Module 5- Computer Systems
(2022-23)
Project

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Requirement Analysis Document Template

Project Name: PSec (Portable Security)	**Team Members: Thijs Frauenfelder, Katy Radzkova, Ayolt ten Have, Victor Zugravu, Frank Bosman, Mikus Vancans**
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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 4-8 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.

- *The project - PSec - is a portable security system based on motion detection through the use of a camera as well as motion sensors as well as sound detection. This idea was chosen for the following reasons:*
  - *the security and safety of personal space and items has always been a primary concern for a majority of people.*
  - *a portable security camera with such features would be a perfect solution to ensure the safety of users no matter if in their home or in a temporary place of stay.*
  - *the product allows for quick and easy control of what is happening via a live stream and allows the performing of necessary actions such as intervention or the seeking of help as quickly as possible.*

Generally, a portable and small security system for any situation with a quick and

painless setup brings more opportunities to secure various things and places and would allow many users to keep their peace of mind from any location.

1.2. **Limitations of the current system(If any)**:
List down the limitations of the currently existing similar systems.

The current limitations of already existing home security systems are:

- *The web interface is not user-friendly.*
- *The network connectivity problem.*
- *Absence or poor quality of the video stream*
- *Delayed security alert notifications*
- *Lack of portability*

1.3. **Intended Audience**
Write about the targeted audience who can have access to your product or the documents.

The Team, Mentors, Project coordinators, Security and Insurance companies, Commercial owners, and anyone who is interested in securing their personal space would be a suitable candidate for our product. Safety of oneself as well as their belongings and home is generally an important requirement for all.

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 home security system are as follows:

Specific (What)	Measurable (Up to)	Attainable (How)	Relevant (Why)	Time-bound (when)
*1. To improve the **efficiency and responsiveness** 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 5-Week 6.*

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*2. To improve the **productivity** of the system by adding motion and sound sensors for monitoring the private space*	*To reach the highest rate of security by maximising the accuracy of motion detection and quality of streaming image/sound*	*To connect necessary devices with the web app and test the system on the accuracy*	*To ensure the personal home space remains private.*	*To establish a working system with pleasant results by Week 4-5*

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*3. To minimize the streaming **delays** of live stream videos of personal space*	*To achieve the least amount of time delay by using a more capable device.*	*By hosting the processing part of the video on a separate and more capable computer.*	*To ensure the user has an accurate view of what is happening in their home.*	*To finish the task between Week 5-Week7*
*4. To improve the **security** of the system by use of authorization and authentication.*	*To evaluate the success of improving the security by using authentication and authorization.*	*By use of a login system on the web page and a keypad, the system will be secured.*	*Security is a very important part of a system…*	*Security is relevant for the whole process until the release of the final product.*

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.

- **System boundaries:**
  - **Software: WEB server, SQL server (database),**
  - **Hardware: Raspberry Pi 4, webcamera, Microphone, Keypad, small display, Powersupply, Motion sensor…**
- Interfaces:
  - Internet through ethernet
  - Wifi as a backup for ethernet
  - Camera connector on Raspberry Pi for the camera
  - USB stick for extra video storage
- Limitations:
  - This project can only support one camera at a time
  - This project can only detect motion and sound and not identify an object caused “motion”
  - This project does not record videos to be saved but captures the picture in terms of a security alert

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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, non-functional as well as security requirements cumulatively. However, it is highly probable that you will need more than the minimum amount to fully cover all the requirements.

While listing your requirements, you are also required to assign the level of priority to the requirements, as done in the examples below. The priority levels are: High **[H]**, Medium **[M]** and Low **[L]**.

Note: that **at least 2** should be Security Requirements.

A. **Functional requirements:** Write the requirements that are directly connected with the functionality of the application.

– *i) "The functional requirements of a **Portable home security system** are:*
  - [**H**]The system should allow users to monitor their secured space using smartphones/tablets.
  - *[**M**]The system should send an alert notification when motion/voice is detected in the secured space*
  - *[**L**]The system should live stream the monitored space with minimum delay*
  - *The system should detect motion with respectful sensors*

B. 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.

– *"The nonfunctional requirements of a **portable home security system** are:*
  - *[**L**]The system should live stream the monitored space at least 90% of the time*
  - [**M**] The video stream/clips should be in a reasonable quality corresponding to the monitored area
  - [**M**]The storage capacity is limited to the 10 most recent pictures/sounds recorded
  - [**M**]The usage of the device and its software should be user friendly

C. Security requirements:

Write the requirements that are the security requirements of your application (Refer to the checklist given in SBD document-Phase 1), etc.

– *i) "The security requirements of a **portable home security system** are:*
  - [**M**] The system should perform user authentication.
  - [**H**] The system should give control of the space monitoring to the authorized

user.

- [**H**]The system should allow access to the locked spaces only by authorization with password/keycode
- [**M**]The system should allow alert notification only to authorized users

Note: You are recommended to use the given priorities to produce a plan for your sprints such that you are able to deliver an **MVP** by the end of **Sprint 3**.

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.

   To conclude, we believe there is a big market for products designed to provide security and protection as these are things most people are concerned about. The portability of our design allows for the product to be used in many different situations - it is not meant for only permanent installation at home but its versatility allows for it to be used when away from home.

   The combination of motion sensing through video processing as well as an actual motion sensor allows any movement to be detected - whether in light or darkness. Sound detection by a microphone adds another layer of safety to the system. This combination makes sure that nothing will go unnoticed by Psec.

   The user-friendly interface allows users to effortlessly check their homes and alter any settings from anywhere they want. Additionally, the authentication and authorisation security measures will make sure the system does not become compromised and that you do not lose control of the system.

   All this together, combines into a product which allows the user to feel safe and protected wherever they are.

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.***