

APPENDIX B: Project Description

Background description

Dramatic increase in blood usage and critical blood shortage are faced by various countries. [4]

According to WHO figures, the total number of blood donations collected globally has increased by 25% over the last decade to around 108 million. [5] Therefore, efforts are being made to increase falling rates in new volunteers.

According to new studies by NHS Blood and Transplant Organization, there are now 40% fewer new blood donors than there were 10 years ago. [6] Similar rates of decline have also been seen in Denmark in the past years. It seems that attitudes toward sole dependency on non-remunerated voluntary blood donation have been changed in recent years and experts in some developed countries are reevaluating the situation and trying to combat blood stock shortages. Besides the effects on the blood bank several economic and psychological studies have shown that incentives have discouraging effects on pro-social behaviors like blood donation and will reduce the number of blood donors in long term. With regard to the results of such studies, it seems that implementing incentive-based blood donor recruitment programs to meet blood requirements by some countries is becoming a challenge for blood banks. [7]

Blood donation – key facts:

- Of the 112.5 million blood donations collected globally, approximately half are collected in the high-income countries, home to 19% of the world's population.
- The blood donation rate in high-income countries is 33.1 donations per 1000 people, 11.7 donations in middle-income countries and 4.6 donations in low-income countries.
- 70 countries report collecting fewer than 10 donations per 1000 people. Of these, 38 countries are in the WHO African Region, 6 in the Region of the Americas, 6 in the Eastern Mediterranean Region, 5 in the European Region, 6 in the South-East Asia Region, and 9 in the Western Pacific Region. All are low or middle-income countries.
- The age profile of blood donors shows that proportionally more young people donate blood in low and middle-income countries than in high-income countries. Blood donor demographics are important for formulating and monitoring recruitment strategies. [8]

Factors such as advances in surgeries and cancer treatment, tightening the blood donation criteria, are playing an important role in increasing the blood demands. Thus, the system needs to be reevaluated in order to keep to amount of blood required and the donations at the same level. To meet blood requirements and overcome the shortages, some blood banks try to recruit blood donors by offering different kinds of incentives. For examples, donors in United States and England are often recruited by widespread use of rewards after donating blood, including a specific amount of money, t-shirts, tickets and so on. [9]

The results indicate that offering money or other sort of incentives may have a negative effect on blood safety and blood donor contribution. Regarding the recent downward trend all around the world in blood collection and increasing demands for blood transfusions, Denmark is trying its best to raise with problem to the public awareness and to get people talking about blood donation. With a constant need for blood donors in most countries, Denmark's digital feedback scheme is an easy system to replicate for any country wanting to encourage people to make a real difference in someone else's life.

Purpose

The purpose of this project is to create a software system for hospitals that will manage a tighter connection between blood donors

Problem formulation

The overarching goal of the project is to make the public and especially the blood donators understand just how important their contribution is. The project focus and our approach and new initiative in Denmark is to keep track of the blood supplies and to give the people who donate a feedback on account of their effort using a client-server architecture. In other words, the system will send a notification to the blood bank when a patient blood was used. Our latest research shows us that our design has caught the public eye thinking that this will give the people who donate a great feeling to know they make such a big difference and maybe even save someone else's life, and will encourage them to come back and donate again.

Questions to be answered are the following:

- How to encourage more people to donate blood?
- How to contact the donors after their blood was used to save another person's life?
- How to make the donors' data accessible to the blood banks?
- How to separate the data seen by the blood banks from the data seen by the hospitals?
- How to notify the blood banks about the blood's expiration date?

The system is split into two different access points. First access point is used by the staff of the blood collecting point, a blood bank. The purpose is to store data regarding the donor, such as name, address, blood type, age, telephone number and email. Each staff member will have his or her own user name and password, which will protect their access from other unauthorized entries. The data from the donors will be stored in a shared database and will be available to the both sides using this system.

The second access point is used by the hospital staff. Each member of the hospital will be able to see the basic data of the patient, such as the ID, name and blood type. The hospital staff will also have a username and password, that will grant them access to the system and will prevent unauthorized access. Whenever a patient's blood is being used, the hospital staff members will send a notification to the blood bank informing them that the blood from patient X was used to save a life. When this happens, the blood bank is in charge of notifying the donors either by sending an email or a text message. Through these SMS and/or emails will give a lot of visibility in social media and traditional media. But above all it will give the donors a bigger feeling of importance and accomplishment and will make them come back and donate again. The text message initiative uses technology to recruit and retain new donors.

The system will grant simultaneous entries from blood collecting points around the country and will manage safe connections with the database whenever simultaneous access happens. This will prevent any errors in the database or possible duplicate requests and will give accurate responses to blood bank users.

As secondary priority, we proposed a few extra features such as the following:

- Each access point will keep a log of entries from all users in order to keep track of all the changes regarding the database. This will be very useful if the stock or usage have to be checked.
- The possibility to undo changes to the database if a wrong entry happens. This option should be available only to staff member with higher authority such as attending physicians, senior residents or even the medical directors.
- Other improvements might be proposed on the way if necessary.

Delimitation

- The contact data will not contain other values other than the ones mentioned above: patient ID, name, address, blood type, age, telephone number and email.
- The system will not include data collection directly from data loggers but only from databases.
- The hospital members will not be able to access other contact details about the donors besides the ID, name and blood type.
- The data regarding the staff from both the blood bank and the hospital will only consist of a username and a password.

Choice of model and method

WHAT? <i>Partial problem</i>	WHY? <i>Why study this problem?</i>	WHICH? <i>Which model/theories are expected to be used to solve the problem?</i>
How to encourage people to donate blood?	Main feature of the system	Requirements for data Use Case Modelling
How to contact the donors after their blood was used to save another person's life?	Notify the donors that a life was saved	Client – Server architecture UML class modelling
How to make the donors' data accessible to the blood banks?	Easy contact	Database design UML class modelling
How to separate the data seen by the blood banks from the data seen by the hospitals?	The hospitals don't need all the contact details of the donors	Design patterns Database design UML class modelling
How to notify the blood banks about the blood's expiration date?	The donated blood expires in 42 days	Design patterns UML class modelling

Figure 1 - Choice of model and method

Time schedule

The time scope is estimated at 500 hours per team. The timeline show below is an estimate planning of the UP regarding the development of the project. The time schedule will be split into several sprints and SCRUM will be used as a framework in order to have a better control over the development of the project. The time and tasks for each sprint will be decided into inception phase.

The phase plan is estimated as follows:

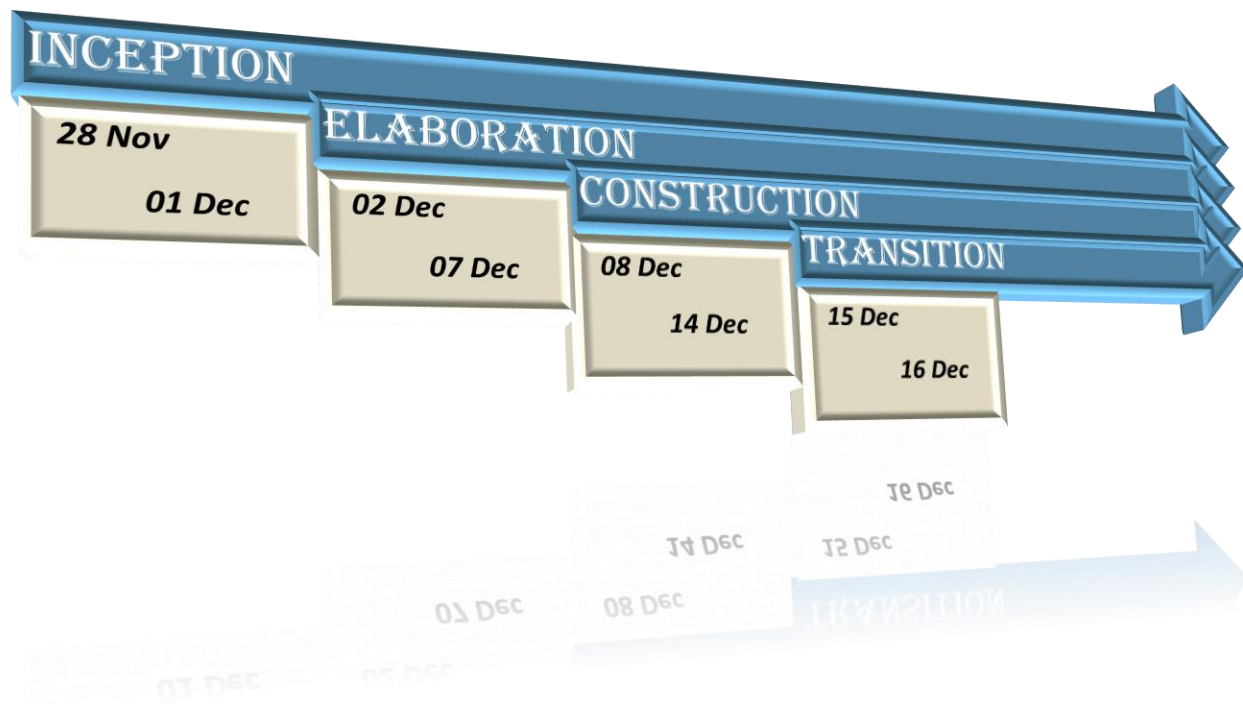


Figure 2 - Unified process phases

Inception phase will begin on 28th on November and will last until 1st of December. The Elaboration phase is estimated to begin on the next day, 2nd of December, and will end approximately on 7th of December, when the next phase will begin. The Construction phase is estimated to start on 8th of December and will end on 14th of December. The next day will begin the fourth and final phase, the Transition, which will last until the last day of the project, 16th of December.