REPUBLIC OF ALBANIA
EPOKA UNIVERSITY

FACULTY OF ARCHITECTURE AND ENGINEERING
Computer Engineering Department

CEN 302 - Software Engineering

Epoka University
Tiranë
June 2018

Meet$_{LY}$

Software documentation done by:

Deni Daja
Klesti Kuka
Bojken Sina
Ernit Hoxha

Received by: Msc. Igli Hakrama

Table of Contents

Simple things should be simple, complex things should be possible.

THIS PAGE IS INTENTIONALLY LEFT BLANK

Executive Summary

1.1 Project Overview

Up until these days, institutions whose activity was related to terrain work, especially in Albania suffered in multiple managing areas. The whole process of assigning jobs to users, keeping track of user locations, developing employee reports, tracking their performance and making sure that the employees deliver proves to be a very challenging task for many Albanian institutions and industries. As a result of these issues, many jobs were poorly executed and documented, thus resulting in missing documentation, legal trouble and a whole set of other consequences.

Meetly, the software we are providing, aims to help the institutions that are dependent on terrain work and job distribution in general. This software will provide a set of solutions for these institutions that makes every step of their work fully digitalized and easier to execute.

1.2 Purpose and Scope of this Specification

The purpose of this software is to provide a set of solutions to the institutions that depend on terrain work, job distribution and user management. In the current state, a full lifecycle of an Albanian institution when it comes to terrain work is very unorganized and unprofessional. The administrators have no way of restraining the deadlines and requirements, and the employees have no way of proving they indeed finished the job as they were required. Job details are often overlooked and this leads to major problems in the future, which may result in the need to revisit reports which is a waste of time and energy. This software will provide a very organized, hybrid and comprehensive solution for these issues, which will increase the cooperation between administrators and their employees, strengthen the trust inside the company and save some much needed time and energy for both parts that go through the process.

2. **Product/Service Description**

The Central Inspectorate is a government institution in Albania whose aim is to improve the effectiveness and accountability of the inspection activities in Albania. One of the main duties of the state is to guarantee the implementation of mandatory rules on daily operations of businesses and individuals. These rules relate to national security, fair competition, fiscal discipline, and much more. But given the importance of the Inspectorate, their execution is often not optimal.

Meetly is a software which aims to redesign the lifecycle that the Inspectorate uses to complete their jobs, and provide new technological solutions to every step of the process. This software will be used by the Central Inspectorate but can be also used by every specific Inspectorate, as our mission is to create a dynamic software, which will prove useful to every branch of the institution.

The software aims to help every step of the inspectorate job, starting from simple job distribution to employee tracking, report generation, dynamic form filling and much more.
If we divide the inspectorate in two major subsections we are able to give a more detailed description of what this software provide for both parties.

Office Workers (Chief Inspectors, Statisticians, Economists)

- Realtime Statistics, Employee Performance, Charts and Graphs
- Location-Based Jobs, Live Feeds, Employee Locations
- Job Distributions, Dynamic Forms, Reports and much more.

Terrain Inspectors

- Job Prioritization, Calculate Route Costs, Get Navigation Directions
- Check in to the job locations
- Watch job requirements and keep the constraints

2.1 Product Context

The context of this software is related to the Central Inspectorate of the government of Albania, even though our scope is to provide a solution for every branch of the Inspectorate and not only the central organization. This solution will be used by every office employee of the inspectorate and also by the terrain inspectors in order to enhance their cooperation, make their jobs easier and make sure they make a full use of their time and energy.

2.2 User Characteristics

There are six user groups that will take advantage and use the software:

- Chief Inspectors
- Terrain Inspectors
- Statisticians
- Human Resources
- Economists and Budget Handlers
- Higher Competence Employees

a) Chief Inspectors

These users will be responsible for distributing jobs to the terrain inspectors through their module called Job Distribution. They will be provided an administrator level account that will be able to CRUD jobs and employees because often they will also undertake performance evaluations for terrain workers. These users are the backbone of the system, making sure that data is generated in the system by continuously assigning jobs to terrain workers.

b) Terrain Inspectors

These users will be responsible for answering jobs that were created by the chief inspectors. Their main system will be the mobile application, and will be only restricted to that. These employees will have a user level account and are not able to CRUD or modify anything on the system, except for watching their jobs, requesting route information and filling out the forms. These users are the main feeders of data, thus making sure that the other employee groups like Statisticians and HR have enough data to perform their jobs from the system.

c) Statisticians

These users will be responsible for studying the reports and live dashboards in order to create statistics on the terrain inspectors. They will have a user level account and will not be able to CRUD or modify the system. Their job will be restricted to watching the reports and the dashboards. Through the functionality of the Reports module, these users will be able to generate very comprehensive reports in Excel and PDF.

d) Human resources

These users will be responsible for handling the employees of the institution. They will have an administrator level account and will be able to CRUD or modify the employees of the company. Their job will be restricted to creating new users, assigning privileges to the users and adjusting their salaries and rewards. They will also have access to inspector reports in order to complete performance evaluations and adjust employee salaries accordingly.

e) Economists and Budget Handlers

These users will be responsible for observing the jobs generated and the costs/rewards of each job. They will have a user level account and will not be able to CRUD or modify anything from the system. Their job will be restricted to watching task statistics, employee salaries, the fuel consumption for every job completed and creating the appropriate reports in order to provide the institution with better future budgets and more efficiency in the long run.

f) Higher Competence Employees

These users may be employees from other institutions which lie above the inspectorate like the Albanian government, whose task is to perform regular checkups on the inspectorate, to make sure their methodology is in full compliance with the law and also perform their own statistics. These users will have a user level account so they can observer everything, but are not able to modify anything on the system.

*2.3 **Assumptions***

It is assumed that the Central Inspectorate has the right to go through all the data generated from every other branch of inspectorates according to law.

It is assumed that the data generated from the system will be fully confidential and only available to the inspectorate and/or higher state institutions which govern the inspectorate.

It is assumed that every terrain inspector is equipped with a smartphone from where they will perform every operation they are required to. If not, the inspectorate is assumed responsible for equipping every inspector with the required device. These smartphones have to be capable of receiving information from GPS satellites. The smartphones are assumed to have an IOS or an Android Operating System.

It is assumed further that the inspectors are able to use smartphones and especially the Meetly mobile application effectively and efficiently.

It is assumed that terrain inspectors need to be within a certain distance from the assigned job in order to prove their correctness and in order to fill out the required form.

It is assumed that every terrain inspector should be limited to watching only jobs assigned to him and not interfere with other inspector's jobs.

It is assumed that office employees have a web browser and an active internet connection.

It is assumed that chief inspectors are aware of the location of jobs they want to distribute to terrain inspectors.

It is assumed that chief inspectors deeply understand the issues regarding specific subjects that are to be controlled, and are able to explain the problem effectively to their terrain inspectors.

It is assumed that every completed task needs to be stored in the system for documentation and research purposes.

2.4 ***Constraints***

This system will be potentially constrained by:

- The fact that inspectors have to be equipped at all times with mobile smartphones.
- The need of a fast internet connection and strong mobile data signals.
- Having every inspector understand the way the system works and training them to use the mobile application correctly and efficiently.
- Smartphones of every inspector have to be equipped with GPS technology.
- The Google Satellite should be available at all times.

2.5 ***Dependencies***

- A specific inspector can use the mobile application only after one or more jobs have been assigned to this specific inspector. Initially, inspectors will have no jobs assigned to them. At this time they will not be able to perform any operation by using their mobile application, since there is no job to operate on.

- Initially, chief inspectors will not be able to create new jobs. If the Inspectorate has no registered inspector, the job creation steps will not be complete, because this specific job cannot be assigned to anyone.

- Inspectors cannot start answering or accomplishing their job from their mobile application, if they are not close to the location of that job. In order to be able to begin completing the job requirements, the inspector should at first “check-in” at the job location.

- The economists of the Inspectorate will not be able to obtain information about the monthly fuel consumption of the inspectors if no jobs are completed through the mobile application.

- The statisticians of the Inspectorate will not be able to use the Report Module for generating report files if no job distribution and job completion is not initially performed by the chief inspectors and the inspectors. In fact, this module will be fully functional when multiple jobs are assigned and/or completed.

- The performance evaluation staff cannot do their respective jobs if inspectors have not been able to complete any job by using the system. Evaluation will be more realistic and helpful if there are lots of jobs completed.

2. Requirements

2.1 Functional Requirements

The requirement numbering follows the scheme - BR_ ##

Req#	Requirement	Comments	Priority	Date	SME Reviewed / Approved
BR_01	The system should have a web application which will be used by administrators.	This will be their main platform of operation.	3	29/03/18	Klesti Kuka/ Deni Daja
BR_02	The system should provide employees with a cross-platform mobile application.	This mobile application will allow employees to accomplish their tasks.	3	29/03/18	Deni Daja/ Klesti Kuka
BR_03	The administrator has to track employee performance at all times. He should be provided with a Dashboard where he could obtain real-time information about his employees.	This module will provide administrators with statistical data. Also, a Live-Feed section will notify administrators about jobs that are being created or completed.	2	29/03/18	Deni Daja/ Klesti Kuka
BR_04	Graphically depicted data is important for every administrator. They need to be able to obtain important information easily.	Different data and information about employee performance will be depicted in various different graphs/charts in the Dashboard Module.	2	29/03/18	Klesti Kuka/ Deni Daja
BR_05	The system should provide administrators with the ability to assign jobs/tasks to their employees.	This will be accomplished by the Map module.	3	29/03/18	Deni Daja/ Klesti Kuka

Req#	Requirement	Comments	Priority	Date	SME Reviewed / Approved
BR_06	Administrators should be able to distribute jobs/tasks on terrain.	This will be accomplished by providing them with the ability to distribute jobs/tasks over a map by assigning specific address to job location.	3	29/03/18	Klesti Kuka/ Deni Daja
BR_07	Administrators should be able to specify correct location of the job on the map by only having to know the job address.	By using Geocoding services from the Google Maps API, we will convert the job addresses specified by the administrators, into precise latitude/longitude values. The latitude/longitude coordinate system allows employees to precisely know where the job is located.	3	29/03/18	Klesti Kuka/ Deni Daja
BR_08	Administrators have to keep track of jobs that are distributed to various locations.	The map module will provide real-time markers on the job locations. The markers will be shown using the latitude/longitude coordinate system.	3	29/03/18	Klesti Kuka/ Deni Daja
BR_09	Given that there will be a considerable amount of jobs distributed on the map, the administrator should be able to differentiate between them. Especially between those markers which, depending on the zoom level of the map, will overlap with each other.	The ability to differentiate between these markers will be provided by creating maker clusters, depending on the zoom levels of the map.	2	29/03/18	Klesti Kuka/ Deni Daja

Req#	Requirement	Comments	Priority	Date	SME Reviewed / Approved
BR_10	Administrators should be able to identify every single job that is distributed over the map. They should be able to check every specific job information.	The specific job information will appear on modals when administrators click the markers. They can check who that specific job was assigned to, when its deadline is, what that particular job requests the employee to accomplish etc.	2	29/03/18	Deni Daja/ Klesti Kuka
BR_11	When creating jobs, administrators need different fields where they will input job information. A form must be provided where job information will be inserted by the administrator.	This will be accomplished by having a button that will trigger a three step modal. This modal will contain the form and the fields required to create jobs. The administrator can choose the employee that the job will be assigned to, this jobs deadline, location etc.	3	29/03/18	Deni Daja/ Klesti Kuka
BR_12	Administrators should be able to also check up on jobs and their specific answers/responses. They will be able to accomplish this on the Jobs Module.	The Jobs Module will show a tabular view of every job with its respective answer/response. If the job has not been completed yet, a simple message indicating that there is no answer for this job will be shown.	3	29/03/18	Klesti Kuka/ Deni Daja
BR_13	The ability to search for any specific job on the Job Module is something that an administrator should be provided with.	This will be provided by the search bar on the Jobs Module. Jobs will also be ordered by the most recently created criteria.	2	29/03/18	Klesti Kuka/ Deni Daja

Req#	Requirement	Comments	Priority	Date	SME Reviewed / Approved
BR_14	Administrators should be able to delete outdated jobs that are no longer needed.	They can accomplish this on the Jobs Module.	2	29/03/18	Klesti Kuka/ Deni Daja
BR_15	Administrators should have the ability to keep track of every employee.	A tabular view of every employee will be provided in the Employee Module.	2	31/03/18	Klesti Kuka/ Deni Daja
BR_16	Being able to check up on every employee information is a must. Administrators should be able to easily search for a specific employee.	On the Employee Module, a search bar will help administrators look up on a specific employee easily.	2	31/03/18	Klesti Kuka/ Deni Daja
BR_17	Employees will mostly work on terrain. That is why they are prone to use a lot of the company's resources. Some of them will have to use different means of transportation. Administrators have to be able to keep track of the fuel consumption of each employee.	Information and data for each employee's monthly fuel consumption will be added in the Employee Module. This way the administrators will be able to manage company resources better.	2	31/03/18	Klesti Kuka/ Deni Daja
BR_18	The company may have a lot of employees. In this case the tabular view of employees should not overflow. Pagination will help administrators to slide through employees with ease.	Pagination for the employees will be implemented in the Employee Module.	2	31/03/18	Klesti Kuka/ Deni Daja

Req#	Requirement	Comments	Priority	Date	SME Reviewed / Approved
BR_19	Administrators have to be able to perform different operations over their employees. Adding new employees, or editing employee information and also deleting existing ones is a power that administrators have to be provided with.	The ability to perform these operations over the employees will be provided in the Employee Module.	3	31/03/18	Klesti Kuka/ Deni Daja
BR_20	Administrators should be able to obtain different reports based on their employee's performance and activity. This will be provided in the Reports Module.	In this module administrators can generate different Excel or PDF files based on employee performance or activity.	2	31/03/18	Deni Daja/ Klesti Kuka
BR_21	In the web application there is a settings/profile page provided for the administrators. Here they can update their settings and their user information.	This functionality is provided by the Setting Page.	2	31/03/18	Deni Daja/ Klesti Kuka
BR_22	The mobile application will allow each user to have its own account.	Employees will operate from this account at all times.	3	31/03/18	Deni Daja/ Klesti Kuka
BR_23	The users will be able to check their assigned jobs on the Map Module of the mobile application.	The Map Module of the mobile application will distribute markers for each job assigned to that specific employee.	3	31/03/18	Klesti Kuka/ Deni Daja

Req#	Requirement	Comments	Priority	Date	SME Reviewed / Approved
BR_24	Employees should be able to distinguish between each active job assigned to them. They should also be able to obtain job information directly from the map.	By taping each marker, the employee will be able to get job information, like job priority, deadline etc.	3	31/03/18	Klesti Kuka/ Deni Daja
BR_25	Employees can manually navigate throughout the map in order to arrive in the job location. However, they will also be provided with the ability to find the shortest path to the destination by simply taping the “Shortest Route” button on that specific job.	When this functionality is used, the shortest route from the employee’s position to the job’s destination will be highlighted. Information such as distance and the time required to get there will also be displayed.	2	31/03/18	Deni Daja/ Klesti Kuka
BR_26	The mobile application will also provide Employees with a module that will allow them to complete their assigned jobs.	In this module Employees will be able to answer to every question asked by the Administrators.	3	31/03/18	Klesti Kuka/ Deni Daja

2.2 Non – Functional Requirements

2.2.1 User Interface Requirements

This project will consist of two parts, the cross-platform mobile application and the web application. In case of the web application the user, first get redirected to the login interface page. The login page will consist of simple login form and a login button. No registration can be done from the front page.
The interface page will ask for the users username and password. The user will login and gain access to the web application, in case the fields authenticity is proven. In case the fields authenticity is not proven, then an error message of "Invalid Credentials" will be given. Since the application is aweb application, it will be compatible with any kind of browser such as Chrome, Mozilla, Opera and Safari.

2.2.2 Learnability

- The application it is simple to use and understand
- Specific error messages will be given whenever incorrect data is entered or changed
- A simple and short tutorial document will be provided together with software explaining each module
- Modules can be accessed without any restriction, thus the user of the application is responsible for any changes made in application log

2.2.3 Performance

The application will be stored in a web server, being a web application.
The application's time of execution will depend on two factors:

1. The algorithm's efficiency for fetching the employee's once the user is logged in.
2. The users internet connection strength.

The hardware and OS system capacity.

2.2.3.1 Capacity

Since the application is an web application it will be possible to be seen by any agent user.
Its accessibility will be constrained only to the registered database users.
Since the web application will be shared, the application will be programmed to create separate sessions for each user, without decreasing the overall performance of the application.

2.2.3.2 Availability

- The web application will be available for use 24/7.
- The web application will work within the optimal level during the working hours of the day. During the rest day access will be slightly restricted, in order to check if the any changes has been done in the system that would cause errors.
- The application can be accessed and used in any geographical, as long as the user has internet connection.
- By creating for users separate session, their overall work efficiency and productivity will not decrease, while using the application
- Specific error messages will be provided, in case an action would cause systems fatal error.

2.2.3.3 Latency

Normally it depends on the user internet connection.
If the user has a good internet connection, it will take at most 10 milliseconds to show the login page and at most 300 milliseconds to show employee contents.

2.2.4 Manageability/Maintainability

The application provided to the user will be with no available bugs and errors.
It will be easy and user friendly.

2.2.4.1 Monitoring

The applications user interface will be easy to use, and will not provide cases that would crush the system. The login interface as mentioned will just be a simple username and password interface. The user of the application will only be able to interact with the applications interface, and respective error messages will be provided in case an action is not allowed or would cause system error. Whenever the user tries to modify, remove and add users data, a message will be provided with specific additional information. The changes will be visible in case such operation is successful. Otherwise an error message with the specific reason why will be shown.

2.2.4.2 Maintenance

In case the system crashes, the application is going to restart. During this process, the application will redirect the user to the page, where the crash occurred. In case the application did not restart correctly this two cases should be taken into consideration:

- The server storing the web application is already down and a restart is already needed.

- Contact the maintenance department, already being informed with the structure and algorithm of the application, in order to fix and make the application accessible.

The application is recommended to be stored in Linux Web Server. It is recommended to install centOS web server. In order to allow the application to use the database, it is required to install Symfony's Doctrine and its components, by especially including the doctrines migrations. It is recommended to install composer, since it responsible for updating and installing any Symfony component.

2.2.4.3 Operations

The operations mentioned below will be provided to the user of the web application:

- Add a job in the GOOGLE map for the specific employee.
- Create a form that employee needs to complete, when finishing the specific job.
- Define the structure of the form.
- Define the nature of the questions in the form.
- Define the nature of the answer, when completing.
- Define the nature of importance for the job.
- Define the time duration for the specific job.
- Users will have the authority to change his/her own credential data.
- CRUD functionality for employees.
- Will have the authority to add or remove new employees.
- Will have the authority of checking and evaluating employees performance.

2.2.5 Systems Interface/Integration

The database management system is the most fragile part of the application. Its access and implementation will be only provided to the IT department. The user is not allowed to make any sort of changes to the database. The application will perform this job for the user.

2.2.5.1 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 library of Symfony, which deals with databases needs to get installed for its proper functionality.

2.2.5.2 System Interfaces

Not decided yet. We still do not have an implemented database.

2.2.6 Security

The application shall be developed in such way, where occurring error will be non-existent. The format of the forms are already predefined along with fields, so in this case no errors will occur. Measures are taken though, when adding new employees or when changing the employees data.

2.2.6.1 Protection

Matching function are checked when adding a new employee or while changing its credentials. The specified functions are checked:

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

2.2.6.2 Authorization and Authentication

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

- A function that checks for valid credentials
- A function for searching employees based on some input
- Empty message in the case that no employee is found
- Provide list of employees completing a specific report
- Provide list of employees completing a report during a specific time period
- List reports based to some criteria

2.2.7 Data Management

The database that the application will be using, will contain this kind of possible information:

- users(id,username,name,password,surname,birthday,email,phone_nr,is_admin etc)
- jobs(id,user id,title,description,deadline,priority,reward etc)
- answers(id,answer_content,answer_time etc..)
- privileges(id,privilege_name..)
- notifications(id,notification_message,notification_time..)

Needs further discussions in this module.

2.2.8 Standards Compliance

The application will be developed in such way that will respect the rules and regulations determined by “Inspektorjati Punes”, in order to provide higher proficiency and productivity in their job.

2.2.9 Portability

Portability it is not an issue. The application will be accessed as long as you have internet connection. The web application can be accessed by using either a computer or mobile phone.

MEETLY TEAM

Deni Daja [ddaja15@epoka.edu.al**]**
Klesti Kuka[kkuka15@epoka.edu.al]
Bojken Sina[bsina15@epoka.edu.al]
Ernit Hoxha [ehoxha15@epoka.edu.al]