



# ***REQUIREMENTS SPECIFICATIONS DOCUMENT***

**FACULTY OF ECONOMICS AND ADMINISTRATIVE SCIENCE  
BUSINESS INFORMATICS**

**CEN 302- SOFTWARE ENGINEERING**

**Tiranë  
April 2019**

Software Documentation by:

Alisa Doçi ( [adoci16@epoka.edu.al](mailto:adoci16@epoka.edu.al) )

Amelia Bullari ( [abullari16@epoka.edu.al](mailto:abullari16@epoka.edu.al) )

Besnik Sulmataj ( [bsulmataj16@epoka.edu.al](mailto:bsulmataj16@epoka.edu.al) )

Klaus Çepani ( [kcepani16@epoka.edu.al](mailto:kcepani16@epoka.edu.al) )

Klementina Idrizi ( [kidrizi16@epoka.edu.al](mailto:kidrizi16@epoka.edu.al) )

Received by:

Msc. Igli Hakrama

# TABLE OF CONTENTS

<b>1. EXECUTIVE SUMMARY.....</b>	<b>4</b>
1.1 PROJECT OVERVIEW .....	4
1.2 PURPOSE AND SCOPE OF THIS SPECIFICATION .....	4
<b>2. PRODUCT/SERVICE DESCRIPTION .....</b>	<b>5</b>
2.1 PRODUCT CONTEXT .....	5
2.2 USER CHARACTERISTICS .....	5
2.3 ASSUMPTIONS .....	6
2.4 CONSTRAINTS .....	6
2.5 DEPENDENCIES .....	6
<b>3. REQUIREMENTS .....</b>	<b>6</b>
<b>3.1 FUNCTIONAL REQUIREMENTS.....</b>	<b>6</b>
3.2 NON-FUNCTIONAL REQUIREMENTS .....	12
3.2 <i>User Interface Requirements.....</i>	<i>12</i>
3.2.1 <i>Usability .....</i>	<i>13</i>
3.2.2 <i>Performance.....</i>	<i>14</i>
3.2.3 <i>Manageability/Maintainability .....</i>	<i>16</i>
3.2.4 <i>System Interface/Integration .....</i>	<i>17</i>
3.2.5 <i>Security.....</i>	<i>17</i>
3.2.6 <i>Protection.....</i>	<i>18</i>
3.2.7 <i>Authorization and Authentication .....</i>	<i>19</i>
3.2.8 <i>Data Management .....</i>	<i>18</i>
3.2.9 <i>Standards Compliance.....</i>	<i>19</i>
3.2.10 <i>Profitability.....</i>	<i>19</i>
3.2.11 <i>Other Non-Functional Requirements .....</i>	<i>20</i>

# 1. Executive Summary

## ***1.1 Project Overview***

This project consists of giving an idea and providing a solution to minimize cost and time for big construction companies, such as “Salillari Co”, which give earth moving heavy equipment for construction.

By creating a software in which we are going to analyze every economic and programing detail, we tend to achieve a successful software application to be used by the company as the most efficient way to handle their business affair for renting earth-moving heavy equipment for construction.

The project is going to provide every economic information needed, that said the project is going to include the number of workers in the company, the cost of every equipment that the company has, the daily price for the equipment and also the packet price for renting them. In the project we are also thinking to add a register, in which every data about the small companies that rent equipment from our company is provided. This solution is going to minimize time, because a company that has rented before does not have to repeat itself giving information when they want to rent again from us.

## ***1.2 Purpose and Scope of this Specification***

The purpose of this specification is the easy access of the products that are for rent and/or sale for the customers and also provide a better way for the managers of the company to control the products, employers and customers.

This specification encompasses several aspects of the process being discussed in as broad scope as possible. The following lines are addressed in the scope:

- In depth documentation of the features of the product.
- Details provided about the cost and the information needed for the product.
- Components & Functional/non-functional requirements.

- Definition of users' means of using and accessing the product.
- Dependencies and Constraints.

Some aspects that are not included in the scope are a:

- The legislative requirements for the product.
- Auditing and financial considerations of the product provided.

## 2. Product/Service Description

### ***2.1 Product Context***

The main service of the company is renting the earth-moving heavy equipment for construction purposes. Some of the products are: excavators, backhoe loaders, bulldozers, skid-steer loaders, motor graders, crawler loaders, trenchers and scrapers. As a big company, Salillari has enough equipment to rent to small companies. This items are going to be rented daily, weekly and monthly. Every equipment has its own rent price and when combined with other equipment may have a discounted price.

The software aims to help every step of the process of renting and/or buying earth-moving heavy equipment for construction companies or individuals.

### ***2.1 User Characteristics***

Our customers include the entire staff of the company and also the guests (manager, economist, employee and guests(clients)):

- Administrator / Manager / Financier
- Employees
- Clients / Guests

## **2.2 Assumptions**

The software is going to be implemented in a website. That means that every one of the users that are going to use the software will have to sign up in the software to be able to use the software.

It is assumed that the guests have knowledge on using a website and signing up.

## **2.3 Constraints**

This system will be potentially constrained by:

- Security concerns on data accessibility.
- The need for a good internet connection.

## **2.4 Dependencies**

Dependencies that affect the requirements:

This product is dependent on a successful communication between the guests and the managers or administrators of the company.

The software is dependent on the users' Internet connection.

# **3. Requirements**

## **3.1 Functional Requirements**

Functional Requirements for this application are stated as below:

Req#	Requirement	Comments	Priority	Date	SME Reviewed /Approved
BR_01	The software shall have different views	The views for guests, employees	1	25/03/2019	Alisa Doci/ Klaus Cepani

	for different user levels.	and administrator should all be different and specific to their functions.			
BR_02	All accounts, for each level of user, shall be secured with a password.	The password will be stored in the database in a hashed form, in order to protect the ethics.	1	26/03/2019	Alisa Doci/ Klaus Cepani
BR_03	Each user will have an unique username.	No to users will have the same username in order to avoid ambiguity.	1	25/03/2019	Alisa Doci
BR_04	To protect the system from spam and abuse, a reCaptcha shall be used.	To prove that you are a human being you must fill the reCaptcha.	3	25/03/2019	Alisa Doci/ Klementina Idrizi
BR_05	The application shall feature a Register page.	This will be the page for users to register.	1	25/03/2019	Alisa Doci
BR_06	The application shall feature an Information Page.	This page will show all the information about the company,	3	25/03/2019	Alisa Doci/ Klaus Cepani

		products and the application. The Information Page will be visible for everyone.			
BR_07	The application shall feature a Contact Us page.	Through this page the user can give feedback.	2	25/03/2019	Alisa Doci
BR_08	After the registration, users can change their passwords, but not their usernames.	The username you firstly choose, will remain unchanged.	3	25/03/2019	Alisa Doci/ Amelia Bullari
BR_09	Each level of user's view shall have Home Page.	The home page shall contain all the functions of the user.	3	25/03/2019	Alisa Doci
BR_106	Admin's View shall have a Finance option, where he will be able to see all the profits.	Admin will be the only user who will have access to the Finance Page.	2	25/03/2019	Alisa Doci/ Besnik Sulmataj
BR_11	Admin's View shall have a Reports option, where he will be able to see detailed statistics of the system.	Admin will be the only user who will have access to the Reports Page.	2	26/03/2019	Alisa Doci



BR_12	The system shall be able to generate weekly reports on sales.	This reports will be expressed in in tables and/or charts.	2	26/03/2019	Alisa Doci/ Klementina Idrizi
BR_13	The system shall be able to generate user and employees rating lists.	Users will be rated according to their activity/ purchase of products.	3	26/03/2019	Alisa Doci
BR_14	Admin shall be able to modify/delete employees form the system.	Admin will be the only user to possess this right.	1	25/03/2019	Alisa Doci/ Klaus Cepani
BR_15	Admin shall be able to add/modify/delete machineries and equipment from the catalog.	Admin will be the only user to possess this right.	1	26/03/2019	Alisa Doci/Amelia Bullari
BR_16	Admin's View shall have a Projects option where he will be able to track all the projects going on at that time.	Admin will be the only user who will have access to the Projects Page.	2	27/03/2019	Alisa Doci/ Klementina Idrizi
BR_17	Every user shall have their own profile page. On this page they will be	They can change their name. surname, telephone	2	25/03/2019	Alisa Doci/ Besnik Sulmataj

	able to edit their own personal information.	number, email address etc.			
BR_18	The User's View will offer a catalog of machineries and equipment they may choose to rent or buy, in order to complete their own construction projects.	This catalog with will be as user friendly as possible.	1	26/03/2019	Alisa Doci
BR_19	The User's View shall have a Payment option.	This page will show the total amount they will need to pay.	2	26/03/2019	Alisa Doci/ Klementina Idrizi
BR_20	The Payment page shall feature a card information form.	The user must fill in their credit card information if they wish to pay online.	2	26/03/2019	Alisa Doci
BR_21	The User's View shall have an History option.	This page will show the user's previous activities.	3	25/03/2019	Alisa Doci/ Amelia Bullari Klaus Cepani
BR_22	Every employee shall have their own profile page. On this page they will be	They can change their name, surname, telephone	2	25/03/2019	Alisa Doci/ Besnik Sulmataj

	able to edit their own personal information.	number, email etc.			
BR_23	The Employee's View shall feature a Schedule Option.	This page will show the employee's future and present commitments.	3	25/03/2019	Alisa Doci/ Klais Cepani
BR_24	The Employee's View shall feature a Payday Option.	This page will show the amount of money the employee earned that week and when he shall be able to receive it.	3	25/03/2019	Alisa Doci/ Amelia Bullari
BR_25	The Employee' View shall feature an History option.	This page will show the employee's previous commitments.	3	25/03/2019	Alisa Doci/ Klementina Idrizi
BR_26	The application interface must be stylish and functional in different devices.	The interface's design must change to be compatible with different devices' screen sizes.	2	25/03/2019	Alisa Doci

## **3.2    *Non-Functional Requirements***

### **3.2.1 *Product Requirements***

#### **3.2.1.1 *User Interface Requirements***

The user interface of the software application will be designed to be compatible with any browser, including Chrome, Mozilla, Safari and Android. We will focus on anticipating what users might need to do and will ensure that the interface has elements that are easy to access, understand, and use to facilitate those actions, while still keeping the application's design fresh and stylish. The software will offer four main interfaces: Admin, Employee, User and Guest.

The Guest Interface shall be offered without the need to log in. As a Guest you will be able to access Home Page, Information Page and Contact Us Page.

Admin Interface shall include:

- Finance button.
- Reports button
- Edit/Modify button.
- Projects button.

Employee Interface shall include:

- Schedule button
- Payday button
- Edit profile button

User Interface shall include:

- View catalogs button.
- Payment button.
- Card Information button.
- History button.

- Edit profile button.

### **3.2.1.2 Usability**

In software engineering, usability is the degree to which a software can be used by consumers to achieve objectives with effectiveness, efficiency, and satisfaction.

For our system to achieve usability it must be:

- Easy to learn
- Efficient to use
- Easy to remember
- Few errors
- Subjectively pleasing

The main aim is to produce a software which must be easy and practical to use. Administrator, employees and users shall find it very comfortable using the software on any device, including their smartphones and tablets, and all it will take are some very basic computer experience.

### **3.2.1.3 Learnability**

Learnability is one of the attributes of a software product that contribute to general usability.

- The software shall be easy to learn and even intuitive to some degree, because the user will be able immediately grasp how to interact with the system.
- There shall be messages and instructions that will help users to easily complete each task.
- Icons and Menu Bars will facilitate the use of the software application.

- The application's interfaces shall use images and colors to further facilitate the usage for every type of user.

#### ***3.2.1.4 Accessibility***

Taking into consideration the user-friendly interface, everything shall be easy to be accessed by different user groups. Every user level shall have their own page with different panels. The software tends to simplify as much as possible accessibility for slightly disabled users.

#### ***3.2.1.5 Memorability***

Within the context of usability and interface design, memorability refers to the user's ability to leave a program and then remember how to use it whenever he chooses to return to it.

We are mostly going to use symbols, icons, and other visual presentation types that allows the user to make a free association with the task at hand. For example, the "Home" icon on most browser is a little house. The reason for this is that people assume that this house is their home. Thus the home concept is communicated to them via a visual cue. The same idea will be used in the design of the product in order to make the usage of the software as simple and memorable as possible.

#### ***3.2.2 Performance***

When we speak about a software's performance, we need to take into consideration three very important factors: response time, workload and platform.

The tasks for each user shall be processed within a few milliseconds, a few seconds in the worst case. So, for the performance to be optimal, the response time shall be minimal.

Workload refers to the capability of the software to handle the maximum number of users interacting with the system at the same time. A good server is needed to support a lot of traffic in the system.

Lastly, a platform is defined as a combination of both the hardware and the software that will host the system. The platform must be able to support the system's functionality.

### ***3.2.2.1 Capacity***

This application will be developed to cover and support all the steps of the process of renting and/or buying earth-moving heavy equipment for construction companies or individuals. The basic idea is very similar to that of an online shop. The application shall be able to work at the same time and on real time for all available users.

All users will use the same database, therefore if too many requests are done at the same time, a slight delay might occur. The starting time of the software will be in no time and for all the other requests delays might depend on the user's internet connection strength/speed. The application shall be stored on the Web Server.

### ***3.2.2.2 Availability***

The application shall operate 24 hours a day, seven days a week and it shall be available to anyone who owns or has access to a digital device, be it a personal computer, laptop, tablet or smartphone. The software shall be compatible with every browser, such as Chrome, Mozilla, Safari etc.

The software shall not encounter downtime since the data used shall be very sensitive and time-varying. Also, the regular maintenance shall not affect the functionalities of the web site.

### **3.2.3 Manageability/Maintainability**

#### **3.2.3.1 Monitoring**

For all errors that might occur, the software application shall be able to provide the users and the administrators with the appropriate feedback, this way the maintenance group shall be able to fix the problem as soon as possible. Also, the maintains group shall conduct periodic reports and that information shall be used to improve the application system. The system will be developed to be secure and reliable.

#### **3.2.3.2 Maintenance**

- The main platforms that will be used to maintain the application are MySQL for the database and the APACHE server.
- The application will be developed in a way that will make it easily extendable. This means that new features can be effortlessly implemented in the existing software.
- The application shall use logs and text files in order to maintain as much information as possible in case that something unexpected happens.

#### **3.2.3.3 Operations**

The main operations for this software application shall be:

- It must be available 24/7.
- Each user shall be able to login in the system.
- Each user shall have access to their information after being logged in.
- The sensitive information entering the system shall be secured.
- The sensate information shall be accessed only by authorized users.
- Only authorized users shall possess the right to edit/delete/modify information.



### ***3.2.4 System Interface/Integration***

The database management system is one of the most important parts of this software application. The whole program will have an admin that will see every logged in person and what he requires. The user who will be logged in shall be able to see if the machineries, they are interested in, are free or not. In case the equipment is occupied, they shall be notified about the future time when the machine will be available for rent or purchase. Also, the management of the staff, will be available through the use of the database created.

#### ***3.2.4.1 Network and Hardware Interfaces***

The application being a web application needs to be stored in a web server, so that the browser user agent would be able to create a TCP connection with server. The server should function with CentOS web server. The Doctrine ORM, which deals with databases needs to get installed for proper functionality.

### ***3.2.5 Security***

- Rules are set to allow only authenticated/authorized users to full read and write access rights to the system's database.
- To protect the database from abuse until it has time to customize the software rules or set up authentication.
- Security provided to the access of user private information.
- Security provided to access of data.
- Restriction provided to access of data.

### ***3.2.6 Protection***

Matching function are checked when adding a new employee or a new client. The specified functions are checked:

- A function that will check for a valid name.
- A function that will check for a valid email address.
- A function that will check for valid password.
- A function that will check for a valid firm.

### ***3.2.7 Authorization and Authentication***

In this part of the software this kind of features are added:

- A function that checks for valid reports.
- A function for entering new employees.
- Provide list of employees completing a specific report.
- List reports based on some criteria.

### ***3.2.8 Data Management***

- The main platforms that will be used are MySQL for database and the APACHE server.
- Other platforms being considered are Cloud Firestore and Realtime Database, which we will primarily use are NoSQL databases. NoSQL stands for “non SQL”, but also “not only SQL”, and it is a non-relational database, which stores data in a large file usually. It offers more flexibility in database design, which does not restrict us in the relations between entities. It also scales better horizontally, meaning that it is better distributed in a more efficient network of nodes.
- Data shall be saved in a JSON tree. This offers easy encoding and decoding directly from Java objects in Android.

- In Cloud Firestore, differently from the Realtime Database, data is stored in Documents and Collections, thus offering better query support, and an offline first approach.

### ***3.2.9 Standards Compliance***

Web site agreement is going to be a legal agreement that will protect user information's and will not share and use them. Also will notify the user in case of new material or machinery available. The software will be designed so that requests can be filed at any hour. This will enable the employees, users and companies to use the system more effectively and freely, without being restricted to the Business working hours.

### ***3.2.10 Portability***

The main idea of the web application is to be used by everyone. The companies working with us that have the ability to rent or by construction material have are also technological equipped to support high connection internet and to have a good browser like Google Chrome. Our web application requires only a minimum amount of graphic card and an internet connection as mentioned above this is not a problem. The software will be able to run on every browser that the user might want to use.

### ***3.2.11 Other Non-Functional Requirements***

The non-functional requirements are going to be some typical non-functional in a web application.

- Recoverability
- Maintainability
- Serviceability
- Security
- Regulatory
- Manageability

- Environmental
- Data Integrity
- Usability
- Interoperability

TO BE CONTINUED....