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Software Engineering

Computer Science

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Project Overview Report

Sprint 1

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Introduction

In this report we will be taking the first steps towards creating a hospital management system which will support different operations in and around a hospital. Our main focus will be implementing all important functionalities in a simple way that allows anyone to use the system, no matter their technical knowledge.

We will first determine all relevant stakeholders for the system. We will discuss how we want the system to operate and from that discussion we will create a domain model and user scenarios to give a better idea of how the system will be used. We will then create relevant user stories to keep track of the functions we wish to implement in the system. We will be discussing what is a part of our system and what is outside of it as well.

What is inside the system and what is outside?

Here we will list the requirements. This will cover everything that is inside and outside the system. Requirements and actions within the system are sorted into classes A and B. Requirements are requirements that are a priority to be implemented, while B requirements will be implemented if we have time. The C class is for actions that are performed outside the system, but still connect to the system's activities.

Table 1

Number	Requirement	Class
1	Receptionists should be able to create new patients.	A
2	Receptionists should be able to change information about a patient.	A
3	Receptionists should be able to delete a patient.	A
4	Receptionists should be able to see available appointments.	A
5	Receptionists should be able to assign a patient an appointment.	A

6	Receptionists should be able to create a bill.	A
7	All staff members should be able to see a patient’s profile.	A
8	Nurses, doctors and specialists should be able to get an overview of all their assigned patients.	A
9	Doctors should be able to assign a patient to a medical treatment.	A
10	Doctors and nurses should be able to see patients' previous medical history.	A
11	Doctors should be able to prescribe medicine to a patient.	A
12	Specialists should be able to add information, such as results from x-rays or bloodwork to a patient's profile, available only to staff members.	A
13	Administrators should be able to see the inner workings of the system for a specific time period.	A
14	Patients should be able to book an appointment through the user portal.	B
15	Patients should be able to log in through the user portal.	B
16	Patients should be able to change basic information about themselves.	B
17	Patients should be able to pick up their prescription at the nearest pharmacy.	C
18	Doctors and nurses should be able to examine their patients.	C
19	Patients should be able to pay their bill.	C
20	Specialists should be able to take x-rays, blood work, etc.	C
21	Pharmacies should be able to give patients their medicine prescription.	C

Stakeholders

The first and most important thing that has to be done is discussing who would be using the system, and who would be associated with it. The stakeholders that were found relevant for this software system are as follows, in no particular order: patients; doctors; nurses; receptionists; specialists; administrators; the Ministry of Health; pharmacies.

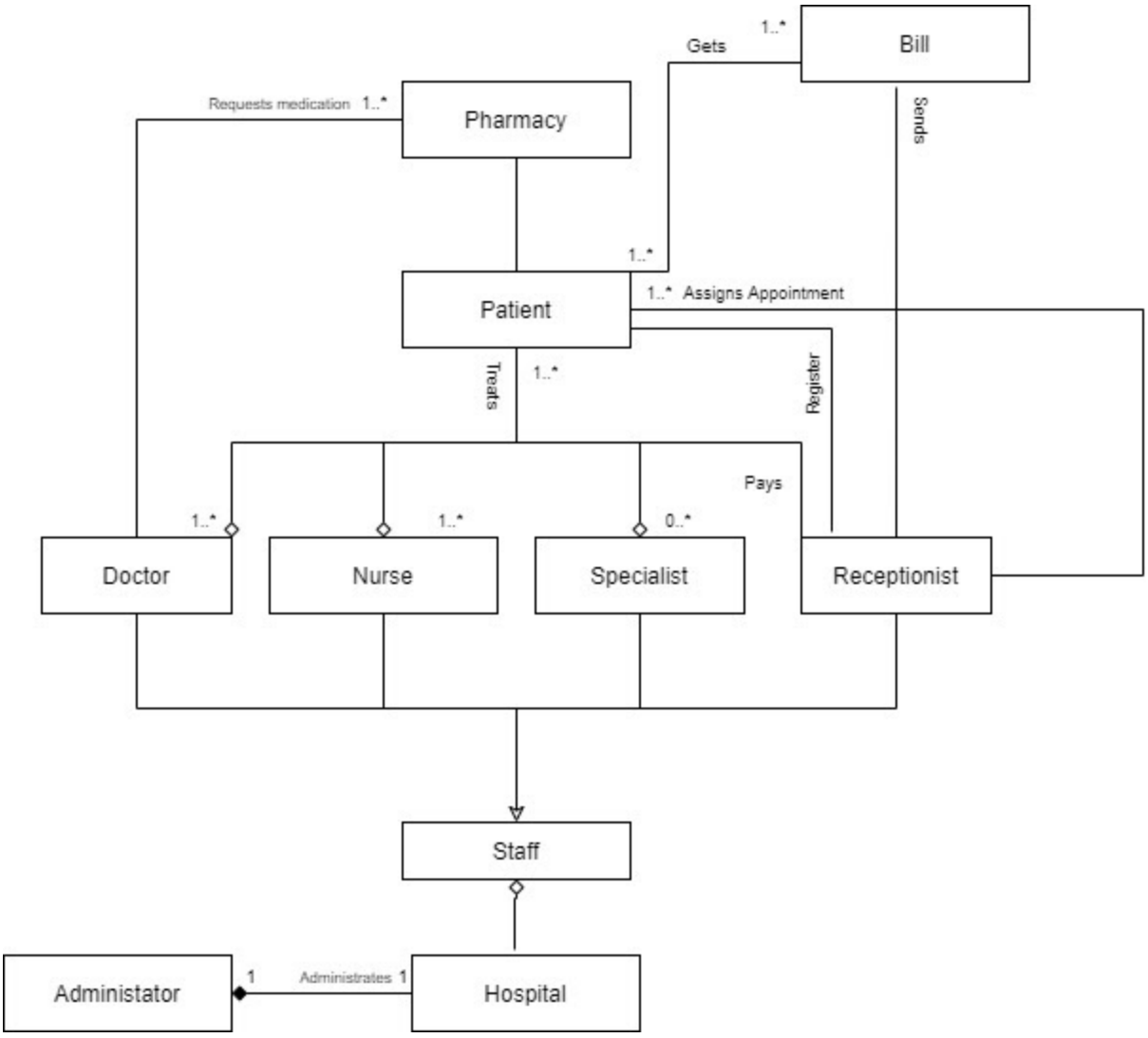
Inside of the hospital, the system will be used daily, by doctors, nurses and receptionists. The system will hold information about patients, staff members and their licenses, operations, appointments, both what patient has the appointment and which doctors and/or nurses are assigned to it, and much more. If time allows, the system will have a separate portal where a patient can sign in, see his information and book appointments. Similar to the system “Heilsuvera”. To avoid any miscommunication between patients and hospital staff, the patient should be able to change or update some basic information in the patient portal. For example, the patient should be able to choose whether he would like to be an organ donor, and this information should be available to all hospital staff. The patient should also be able to update his preferred name and pronouns to promote inclusion, as well as mention if his religion doesn’t allow certain medical practices/treatments, and so on. The system will also be used daily by specialists. This includes all sorts of staff members who interact with the system, like paramedics or staff members that for example take x-rays and need to use the system to make the x-rays available to doctors and nurses.

There are also stakeholders who are not in direct contact with the system or use the system daily that are still affected by it. Since doctors will need to be able to give a patient a prescription, pharmacies are an important stakeholder. A doctor needs to be able to prescribe medication that the patient can immediately collect at any pharmacy. For this to work, the system will need to communicate with the system that pharmacies use. Administrators are also important stakeholders in the system, although they might not use it daily. Administrators will need to have an overview of the inner workings of the hospitals to make sure that everything is done well and legally. The Ministry of Health is also a stakeholder, as they are affected by the system's functionality. The Ministry will be in contact with the administrators of the hospital and are thus affected in case the system doesn’t fully work for the administrators.

Domain Model

The Domain Model was created using the domain diagram creator Draw.io. The model was created based on the user stories that were created for this sprint and shows how the components of the system will interact with each other. Specialists include paramedics, medical technologist, X-ray technician, surgeons, anesthesiologist etc. Administrators here include the Ministry of Health. In future sprints the model is expected to change and grow even more.

Diagram 1



Scenarios

The following scenarios describe a typical, everyday interaction with the system. Here we have a scenario where a doctor needs to prescribe medicine to a patient, and a scenario where a new patient visits the hospital. There is both a written text of the scenario that explains the scenario in a single flow, and a table that shows the scenario step by step. This gives a good idea on how the system might be used.

Prescriptions

A doctor finishes an appointment with a patient. The patient has an infection, and the doctor needs to prescribe the patient with some antibiotics. In the beginning of the appointment the doctor used the system to view the patient's information by finding his profile. The doctor now views his profile to see if the patient has any allergies that would affect which antibiotics he should prescribe. The doctor then clicks a button on the patient's profile and depending on if or what allergies the patient has, creates a prescription for the patient that will immediately be sent to all pharmacies, allowing the patient to quickly pick up his medicine.

Table 2

Name	Patient receiving a prescription
Actors	Patient, doctor, pharmacy, the system
Precondition	A patient has an appointment with a doctor, and during the appointment the doctor determines that the patient has an infection.
Main success scenario	1. The doctor uses the system to see the patient's profile 2. The doctor sees that the patient has no known allergies 3. The doctor presses a button on the patient's profile 4. A window pops up for the doctor to create a prescription for the patient 5. The doctor prescribes the patients with antibiotics 6. The doctor confirms the prescription 7. All pharmacies can now access the information about this particular patient having this prescription
Secondary scenario:	1. The doctor uses the system to see the patient's profile 2. The doctor sees that the patient has an allergy 3. The doctor presses a button on the patient's profile 4. A window pops up for the doctor to create a prescription for the patient 5. The doctor prescribes the patients with antibiotics that will not cause an allergic reaction for the patient. 6. The doctor confirms the prescription 7. All pharmacies can now access the information about this particular patient having this prescription
Postcondition	The patient can go to any pharmacy to collect his prescription

A new patient

A patient comes into the hospital and wishes to see a doctor. This patient has never been treated at this hospital before. The receptionist checks the patient in by creating a new patient in the system and filling out all the relevant information in the system. This information includes the patient's full name, social security number, address, phone number, email address and allergies. After the patient has been created, the receptionist assigns the patient an appointment with a doctor and/or nurses, by seeing in the system which doctors and nurses are available.

Table 3

Name	A new patient
Actors	Patient, receptionist, the system
Precondition	A person that has not been treated at this hospital before wants to book an appointment with a doctor
Main success scenario	1. The receptionist is located at the home page of the system 2. The receptionist presses a button "Create new patient" 3. The receptionist fills out all important information: a. Full name b. Social security number c. Address d. Phone number e. Email address f. Allergies 4. The receptionist chooses "Create patient" 5. The receptionist assigns the new patient an appointment
Postcondition	The patient can now book appointments and the hospital staff can see his information and add to it.

Final words

This first sprint was a good premise to get acquainted with each other and set a strong foundation for building a good group. We feel comfortable making decisions together and have had no major conflicts in personalities or preference in how we want to work on this assignment. We will have meetings once or twice a week to keep this up and make sure to keep up good communication between the group members.

In this report we have put up a clear picture on who the stakeholders of the system are and how they will use it or are affected by it. We have gone over how the system will be set up, what the major functionalities of the system will be and who will use them. We hope that we will be able to implement everything we have in mind for the system and will work our hardest to make it work.

Overall, we are happy with how this assignment's first week went and are excited to apply what we have learned here in the coming weeks and in projects we work on in the future.