|  |
| --- |
| Software Engineering Project |
| Electronic Health Record System |
| Requirements Report |
|  |
|  |
|  |

**05120000238 – Murat Can ÜSTE**

**05120000251 – Nagihan KALAYCI**

**05130000247 – Bilge ULUSAY**

**Contents**

[1 Introduction 2](#_Toc467252339)

[1.1 Purpose of the Requirements Document 2](#_Toc467252340)

[1.2 Scope of the Product 2](#_Toc467252341)

[1.3 Definitions, Acronyms and Abbreviations 2](#_Toc467252342)

[1.3.1 Definitions 2](#_Toc467252343)

[1.3.2 Acronyms 2](#_Toc467252344)

[1.3.3 Abbreviations 2](#_Toc467252345)

[1.4 References 2](#_Toc467252346)

[2 Identification of Viewpoints 3](#_Toc467252347)

[2.1 Principal Viewpoints of the System 3](#_Toc467252348)

[2.1.1 Interactor Viewpoints 3](#_Toc467252349)

[2.1.2 Indirect Viewpoints 4](#_Toc467252350)

[2.1.3 Domain Viewpoints 4](#_Toc467252351)

[2.2 Viewpoint Hierarchy Diagram 5](#_Toc467252352)

[2.3 Requirements of each Viewpoint 5](#_Toc467252353)

[2.3.1 Requirements of the Interactor Viewpoints 5](#_Toc467252354)

[2.3.2 Requirements of the Indirect Viewpoints 6](#_Toc467252355)

[2.3.3 Requirements of the Domain Viewpoints 6](#_Toc467252356)

[3 Requirements Definition 7](#_Toc467252357)

[3.1 Functional Requirements 7](#_Toc467252358)

[3.2 Non-Functional Requirements 8](#_Toc467252359)

[3.3 Domain Requirements 8](#_Toc467252360)

[3.4 Volatile Requirements 8](#_Toc467252361)

[3.5 Enduring Requirements 8](#_Toc467252362)

[4 Requirements Interviews with Domain Experts 9](#_Toc467252363)

[5 Requirements Prioritization and Negotiation 10](#_Toc467252364)

[6 Requirements Traceability Matrix 11](#_Toc467252365)

[7 Use Cases of Main Scenarios 12](#_Toc467252366)

[8 Domain Model 13](#_Toc467252367)

# Introduction

## Purpose of the Requirements Document

This document contains the requirements of the *Electronic Health Record System.* It is written to allow people to understand *what* the EHRS should do.

In this document, we specify the viewpoints , stakeholders and the requirements of the *Electronic Health Record System* that will be implemented.

## Scope of the Product

The lately technological improvements in information technology (IT) have made a great impact on medical organizations. Today, health information systems are used in virtually every hospital. Health information technologies are used mainly to increase efficiency, quality of service and to reduce costs in hospitals.

*Electronic Health Record System* will provide the doctors and their staff with an electronic copy of the patient file. Personal information and medical information about the patient will be stored and managed by the system. Medical information may consist of any health related information related to a patient. Some important medical information the system supports can be listed as examinations, patient stories, symptoms, tests (blood, urine, etc.), diagnosis, treatments and prescribed medications. The system will also be able to assist physicians in diagnosing and treating a patient by providing diagnosis and treatment recommendations according to the provided information, remind patients of an upcoming event (any appointment, periodic check-up, periodic test, etc.) by sending emails or notifications and track information for billing purposes.

## Definitions, Acronyms and Abbreviations

### Definitions

* **Medical Science:** A broad term that covers such areas as biochemistry, molecular biology, medicinal chemistry, microbiology, neuroscience, physiology, nutrition, pharmacology, toxicology, vision science and biomedical technology.
* **Medical Record/Data:** The systematic documentations of a single patient’s medical history and care across time within one particular health care provider’s jurisdiction.
* **Drug Data:** Information on drugs and drug targets.

### Acronyms

* **EHRS:** Electronic Health Record System

### Abbreviations

## References

[1] Sommerville, Ian. 2010. *Software Engineering*. 9th ed. Pearson.

# Identification of Viewpoints

## Principal Viewpoints of the System

### Interactor Viewpoints

#### Users

|  |  |
| --- | --- |
| Viewpoint | Description |
| Doctor | Doctors who are responsible for assessing and treating patients. |
| Patient | Patients whose information is recorded in the system. |
| Nurse | Nurses who coordinate the consultations with doctors and administer some treatments. |
| Pharmacist | Pharmacists responsible for the dispensing of prescriptions, also the purchase, manufacture and quality testing of all medicines used in a hospital. |
| Laboratory | Hospital laboratories where tests are done on clinical specimens in order to obtain information about the health of a patient as pertaining to the diagnosis, treatment, and prevention of diesease. |
| Health Technician | Healthcare technicians who are responsible of assisting medical staff complete tasks around their assigned unit or clinic's and accommodate patient needs. |
| Hospital Kitchen | Hospital kitchen staff who provide meals to inpatients as per the instructions of the dieticians and physicians. |
| Registration and Admission | Medical receptionists who manage patients’ appointments and registration. |
| Accounting | Accounting Employees who are responsible for accumulating and reporting on financial information about the performance, financial position, and cash flows of the hospital |

#### System Staff

|  |  |
| --- | --- |
| Viewpoint | Description |
| System Administrator | System administrators who are responsible fort the upkeep, configuration, and reliable operation of the system. |
| IT Employee | IT staff who are responsible for installing and maintaining the system related hardware/software. |

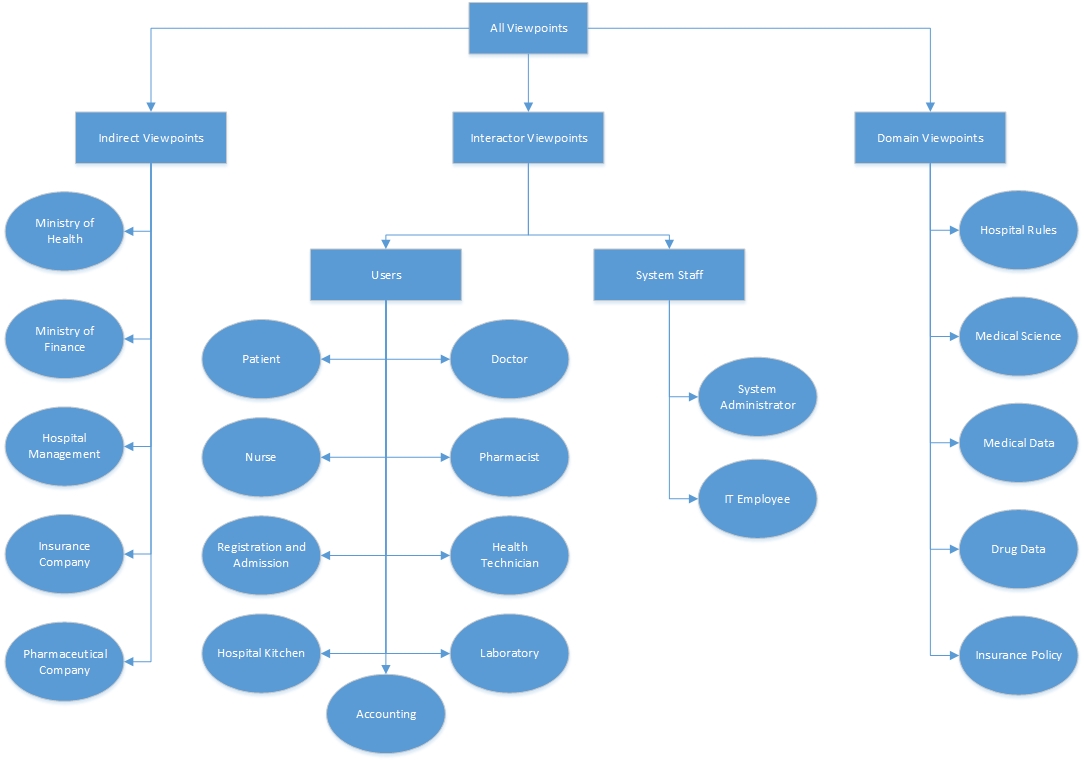
### Indirect Viewpoints

|  |  |
| --- | --- |
| Viewpoint | Description |
| Hospital Management | Healthcare managers who obtain management information from the system. |
| Ministry of Health | Ensures that all organisations and institutions that produce health goods and services conform to standards of safety by setting policies, goals, regulations. |
| Ministry of Finance | Responsible for goverment finances, economic policy and financial regulations. |
| Insurance Company | Insurance companies which sell life insurance, annuities and pensions product. |
| Pharmaceutical Company | Pharmaceutical companies which discovers, develops, produces, and markets drugs or pharmaceuticals for use as medications. |

### Domain Viewpoints

|  |  |
| --- | --- |
| Viewpoint | Description |
| Hostpital Rules | Hospital rules and regulations affecting patient care and conduct. |
| Medical Science | Requirements and constraints related to medical science. |
| Medical Data | Requirements and constraints related to compiling and maintaning medical data. |
| Drug Data | Detailed drug data with comprehensive drug target information is needed for the system. |
| Insurance Policy | Domain requirements and constraints related to insurance policies. |

## Viewpoint Hierarchy Diagram



## Requirements of each Viewpoint

### Requirements of the Interactor Viewpoints

|  |  |
| --- | --- |
| Viewpoint | Requirements |
| Doctor | Manage patients medical info, prescriptions, appointments and admissions. |
| Get diagnosis and treatment recommendations from the system. |
| Patient | Book appointments. |
| View his/her own medical info, prescriptions, appointments, admissions. |
| Get notifications about upcoming events.(appointments, check-ups, etc.) |
| Nurse | View and update patients medical information. |
| View patient prescriptions. |
| Pharmacist | View patient prescriptions. |
| Manage medical item stocks. |
| Laboratory | View patient info. |
| Add and update laboratory results. |
| Health Technician | View and update patients medical information. |
| Hospital Kitchen | View patients medical info. |
| View patients admission info. |
| Registration and Admission | Manage patients appointments and admissions. |
| Accounting | View patients information and the operations, treatments done on them for billing purposes. |
| View hospitals stocks, purchase history, employee informations for keeping account of its finance. |
| System Administrator | Manage the system. |
| IT Employee | Install required hardware/software to appropriate places in the hospital. |

### Requirements of the Indirect Viewpoints

|  |  |
| --- | --- |
| Viewpoint | Requirements |
| Hospital Management | Manage the hospital employees. |
| Determine rules and regulations related to the hospital. |
| Ministry of Health | Ensures that the hospital and the system conform the standarts of safety. |
| Ministry of Finance | Ensures that the hospital and the system abide by the goverment finances, economic policy and financial regulations. |
| Insurence Companies | Specifies different insurance policies for the patients that the system should know of. |
| Pharmaceutical Company | Publish drug/medicine information that the system should know of. |
| Works with the hospitals for contracts about drugs/medicines that the hospital will use. |

### Requirements of the Domain Viewpoints

|  |  |
| --- | --- |
| Viewpoint | Requirements |
| Hospital Rules | Specific domain requirements related to hospital rules and regulations that the system should comply with. |
| Medical Science | Requirements and constraints related to the medical science that the system should comply with. |
| Medical Data | System should comply with the standarts of keeping medical data. |
| Drug Data | System should comply with the standarts of drug/medicine data. |
| Insurance Policy | System should be able to behave according to different policies when doing operations related to billing processes. |

# Requirements Definition

## Functional Requirements

|  |  |  |
| --- | --- | --- |
| Stakeholder | Id | Requirement |
| System |  | System shall generate profile of each person who is a citizen of that country. |
|  | System send e-mail and message to patient to remind her/his appointment |
|  | System send e-mail and message to patient every three months to remind her/his regular check-up |
|  | System send e-mail and message to patient every months to remind her/his regular tests. |
|  | System shall send inpatients medical information and dieatry list to the hospital kitchen. |
|  | System should alert to doctor about compliance with medaication of patient when he/she decides the treatment. |
|  | System should be able to give diagnosis and treatment recommendations to doctor. |
| Doctor (User) |  | Doctor should be able to manage (view/add/update) patients medical information. |
|  | Doctor should be able to manage (view/add/update) patients prescriptions. |
|  | Doctor should be able request patients admission and discharge to/from the hospital. |
| Patient (User) |  | Patient should be able to get an appointment from the system online. |
|  | Patient should be able to view his/her appointments from the system online |
|  | Patient should be able to view his/her prescriptions online. |
|  | Patient should be able to view his/her medical information online.(such as laboratory results) |
| Nurse (User) |  | Nurse should be able to view patients medical information. |
|  | Nurse should be able to update patients medical information. |
|  | Nurse should be able to view patients prescriptions. |
| Pharmacist (User) |  | Pharmacist shall be able to get patient's medication information records page with patient identity number. |
|  | Pharmacist should be able to view patients prescriptions. |
|  | Pharmacist should be able to view hospitals drug/medicine stocks. |
| Laboratory Worker (User) |  | Laboratory workers should be able view patients information. |
|  | Laboratory workers should be able to manage laboratory results of the patients. |
| Health Technician (User) |  | Health Technician should be able view patients medical information. |
|  | Health Technician should be able to update patients medical information. |
| Hospital Kitchen Worker (User) |  | Hospital kitchen workers should be able view patients medical information and dietary list. |
|  | Hospital kitchen workers should be able to view patients admission information. |
| Registration and Admission (Medical Receptionist – User) |  | Medical receptionist shall be able to search the appointments list when patient call for making appointment |
|  | Medical receptionist should be able to manage patients appointments and admissions. |

|  |  |  |
| --- | --- | --- |
| Accounting |  | Accountant should be able to view the list of operations and treatments done on the patient as well as patients admission information. |
|  | Accountant should be able to view hospitals stocks and purchase history. |
|  | Accountant should be able to view employee informations. |
| System Administrator |  |  |
| IT Employee |  |  |

## Non-Functional Requirements

|  |  |  |
| --- | --- | --- |
| Category | Id | Requirement |
| Organizational Requirement |  | Users of system shall authenticate themselves using their identity number. |
|  | System shall designate identity number in ways that first three digit defining user's role. |
| Product Requirement |  | Flexible integration with a wide range of external entities |
|  | Interface shall implement device independent. |
| External Requirement |  | System shall be available to all users during daytime. Downtime shall not exceed 10 seconds in any one day. |
|  | System has to direct integration with diagnostic & other clinical equipment . |
|  | System has to e-prescribing with full interaction checks and alerts. |

## Domain Requirements

|  |  |
| --- | --- |
| Id | Requirement |
|  | Special drugs and prescription types that defined by Ministry of Health (Green Prescription, Red Prescription etc.) |
|  | Ministry of Health specifies prescription expire dates |
|  | Insurance discount must be considered while preparing the prescription total. |

## Volatile Requirements

|  |  |
| --- | --- |
| Id | Requirement |
|  | User permissions may change. (Must be editable by maintenance engineer.) |
|  | Prescription types may change (green, red etc.) |
|  | Changes of screen resolution |
|  | Hardware changes (for example: If server hard drive capability comes short) |

## Enduring Requirements

|  |  |
| --- | --- |
| Id | Requirement |
|  | Doctors add prescriptions |
|  | Pharmacists view and approve prescriptions |
|  | Stock listing ,stock decrementing |

# Requirements Interviews with Domain Experts

In this part, we list the requirements taken from domain experts during an interview with them.

|  |  |  |
| --- | --- | --- |
| Name : | |  |
| Job : | |  |
| Telephone : | |  |
| Email : | |  |
| **Id** | **Requirement** | |
|  | System shall send informative e-mail for pregnant woman for her and baby health. | |
|  | System shall alert to mother for vaccine time of her baby. | |
|  | System shall alert to cancerous patient who has to come for check-up every year,every two year and every five year. | |
|  | System shall alert to each woman for breast cancer tests every six months. | |

|  |  |  |
| --- | --- | --- |
| Name : | | Nurşen ÜSTE |
| Job : | | Nurse |
| Telephone : | | +90 507 205 55 81 |
| Email : | | - |
| **Id** | **Requirement** | |
|  |  | |
|  |  | |
|  |  | |
|  |  | |

# Requirements Prioritization and Negotiation

# Requirements Traceability Matrix

# Use Cases of Main Scenarios

|  |  |  |
| --- | --- | --- |
| Id : |  | |
| Title : |  | |
| Description : |  | |
| Primary Actor : | |  |
| Stakeholders and Interests : | | * ***<stakeholder> : <interest>*** * ***<stakeholder> : <interest>*** |
| Preconditions : | | * … |
| Success Guarantee (Postconditions) : | | * … |
| Main Success Scenario : | | 1. … 2. … 3. … |
| Alternative Flows : | | *<alternative scenario step><letter symbol incrementing from a>. <reason>*   1. *<steps>* 2. *…*   *<alternative scenario step><letter symbol incrementing from a>. <reason>*   1. *<steps>* |
| Exceptions : | | **…** |
| Special Requirements : | | * **…** * **…** |

# Domain Model