404! Requirements Specification

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1. Executive Summary

1.1 Project Overview

When you first open a restaurant, usually you do not have a lot of capital and you focus to invest in the most important elements of the business and neglect the importance of having an information management system.

However after you gain a loyal customer base and create a very well known brand (image), your customer number increases and you can not manage any more the flow of information with “primitive” programs such as Excel. In order to be more efficient and effective in your service, you have to adapt with new technology and create a customized Restaurant Management Information System.

Our restaurant is located in Durres, one of the most important cities in Albania, around 33 km away from the capital, with 500-600 thousands citizens living there and always the first choice of many people to spend weekends or summer days near the beach. Durres is easily accessible for everyone living in Albania. According to our research, during summer sundays around 800000 tourists visit Durres, increasing the Durres’ population into 1.3-1.4 million which means that our customer base will increase and we have to make sure that we will offer them the best service we can and to optimize each activity.

For us to be able to optimize, to be fast in making orders and delivering these orders, to control the increase in the number of employees and also to keep track of all data in order to analyze and forecast for each process, our only solution is to build a customized Restaurant Management Information System.

1.2 Purpose and Scope of this Specification

The purpose of this system is to automate all processes of the restaurant online.The software will be used by all the parties, including owner, manager and employees. Currently the

restaurant doesn't use a certain system but only MS-Excel to record the employee data and inventory. With the increase in the number of customers, suppliers, employees and cash flow, it is necessary to track in an efficient way all the operations of a business. This system will provide a working environment that will be more flexible and efficient. It will facilitate the communication between all internal actors like the owner, manager, economist, the servers, the bartenders and other employees of the restaurant. Since the restaurant is a medium size business, involvement of the suppliers in the system is outside of our scope.

In this scope:

- Product/service description (discussed in Part 2)
- Functional and non functional requirements (discussed in Part 3)
- User case scenarios (discussed in Part 4)
- Specified later!

2. Product/Service Description

This is a software that aims to create a communication channel between all the actors inside a restaurant that will facilitate the operation and organization of the restaurant. It is created on the basis of the client's requirements by following the way the company operates with actors inside and outside the restaurant. What our project suggests is a way to automate all processes of the restaurant online. Each employee can checkin/out at the system and have his wage calculated automatically. They can also check their timesheets daily/weekly/monthly and also make complaints/suggestions to the owner/manager at the end of their shift. Every bill and calculation will be registered by the system, making it easier for the manager to calculate profit, sales and tips at the end of the shift. In case of any reservations due to customer demand, the manager is the only one that can book/reserve a table in the

system. The managers will get alerts regarding the need for supply directly from the system, so they can directly place orders for the suppliers. Servers and bartenders can open and close their tables easily using the system, while every transaction is transparent to everyone. Each economic transaction, like employee's wages and/or bill payments for the suppliers will go directly to the economist account. In this way, the owner can track and handle in real time all operations occurring at the restaurant.

2.1 Product Context

Our product is a software for better management of the restaurant. There are a lot of businesses that are recently adjusted with the latest technology, so there are many similar products like ours. Of course, there is a huge difference from others, because it is especially designed only for our client. It is an independent product, which will be managed by the owner and also has its own branches for the other employees. There is no interconnection of our system with other ones, because the restaurant is still in a medium size and does not have work relationships with other businesses or previous systems used. The suppliers are not in the objective of this system, because they do not possess a product like ours and cannot interconnect with us properly.

2.2 User Characteristics

The software will include/perform the interaction between 6 users, the owner of the restaurant, the manager, the economist, the server(s), the bartender(s) and other employees (kitchen & cleaning staff).

The owner:

The owner represents the person that owns the restaurant. He/she can have access in all the documents and timesheets of his employees, check their hours and wages. Also, he/she can check the suppliers, the inventory and every bill account. The owner can open and edit/delete every account registered in the system. He/she is the only one who can register the manager and the economist in the

system. He can also double check before the wage of the manager and economist is transferred to the relevant accounts. Every employee logs in the system using a specified id.

Manager:

The manager is registered from the owner and should clock in/clock out at the beginning/ending of his/her shift. He/she can register/add/delete employees, access and change their timesheet in case of any problem. He/she is the only one that can delete/edit an order/ table after it is put in the system. (In case the server makes any mistake with the order, or the client doesn't want the item anymore). He/she is the only one that can book tables according to the customer demand. The manager can also disable any item in the menu in case the restaurant has run out of it. He/she will get an alert for items that request immediate supply, so that he/she can make the orders to the suppliers.

Economist:

The economist is registered by the owner and he/she has access to every economic situation in the restaurant. After the manager puts an order for the suppliers, the bill will go directly to the economist account for him/her to make the necessary payment. Also, he/she is responsible for each employee wage transaction. Also, he will take care of all necessary documents regarding taxation.

Server:

A server is registered from the manager. He/she should clock in/clock out at the beginning/ending of his/her shift. He/she can check their timesheet to check the hours they have made during the period. They can open tables, take orders from the clients and put them in the system. They can also close tables when the clients are gone. The server should cashout at the end of his/her shift.

Bartender:

A bartender is registered from the manager. He/she should clock in/clock out at the beginning/ending of his/her shift. He/she can check their timesheet to check the hours they have made during the period. They cannot open tables and take orders from the clients but they have some reserved seats at the bar in case any client wants to drink something there. He/she cannot take food orders. They can close their seats in the system once the clients are gone. The bartender should also send an alert to the manager if the bar is running out of any item.

Other employee:

Other employees' sector includes the kitchen staff and the cleaners. He/she should clock in/clock out at the beginning/ending of his/her shift. He/she can check their timesheet to check the hours they have made during the period.

2.3 Assumptions

- Manager might not come to work one day so one of the waiters (assigned from the manager) can take responsibility over the manager`s flow of actions.
- System might be down for a certain part of the day and the waiters have to write bills physically and then enter them into the system.
- If the customer doesn't show up within 30 minutes of the reservation time, the manager should delete the reservation.
- It is assumed that the Owner will have access rights to all other employees accounts and to all data entered by each employee and update the system through any connected device effectively and efficiently.
- It is assumed that each employee and the Owner will have access in the system through a simple connection via a computer or mobile device.

- It is assumed that the computer devices used to access the system will have either Linux, Mac OS or Windows operating systems. The mobile devices are assumed to have either IOS or Android operating systems.
- It is assumed that the Waiters must be equipped with a tablet for taking orders.

2.4 Constraints

The project will have the possible following constraints:

- Scope:

Client's requirements should be completed in detail. There shouldn't be any extra function outside the scope.

- Schedule:

Project needs to be finished by the beginning of June, and no later.

- Quality:

The software's user interface should be easy to understand. Users should take no longer than 10 minutes to learn how to use it.

- Resources:

Due to the situation created by the Corona Virus every analysis and research should be made by the internet or phone.

- Risks:

The law nr 9887 on protection of personal data should be respected.

Every user must have basic knowledge on using a web application.

The users must have internet access in order to use the software.

- Other constraints can be found during the way.

2.5 Dependencies

Dependencies that the users of the system need to know in order to operate within the system.

- The owner is the only one that can register or delete the manager and the economist accounts in the system.
- The servers, bartenders and other employees can be registered also by the manager.
- The manager cannot edit the employees dashboard without the approval of the owner.
- The employees cannot be registered in the system without all the data needed for the company to hire a new employee.
- The servers and bartenders cannot delete any order/table without the approval of the manager.
- The server cannot order an item which is disabled from the manager.
- The bartender is obligated to contact a server for any food order.
- The bartender cannot take more than 4 clients at a time. (only 4 seats available)
- A server cannot pick/edit/change a table which is already chosen from another server.
- The employees cannot edit or change their timesheets without the approval of the manager.
- Orders for the suppliers cannot be made without the alert of the system towards the manager.
- The manager cannot add items/amount in the inventory without providing the bill as well.
- The economist cannot process his and the manager's salary with the approval of the owner.
- The manager and the economist cannot access or make any changes if they are not clocked in.
- The servers and bartenders cannot serve or put orders in the system if they are not clocked in.

3. Requirements

- ***Functional Requirements***

Req#	Requirement	Comments	Priority	Date Rvwd

BR.1	Register restaurant name on database	Enter the restaurants details	1	20.4.20
LR.2	Handle multiple accounts	Based on user, each will have a certain interface	1	20.4.20
BR.3	There is one admin, one manager, one economist, waiters and bartenders and the kitchen staff	Every user will have certain rights	2	20.4.20
BR.4	Each account should be secured with passwords	The password should fulfill the regular expression rule	2	20.4.20
BR.5	Handle the unregistered users.	Each user should be registered.	3	20.4.20
LR.6	Manager manages servers and bartenders and the other employees.	Is responsible for their actions and functionalities	~~2~~	20.4.20
BR.7	Handle suppliers.	Manager should be able to handle the suppliers	~~2~~	20.4.20
BR.8	Handle inventory.	Whenever there is a product missing, an alert will be shown on the manager's account so they can make the correct order and then add the amount on the database.	~~2~~	20.4.20
BR.9	Adding a new food, drink or category.	Manager is responsible for this actions	~~2~~	20.4.20
BR.10	Able to view cash flows.	Economist, Manager and Owner	~~1~~	20.4.20
BR.11	Able to view the starting date, ending date of each cash flow , revenue, expenses and net profit.	Economist, Manager and Owner	~~1~~	20.4.20
BR.12	Employee Payments.	Payments are handled by the economist.	~~1~~	20.4.20
BR.13	All employees can clock in and out of their shift.	The system will keep track of working hours the waiter has made in his shift	~~1~~	20.4.20
BR.14	When checking out an order the system should apply the VAT automatically.	Before printing the receipt the VAT (20%) will be calculated and displayed	~~2~~	20.4.20
BR.15	The waiter is able to check tables available to choose for the orders.	If the waiter chooses a chosen table, warnings will appear on his screen.	~~2~~	

BR.16	Able to watch the number of tables he has served.	The waiter's orders will have the date, id, number and the total price of each and it can be accessed by the manager and the owner.	~~2~~	20.4.20
BR.17	Close the tab of a customer.	Waiters can close their open tabs by cash or credit card.	~~2~~	
BR.18	Cashout at the end of the shift.	The waiters and bartenders should cashout at the end of the shift so the sales and tips are shown and declared.	~~2~~	20.4.20
BR.19	Able to check hours worked during the week.	Every employee is able to check an print their working hours	~~3~~	20.4.20
BR.20	Able to leave and receive notes.	Every employee is able to receive and leave a note from/to the manager and the owner.	~~3~~	20.4.20
BR.21	Able to change the timesheet of each employee.	Manager can edit the timesheet of employees in case of any problem.	~~3~~	20.4.20
BR.22	Check daily sales of each bartender and server.	Manager and owner can access the daily sales of each employee as they are saved in the timesheet database/interface.	~~2~~	20.4.20
BR.23	Check and upload documents of the taxation.	Only the owner can access the documents, while they are uploaded only by the economist.	~~3~~	20.4.20

BR.24	Request PDF for bills, sales and employees timesheet.	PDFs are generated upon the request of the owner or manager.	~~4~~	20.4.20

3.1 Non-Functional Requirements

3.1.1 User Interface Requirements

- The software will be web-based and can be accessed by any browser, such as google, mozilla, safari, and internet explorer.
- The system must be usable without printing a guide or watching an explanation video, it shouldn't take more than 10 minutes to learn how to use it. Therefore the user interfaces must be as easy as possible. There will be different system modules in order to structure and simplify the user interface.
- In order for the users to log in to their main page, they should type in their unique work number. If the number is wrong and it is not recognized by the system, an error message explaining the situation will be shown in the screen.
- If the login is successful, the system will direct the users to their main page displaying their dashboard.
- Server dashboard will visually represent all the key factors of the other modules. A side bar is provided in the left so that the user knows what functionalities he can perform.
- Bartender dashboard will visually represent all the key factors of the other modules. A side bar is provided in the left so that the user knows what functionalities he can perform.
- Employee dashboard will visually represent all the key factors of the other modules. A side bar is provided in the left so that the user knows what functionalities he can perform.
- Economist dashboard will visually represent all the key factors of the other modules. A side bar is provided in the left so that the user knows what functionalities he can perform.

- Manager Dashboard will visually represent all the key factors of the other modules. A side bar is provided in the left so that the user knows what functionalities he can perform.
- Owner Dashboard will visually represent all the key factors of the other modules. A side bar is provided in the left so that the user knows what functionalities he can perform.
- Myhours dashboard will make it possible for all users of the system to check their working hours.
- Employee Dashboard is accessed only by the manager, owner and economist and displays details regarding all users registered in the system and their characteristics.
- Timesheet dashboard is accessed only by the manager and the owner and it displays the daily activity of all employees such as time in & time out and sales.
- Suppliers and Inventory dashboard is accessed by the manager and the owner and it displays the list of all suppliers of the business and items in inventory followed by their characteristics.
- Bills dashboard displays all the bills of the clients and also the bills of the inventory. It can be accessed by the owner, manager and economist.
- Notes dashboard can be accessed by all the users of the system. They can leave any message for the manager and/or the owner.
- Menu dashboard can be accessed from all the users besides the economist and “other” employees. It displays the menu divided into two sections, drinks and food.
- Tables dashboard can be accessed by all the users of the system besides the economist and “other” employees. It displays all the tables available in the business, followed by the open and reserved ones.

3.1.2 Usability

After the software will be delivered to the client, we should make sure that all the employees can navigate it efficiently.

- Usability Testing

We will use the moderate method of usability testing, which consists in a supervisor (one of us or all of us) who introduces the way how to use it to the client, although its user interface will be very easy to manage. The client can make questions and take answers by us.

- Accessibility & Efficiency

This information management system can be accessed only by having an internet connection, like Wi-Fi or network connection. The devices to open the software are a lot: a smartphone, tablet (any kind of touch-screen table), browser in a laptop or PC. Nowadays, all the tablets and smartphones include all the possible apps to store information, materials, documents, inventory that can be used in the software by the owner, manager, economist etc. This facilitates the management from the administrator from any possible place he can be.

- Flexibility

Our product will be very easy and well organized to be understood. The system will have an error detection process, which will handle any possible error very quickly, so the employees will not have any worries or difficulties. The interface will be organized in that way that each action will have its own button with a description, so the client will not get confused.

3.1.3 Performance

3.1.3.1 Capacity

Since it is a web application, minimum system requirements for the computer to run a web application are:

- Operating System should be Windows 7 or later, linux and MAC compatible.
- Processor should be Intel Pentium 4 or later.
- Memory should be 2GB min (4 GB recommended).

Taking into consideration the number of users of the software (approximately 20) and the total pages of the software (about 200-300 pages):

- Web server hard drive size - 27,5MB
- There should be up to 20 simultaneous users supported.

3.1.3.2 Availability

Include specific and measurable requirements for:

- The software should work 24/7, even though it will be used 12-15 hours per day.
- The system is committed to be available from 9am to 12 am, so it requests a high availability level.
- The software is supposed to cover all geographical areas. (while they have internet access)
- Impact of downtime on users is quite high and can result in data loss and lost productivity.
- The maximum permitted number of failures per hour shouldn’t exceed 3.
- MTBF should be 0,33 failure/hour.

3.1.3.3 Latency

- The maximum acceptable time for a service request shouldn’t be more than 8 sec.

3.1.4 Manageability/Maintainability

3.1.4.1 Monitoring

This restaurant information management system will have to be monitored by us for any possible failure or error in order to be corrected as soon as we can. It will have included an error handling process.

This will be done by error reporting functions, which will report directly to us the concern or feedback of the user. These functions allow us to customize problems by their level of importance. One of these functions will be the logging ones, which allow you to send messages to an email for example.

The other part will be handled by our data collection and records of all activities including HTTP requests during the day.

3.2.4.2 Maintenance

Except the construction of the all system, we have focused our attention also in the continuous maintenance.

According to some modularities and our interface design, there will be buttons, which give the possibility to keep your employees organised. Here are included the add, delete, edit their personal information buttons in order to maintain the changes in the list.

About the complexity issues, we know that the level of innovative services is continuously growing, so there is a special team to adapt with the rapid changes of the technology by perfecting the interaction between pieces of code. Since complexity can be measured as the quality grade, our system's grade will always be high. Also, every action that has been taken is saved in our server and in our database and it can be restarted anytime if any possible disaster occurs.

3.2.4.3 Operations

Specify any normal and special operations required by the user, including:

- Periods of interactive operations

The system should be available from 9am to 12 am.

- Periods of unattended operations

Unattended operations include the time between 12 am to 9 am.

- Data processing support functions

We will use validations to ensure that each input is appropriate and not malicious.

Summarize at the end of each working day the sales and expenses in a detailed report by using a sorting algorithm to arrange the data.

Classify all the items of the menu and inventory according to their category.

- Backup and recovery operations

There is available a backup server, in case that our current server breaks down for any circumstances.

- Safety considerations and requirements

Each user has its own address with an unique ID and password and only he can log in to its page. Also, a random work number is generated for each user encrypted with the b- encryption standards, so every personal information is secret and cannot be accessed.

For every HTTP request that is being generated, there will be applied the 2 Golden Rules (filter external input and escape output).

- Disaster recovery and business resumption

We are using MySQL for the database and Apache for the server. Everything is being recorded and saved in case of any fatal crashes of the system. There is a backup server, which will be used to restart the system and it only needs some confirmations from the user or from our IT supervisor.

3.1.5 System Interface/Integration

The database will be provided to employees such as bartenders, waiters and other employees only as information. They would not have access to change anything on the menu or the structure of the database. Only the owner and the manager will have access to the DB configuration.

Credit card machinery configuration system. (to be revised later)

3.1.5.1 Network and Hardware Interfaces

Our system is a web application that will be stored in a web server, which means that the browser will create a TCP connection with the server. Every browser is able to support this connection, ensuring us that our system will function properly and each employee who would have access to his/her page if they provide the correct credentials.

3.1.5.2 **Security**

3.1.5.3 Protection

- When the manager or owner registers new users, a random work number is generated for that user encrypted with the b- encryption standards.
- Usage of x-xss-protection security header.
- Implement https, use the 2 golden rules (filter external input and escape output).
- For the data integrity, the software will always do validations and keep an audit trail.

3.1.5.4 Authorization and Authentication

- The users cannot change by themselves their work numbers, but the manager can by using the Two Factor Authentication method.
- The database is centralized and can only be accessed by the authorized users (owner and manager), who perform all CRUD functionalities.
- Session to be used for currently logged in users.

3.1.6 Data Management

Entities:

Employee

Menu Items

Order

Inventory

Bills

Timesheet

Sales

Table

Suppliers

Employee table will contain all the general information about the employee

emp_id integer PK

emp_name varchar max 15

emp_surname varchar max 15

emp_birthday DATE - format YYYY-MM-DD

emp_status (this option will help us to differentiate owner, manager, economist, waiters, bartenders, other employees) varchar max 20

emp_photo

----Storing images in a database can potentially put unnecessary load on your database and the network between your database so a general practice is to store images in directories on the file system and store references to the images in the database. e.g. path to the image,the image name, etc.---

emp_email varchar 50

emp_hourly_wage int default =0

Employee Information

can be accessed upon login

uniquely represented by ID

Only the owner and the manager have the right to add, delete, update.

Timesheet

This table will be connected with the Employee table through emp_id

time_id integer PK

clock_in TIMESTAMP - format: YYYY-MM-DD HH:MI:SS

clock_out TIMESTAMP - format: YYYY-MM-DD HH:MI:SS

emp_id

daily_wage[(clock_out - clock_in)*emp_hourly_wage from emp table which is connected by emp_id]

Everyone will have the right to put a timesheet record which means anyone would clock in and clock out but only the owner and manager have the right to edit or delete the record.

Suppliers

We decided that suppliers would not have individual access in our system but we still need a table with supplier information in order that the manager can contact the suppliers.

sup_id int PK

sup_name varchar 50

sup_email varchar 50

sup_phone_nr int

sup_products varchar 50

The supplier information will be accessible only to the owner and the manager.

MenuItems

menu_item_id int PK

dish_name varchar 50

dish_price int by default =0

type varchar 20 (Food or Beverage)

product_name varchar 20 (Ingredients)

ing_id (will connect with inventory table through inv_id)

amount_of_ingredient

Owner and the manager will have access here to change meanwhile the bartender and waiter can only see the information in the database but cannot add or delete a menu item.

Order

order_id int pk

menu_item_id(menu table) FK

emp_id (employee table) FK

table_id (table_id) FK

order_total int default=0

Table

table_id int PK

open_time TIMESTAMP - format: YYYY-MM-DD HH:MI:SS

closed_time TIMESTAMP - format: YYYY-MM-DD HH:MI:SS

status int (1 or 0)

order_id (connect with order) FK

Waiter and manager can open and close a table.

Daily_Expense

exp_id int PK

daily_date DATE - format YYYY-MM-DD

exp_amount int

Sales

sale_id int PK

daily_date DATE - format YYYY-MM-DD FK (Daily_Expense)

profit (order_total - ex_amount)

Bill (for the bills of supplier)

Bill_id int PK

Bill_date DATE - format YYYY-MM-DD apo DATETIME - format: YYYY-MM-DD HH:MI:SS

Bill_supplier FK for supp_id

Bill_description varchar 100

Bill_amount int

Bill_pdf

Inventory

inventory_id int PK

product_name varchar FK (MenuItems)

supplier_id int FK (Supplier)

amount_available int

Our interface main goal is to be easy and fast to use in order to be efficient. The interface will be developed using html, css , bootstrap. A majority of the menu items will be just to select them so the waiter would not have to type and spend time.

All users of our system will have their personal credential (username and password) in order to login and access their page. Records will be created everyday when the employee will clock in and clock out in order to create a proper timesheet and a proper way of calculating the checks in the end.

3.1.7 Standards Compliance

There are functions or modularities that are created in accordance with law and regulations standards.

- Employees dashboard & Timesheets

According to “Kodi i Punes” in Albania, the owner is obliged to have a detailed list of personal information of the employees, to keep track about the overall period in work of an employee, to declare the employees’ wages and to declare and pay their insurances. This is all done at the employees dashboard and timesheets functions. All the personal information should be kept private (9887 Law).

- Sales & Bills

According to taxes on profit, there is a need by law to keep track of every sale that is made declared in every bill, in order to generate legal profits. These ones are organized in sales and bills functions controlled by the economist and owner.

Also, TVSH should be included in the receipt, so everything is transparent to the client.

3.1.8 Portability

- Php used as portable scripting language
- Operating system- Windows 7 or later, linux and MAC compatible.

3.2 Domain Requirements

This web based application will be used within the restaurant system/network and it does not need to communicate with any other system. It should be accessed only by the users that are registered in the system (all the employees).