunktionen, så att den mer liknar words funktioner.
- Ingenting fungerar bättre än profdoc, dvs en del saker fungerar, men är ingen fördel för en primärvårdsläkare.
- Att man kan komma åt patientkournalen oavsett var på sjukhuset man befinner sig. Att kunna kopiera journalanteckningar som är samma mellan olika besök.
- Informationen man kan hitta om patienten. Behandlingar på olika enheter   Vilket ger en bättre och snabbare bedömning av patienten.
- Journalen alltid (för det mesta) tillgänglig, slippa leta
- Användarvänligt. Vid vår operationsavdelning har vi inte några större problem
- Att du alltid har jornal på plats.
- Man ser alla vårdinsatser.
- Lättare att hitta journaler. Lättare hitta svåra ord i redan skriven journal.
- Vet inte
- bra att kunna hitta pats journal direkt.Att jag kan skriva in mina insatser för pat i anslutning till patkontakten
- Länkningen mellan IMX är utmärkt, man får upp vårdkontakten i COSMIC med rätt dr och datum.
- Tillgänglighet
- Tillgång till alla journaker från sjukhuset.
- Det mesta
- vid provtagning etiketter id märkning tiil rör lkara
- Det bästa är att kunna se andra vårdgivares anteckningar, allt kommer in direkt i programmet vad gäller rtg-lab-microbiologi-svar mm.Sökfunkionen angående patienters bokade tider.
- Nä, jag orkar inte! Jag satt och skrev ner en oerhörd massa åsikter som raderades när ngt fel uppstod. Ring gärna istället 018-611 89 08, Ulrika.
- lätt att komma åt information, direkt feedback på det man skriver
- Vet inte vad de ska vara långa svarstider.
- Lätt att få fram uppgifter, lättläsligt, medicinlista då den är rätt ifylld.
- Att öppna full behörighet. Receptmodulen.
- Praktiskt att kunna "nå" journalen utan att behöva söka den. Ser allas anteckningar snabbt. Kvalitetssäkring för patienten.
- Tillgång till hela journalen, dåligt handskrivna dokument,
- tILLGÄNGLIghet
- Tillgängligheten

- Journalen, i sin helhet, finns alltid tillgänglig. Enkel att arbeta med. Sökorden är valda för att passa just vår enhet. E-recepten är toppen!
- Har för kort erfarenhet av Cosmic, fem veckor, för att kunna ge ett bra svar.
- Smidigt att plocka fram journaler, samt diktera och lyssna av redan dikterade besök som inte är utskrivna
- Har inget att jämföra med, alltså är det svårt att besvara frågan. I Jämförelse med pappersjournal, så är ju detta fantastiskt bra.
- Att jag kan lyssna av indikterade notat, som ej är utskrivna
- Filtreringsfunktionen
- Fungerar bra på avdelningsnivå. Extra bra att vi har möjlighet(i viss mån)välja egna fasta val på respektive avdelning för omvårdnaddokumentation då verksamheten/patientklientelet är så olika.
- Får info snabbt vid nyinläggningar.
- Att jag kan läsa andra klinikers journal. Att många funktioner är samlade i samma program. (provsvar, remisser, röntgensvar m..)
- Bra med tillgängligheten. Skulle ej vilja återgå till pappersjournal. Smidigt att ha allt på samma plats.
- Jag tycker att det fungerar bra att skriva i journalen och doktorerna dikterar snabbare nu än tidigare, vilket gör att diagnossättningen i Imx blir klar.Snabbare utskrifter (hög), behöver inte leta på band. Skönt att slippa journalerna.
- toppen att kunna ta fram journal när pat ringer och undrar något Sparar tid
- Det går att få fram många uppgifter, bl a från andra vårdgivare.
- Kassan är enkel.
- Just nu ingenting!
- Bra att alla har tillgång till journalen, inget letande.
- svårt att se fördelar på så kort tid
- Det är smidigt att kunna läsa andra klinikers journaler och provsvar och recept. (Däremot hinner varken undertecknad eller sjukhusläkarna uppdatera medicinlistan på alla pat som varit på besök.) Mycket snabbare svar med röntgen via datorn.
- de mesta
- Recept
- inget
- ?
- Tidboken
- lättillgängligt
- Att skriva. Mallarna.
- Tillgängligheten,att kunna se vad som hänt patienten tidigare, snabbt (om diktatet är utskrivet)
- Tydligare att läsa. Överskådligare än pappersjournal.
- Bra att kunna läsa jnl från sjukhuset. Fler alternativ, kan utvecklas mkt. Roligt.
- läkemedelsmodulen
- No comment (24)

VAD SKULLE DU VILJA FÖRÄNDRA I COSMIC?

- Rtg kopplat till journalen, dvs kunna nås via ikon i journalen. (En inloggning för alla journal/rtg-funktioner.) Mer Windows-baserad layout.
- Det finns mycket man skulle vilja förbättra. T ex att kunna infoga en diagnos efter att man skrivit in diagnoserna, när man skriver i en epikris. Det går inte idag utan då hamnar diagnosen sist eller så får man ta bort alla diagnoser från platsen där man ska infoga.   Datumfunktionen i mallarna. På inneliggande får man t ex alltid inskrivningsdatum, vilket ofta blir fel då man glömmer ändra till rätt datum. Etc, etc.
- Se till att det går att hanter Waranlista, läkemedelsan´visning, hjälpmedelskort. förbättra sjukskrivningsmodulen och receptmodulen. Harmonisera journalens sökord med verkligheten.
- Hanteringen av forskningsjornaler. Åtkomst av bilder från olika bildgenererande utrustningar. Förbättringar av upplägget i Kovis
- Saknar meddelande funktion. Ett samlat dokument där all viktig info om patienten står som   anhöriga. vilka sjukdommar patienten har. vaccinationskort. + annan viktig info. så man slipper läsa igenom stor mängd text.
- bättre mallar för blanketter, t ex brev och intyg inte enligt UAS skrivregler
- Vet ej
- Skapa ett datoriserat datasystem som mer påminner om den gamla journalen. Att använda sig mer av virituella system så som dataspel är uppbyggda.
- Rättstavningsprogram fattas. Kan ej diktera gruppanteckning. Smidigare att lägga till sökord i mallarna och att dom stannar kvar samt att ändra i mallarna nu när man har uptäckt brister.
- Tillväxtkurva f
- Diktatlistan. Att alla mallar passar. Ett ordbehandlingsprogram. Att blanketterna blir mer anpassade att användas, det går ibland inte att få med allt som dikteras och att när man skriver för länge så blir man utkastad och får börja om igen.
- "ta med" sig pat till IMX. Går nog inte att radda upp här
- Det ska vara wordbaserat!
- Det skulle finnas en rubrik för sjukgy,en för kurator, en för psykolog , dietist osv Alltså inte bara läkarens anteckningar.Nu "försvinner"   våra anteckn eftersom det skrivs så mycket.
- Jag skulle vilja kunna svara på en bevakning som man gör i Notes. Utrymmet att skriva i blanketter är för litet, ofta så dikterar dr mer text än vad det finns plats för. Automatiskt stor bokstav efter punkt skulle vara toppen (som det ju är i Word).
- Kortare väntetid för lägga till sökord vid journalskrivning En funktion att för kunna besvara på bevakning som skickats eller mottagits
- Det borde vara möjligt att göra ändringar i hela notatet vid ett tillfälle och inte bara i varje sökord för sig. En översikt med alla diagnoser vore också bra. Detta finns i ProfDoc.
- Färre musklick, logiskare :) Tab-ordningsföljder. Men jag vet att de jobbar på det!
- Att man kan ha en patient som man bokar medans "fönstret " visar en annan patient. Tidboken känns lite plottrig.En viss oro finns över att patientjournalen kan läsas av så många.
- Se svar ovan! Har hur mkt som helst, kanske det var därför det inte gick att fortsätta, överbelastning? Mkt gäller ren o skär patientsäkerhet, ologisk uppbyggnad-dåligt arbetsredskap, layouten trist o gammalmodig. COSMIC är uppenbart inget program som är framtaget för att driva primärvård.
- för mig mer passande sökord, inte så begränsat, mer fritt
- Ett stabilare system
- enklare sammankoppling mellan IMX och COSMIC Längre inloggningstid
- Provbeställningen är för knepig, svårt att hitta provet som önskas. Möjligheten att själv lägga in snabbkommandon för att journalskrivningen ska gå snabbare.

- Tillväxtkurvor!!!!!!!!!! Hur svårt kan det vara???? På barnsjukhuset är det ett av våra viktigaste arbetsverktyg.   Vända datumordningen när man läser anteckningar.   Vid filtrering av tex dietistanteckningar, så kommer det 50 i taget. Om ingen dietistant. ej finns, tar det väldigt lång tid att stega vidare.   Sammankoppla IMX med Cosmic - går det? Nu måsta man starta upp IMX m och återigen knappa in personnumret. Opraktiskt!
- Kunna använda som man kan med ett Wordprogramm,som tex. svenskan, kopiera texter m.m.
- Mycket
- Ha länkar t.ex. rtgus och lab, ssom små ikoner (jfr Internet)som ligger i den anteckningen då us beställts. medeicindeln behöver ses över fr.a. intravenösa delen. Integrera IMX, Web 1000 och labsvaren
- Svårt att få en löpande bra text när man inte själv kan bestämma i vilken ordning sökorden skall skrivas. Går inte att använda recepten "särskilda läkemedel" som e-recept. Texten hamnar fel, apoteket klagar. Vill ,som ssk i övm, läsmöjlighet av apodoslistor. Önskar att det fanns en liten lampa som tändes när patienten löst ut sina e-recept........
- Se ovan, men redan nu skulle jag vilja ha i flera förvalda knappar, det är för många tryck och så är makuleringsförfarandet för krångligt om man råkar trycka fel, ingen bra ångra funktion i kassan t ex.
- ???
- Har arbetat med det i 4 dagar och upplever att jag vill förändra det mesta.Mycket omständligt och svåröverskådligt
- bättre översikt
- Väl mycket musklickande ibland.
- Journalstrukturen är en översättning av pappersjournal till datorform som är otymplig och omodern. Flerskärmsstöd eller större skärmar är också ett mpste, det ryms alldeles för lite information på en 15 tums skärm vilket leder till att man i värsta fall skriver ut papperskopior för att sedan kunna sitta och arbeta effektivt.   Läkemedelsmodulen måste kunna hantera vid behovs infusionordinationer bättre Cosmic är segt! Antingen behövs snabbare datorer eller bättre kodat Cosmic. Införa dubbelklick funktion vore bra. Nu när man dubbelklickar på vissa saker gör inte programmet vad man tycker den borde göra. T.ex. dubbelklick på ny blanket leder till information om blanketten, det logiska vore ju att den öppnas så man kan skriva den.
- Utvecklingen av systemet som jag upplever står still och förbättringar som ej åtgärdas.
- Jag saknar stavningskontrollen, och Words funktioner tex, fetstil mm. Breven är väldigt fula, borde se ut som de i (Vard) som är utformade av informationsavdelningen.
- ta med mig patienen mellan IMX och Cosmic
- Fler direkta länkar
- RP-blankett där man kan skriva "fri text". Meddelandefunktion skulle vara bra.
- Enklare, mindre knapptryckningar.
- Jag vill ändra vad som syns i "20 senaste ant". Jag vill att det skall synas status och vissa IVP (från sjuksköterskor)i 20 senaste ant eller en samlad bild med sjuksköterskans samlade anteckningar från samma dag: kontaktorsak, status och ev IVP. Som det nu är syns någon IVP, något resultat men det hänger inte ihop på något sätt. Framförallt tycker doktorerna att det är oläsligt och inte inbjuder till att fortsätta att läsa sköterskeanteckningarna. Jag skulle vilja ha en bättre overblick över det som finns som förval i varje IVP. När jag har valt IVP borde det i vänster fält på skärmen synas förval så att jag lättare får en överblick i vad jag kan välja.
- tydligare skrivbordmiljö, nu plottrig med alla små rutor och val
- Om vi ska utgå ifrån besökslistan, så måste den göras överskådligare. (bara visa våra besökande patienter och inte administrativa ärenden som reg på oss etc.) smidigare sökfunktion, dels planerade vårdåtgärder. dels adressregister för remisser. dels var finna viss kliniks journal. Helst sökbart på klinikens namn. (hänvisning var hitta etc.)

- fler snabbvals knappar,lättare att lägga till sökord som saknas vid dokumentation, samt ångra avsluta om man råkar avsluta fel patient samt om patienten återkommer inom samma dygn
- Så mycket att det inte räcker med ett par minuter att skriva ned det.
- bytas ut
- LAB
- Se tidigare fråga. Jag vill kunna se allt som gjorts vid ett läkarbesök; intyg, recept, remisser, provsvar som är knutna dit.
- Få in läng-viktkurvor. Att kunna söka på min personalkategori utan att behöva söka fram nästa 50 flertalet gånger (tar lång tid om det är över 1000 anteckningar). Att vara smidigare att gå mellan Cosmic och IMx.
- Överskådligheten i vår Hyposensibiliseringsmall Att även vi sjuksköterskor ska kunna komma åt dikterade men ej utskrivna journaler
- Snabbare sätt att kunna skriva vidare åtgärd och resultat i rapportbladet och även snabbare i vårdplanen att kunna signera.
- Tidboken, ger dålig överblick eftersom man inte ser hela dagen. GÅr att ställa om men så fort man går ur tidbok återgår grundinställningen. Saknar meddelandefunktionen samt att kunna skriva RP-blankett med kort information som inte går in i jnl.
- bättre funktion av Kovis
- mera användarvänlig betydligt färre klick
- No comment (25)

HUR MÅNGA TIMMAR OM DAGEN ANVÄNDER DU COSMIC?

1-2 timmar	29 (40%)
2-4 timmar	11 (15%)
>4 timmar	33 (45%)
Not finished	6 (-1%)
Skipped	1 (-1%)

KÄNNER DU TILL COSMICS SUPPORTSYSTEM?

Ja	46 (64%)
Nej	26 (36%)
Not finished	6 (-1%)
Skipped	2 (-1%)

OM "JA", ANVÄNDER DU DET?

Ja	23 (44%)
Nej	29 (56%)
Not finished	6 (-1%)
Skipped	22 (-1%)

HAR DU FÅTT NÅGON FORMELL UTBILDNING I COSMIC?

Ja	65 (90%)
Nej	7 (10%)
Not finished	8 (-1%)

OM "JA", HAR DU FÅTT MER ÄN EN UTBILDNING?

Ja	22 (34%)
Nej	43 (66%)
Not finished	8 (-1%)
Skipped	7 (-1%)

OM "JA, HUR LÄNGE SEDAN VAR DET DU FICK DIN FÖRSTA UTBILDNING?

>12 månader	44 (70%)
6-12 månader	6 (10%)
3-6 månader	2 (3%)
1-3 månader	3 (5%)
0-1 månad	8 (13%)
Not finished	8 (-1%)

Skipped   9 (-1%)

HUR MÅNGA DAGAR TOG DET INNAN DU KÄNDE ATT DU BEHÄRSKADE COSMIC?

>12 dagar	24 (38%)
6-12 dagar	6 (9%)
3-6 dagar	17 (27%)
1-3 dagar	11 (17%)
0-1 dag	6 (9%)
Not finished	8 (-1%)
Skipped	8 (-1%)

VAD TYCKER DU OM UTBILDNINGENS LÄNGD?

För kort	24 (37%)
Lagom	40 (62%)
För lång	1 (2%)
Not finished	8 (-1%)
Skipped	7 (-1%)

HUR BRA VAR UTBILDNINGEN?

Fyll i den siffra som passar bäst. 1 = dålig, 10 = bra

1	4 *(6%)*
2	2 *(3%)*
3	8 *(12%)*
4	10 *(15%)*
5	10 *(15%)*
6	7 *(11%)*
7	14 *(21%)*
8	8 *(12%)*
9	2 *(3%)*
10	1 *(2%)*
Not finished	8 *(-1%)*
Skipped	6 *(-1%)*

VAD TYCKER DU VAR BÄST MED UTBILDNINGEN?

- Inget jag kan komma ihåg
- Bra lärare med sjukvårdbakgrund
- Visningen av överskådligheten i COSMIC
- Tydlig och det hjälpte mig att jag hade arbetat lite i systemet innan jag gick utbildningen.
- Fick prova själv
- Jag kommer inte ihåg detaljerna. Vi var pilotklinik och har använt COSMIC minst tre år
- Att vi arbetade med patientfall.
- Praktisk tillämpning
- ATt sitta i den miljö som man är van vid. Att personen som lärde oss visste vad vi hade för önskemål. ATt sitta och jobba i övningsdatabas för sig själv, trycka och trycka fel som inte gör något.
- Kommer inte ihåg.
- Bra genomgång med det mesta
- Vi satt i små grupper och fick testa allt, skriva journal, skicka bevakning mm. Dessutom hade vi två duktiga utbildare.
- Praktiska delen.
- Ganska goda möjligheter att öva själv.
- Kunniga lärare
- Nu måste jag skilja på mina 2 första dagar, med väldigt pedagogisk utbildningspersonal. Dom gav mej väldigt mkt.Även bra blandning på oss som fick utbildningen, dom flesta var sjuksköterskor.
- Maten.
- praktiskt prova under handledning
- Kommer tyvärr ej ihåg utformningen av utbildningen
- Användarmanualerna. Möjligheten att prova på många moment innan man gör det i patientjournal.
- Litet verksamhetsområde,välutbildade lärare lokalt som vi kände personligen. De kände sedan tidigare till våra svagheter-styrkor i dataarbetet.
- ?
- Tålamod hos utbildarna och vi har daglig support i 2 v
- Att den hölls i utbildningslokaler på annan plats än där man normalt arbetar så att man kunde vara ostörd
- Påhittade "mallpatienter" som var och en fick praktisera/öva sina nyfunna kunskaper i.
- Snabb översokt och veta hur man startar övningsprogrammet.
- Att få lösenord
- öva
- vet inte
- ???
- ?
- at utbildarna har arbetat med COSMIC i kliniken. En del hade gjort det.
- Framför allt vid det andra tillfället lugnt tempo, utbildare som ansträngde sig att förstå vad som var problemet.   fördelen med en läkare som deltog i undervisning var att hon kunde relatera till varför något var ett problem i den dagliga verksamheten. (däremot kanske inte den mest engagerade pedagogen)
- UTbildarna
- Mkt tid till att prova sig fram och öva (med handledare i närheten)för den som behöver det.
- Praktiska övningar.
- Kunniga utbildare. Bra att ha varsin dator.
- Vet ej

- det minns jag inte.
- Gav red information.
- kommer inte ihåg
- No comment (38)

- Inget jag kan komma ihåg
- Inget speciellt
- För liten träning på problem som kan dyka upp och hur man kan hantera dessa.
- Vet ej
- Att det är sjukvårdspersonal som lär ut. Vore det inte bättre att de som konstruerade programmet (specialisterna) utbildade. Alldeles för lite/kort utbildning. Hann omöjligt lära sig systemet på den tiden. Vore bra med uppföljande utbildningar så man kan bygga på sin kunskap. Nu blir man mest självlärd.
- Kort "korvstoppning". Sedan ut i verksamheten och köra igång - inte bra.Som bäddat för strul.
- Mera specifika uppgifter för respektive yrkesgrupp.
- För kort.
- Den som höll i utbildningen var dålig på att ha utbildning.
- Det var svårt att göra mallarna det fanns inte så mycket inf. att tillgå för oss som inte är medicinsk personal.
- Kan inte komma på något.
- Interna utbildare som själva var helt nya i sin roll och sitt användande av Cosmic.
- Det var ingen riktig lärarledd utbildning.
- Korvstoppning
- Min 3:e dag som jag gick separat. Kom med helt fel personalkategori. Den dagen gav mej inte mkt.
- Proffesionsindelningen, ett utbildningsprogram som inte överensstämmer med "skarpa" versionen.
- Dålig lokal, stressigt lärde de mesta själv med hjälp av kollegor.
- Så mycket info på en gång att det blev mycket rörligt. Svårt att ta till sig info så komprimerat.
- Fick ingen formell utbildning alls
- Minns inte.
- ?
- De som utbildade var inte speciellt välutbildade.
- Kan ej bedöma.Cosmic är rörigt
- Våra egna mallar var ännu bara på planeringsstadiet så man visste ännu inte om det vi skulle arbeta med på avdelningen skulle ha några likheter med övningsmiljön, dessutom gjordes arbetet med mallarna parallellt och utan särskilt mycket uppbackning så vi som skulle utbilda våra arbetskamrater jobbade hårt och, kändes det som, ofta i blindo.
- Att det var så stor skillnad bland deltagarna vad gäller datavana så vissa uppgifter tog så lång tid att gå igenom för att vissa på utbildningen hade problem med mus osv.
- Vi fick bara sekreterarutbildning 1 dag.
- för mycket på kort tid
- vet inte
- Utbildarna var inte samspelta. Det kändes bökigt och virrigt.
- Att utbildarna verkade osäkra på vissa saker som vi frågade om.
- att undervisningsCosmic inte var uppdaterad så att den stämmer med "skarpt läge". Vore bättre att ha med support ute på mottagningen. Vi har kallat in it personal från PV för att få mer hjälp. det är ett stort system och tar lång tid att lära sig alla moduler. En del saker har vi inte nytta av som utb. gav annat borde vi haft mer av.Manualerna inte korrekta och för mycket text- behöver skräddarsys mer till de olika mottagningarna.Här finns en hel del att förbättra.
- De som konstruerade programmet och de som undervisar i det och har ansvar för det har inte klart för sig vad verksamheten kräver. Det innebar att de inte alltid kund förstå varför något inte fungerade i

verkligheten (det funkar ju så bra "in vitro". Det tar väl inte så lång tid att klicka några extra gånger)Användarna förväntas anpassa sig efter systemet. Det borde vara tvärtom.

- SAtt utbildarna kunde systemet så dåligt.
- den var kort och heldag många moment samtidigt i programet
- Att man inte lade övningstiden i slutet av dagen för de som behövde det. Om man lär sig snabbt fick man sitta och vänta länge.
- Utbildningen var mest för vårdavdelning som ej stämmer med för oss som jobbar på mottagning
- Svårt att sätta sig in i utan att först prova systemet. Hade gärna haft utbildningen uppdelad på yrkesgrupper.
- Jag tycker det är svårt att tillgodogöra sig allt på en gång Det hade varit bättre att vi också fått en "reutbildningsomgång" när systemet varit igång ett tag Då har man lite insikt och vet vad man ska fråga om och vad man behöver veta
- Mkt dålig pedagogik. Utbildarna kunde inte svara på frågor. Ubildningsmodulen var inte uppdaterad, kunde inte visa hur det fungerar ute i verkligheten. Många fel och "buggar" vilket gjorde att man fått lära sig i skarp drift istället.
- svårt att hitta tider som passade min tjänst på kliniken
- No comment (38)

SKULLE DU VILJA LÄGGA TILL NÅGOT MOMENT SOM DU TYCKER SAKNADES UNDER DIN UTBILDNING?

- Nej
- nej, det som saknades och är en stor del av mitt vardagliga arbete kan inte hanters av Cosmic.
- Hur man löser problem som uppstår vid inmatningen av data. Utbildningen bör vara i flera pass. Först en grundläggande undervisning, sedan en mer fördjupad efter att man använt Cosmic i skarpt läge.
- Jag skulle vilja ha en em kurs för repitering(snabb genom gång)
- ?
- En uppföljning inte så långt efter första utbildningen så att man hinner få med sig en bild av det man håller på med.
- Kommer inte ihåg.
- Nej.
- Erfaren Cosmicanvändare på plats i lokalen vid utbildningen.
- Bättre utbildning i läkemedelsdelen.
- Kunskap vore inte helt fel, både för lärare o elever. Tycker att det var en mkt ojämn kunskapsnivå hos instruktörerna. Upplevde att man inte fick svar på sina frågor. En bok eller åtminstone ett slags kompendium hade varit på sin plats som kurslitteratur, inte 1 kg lösa papper, varav man skulle stryka lite text i här o var.
- Bättre lokal, mera tid avsatt.
- Flera kortare utbildningstillfällen under första 1-2 mån.
- Massor.
- När det grundläggande har lärts behövs påbyggnad
- Skulle behövas uppföljande utbildning. Efter att ha använt systemet en tid blir man mogen för finesserna. Risk att man glömt bort en del av utbildningen som man inte nyttjande direkt.
- Kan ej bedöm ännu
- Ett färdigt system, det är inte roligt att höra: "men det kommer att vara annorlunda när den nya versionen kommer!"
- Vi borde ha fått mer utbildning om hur läkarna dikterar för att kunna hjälpa till när det krånglade i början.
- vet inte
- Primärvården borde satsa på att utbilda sina utbildare bättre. Mycket som man frågade om visste dom inte.
- se ovan
- nej eftersom det är redan för många moment som man blir trött på
- Praktisk övning parallellt hela tiden, efter varje moment. Man kan inte lära sig hela kedjan av moment på en gång. Man måste göra själv för att kunskapen ska fastna.
- No comment (49)

HADE DU HÖRT TALAS OM COSMIC INNAN DU BÖRJADE ANVÄNDA DET?

Ja	52 (74%)
Nej	18 (26%)
Not finished	9 (-1%)
Skipped	1 (-1%)

OM "JA", VILKEN VAR DIN ALLMÄNNA UPPFATTNING?

- Hade ingen uppfattning mer än att det skulle bli skönt att få datajournal.

- Ingen speciell
- Det kändes bra att slippa pappershanteringen.
- Hade hört att systemet var krångligt.
- Hade ingen direkt åsikt
- Spännande och naturligt att införa en "datajournal".
- Att det varigt struligt på andra ställen där det införts också.
- Ett nytt datasystem. Mycket strul med information om mallarna.Svårt att få till tid för att göra mallarna pga stor arbetsbelastning. När vi äntligen gjorde dom fick vi vänta pga att den som gjorde dom ej hade tid (höll på med BUH)
- Att det var långt fram i tiden, hörde detta redan 1977 när jag började jobba, att snart så kommer datajournalen. Men var positivt inställd från början, alltid roligt med nya saker att utvecklas med.
- Mycket bra med en datoriserad journal
- Motstånd Det sades vara ett ganska dåligt systemMärkligt att varje landsting verkar ha sitt eget system
- Att det skulle vara ett bra och säkert journalsystem, men dyyyrt!!
- Intressant, spännande.   Nytt sätt att arbeta för alla yrkeskategorier.
- Spännande, efterlängtat
- Ett väldigt komplicert och "opålitligt" program. Personal var sjukskriven pga Cosmic på VC.
- Att politikerna "köpt grisen i säcken". Varför fick vi inte fortsätta med det system vi hade innan som vi gillade och behärskade mkt bra, det hade besparat landstinget åtskilliga kronor, o personal.Cambio har väl vassaste försäljartekniken helt enkelt.
- ingen
- Skräp
- Orolig då man hört hur struligt och knepigt det var.
- Vi var först att börja med Cosmic. Många påstod att det inte skulle gå att genomföra.Våra duktiga utbildare fick oss emellertid att bli intresserade och nyfikna inte det genomfördes.
- Att jag visste för lite för att kunna ha en uppfattning. Hade bara hört negativa saker.
- Var något nytt. Vilka kommer åt den etc
- Positiv.
- Ungefär som det jag upplever - ohanterligt system
- Ingen uppfattning eftersom ingen hade någon erfarenhet av systemet.
- Får väl pröva och bilda min/vår egen uppfattning om det.
- Bra att få ett enhetligt system.
- Att det var dåligt
- Skönt att slippa journalletande.
- Har bara hört negativt om Cosmic.
- Att det var krångligt och svårt att lära sig.
- Att många hade haft problem med Cosmic och att det var svårt.
- stort motstånd till att behöva byta från proffdoc från personalen
- Hadeinte hört särskilt mycket, relativt neutral. Positivt från öronkliniken. midre pos från de vårdcentraler som provat.
- ingen uppfattning
- Ett ofärdigt system med potential
- dålig
- ej förväntningar
- Negativ.
- Bra.
- Krångligt med datahantering.
- Ganska negativ eftersom det är den bild som lämnats från media och många vårdcentraler.

- posetiv
- No comment (37)

VILKA ÄR DINA ALLMÄNNA ÅSIKTER OM COSMIC IDAG?

- Hyfsat fungerande system (jmf med andra.
- Jag tycker det är bra med Cosmic. Det finns som jag påpekat en hel det förbättringar att göra som jag hoppas man tar hänsyn till så att det blir mer användarvänligt.
- Icke utvecklat system främst anpassat för administratörer och ekonomer. Klarar ej primärvårdens krav på hantera det vardagliga arbetet. Omständligt, tar lång tid pga flera knapptryckningar krävs. Ser ingen fördel jmfrt med profdoc annat än att jag kan läsa anteckningar från sjukhuset
- Vidareutbildning krävs efter att man använt systemet en tid
- Det fungerar bättre och bättre. ger vinster för personal och patienter. De största vinsterna kommer vi få se när alla använder systemet fullt ut.
- Synda att man börjar använda ett system som ej är helt färdigutvecklat och att alla divisioner skall gå igenom samma procedurer. Göra samma misstag, sitta med samma mallar. Snacka om ineffetivt.
- Utifrån mitt perspektiv som op.ssk. tycker jag att det fungerar bra.
- Ett oerhört invecklat system som är långt ifrån användarvänligt.Tar alldeles för lång tid att arbeta med som innebär en avsevärd minskning av tid hos patienterna - och det är väl därför vi är här ???
- Bra med journalföringen, får snabb inf om patienten.
- Att jag inte skulle vilja gå tillbaka till pappersjournal. När man kommit på alla rutiner runt om så man inte glömmer något så är det enkelt att använda. Det som fattas är förstås ordbehandlingsprogram och att patienten inte följer med från IMX, men detta jobbas det ju på. Diktatlistan skulle ju bli annorlunda den också hörde jag, bra.
- Mycket bra med datoriserad journal. Finns dock många saker att önska vilket vi framför till supporten
- Konstigt att det finns så många olika system ingen koppling till imx Imx är ett klumpigt system med många "inknappningar"Filtreringen i c. fungarar dåligtNär man dikterar vore det bra om man samtidigt kan ha journalen framme.
- Cosmic är ett bra journalsystem, men jag tycker att det har blivit trögare, ofta är det "timglas" en stund när jag byter sökord i journalmallen vid journalskrivning.
- Positiva. God tillgänglighet. Logisk miljö att arbeta i. Mycket bra arbetsredskap.
- Cosmic är överlag ett bra program, men läkemedelsdelen för sluten vård är krånglig.
- Framtiden, patientsäkert, nödvändigt, täcker många olika verksamhetsområden (på gott och ont)
- Ett bra program med , som är lite svårt ibland att hitta rätt direkt i. Men att kunna samordna olika sjukvårdsgivare är enormt bra.
- Tyvärr så är de värre än tidigare. Jag trodde inte att det skulle vara så illa som jag hört ryktas här o var. Jag gillar inte att få sitta o stöta på buggar om dagarna, stöta på om förbättringar o tjata o ingenting händer. Jag o mina arbetskamrater sitter som produktutvecklare varje arbetsdag utan att få någon som helst ersättning för detta, på sin höjd blir man hörd genom att man "är korkad" som inte fattar vissa "finesser". De så kallade "finesserna" är oftast en försämrad version av det vi tidigare varit vana vid fungerat bra.
- ok
- Inget vidare bra system finns bättre på marknaden
- Eftersom jag ej har något annat att jämföra med tycker jag det fungerar bra.
- Det finns vissa bra funktioner, men fortfarande stora brister även om det blivit bättre. Ej särskilt användarvänligt.
- Se tidigare svar i enkäten. Förresten, varför stod inte dietist som en personalkategori? Morr!

- Fungerar väl hyfsat bra, men skulle kunna bli mycket bättre.
- Tveksamt bra
- Krånglig!! Medicindelen är urusel fra. interavenösa delen!!!!
- Se fråga ett.
- Det finns flera saker som skulle kunna göras bättre men i stort sett är det ok att arbeta med Cosmic.
- helt OK
- Positiv.
- Ännu sämre
- Det är synd att användningen fortfarande är så begränsad. Dessutom får man känslan av att det dokumenteras mycket i onödan för att personalen är rädd att information inte ska nå fram om den inte står på flera ställen. Många läkare verkar heller inte läsa vårdplanerna utan endast den kronologiska journalen.
- Bra.
- Är det verkligen vår uppgift att utveckla ett inköpt program som är fullt av buggar?
- Att det fyller sin funktion, men kan förbättras
- Dålig utveckling. Få personer som arbetar på förvaltning och projekt.
- Bra, journalen är alltid på plats. Lätt att se diktaten.
- Acceptabelt fungerande men kan förbättras med all säkerhet
- Det känns inte så negativt som man har hört från början.
- Än så länge inte bra men att det kommer att bli bättre.
- Fungerar bra, går alltid att göra bättre..
- det märks att det är ett administrativt/ekonomiskt system ursprungligen och känns inte gjort för att hjälpa till i patientkontakter i PV arbetet.Ergonomiskt uruselt med alla musklick istället för tangenter, massor med kortkomandon som tar tid att lära sig då de inte är lika som i Proffdoc. Vi måste nu köpa in rollermouse eller dyligt till alla datorer för att skona axlar och armar.
- Programmet utgår inte ifrån våra behov eller vår vardag. Ställvis onödigt krångligt(har jag loggat in på en enhet och inte gått ifrån datorn,varför extraklicka att det hela tiden är därifrån jag beställer.) Känns inte "färdigt". De fördelar som finns beror ffa på datorjournal överhuvudtaget och mindre på Cosmic. Det finns ännu sämre program, men det borde finnas bättre. "Datajournal for dummies."
- kunde snabbas upp
- Ett ofärdigt system med potential
- omständigt
- för jobbigt och för mycket upprepningar och all dess klikandes. Och vi undersköterskor har ej fått nått mall.
- Helt ok. Alla program har sina för-och nackdelar. Det som oroar mig är förstås patientsäkerheten; om data försvinner..
- Det är ett OK system med en del brister. Känns inte optimalt. Under all kritik att det inte finns tillväxtkurvor.
- Fungerar rätt så bra men det finns fortfarande en del problem som uppstår efter uppdateringar.
- OK Vill ej gå tillbaka till det gamla
- Betydligt mer positiv.
- Det kommer att bli bra när programmet anpassats efter Primärvårdens synpunkter. Roligt som sagt.
- rätt bra journalsystem i kliniken
- för trög och dålig överblick
- No comment (25)

APPENDIX B: PROTOTYPE

1. INTRODUCTION

The main reason to why we created this basic prototype was that the people; doctors, nurses, in the hospital either found it too complicated to use. We started to do a login screen were the user could login, you could choose if you want to login as an administrator, nurse or doctor. But only the admin part works in this prototype login-screen. We developed this login-screen in the programming language C # (C Sharp).

Our goal was to create a basic prototype user interface for a medical referral system, which we would like to compare with the basic in the COSMIC system which is used in the Akademiska University Hospital in Sweden.

When we were finished with the prototype login-screen we started to create the prototype from the scanned papper referrals (see 6. Referral Forms). We designed these several types of referrals in the computer (see 7. Prototype Interface), and at the same time we made it have a good user interface which was easy to understand.
After finishing the design prototype we implemented the design prototype in the programming part and linked it with the login-screen.

Overall, the prototype team delivered a system that modeled a system users should already know. Hopefully, this will reduce the amount of learning time and people will want to use the new system. Hospital several times to see the real COSMIC system and try to understand why it was hard to use the COSMIC system for the people in the hospital.

[Sections in *italic* describe the current solution in COSMIC.]

The information below is a short summary of what features should be available in the system:

- Sending referral
- Receiving referral
- Sending answer
- Receiving answer

2. USER CHARACTERISTICS AND OBJECTIVES

The secretaries handle most of the referrals when they come in and send them to the doctors that treat the patient. Nurses and secretaries both write outgoing referrals, the doctor must sign the see referrals before they are sent.

The users are doctors, nurses, secretaries and other employees in hospitals and primary care units. Their computer experiences vary greatly, but most of them have only basic expertise. They want a system that is easy to understand without much training. It should be intuitive and easy to use so that it supports their work best.

3. OPERATIONAL SCENARIOS

Example Receiving of a referral in the laboratory:

- The referral system in the lab receives the referral. The status is set to "received"
- A nurse/doctor (?) accepts the referral, status "accepted"
- Patient sometimes books a time for the lab in advance, referral gets the status "booked"
- Patient arrives and pays, status is set to "test started"
- Patient goes to the doctor
- Doctor enters referral for the lab into the system
- Patient picks a number for the queue
- Lab nurse meanwhile prints out some labels e. g. for the blood samples
- Lab nurse calls patient to the lab
- Lab nurse takes blood samples
- Patient can go home
- Lab nurse tests samples
- Lab nurse sets status to "test finished"
- Lab nurse enters the results in the system
- Lab nurse sends the answer to the sender

4. FUNCTIONAL REQUIREMENTS

There should be three major types of referrals:

- Radiology
- Lab
- Consultation

4.1 SENDER

A referral shall contain information about the sender:

- Unit
- Ward
- Name of the responsible doctor
- Profession
- The logged in doctor is set as default

A referral shall contain information about the doctor to send the answer to:

- Unit
- Ward
- Name of the responsible doctor
- Profession
- The logged in doctor is set as default

A referral shall contain information about the receiver:

- Unit
- Ward
- Name of Receiving Doctor

A referral shall contain information about the patient:

- Name
- SSN

A referral shall contain information about the paying unit, selectable from a list of units where the physician is employed:

- Unit
- County
- Address

A referral shall contain a option of whether it's an emergency.

A referral shall contain a option of whether a preliminary response is desired.

A referral shall contain the case history.

What kind of analysis should be performed by the receiving ward?

There should be an option for printing a referral.

There should be an option for sending a referral.

4.1.1 RADIOLOGY

A radiology referral shall contain information about which body part to be examined and how it is to be examined.

There will be a field where the doctor can input what he is looking for, such as cancer growth or an infection for a lung test.

4.1.2 LAB

A lab referral shall contain information if a patient has any blood contagions.

There should be different kinds of packages with preselected tests. Each package should match a specific syndrome. The users must be able to select multiple packages and add additional tests if necessary.

4.1.3 CONSULTATION

Consultation referrals shall contain information about the requested type of consultation.

4.2 RECEIVER

The receiver shall be able to see the date and time the referral was sent.

A referral shall contain information about the doctor to send the answer to and include their:

- Name
- Profession
- Unit
- Ward

A referral shall contain information about the patient

- Name
- SSN

There should be a link to the patients journal.

A referral shall indicate whether it is an emergency.

A referral shall indicate whether a preliminary response is desired.

A referral should contain a mandatory choice of accept or refuse or hold decision. If the decision is put on hold the status of the referral should not be changed.

4.2.1 RADIOLOGY

A radiology referral shall contain the case history for the patient.

A radiology referral shall contain information about which body part to be examined.

The receiver of the referral must be able to book an appointment.

4.2.2 LAB

A referral shall contain information about what test should be performed.

A referral shall contain information if a patient has any blood contagions.

4.2.3 CONSULTATION

A referral shall contain information about what activity should be performed.

The receiver of the referral must be able to book an appointment.

4.3 SENDING AN ANSWER

There must be a possibility to add another receiver for the answer.

There must be a way to insert preliminary responses.

There must be a way to insert a final answer.

There must be a way to save the answers without sending or signing the referral answer.

There must be a way to send and sign the referral.

4.4 RECEIVING AN ANSWER

An inbox should receive the answer for the referral.

From the inbox the answer should be directed to a doctor that will be responsible for the referral answer.

In COSMIC a secretary handles the inbox for each unit and "forward" the referral answer to the doctor. If the doctor is not present another doctor gets the answer.

4.5 STATUS

Here is a description of how the status is procceded in the system.

(a) = Automatically set

Referral status:

1. Referral unsent (a)
2. Referral signed and sent (a)
3. Referral received (a)
4. Referral accepted
5. Referral partly accepted
6. Referral refused
7. Time booked
8. Test started
9. Test finished
10. Part of answer sent
11. Answer signed and sent (a)
12. Answer received (a)

The picture at the right exhibits the referral workflow.

The picture below is a printscreen of the COSMIC referral order status.

Utbildning Läkare10 Primärvården, (pvlk10), Cambio COSMIC

Arkiv Patient Journal Läkemedel IMx RoS Översikter Remiss och svar Resursplanering Bevakning Digital diktering KoVis Fönster Hjälp

Hämta... Rensa 19 770404-2394 Karl **Bertil** Hansson 29 år Sök ▲ ! ▯ P G

Beställningsstatus

Visa vy för ● Vald patient ○ Alla vårdmottagare Beskrivning

Visa

Fr.o.m 2006-09-05 Beställande enhet (Alla i urval) Specialitet (Alla) Min. status -2 Antal 6 Uppdatera

T.o.m 2006-10-05 Beställare Läkare10 Primärvården ● Remissdatum Max. status 8 ☑ Avancerat
○ Planerat provtagningsdatum

Datum	Personnummer	Förnamn	Efternamn	Typ	Status	Provtagning...	Planerat provtagningsdatum	Förändring	Mottagan
2006-09-07 00:00	19 770404-2394	Bertil	Hansson	Konsultation - intern	8			2006-09-08 13:25	Gimo HLM
2006-10-05 11:04	19 770404-2394	Bertil	Hansson	Lokala analyser	6	2006-10-05 11:...		2006-10-05 11:06	Gimo HLM
2006-09-07 00:00	19 770404-2394	Bertil	Hansson	Konsultation - extern	6			2006-09-07 14:04	Hudkliniken
2006-09-07 11:52	19 770404-2394	Bertil	Hansson	Klinisk kemi	4	2006-09-11 11:...	2006-09-11 11:54	2006-09-07 11:55	KKF Lab-1
2006-10-05 12:46	19 770404-2394	Bertil	Hansson	Lokala analyser	1			2006-10-05 12:46	Gimo HLM
2006-10-05 11:29	19 770404-2394							2006-10-05 11:29	Röntgen E

Förklaring Beställningsstatus

Provbundna remisser
-1. Makulerad
0.
1. Beställning
2.
3. Utskriven
4. Provtagning/undersökning
5. Kvittens från lab
6. Preliminärsvar finns
7. Svar finns
8. Kompletterande svar finns

Radiologiremisser
-1. Makulerad
0. Ny
1. Beställning
2.
3.
4.
5.
6. Preliminärsvar finns
7. Svar finns
8. Kompletterande svar finns

Konsultationsremisser
-2. Awisad
-1. Makulerad
0. Beställning
1. Obedömd
2. Bedömning pågår
3. Bedömd
4. På väntelista
5. Bokad
6. Osignerade svar
7.
8. Svar finns
9.
10. Avslutad
11. Avregistrerad

Lokala analyser
-1. Makulerad
0. Ny
1. Beställning
2.
3. Utskriven
4. Provtagning
5.
6. Delsvar finns
7. Alla analyser besvarade
8.

Stäng

Hjälp: Utbildning

Start Provtagningsanvisninga... http://www.internt.lul.se... Utbildning Läkare1... E-post :: INBOX - Micros... namnlös - Paint 13:11

The picture below is a sequence diagram of how the referral function should work:

5. UNITS USING X-RAY REFERRALS

Here is the list of which X-ray units uses the referrals.

- Emergency and Rehabilitation division
- Geriatrics
- Surgery
- Hand
- Neurodivision
- Neurology
- Ear Surgery
- Plastic Surgery
- Eyes
- Ears
- Oncology
- Thorax and Medicine
- Skin
- Hematology
- Oncology

- Rheumatology
- All Psychiatric units
- Hospital of Enköping
- Center of Surgery
- Center of Medicin
- Primary Care in Uppsala County
- Alunda
- Bålsta
- Enköping
- Fjärdhundra
- Gimo
- Doctor on call unit in Enköping
- Öregrund
- Örsundsbro
- Österbybruk

REMISS. RADIOLOGISK UNDERSÖKNING

Akademiska ☐ UAS   Enköping ☐ ENK   Samariter-hemmet ☐ SHS   Tierp ☐ TI   Östhammar ☐ OH

018-611 00 00   0171-41 80 00   018-611 00 00   0293-150 00   0173-861 55

REM. ENHET: namn, kvittningskod/ansvarsnr, avd, telefon

Person nr

Namn

F-kassa

Adress

Postnr, Ort

Telefon

Tel rem.avd: ....   Tel rem.läk: ....

BET. ANSVARIG: namn, kvittningskod/ansvarsnr, avd.

Undersökning   Frågeställning   Tid för undersökning datum, tid, lab

Datum   Rem läkare   Föregående relevant radiologisk undersökning (när, var)

Anamnes, status

Röntgenavdelningens anteckningar/Prelsvar

På avd/op

AKUT

Inom 24 h

Prel svar:

Rörpost nr:

Vid undersökning med kontrastmedel Intravaskulärt,
Tillstår patienten riskgrupp för att utveckla kontrastmedelsnefropati?
☐ Ja   ☐ Nej
- nedsatt njurfunktion
- dehydrering
- diabetes mellitus
- myelom
Om riskpatient, ange kreatininvärde.

Gravid   P-krea   µmol/L

☐ Ja   Sjuvård behandling (Biguanidtyp, Glucophage, Glucomet, Metformin etc) ska sättas ut.
Se socialstyrelsens skrifter 2001-03-16.

☐ Nej   Id-kontroll

Längd   Vikt

SSK

Dr   Kv   mAs

Proj

Band/Film nr

REMISS. RADIOLOGISK UNDERSÖKNING

Akademiska	Enköping	Sjukvården-hemmet	Tierp	Östhammar
☐ UAS	☐ ENK	☐ SHS	☐ TI	☐ OH
018-611 00 00	0171-41 80 00	018-611 00 00	0293-150 00	0173-861 55

Person nr

Namn

REM. ENHET: namn, inrättningskod/ansvarsomr, avd, telefon

F-kassa

Adress

Postnr, Ort

Telefon

Tel rem.avd: ....   Tel rem.läk: ....

BET.ANSVARIG: namn, inrättningskod/ansvarsomr, avd.

Tid för undersökning datum, tid, lab

Undersökning

Frågeställning

Rem.läkare

Datum

Föregående relevant radiologisk undersökning (när, var)

Anamnes, status

På avd/op

AKUT

Inom 24 h

Pref svar:

Rörpost nr:

Vid undersökning med kontrastmedel intravaskulärt.
Tillhör patienten riskgrupp för att utveckla kontrastmedelsbiverkan?
☐ Ja ☐ Nej

- nedsatt njurfunktion
- dehydrering
- diabetes mellitus
- myelom

Om riskpatient, ange kreatininvärde.

Gravid

Ja

Nej

P-krea   μmol/L

REMISS. RADIOLOGISK UNDERSÖKNING

Akademiska   Enköping   Samariter-hemmet   Tierp   Östhammar

☐ UAS   ☐ ENK   ☐ SHS   ☐ TI   ☐ OH

Person nr
Namn
F-kassa
Adress
Postnr, Ort
Telefon

REM. ENHET: namn, inrättningskod/ansvarsnr, avd, telefon
Tel rem.avd: Tel rem.läk:
BET ANSVARIG: namn, inrättningskod/ansvarsnr, avd.
Undersökning
Frågeställning
Tid för undersökning datum, tid, lab
Datum   Rem läkare
Föregående relevant radiologisk undersökning (när, var)
Anamnes, status

Röntgenavdelningens anteckningar/Prelsvar

Gravid   Vid undersökning med kontrastmedel
Ja   Nej

På avd/op
AKUT
Inom 24 h
Prel svar
Röntpost nr:

REMISS, MRT, MRS

AKADEMISKA SJUKHUSET
751 85 UPPSALA   TEL: 018-66 37 17
TIDSBESTÄLLNINGEN

Person nr
Namn
Yrke
F-kassa
Adress
Postnr, Ort
Telefon

REM ENHET: namn, inrättningskod, ansvarsnr, avd, telefon
BET ANSVARIG: namn, inrättningskod, ansvarsnr, avd
Frågeställning
Undersökning
Datum   Rem läkare
Föregående radiologisk undersökning (när, var, vad)

ANAMNES, STATUS, RÖD RUTA MÅSTE VARA IFYLLD

Metallproteser, pacemaker, clips
el annan metall i kroppen?
(Gäller ej amalgam)
Graviditet, vecka?   MRS
Proj   Vikt   Id-knt   SSK   Dr   Band nr

MRT-sektionens anteckningar

Akut
Prel svar

REMISS, MRT, MRS

AKADEMISKA SJUKHUSET
751 85 UPPSALA   TEL: 018-66 37 17
TIDSBESTÄLLNINGEN

REM ENHET: namn, inrättningskod, ansvarsomr, avd, telefon

BET ANSVARIG: namn, inrättningskod, ansvarsnomr, avd

Frågeställning

Datum   Rem läkare

ANAMNES, STATUS, RÖD RUTA MÅSTE VARA IFYLLD

MRT-reaktionens anteckningar

PRELSVAR **PRELSVAR** **PRELSVAR**

PRELSVAR

Person nr

Namn

Yrke

F-kassa

Adress

Postnr, Ort

Telefon

Tid för undersökning datum, tid, lab

Undersökning

Föregående radiologisk undersökning (när, var, vad)

Akut

Prel svar

Metallgrossor, pacemaker, clips el annan metall i kroppen? (Gäller ej amalgam)

Graviditet, vecka?

Vikt

Miljömärkt trycksak / Eddbins Tryckeri AB

art 818181 Ställin & Persson AB / Eddbins Tryckeri AB

Remiss, konsultation

Blad nr

Personnr

Namn

Adress

Tfn

Rem inrättning, klinik, avd/mott

Remiss till (institution, handläggare, adress)

Rem datum

Rem läkare (klartext)

Tidsbeställningsuppgifter

Akutsvar till

Föreg. undersökning var, när, vad

Förflyttas i
- [ ] stol
- [ ] säng

Undersökes
- [ ] på avd
- [ ] i säng

Diagnos, fråga

Anamnes, status
(prorättgingsdatum)

Svar
Handläggare

Undersökningsdatum

Konsultbeställningens noteringar

Referral-Radiologic-Examination

To?

Akademiska	Enköping	Samariterhemmet	Tierp	Östhammar
☑ UAS	☑ ENK	☑ SHS	☑ TI	☑ OH
018-611 00 00	0171-41 00 00	018-611 00 00	0293-15600	0173- 881 55

Referral Entity: name, ward/unit-code, unit, telephone

Telephone Referral Ward: Telephone Referral Doctor

Paying-responsibility

Name, Ward/Unit-code, Unit, Telephone

Examination

Examination:

Date   Referral Doctor

Unit: Preliminary answer:
Emergency: Rörpost nr:
Within 24 h:

History-field /-Anamnesis

Patient

SSN: YYYY-MM-DD - NNNN
Name:
F-Kassa:

Address:
Zipcode, City:
Phonenumber:

Time for examination, date, time, lab

Question at issue

Previous relevant radilogic examination (when, where)

Pregnant: *Yes* ○ *No* ○
Vid undersökningen med
kontrastmedel intravaskulärt.

Tillhör patienten riskgrupp för att utveckla
kontrastmedelsnefropati.

Ja/Nej
-Nedsatt njurfunktion
-dehydrering
-diabetes mellitus
-myelom

om riskpatient ange kreatininvärde :

P-Krea: µmy mol/L

Length:	Weight:	ID-controll
SSK:		
Doctor		
Proj	Kv	mAs
Band/Film nr		

Notes from the X-ray-unit/Preliminary answer

Referral-MRT, MRS

To:

Akademiska Hospital Telephone: 018-66 37 17
751 85 Uppsala

Referral Entity: name, ward/unit-code, unit, telephone

Telephone Referral Ward: Telephone Referral Doctor

Paying responsibility
Name, Ward/Unit-code, Unit, Telephone

Patient
SSN: YYYY-MM-DD - NNNN
Name:
F-Kassa:
Address:
Zipcode, City:
Phonenumber:

Examination
Examination:

Date Referral Doctor

Unit: Preliminary answer:
Emergency:
Within 24 h:

Time for examination, date, time, lab

Question at issue

Previous relevant radiologic examination (when, where)

History field / Anamnesis
Red field must not be empty

Metallproteser, pacemaker, clips
eller annan metall i kroppen?
(Gäller ej amalgam)

Weight: Pregnancy, week?

ID-controll
SSK:
Doctor
Proj MRS
Band/Film nr

Notes from the MRT unit/section

Referral

Sender
Name:
Profession:
Unit:
Ward:

Patient
Name:
SSN: YYYY-MM-DD - NNNN

Sender to Doctor
Name:
Profession:
Unit:
Ward:

Option
Emergency: Preliminary response:

Receiver
Name:
Unit:
Ward:

History field / Anamnesis

Referral MRT, MRS

To?
Referral to (institution, adress):

Referral Entity: name, ward/unit-code, unit, telephone

Telephone Referral Ward:

Telephone Referral Doctor

Patient
SSN: YYYY-MM-DD – NNNN
Name:
F-Kassa:
Address:
Zipcode, City:
Phonenumber:

Examination
Date

Referral Doctor

Moves in a: Char: Bed:
Examination in a: At ward: Bed:
Emergency answer to: Preliminary answer:

Time for examination, date, time, lab

Question at issue

Previous relevant examination (when, where)

History field / Anamnesis

Referral

Sender
Name:
Profession:
Unit:
Ward:

Patient
Name:
SSN: YYYY-MM-DD – NNNN

Sender to Doctor
Name:
Profession:
Unit:
Ward:

Option
Emergency:
Preliminary response:

Receiver
Name:
Unit:
Ward:

Which body part to be examined
Body part:
you can also select from the picture:
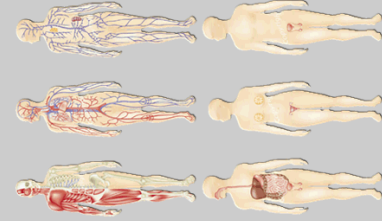
History field / Anamnesis
text

What is the Doctor looking for?
Infection: text
Cancer:
Test: