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| **Software Requirement Specifications**  ***[Project Title]***  ***Version: [xx.xx]***   |  |  | | --- | --- | | Project Code |  | | Supervisor |  | | Co Supervisor |  | |  |  | | Project Team |  | | Submission Date |  | |

[Instructions]

* No section of template should be deleted. You can write ‘Not applicable’ if a section is not applicable to your project. But all sections must exist in the final document.
* All comments/examples mentioned in square brackets ([]) are in the template for explanation purposes and must be replaced / removed in final document.
* This’ Instruction’ section should also be removed in final document.
* MS-Word Reviewing feature must be used to get the document reviewed by supervisors or co-supervisors.

Document History

[Revision history will be maintained to keep a track of changes done by anyone in the document.]

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| --- | --- | --- | --- |
| **Version** | **Name of Person** | **Date** | **Description of change** |
|  |  |  | [e.g. Document Created] |
|  |  |  | [Added Non-functional requirements] |
|  |  |  | [Added UseCase x.x.xx] |
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Distribution List

[Following table will contain list of people whom the document will be distributed after every sign-off]

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| **Name** | **Role** | |
|  | | Supervisor |
|  | | Co- Supervisor |
|  | |  |

Document Sign-Off

[Following table will contain sign-off details of document. Once the document is prepared and revised, this should be signed-off by the sign-off authority.

Any subsequent changes in the document after the first sign-off should again get a formal sign-off by the authorities.]

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| **Version** | **Sign-off Authority** | **Sign-off Date** |
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**Table of Contents**

*[1.](#_30j0zll)**Introduction 7*

[1.1.](#_3znysh7) Purpose of Document 7

[1.2.](#_2et92p0) Intended Audience 7  
1.3 Abbreviations ………………………………………………………………………………………...7

[1.4.](#_tyjcwt) Document Convention 7

*[2.](#_3dy6vkm)**Overall System Description 8*

[2.1.](#_1t3h5sf) Project Background 8

[2.2.](#_4d34og8) Project Scope 8

[2.3.](#_2s8eyo1) Not In Scope 8

[2.4.](#_17dp8vu) Project Objectives 8

[2.5.](#_3rdcrjn) Stakeholders 8

[2.6.](#_26in1rg) Operating Environment 8

[2.7.](#_35nkun2) System Constraints 8

[2.8.](#_1ksv4uv) Assumptions & Dependencies 8

*[3.](#_2jxsxqh)**External Interface Requirements 9*

[3.1.](#_z337ya) Hardware Interfaces 9

[3.2.](#_3j2qqm3) Software Interfaces 9

[3.3.](#_1y810tw) Communications Interfaces 9

*[4.](#_4i7ojhp)**Functional Requirements 10*

*[4.1.](#_2xcytpi)**Functional Hierarchy 10*

[4.2.](#_1ci93xb) Use Cases 10

[4.2.1.](#_3whwml4) [Title of use case] 10

*[5.](#_2bn6wsx)**Non-functional Requirements 11*

[5.1.](#_qsh70q) Performance Requirements 11

[5.2.](#_3as4poj) Safety Requirements 11

[5.3.](#_1pxezwc) Security Requirements 11

[5.4.](#_49x2ik5) User Documentation 11

*[6.](#_147n2zr)**References 12*

*[7.](#_3o7alnk)**Appendices 13*

1. ***Introduction***

* 1. ***Purpose of Document***

The purpose of the document is to collect and analyze all assorted ideas that have come up to define the system, its requirements with respect to consumers. Also, we shall predict and sort out how we hope this product will be used in order to gain a better understanding of the project, outline concepts that may be developed later, and document ideas that are being considered, but may be discarded as the product develops.In short, the purpose of this SRS document is to provide a detailed overview of our software product, its parameters and goals. This document describes the project's target audience and its user interface, hardware and software requirements.

* 1. ***Intended Audience***

The purpose of this document is to give a detailed description of the requirements for our Final year Project. It will illustrate the purpose, scope and complete description for the development of system. It will also explain external interface requirements and system requirements as well as non-functional requirements. This document is primarily intended to be proposed to a customer for its approval and also for further processing such as additions to be developed in later releases.Customers/hospitals can refer to section 3 and 4 for the list of requirements implemented in Version final. .This document will also be used as a reference for developing and testing Version final

**1.3 Abbreviations**

[Describe the abbreviations use this document.]

* 1. ***Document Convention***

Throughout this document, All the user entities are written in capitalizations i.e., first

letter as capital. Also, any significant term which has been described in the glossary is

made bold and italic in the text. On the other hand, those terms which are significant (but

not described in glossary) are bold in text.The document is prepared using Microsoft Word 2020 and has used the font type 'Arial'. The fixed font size that has been used to type this

document is 10pt and for headings 12pt with 1 linespacing

1. ***Overall System Description***
   1. ***Project Background***

Blockchain is also used in the healthcare management system for effective maintenance of electronic health and medical records. The technology ensures security, privacy, and immutability. This work proposes a framework by integrating the blockchain and Federated Deep Learning in order to provide a tailored recommendation system.Electronic medical records contain personal and confidential information that traditional storage methods must protect against cyberattacks and third-party authentication. To overcome this challenge, a method of distributed storage was proposed in this work. The focus of this work is also on making treatment recommendations to patients by comparing their medical records with historical data. This work is motivated by the limitations of existing work. The current study supports his EHR preservation, but the recommendation system is neither discussed nor incorporated, making it difficult to create a treatment recommendation system. Federated learning may therefore lead to more accurate treatment recommendations.

* 1. ***Project Scope***

Primarily, the scope of our final year project is limited.We will be limiting our scope to the medical sectors where a patient data will be recorded on our system and by means of recording we will be using that data only to train our machine learning model.We will be using the concept of federated Learning Through Federated learning, multiple organizations or institutions work together to solve a machine-learning problem under the coordination of a central server or service provide.. Thus, a deep-learning model is maintained and improved upon within a central server. The model is trained by distributing itself to hospitals which allows these sites to keep their data localized. Data from each collaborator is never exchanged or transferred during training. Instead of bringing the data to the central server, as in conventional deep learning, the central server maintains a global shared model, which is disseminated to all institutions. Each entity subsequently maintains a separate model based on its own patients’ data. Thereafter, each center provides feedback to the server based on its individually trained model—either by its weight or the error gradient of the model. The central server aggregates the feedback from all participants, and based on predefined criteria, updates the global model. The predefined criteria allow the model to evaluate the quality of the feedback and therefore to only incorporate that which is value-adding. The feedback from centers with adverse or strange results can thus be ignored. This process forms one round of federated learning, and it is iterated until the global model is trained.

* 1. ***Not In Scope***

We will be only targetting one/two disease for the recommendation and it will running on local environment not globally deployed . It will be on private blockchain and only people who are connected will have the feasibility to connect to it

* 1. ***Project Objectives***

[This section will describe the objectives of project that how it is going to address the problem\opportunity identified in business environment and what would be the end result of project.]

* 1. ***Stakeholders***

[This section will describe stakeholders of the system. This will include different business user classes that are expected to interact with system and similarly the technical people who are going to be involved in software development/management]

* 1. ***Operating Environment***

[Describe the environment in which the software will operate, including the hardware platform, operating system, network environment and other software components or applications with which it must coexist.]

* 1. ***System Constraints***

[Describe the constraints imposed on the system by the external environment. External environment may be caused by the stakeholders, business conditions, technical issues, academic requirements etc and may include the following:

* Software constraints
* Hardware constraints
* Cultural constraints (includes language etc.)
* Legal constraints
* Environmental constraints (e.g., the environment where the software will be installed, It could be a noisy environment, which may require that there is no sound event in the project).
* User constraints (e.g., the project is developed for children, so it may be required that the project has more graphic controls rather than textual controls).
* Off the shelf components that might be used in the project may have their constraints that are consequently transferred to the project.]
  1. ***Assumptions & Dependencies***

[This section will identify:

* Any assumptions taken regarding the system or environment
* Any dependency of system on any external factor.]

1. ***External Interface Requirements***

[This section is intended to specify any requirements that ensure that the new system will connect properly to external components. Place a context diagram showing the external interfaces at a high level of abstraction.]

* 1. ***Hardware Interfaces***

[Describe the characteristics of each interface between the software and hardware components of the system. This description might include the supported device types, the nature of the data and control interactions between the software and the hardware.]

* 1. ***Software Interfaces***

[Describe the connections between this system and other external software components (identified by name and version), including databases, operating systems, tools, libraries, and integrated commercial components. Identify and describe the purpose of the data items or messages exchanged among the software components. Describe the services needed and the nature of the inter-component communications. Identify data that will be shared across software components. ]

* 1. ***Communications Interfaces***

[Describe the requirements associated with any communication functions the system will use, including e-mail, web browser, network communications standards or protocols, electronic forms, and so on. Define any pertinent message formatting. Specify communication security or encryption issues, data transfer rates, and synchronization mechanisms.]

1. ***Functional Requirements***
   1. ***Functional Hierarchy***

[This section will give a big picture of overall system functionality. The main modules/features of system and their sub-functions will be described here in the form of a functional hierarchy so that, before getting into the use case, audience could grab the idea of overall system functions.]

* 1. ***Use Cases***
     1. ***[Title of use case]***

[Use Case Diagram]

[Use Case Description]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **<Use case Id: name>** | | | | |
| **Use case Id:** | | Write use case reference number. | | |
| **Actors:**  <List of actors (external agents), indicating who initiated the use case> | | | | |
| **Feature:** <Feature from which the use case is driven> | | | | |
| **Pre-condition:** | | <List the assumptions required before this Use Case can be executed. > | | |
| **Scenarios** | | | | |
| **Step#** | **Action** | | | **Software Reaction** |
| **1.** | Numbered actions of the actors | | | Numbered description of system responses |
| **2.** |  | | |  |
|  |  | | |  |
| **Alternate Scenarios:** Write additional, optional, branching or iterative steps. Refer to specific action number to ensure understandability. | | | | |
| **1a:**    **2a:** | | | | |
| **Post Conditions** | | | | |
| **Step#** | **Description** | | | |
|  | Sequentially list conditions expected at the completion of the use case. | | | |
|  |  | | | |
|  |  | | | |
| **Use Case Cross referenced** | | | <Related use cases, which use or are used by this use case> | |

1. ***Non-functional Requirements***
   1. ***Performance Requirements***

[The performance characteristics of the system that are required by the business should be outlined in this section. Performance characteristics include the speed, precision, concurrency, capacity, safety, and reliability of the software. These characteristics define the performance of the project.]

* 1. ***Safety Requirements***

[Specify the requirements that are concerned with possible loss, damage, or harm that could result from the use of the system. Define any safeguards or actions that must be taken, as well as potentially dangerous actions that must be prevented. Identify any safety certifications, policies, or regulations to which the system must conform.]

* 1. ***Security Requirements***

[Specify any requirements regarding security, integrity, or privacy issues that affect the use of the system and protection of the data used or created by the system. Define all user authentication or authorization requirements, if any. Identify any security or privacy policies or certifications the system must satisfy.]

* 1. ***User Documentation***

[List the user documentation components that will be delivered along with the software, such as user manuals, online help, context-sensitive help and tutorials.]

1. ***References***

[This section should provide a complete list of all documents referenced at specific point in time. Each document should be identified by title, report number (if applicable), date, and publishing organization. Specify the sources from which the references can be obtained. (This section is like the bibliography in a published book).]

1. ***Appendices***

[This section should include supporting detail that would be too distracting to include in the main body of the document.]