Module 5- Computer Systems (2021-22)
Project

UNIVERSITY OF TWENTE.

Requirement Analysis Document Template

Project Name:	**Team Members:**
Team ID:	**Mentor(s):**

Instructions:

A. All the sections should be written in a clear, concise, and understandable way.
B. You must fill in the basic information about your projects such as Project Name, Team Members, Team ID, and Mentor(s).
C. Make sure to consider the checklist of the Requirement Analysis phase provided in the Security by Design document.
D. The length of the document should be between 4-10 pages.

1. Introduction

There are several existing applications that you can select as a base for your project. In this section, you need to give a small background of already existing applications. In case an existing application is chosen you need to give **at least 2 new features** and include these in the requirements.

The following points are introduced to get to know the purpose of your application, limitations of the existing system on which your project is based, etc.

1.1. **Purpose**:

You should know the purpose of creating your application. Write the reason for selecting this project by mentioning the usefulness, quality, etc. of the system.

For example:

"The project namely IOT based home automation system is selected for the following reasons:

- *This can digitally monitor and control the home devices such as electronic appliances, light systems, etc., from a remote location using smartphones/tablets. You have to just connect to the internet.*
- *This can be used for safety and security purposes by including the access control feature and the alarm systems in a front door.*
- *This……"*

1.2. **Limitations of the current system(If any)**:

List down the limitations of the currently existing similar systems.

For example:

"The current limitations of already existing smart home automation system are

- *The web interface is not user-friendly.*
- *The synchronization issue, if connecting with different IoT devices at the same time.*
- *The network connectivity problem.*
- *a lot of energy/power consumption.*

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- *no decision-making capability.*
- *....”*

1.3. **Intended Audience**

Write about the targeted audience who can have access to your product or the documents. **For example** *users/stakeholders (Mentor, Project Coordinator, Module Coordinator, Any specific User(s), etc.)*

1.4. **Define SMART Goals**:

This section is used to list down the target/expected results from the project. All the goals should be written in a SMART (Specific + Measurable + Attainable + Relevant + Time-bound) way.

For example

“The goals for the project IoT based smart home system are as follows:

Specific (What)	Measurable (Up to)	Attainable (How)	Relevant (Why)	Time-bound (when)
*1. To improve the **efficiency** of the system by having a user-friendly web interface.*	*To evaluate success rate/errors for improving the system.*	*To test the system with the improved web interface.*	*To ensure within the team the success of the system regarding the web interface.*	*To finish the task between Week 4-Week 5.*
*2. To improve the **productivity** of the system by adding sensors such as door and window sensor, motion sensor, light sensor, temperature sensor, etc. for controlling the devices.*				
*3. To improve the **quality** of the system…*				

*4. To improve the **security** of the system…*				

1.5. **Scope:** This section is required to write about the important resources to achieve the goals of your system. The technology used to develop your project (methods/algorithms, software requirements, hardware requirements), the duration of the project, and the project constraints should be included here. The project constraints can be any technical hiccups, lack of resources, internal and external conditions (boundary conditions), etc. that can help further to avoid the related problems in the future during execution. In short, you can utilize this section to write about the limitations and boundaries of your project.

For example

- *"System boundaries (Software and hardware):*
  - *Software: MQTT server to manage the flow of data between IoT devices, Mobile applications, Python language, HTML, PHP, Algorithms used, etc.*
  - *Hardware: Raspberry Pi 4, Sensors, Power supply, USB web camera, etc.*
- *Interfaces: To name a few such as the Internet via WiFi, backup methods such as 4G hotspot, etc.*
- *Limitations:*
  - *This project can only monitor and control the lights of a home.*
  - *This project can only control the 'n' IoT devices at a time.*
  - *…"*

2. **Product features:**

This section describes the functionality that you want to have in your product such as the components used for the application and its functionality, appearance, performance in terms of speed/time, etc. You can specify them in the form of functional and non-functional requirements. A minimum number of 7 requirements (9 in case of selecting an existing application) is to be expected for your application. That includes functional as well as non-functional requirements cumulatively. However, it is highly probable that you will need more than the minimum amount to fully cover all the requirements.

2.1 **Functional requirements:**

Write the requirements that are directly connected with the functionality of the application.

For example,

*i) "The functional requirements of a **smart home automation system** are:*

- *The system should give the option to the user to select the mode between cloud and stand-alone.*

- *The system should allow users to control and monitor their home devices using smartphones/tablets.*
- *The system should...*
- *The system should... "*

*ii) "The functional requirements of a **simple calculator** are:*

- *The system/product should perform all the arithmetic operations according to the given keys.*
- *The system/product should have the On/Off button to switch on or switch off the calculator.*
- *The system should ..."*

2.2 **Nonfunctional requirements:**

Write the requirements that are not the specific actions for your application but improve the quality of the system. This can be related to the storage capacity, performance requirements, Security requirements (Refer to the checklist given in SBD document-Phase 1), etc.

For example:

*"The nonfunctional requirements of a **smart home automation system** are:*

- *The system should perform user authentication [1]**(Security requirement).***
- *The system should give control of the smart devices to the authorized user **(Security requirement).***
- *The system should be able to monitor the average latency between the gateway and the devices.*
- *The system should…"*

*"The nonfunctional requirements of a **simple calculator** are:*

- *The layout for the keys should not exceed more space than the layout of the calculator.*
- *The system should be able to work with a minimum of 10 digits.*
- *The system should not exceed the specified memory range.*
- *The system should complete the arithmetic operation computation within t milliseconds.*
- *To access the application, one should require authentication. [1]**(Security requirement).***
- ***…"***

3. **Conclusion:** You should write the concluding remarks here. You can do this by **highlighting noteworthy design decisions and challenges** for the next phase that you recognized.

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4. **Reference**: List the existing literature (documents/articles/blogs/research papers) references you have considered for finalizing the project idea.

[1]**Note:** ***The security requirements should be mapped with the SBD requirement analysis (phase 1) checklist. You are free to write the security requirements in the form of a user story/abuse case.***