



PPU College of
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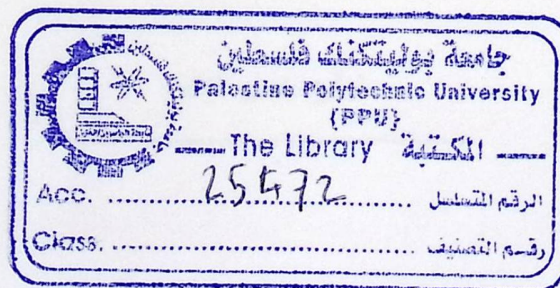
The Home of Competent Engineers and Researchers

Palestine Polytechnic University
College of Engineering and Technology
Electrical and Computer Engineering Department

Graduation Report
Mobile Menu

Project Team
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Hebron – Palestine
Dec, 2011

جامعة بوليتكنك فلسطين
الخليل- فلسطين
كلية الهندسة و التكنولوجيا

دائرة الهندسة الكهربائية والحاسوب

اسم المشروع :
Mobile Menu

أسماء الطلبة:

رشا سلهب

منير السلامين

ونام عابدين

بناء على نظام كلية الهندسة و التكنولوجيا وإشراف ومتابعة المشرف المباشر وموافقة أعضاء اللجنة الممتحنة تم تقديم هذا المشروع إلى دائرة الهندسة الكهربائية و الحاسوب وذلك للوفاء بمتطلبات درجة البكالوريوس في تخصص هندسة أنظمة الحاسوب.

توقيع المشرف

توقيع اللجنة الممتحنة

توقيع رئيس الدائرة

Dedication & Appreciation

The team would like to dedicate this Graduation Project to their Parents, Families and Friends for their continuous support.

The team would also like to thank The Palestine Polytechnic University, Dean Ra'ed Amro, Chairperson Ramzi Al-Qawasme, Adviser Mazen Zassoum, Supervisor Wisam Shamroukh and the staff of the University for their Efforts.

Special thanks to Eng. Abd Al-Qader Al-Zaro.

In memory of Khadija Abdeen, a wonderful person who has contributed her entire life to the education of many generations in Hebron, Palestine.



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Using

Software Project Management Plan

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ABSTRACT

The Project aims to design software application for touch-mobile that showing the menu of the restaurant (with prices), so that the waiter clicks on the required items and send them to a computer in the kitchen to be prepared. After preparation the accountant print a bill that contains table No. and the total price.

The goal from this idea is to enhance the restaurants services ,because of the problems that complain customers during the service,where many human mistakes happen during the service,like serving the customers meals they didn't ask, or that some customers lose their priority ,or latency in serving the client which causes the inaccurate and latency in the service system, which led us to find another system that decreases the problems and helps to provide the required services in a better performance and less time with more accuracy and less mistakes which makes the restaurant service more efficient and the customers more satisfied and more comfortable ,and returns more financial income for the restaurant.

This document is representing the Software Project Management Plan for subject Mobile Menu, which includes all management issues that relating with Mobile Menu.

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1.1.1 Scope, Purpose and Objectives

In current restaurants, they using menu boards to provide the customers with their food and drink options. The scope of this project is summarized by two concepts. The first one is to enhance the static menu to electronic format using a mobile device, waiter will be able to use it to check an electronic order. The second one is how transfer this electronic order to display screen at the kitchen to be prepared.

The main objective for this project by electronic format menu, serving to customers will be more easily and more quickly than using paper menu. It also provides the restaurants to update their menu without needing to print a new menu.

1.1.2 Assumptions and Constraints

The scope of this project is expected to complete the project within two quarters. This project will develop in the next time specified in the plan of the project under the guidance of Mr. Wasim Starwala, who usually agreed to be the Supervisor and a guide for this project.

1.2 Project Deliverables

The list of project deliverables is:

- Software Project Management Plan (This Document)
- Software Requirements Specification
- Software Design Document
- Software Test Documentation
- Software Product with Implementation Details

1. INTRODUCTION

This document provides the Software Project Management Plan for subject Mobile Menu (MM). The current chapter includes an Overview of MM and Project Deliverables.

1.1 Project Overview

1.1.1 Scope, Purpose and Objectives

In current restaurants, they using static menus to provide the customers with their food and drink options. The scope of this project is summarized by two concepts. The first one is to exchange the static menus to electronic format using a mobile device; waiters will be able to use it to choose an electronic order. The second one is how transfer this electronic order to display screen in the kitchen to be prepared.

The main objective for MM that by electronic format menu, servicing in restaurants will be more easily and more quickly than using paper menus. It's also provides the restaurateurs to update their menus without needing to print a new menus.

1.1.2 Assumption and Constraints

The team of this project is expected to complete the project within two semesters. This project will beready in the time that specified in the plan of the project,under the guidance of Mr. Wisam Shamroukh, who kindly agreed to be the Supervisor and a guide for this project.

1.2 Project Deliverables

The list of project deliverables is:

- Software Project Management Plan (This Document).
- Software Requirements Specification.
- Software Design Description.
- Software Test Documentation.
- Software Product with Implementation Details.

1.3 Definitions and Acronyms

Table 1.3.1 represents the definition of all terms and acronyms required to properly interpret the SPMP.

Table 1.3.1: Definitions and Acronyms

Term	Definition
SPMP	Software Project Management Plan.
MM	Mobile Menu.
SRS	Software Requirements Specification.
SDD	Software Design Document.
STD	Software Test Document.
LAN	Local Area Network

1.4 Scheduling and Budget Summary

Table 1.4.1 represents the scheduling of the submission of each item of MM.

Table 1.4.1: Scheduling Table

Item	Date
Software Project Management Plan	22 th May. 2011
Software Requirements Specification	22 th May. 2011
Software Design Description	22 th Dec. 2011
Software Test Documentation	22 th Dec. 2011
Software Product with Implementation Details	11 th Jan. 2012

Table 1.4.2 represents the budget summary to implement the MM, as a simple system (1 waiter and 1 screen in the kitchen).

Table 1.4.2: Budget Summary.

Component Name	No.	Price/1 Item (Dollar \$)	Total
Computer	3	850	2550\$
Mobile Device	1	500	500\$
Display Screen	1	1300	1300\$
Access Point	1	100	100\$
Printer	1	100	100\$
Total			4550\$

1.5 Evaluation of the SPMP

The preliminary draft of SPMP will be delivered to the supervisor of the MM (Mr. Wisam Shamroukh), after the approval, copies of the same will be delivered to Department of Electrical and Computer ^{in EWJ} in Palestine Polytechnic University on the date referred to. (see section 1.3 Schedule and Budget Summary).

1.6 SPMP Structure

The rest of this document is structured as following. Chapter Two represents the Project Organization, which specifies the process model for the project and its organizational structure.

. Chapter Three represents the Project Management Plan, which describes each task in the project, tasks dependency and the time table.

2. PROJECT ORGANIZATION

This chapter specifies the software process model for the project, the roles and responsibilities and tools and techniques.

2.1 Software Process Model

The process model used to implement the documentations of MM is Software Engineering Standards. By using some formats for each document that will be delivered.

MM will be implemented as a working system using “Netbeans IDE 7.1”, by creating a mobile application to implement the electronic menu on the mobile, and windows application to implement each Supervisor, Chef and Accountant applications.

“Oracle Database 10g Express Edition” is used to build the database of the MM, connected with “netbeans 7.0.1 IDE”.

The last software used is “Microsoft Project 2011” to implement the timetable of the project.

2.2 Roles and Responsibilities

The team is responsible for all documentations to be written and delivered in the specific dates, and responsible for all work to implement the MM as a working system and deliver it in the specific date.

2.3 Methods, Tools and Techniques

Refers to section 2.1, this project determines to use a mobile and build the mobile application on. Two personal computers are needed to run supervisor and accountant applications on and one touch screen to display orders to the chef Server also needed to build the database on, and interface all parts of MM with each other by Local Area Network (LAN) and Wi-Fi network.

3. PROJECT MANAGEMENT PLAN

This chapter represents the project plan to implement MM, and the risks that may be faced within implementation.

3.1 Project Plan

This subsection represents the plan of MM. The plan is specified using “Microsoft Project 2011” (as mentioned in section 2.1).

3.1.1 SRS Plan

As shown in the following figures, each task and its subtasks in specify the requirements of MM, and complete the SRS documentation.













	 Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		- Preliminary Documentation	25 days	Sun 2/27/11	Thu 3/31/11	
2		Background Research	5 days	Sun 2/27/11	Thu 3/3/11	
3		Requirements Elicitation	5 days	Sun 3/6/11	Thu 3/10/11	
4		Complete Analysis/Use Modeling	5 days	Sun 3/13/11	Thu 3/17/11	
5		Complete Diagrams	5 days	Sun 3/20/11	Thu 3/24/11	
6		Review Requirements	5 days	Sun 3/27/11	Thu 3/31/11	
7		- Final Documentation	37 days	Sun 4/3/11	Sun 5/22/11	1
8		Report First Draft	20 days	Sun 4/3/11	Thu 4/28/11	
9		Report Proof read	5 days	Sun 5/1/11	Thu 5/5/11	
10		Report Final Draft	5 days	Sun 5/8/11	Thu 5/12/11	
11		Report Submittef	7 days	Sun 5/15/11	Sun 5/22/11	

Figure 3.1.1.1: Timetable chart for SRS Plan.

Mobile Menu

SPMP

3.1.1 SDD and STD Plan

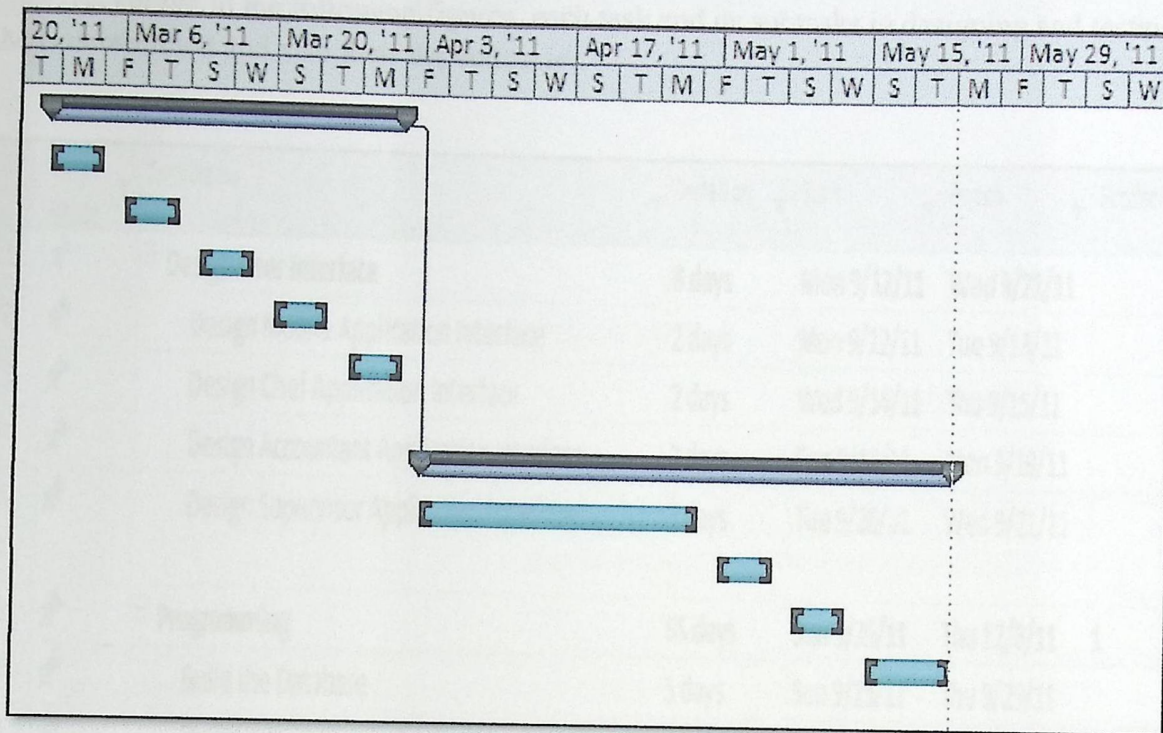


Figure 3.1.1.2: Gantt Chart SRS.

Requirements	20 days	Mar 20, '11	Apr 10, '11
Analysis	10 days	Mar 27, '11	Apr 7, '11
Design	10 days	Apr 4, '11	Apr 14, '11
Development	20 days	Apr 11, '11	May 1, '11
Testing	10 days	Apr 18, '11	Apr 28, '11
Deployment	10 days	Apr 25, '11	May 5, '11
Test Project	10 days	Apr 25, '11	May 5, '11
Unit Testing	10 days	Apr 25, '11	May 5, '11
Subversion Setup	10 days	Apr 25, '11	May 5, '11
System Setup	10 days	Apr 25, '11	May 5, '11
Preparing Documentation	10 days	Apr 25, '11	May 5, '11
Preparing Software Design Document	10 days	Apr 25, '11	May 5, '11
Preparing Software Test Document	10 days	Apr 25, '11	May 5, '11

Figure 3.1.1.1: Timeline chart for SDD and STD.

3.1.2 SDD and STD Plan

As shown in the following figures, each task and its subtasks in designing and testing MM is determined and also their dependencies.

Task Mode	Task Name	Duration	Start	Finish	Predecessors
1	[-] Design User Interface	8 days	Mon 9/12/11	Wed 9/21/11	
2	Design Mobile Application Interface	2 days	Mon 9/12/11	Tue 9/13/11	
3	Design Chef Application Interface	2 days	Wed 9/14/11	Thu 9/15/11	
4	Design Accountant Application Interface	2 days	Sun 9/18/11	Mon 9/19/11	
5	Design Supervisor Application Interface	2 days	Tue 9/20/11	Wed 9/21/11	
6	[-] Programming	55 days	Sun 9/25/11	Thu 12/8/11	1
7	Build the Database	5 days	Sun 9/25/11	Thu 9/29/11	
8	Programming Mobile Application	15 days	Sun 10/2/11	Thu 10/20/11	
9	Programming Chef Application	10 days	Sun 10/23/11	Thu 11/3/11	
10	Programming Accountant Application	10 days	Sun 11/6/11	Thu 11/17/11	
11	Programming Supervisor Page	10 days	Sun 11/20/11	Thu 12/1/11	
12	Connect the Mobile Application With Database	5 days	Sun 12/4/11	Thu 12/8/11	
13	[-] Test Project	60 days	Sun 9/25/11	Thu 12/15/11	
14	Unit Testing	55 days	Sun 9/25/11	Thu 12/8/11	
15	Subsystem Testing	35 days	Fri 10/21/11	Thu 12/8/11	
16	System Testing	5 days	Sun 12/11/11	Thu 12/15/11	6
17	[-] Preparing Documentation	69 days	Mon 9/12/11	Thu 12/15/11	
18	Preparing Software Design Dscription	64 days	Mon 9/12/11	Thu 12/8/11	
19	Preparing Software Test Document	60 days	Sun 9/25/11	Thu 12/15/11	
20					

Figure 3.1.2.1: Timetable chart for SDD and STD.

Mobile Menu

SPMP

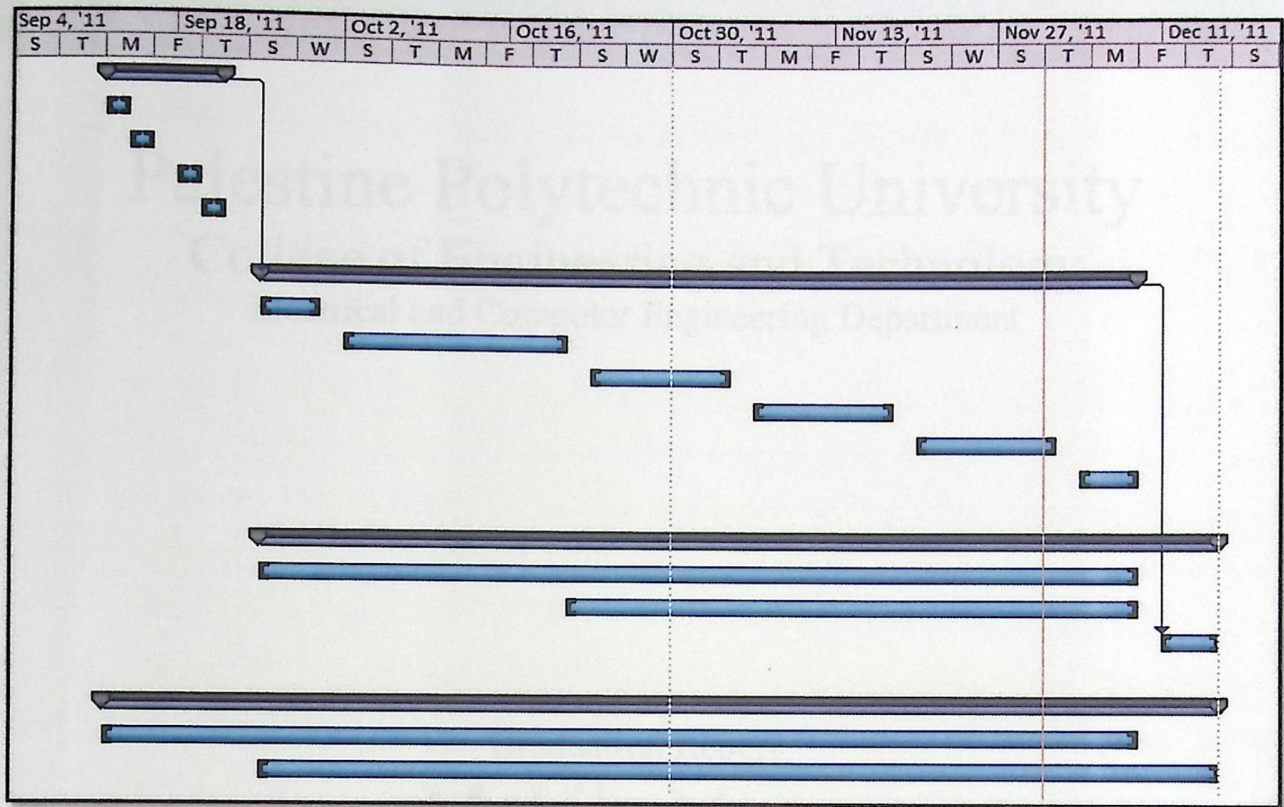


Figure 3.1.2.2: Gantt Chart for SDD and STD.

Using

Software Requirements Specification

Project Team

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Graduation Report

Mobile Menu

Using

Software Requirements Spacification

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Hebron – Palestine

Dec, 2011

ABSTRACT

The Project aims to design software application for touch-mobile that showing the menu of the restaurant (with prices), so that the waiter clicks on the required items and send them to a computer in the kitchen to be prepared. After preparation the accountant print a bill that contains table No. and the total price.

The goal from this idea is to enhance the restaurants services ,because of the problems that complain customers during the service, where many human mistakes happen during the service, like serving the customers meals they didn't ask, or that some customers lose their priority ,or latency in serving the client which causes the inaccurate and latency in the service system, which led us to find another system that decreases the problems and helps to provide the required services in a better performance and less time with more accuracy and less mistakes which makes the restaurant service more efficient and the customers more satisfied and more comfortable ,and returns more financial income for the restaurant.

This document is representing the Software Requirements Specification for subject Mobile Menu, which includes all functional and non-functional requirements to implement the final produced software of MM.

2.2 Product Features

2.3 User Characteristics

2.4 Constraints

2.5 Assumptions

1. REQUIREMENTS

1.1 Functional Requirements

1.1.1 Waiter Functional Requirements

1.1.2 Cashier Functional Requirements

1.1.3 Supervisor Functional Requirements

1.1.4 Accountant Functional Requirements

1.2 Non-Functional Requirements

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1.1 Purpose

The purpose of this document is to provide a full description of the various tables of the MM using SRS. SRS is used to determine the functional and non-functional requirements of MM.

The primary audience of this project is the restaurant. This document should give them full explanation about the new version of MM.

1.2 Scope

In current restaurant, they using table system to provide the customers with food and drink options. The scope of this project is summarized by two examples. The first one is to establish the table system in electronic format using a mobile device, waiter will be able to use it to check an electronic order. The second one is how to order the electronic order to display waiter in the kitchen to be prepared.

1. INTRODUCTION

“A Software Requirements Specification (SRS) – a requirements specification for a software system – is a complete description of the behavior of a system to be developed. It includes a set of use cases that describe all the interactions the users will have with the software. In addition to use cases, the SRS also contains non-functional requirements. Non-functional requirements are requirements which impose constraints on the design or implementation (such as performance engineering requirements, quality standards, or design constraints).”[1].

This chapter provides an overview of the project Mobile Menu (MM) using Software Requirements Specification (SRS). It includes the purpose of using SRS, a brief scope of the final software of MM, definitions and abbreviations of all terms used in the document, literature review gives an overview about some existing restaurants menu and ordering systems problems, problem statement which describes the goal of this project, references that used in this document, and overview of the structure of the document.

1.1 Purpose

The purpose of this document is to provide a full description of the external behavior of the MM using SRS. SRS is using to determine the functional and non-functional requirements of MM.

The primary audience of this project is the restaurateurs. This document should give them full explanation about the final software of MM.

1.2 Scope

In current restaurants, they using static menus to provide the customers with their food and drink options. The scope of this project is summarized by two concepts. The first one is to exchange the static menus to electronic format using a mobile device; waiters will be able to use it to choose an electronic order. The second one is how transfer this electronic order to display screen in the kitchen to be prepared.

1.3 Benefits

In electronic format menu, servicing in restaurants will be more easily and more quickly than using paper menus. It's also provides the restaurateurs to update their menus without needing to print a new menus.

Easily and quickly servicing increase the productivity of the restaurants, and it is the primary benefit of MM for the restaurateurs.

1.4 Definitions, Acronyms and Abbreviations

This section provides the definitions, acronyms and abbreviations of all terms related to MM and used to write this document.

Table (1.4.1): Documentation Definitions

Term	Definition
Mobile	The device that will be used to build the application in.
Display Screen	Screen that will be used to display the order in the kitchen.
Item	Single option in menu.
Order	one or more items.
Staff	All employees in the restaurant.
Customer	The member that will be serviced in the restaurant.
Waiter	The member using the mobile device to servicing customers.
Chef	The member prepares the orders to be delivered to customers.
Supervisor	The member that watching all actions of waiter and chef.

Table (1.4.2): Documentation Acronyms

Acronyms	Description
SRS	Software Requirements Specification.
MM	Mobile Menu.
DBMS	Database Management System.
LAN	Local Area Network.

1.5 Literature Review

✓ **"Menu & Ordering System"**, By Dr David Carrington

The project idea is Touch screen on all restaurants' tables, which contain the menu's items. Customers can choose required items using the touch screen, then the order is sent to the restaurant kitchen, when the order is ready, waiter brings it to the customer's table.

✓ **"Bluetooth Restaurant System"**, applied as a graduation project in Palestine Polytechnic University, college of administrative sciences and informatics, the project depends on using the Bluetooth technology in the customers' mobiles, so when the customer arrives the restaurant carrying his mobile that supports the Bluetooth technology, a file message that contains the food menu is sent to his mobile. When the customer receives the message and downloads the attached file, he can pick the order he wants and sends the order to the counter.

✓ **"Simple iPhone APP for the restaurant menu"**, By Mikehan in the United States. The project idea is to create an iPhone APP restaurant menu for iPhone with the MySQL database information of that restaurant, so that the customer can see the restaurant menu in iPhones.

1.6 Problem Statement

The goal of MM is to enhance the servicing in restaurants, so MM can decrease the human errors that happen during servicing, such as customer priority, if more than one customer orders a meal/s, MM deals with this case using a queue algorithm, the first customer ordered, first to be serviced. Also, accuracy is necessary in servicing, MM can provide full accuracy orders, if used correctly.

MM also decreases the error that occurs in the accounting, which decreases the accuracy of accounting for the restaurant.

1.7 SRS Structure

The rest of this document is structured as following. Chapter Two represents an Overall description of what the final software will be. Chapter Three represents the Specific Requirements, such as functionality, usability, reliability, Reliability, Performance, Supportability, Design Constraints, and Purchased Components. Chapter four represents UML analysis models.

2.1 Product Perspective

The final product of the MMS project is derived from software and hardware components, in addition to an external interface.

Figure (2.1) shows out a general block diagram of what is MMS system.

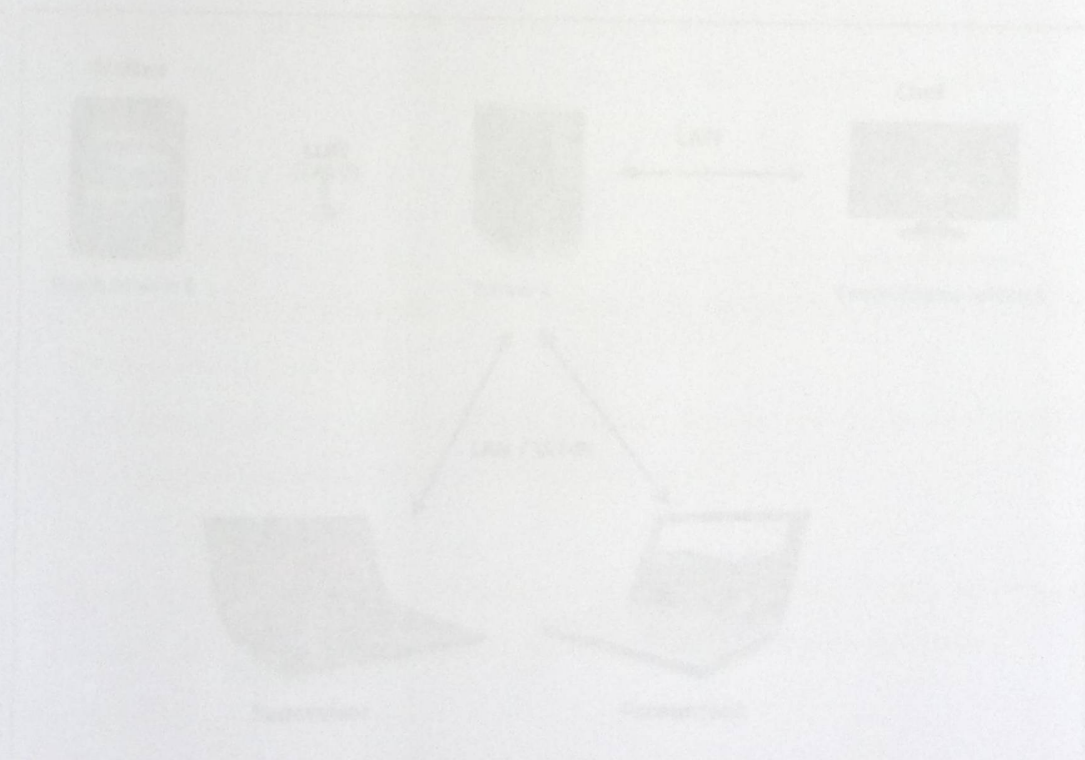


Figure (2.1) General Block Diagram.

2. OVERALL DESCRIPTION

This chapter describes the general factors that affect the software of MM. the final product of MM is combined between software and hardware interfaces. User characteristics, constrains on building application, assumptions and dependencies also provided.

2.1 Product Perspective

The final product of the MM project is derived from software and hardware interfaces, in addition to an external interfaces.

Figure (2.1) sorts out a general block diagram of what is MM system.

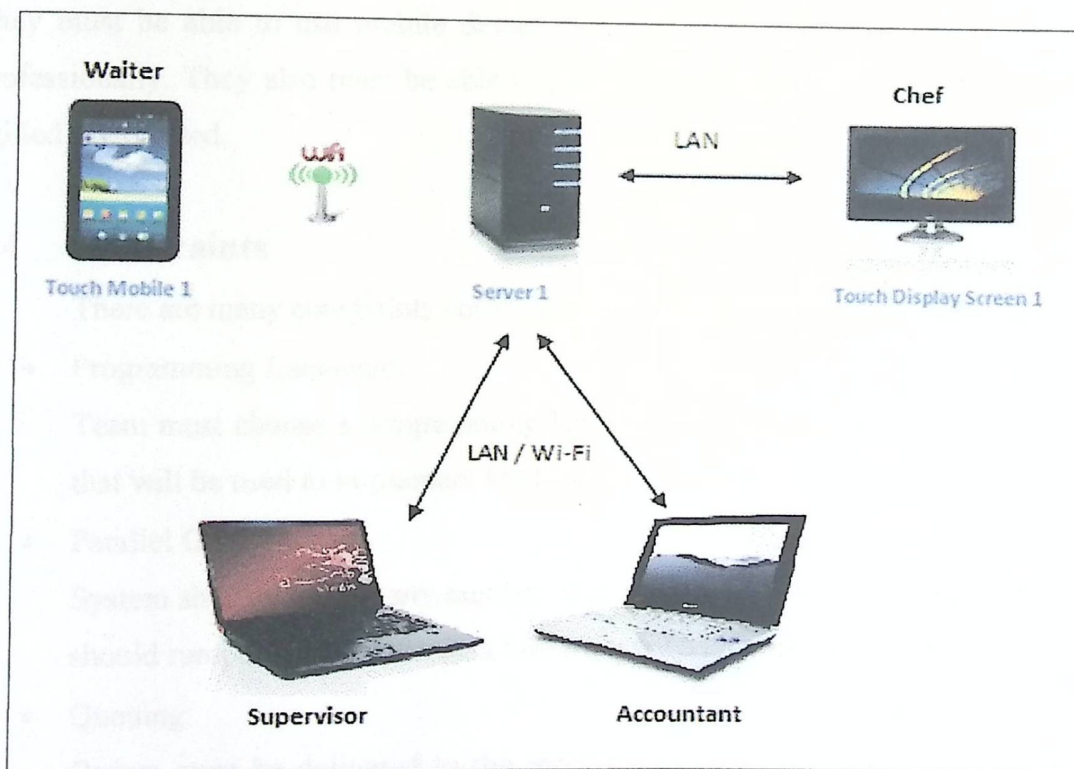


Figure (2.1): General Block Diagram.

2.2 Product Functions

The main functions of the product that will be installed in a mobile device are:

- Waiter will place customer's order in his touch mobile screen.
- When he submits the order it will be transferred by Wi-Fi connection to touch display screen in the kitchen (through the server).
- Chef will receive the order, when he prepared the order; notification will be sent to the waiter so he delivers the order to customer.
- Any changes in any item under any circumstances will be controlled by the chef of the restaurant.

2.3 User Characteristics

The users of final product of MM are waiter, chef, accountant and supervisor. They must be able to use mobile device, display screen and PC screens respectively professionally. They also must be able to train other for using these devices. No highly skilled is expected.

2.4 Constraints

There are many constraints could be face in designing the application, such as:

- **Programming Language:**
Team must choose a programming language that can be run in the mobile device that will be used to implement MM mobile device..
- **Parallel Operation:**
System should provide any number of mobile devices and display screens, and all should run parallel without data lose from individual device failures.
- **Queuing:**
Orders must be delivered to the server using queue algorithm. First order sent, first displayed in the screen.
- **Recovery**
If any error happened, system should recover itself, without customers notice, and without any data lose.

2.5 Assumptions

The assumptions of using the MM in restaurants are:

- The mobile device which will be used has sufficient memory to install the application on.
- The mobile device is also should has a long term battery.
- The mobile device should provide a Wi-Fi technology.
- The display screen should be able to exchange information with the computer placed in the kitchen, and the mobile device through the server.

3. REQUIREMENTS

This chapter represents the functional requirements and non-functional requirements required to project MM. functional requirements specified according to the main actors of MM, supervisor, waiter and chef. Other requirements will be described such as usability, reliability, performance, supportability, purchased components and interfaces of MM.

3.1 Functional Requirements

This section is provides the main functions of waiter, chef, supervisor and accountant. (The description of each function is represented in section 4.2).

3.1.1 Waiter Functional Requirements

- Waiter can log into a system using their assigned username and password.
- Waiter can log out of system.
- Waiter can chose any items required by a customer, with their quantities and put any notes about items required, and send order to the kitchen.
- Waiter can open account for a customer.

3.1.2 Chef Functional Requirements

- Chef can get all orders through a touch display screen.
- Chef can indicate that the order is ready to be delivered.
- Chef can control the availability of any item that inserted into restaurant's menu.

3.1.3 Supervisor Functional Requirements

- Supervisor can add new item.
- Supervisor can update item.
- Supervisor can add a new waiter
- Supervisor can update waiter's information.
- Supervisor can add a new table.

3.1.4 Accountant Functional Requirements

- Accountant can get the bill.
- Accountant can change the status of each bill (paid/not paid).

3.2 Non-Functional Requirements

3.2.1 Security

- Security of wireless communication is WPA2-PSK.
- The password used for wireless communication prefer to be 80 bits.
- The Password used for mobile log in prefer to be 64 bits.
- Every password used in the system prefer to be changed every three month.

3.2.2 Usability

The following subsections represent the usability of each user of MM (Waiter, Chef, Supervisor and Accountant) and the time required to train on it.

3.2.2.1 Supervisor Usability

Supervisor must have a good degree of computer literacy and working with software, needs to have one month to train on the system, because the system allows him to have a full controlling of the restaurant, retrieval of the daily action of the waiter, chef and accountant, he also can modify all database data.

3.2.2.2 Waiter Usability

Waiter must know how to deal with electronic devices, can use the full mobile applications, the waiter will deal with the system that will be installed on mobile device. The waiter needs one month to train on the system.

3.2.2.3 Chef Usability

Chef must have general knowledge of dealing with the computer, no extensive knowledge required, chef needs one week of training to deal with the system, because the chef is the most important actor in the restaurant "the heart of the restaurant" so team gave special importance to the chef Application to make it easy to deal with, which facilitate the work of chef and reduces the problems faced by him.

3.2.2.4 Accountant Usability

Accountant must be excellent with the general accounting information to use his application, and must know how to use his application to produce maximum accuracy of accounting to the restaurant.

3.2.3 Reliability

This section provides the requirements for the reliability of the MM.

3.2.3.1 Availability

The percentage time that the project will be used in the restaurant is determined by the number of the customers. While there is a customers need to be serviced the waiter needs to use the mobile to send orders to kitchen, the kitchen needs to use the display-screen to determine the orders which will be prepared, supervisor needs to control supervisor's requirements and the accountant needs to control the bills.

3.2.3.2 Accuracy

The system shall be in a high rate of accuracy; any errors in the order or bills will annoy the costumers and decrease the productivity of the restaurant within the days.

3.2.4 Performance

The system shall support any number of mobile, display screens and PC at any time, and all shall operate in parallel; usage of one mobile does not affect usage of another mobile, screens and PC also.

The system shall support any number of orders, such that no order shall be lost under any circumstances.

3.2.5 Supportability

This subsection represents the software and protocols used in the MM system, and how to use them, and employ them in line with the system.

3.2.5.1 WPA2-PSK

"Wi-Fi Protected Access (WPA) and Wi-Fi Protected Access II (WPA2) are two security protocols and security certification programs developed by the Wi-Fi Alliance to secure wireless computer networks. The Alliance defined these in response to serious weaknesses researchers had found in the previous system, WEP (Wired Equivalent Privacy).

The WPA protocol implements the majority of the IEEE 802.11i standard. The Wi-Fi Alliance intended WPA as an intermediate measure to take the place of WEP pending the preparation of 802.11i. Specifically, the Temporal Key Integrity Protocol (TKIP), was brought into WPA. TKIP encryption replaces WEP's small 40-bit encryption key that must be manually entered on wireless access points and devices and does not change. TKIP is a 128-bit per-packet key, meaning that it dynamically generates a new key for each packet and thus prevents collisions. TKIP could be implemented on pre-WPA wireless network interface cards that began shipping as far back as 1999 through firmware upgrades. However, since the changes required in the wireless access points (APs) were more extensive than those needed on the network cards, most pre-2003 APs could not be upgraded to support WPA with TKIP. Researchers have since discovered a

flaw in TKIP that relied on older weaknesses to retrieve the key stream from short packets to use for re-injection and spoofing.

WPA also includes a message integrity check. This is designed to prevent an attacker from capturing, altering and/or resending data packets. This replaces the cyclic redundancy check (CRC) that was used and implemented by the WEP standard. CRC's main flaw was that it did not provide a sufficiently strong data integrity guarantee for the packets it handled. MIC solved these problems. MIC uses an algorithm to check the integrity of the packets, and if it does not equal, it drops the packet." [2].

3.2.5.2 Microsoft Security Essential

Microsoft released a free program to protect files from spy ware and viruses, the advantage of this program that not uses a lot of system resources at the level of the processor or memory, and will benefit from this program so as to provide protection from security risks of the devices used in the system.

3.2.6 Design Constraints

- Choose the suitable programming language to run into the mobile device.
- The system should recover itself quickly (in seconds) if any error happened.

3.3 Interfaces

This subsection defines the interfaces that must be supported by MM.

3.8.1 User Interface

The final product will be used by four users

Mobile Device User

- Mobile is used by waiter to choose customer needs.
- It shall be a touch-screen mobile.
- It shall provide the waiter by the application of MM on the touch-screen.

Display Screen User

- Display Screen is used by chef.
- It shall display the items of any order to chefs to be prepared.

PC Display Screen

- Two PC Display Screens are used by accountant and supervisor.
- They shall display their applications to make any operation allowed to them.

3.3.2 Hardware Interface

- To implement the hardware side of MM we need (mobile device, display screen, 2 computers, access point and server).
- All hardware components should have good industrial; can resist the liquid and stains.
- The Mobile device which may to be used in MM is Samsung Galaxy Tap. The features of this device are:
 - Galaxy Tab give waiter better experience for work, sharper HD quality screen, better multitasking.
 - Galaxy Tab offers a superlative experience with thinnest and lightest tablet available.
 - Galaxy Tab use Google's Android 2.2 platform, bringing user great performance and fully integrated with services.
 - The RAM of Galaxy Tab is 592 MB and the ROM 2 GB up to 32 GB expandable memory.
 - Wi-Fi 802.11 b/g/n connectivity is support.
 - The processor of Galaxy Tab is 1 GHZ.
 - 7.0" AMOLED display with 600*1024 pixel resolution.

3.3.3 Software Interface

3.3.3.1 Database Management System

To interface the hardware components of MM with each other, software interfaces needed to be used, such as a DBMS to store all employees' data, the items of the menu and all orders.

3.3.3.2 Integrated Development Environment (IDE)

Also an Integrated Development Environment (IDE) needed to write the code of applications to implement MM.

3.3.4 Communication Interface

MM needs a wireless connection to connect the mobile device with access point that also connected with the server and supervisor computer, Local Area Network needs to connect the chef computer with display screen and supervisor computer.

4. ACTIVITY DIAGRAMS AND DESCRIPTIONS

4.1 Activity Diagrams

Figures 4.1.1 - 4.1.3 represent the Log-In, Log-Out and Add Order activity diagrams (respectively) to provide a graphical representation of a waiter logging into/out the system and places an order to be prepared.

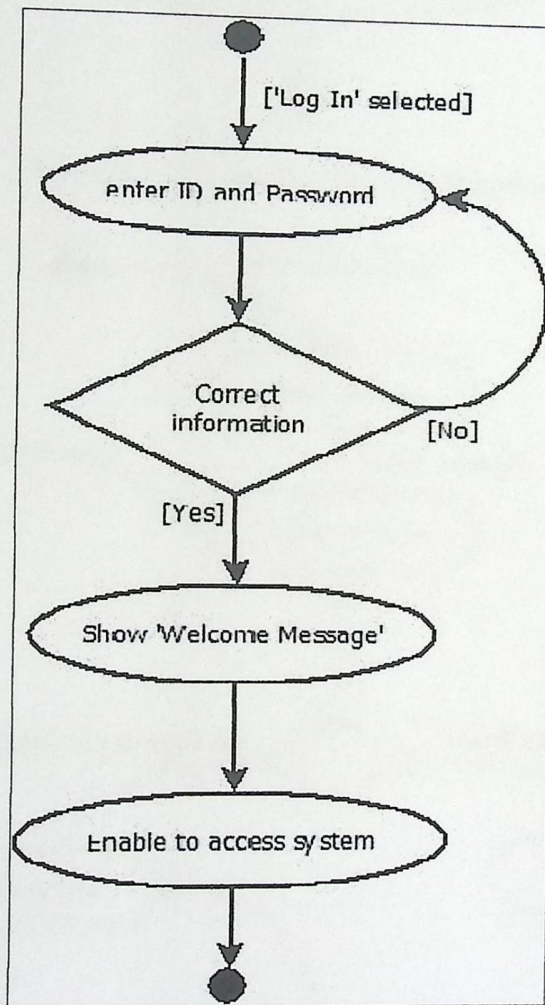


Figure 4.1.1 Log-In Activity Diagram

Mobile Menu
SRS

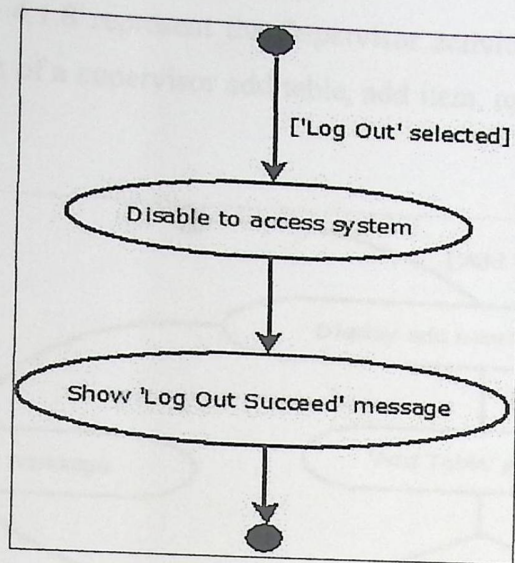


Figure 4.1.2 Log-Out Activity Diagram

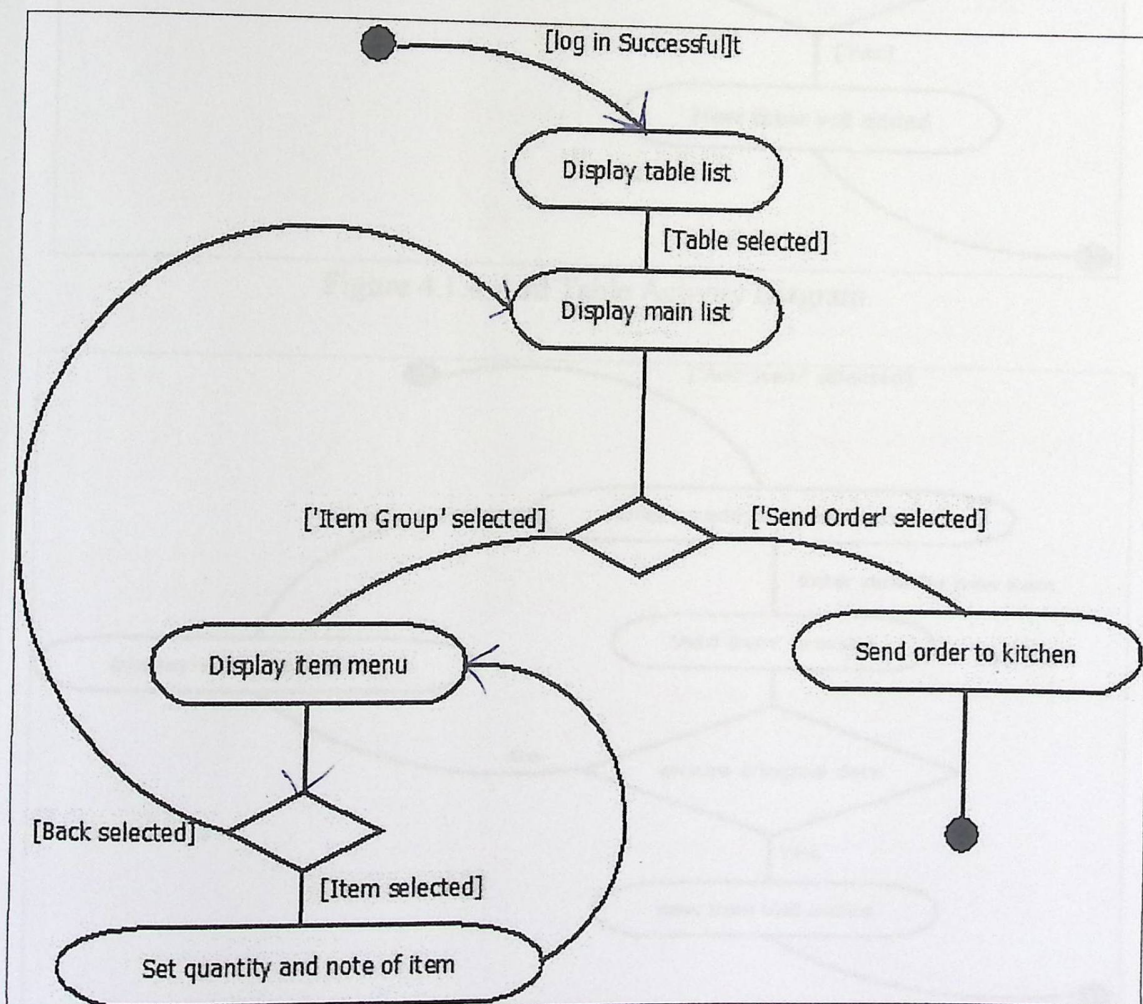
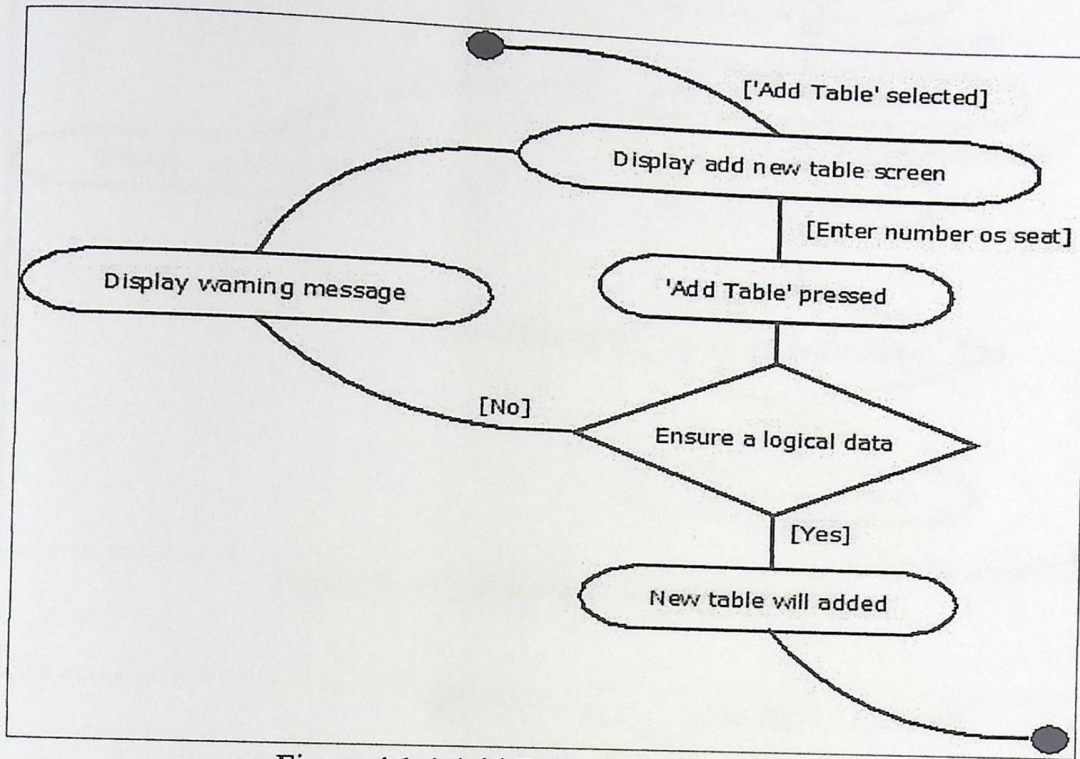


Figure 4.1.3 Add order Activity Diagram

Mobile Menu

SRS

Figures 4.1.4 – 4.1.8 represent the Supervisor activities diagrams to provide a graphical representation of a supervisor add table, add item, update item, add waiter and update waiter.



Arrows

Figure 4.1.4 Add Table Activity Diagram

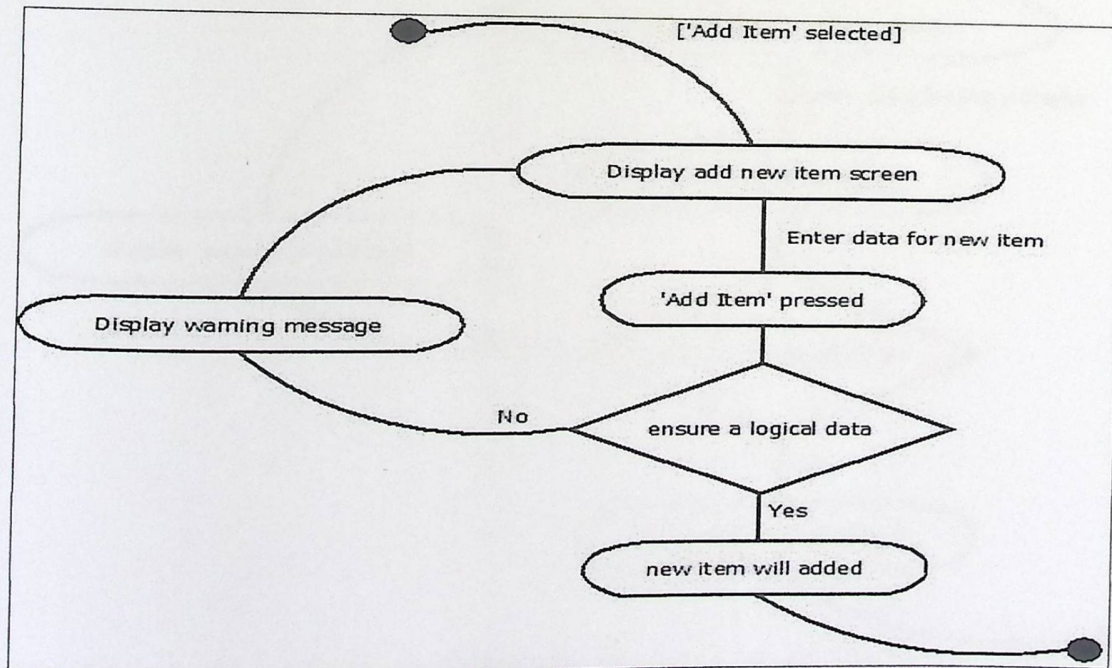


Figure 4.1.5 Add Item Activity Diagram

Mobile Menu
SRS

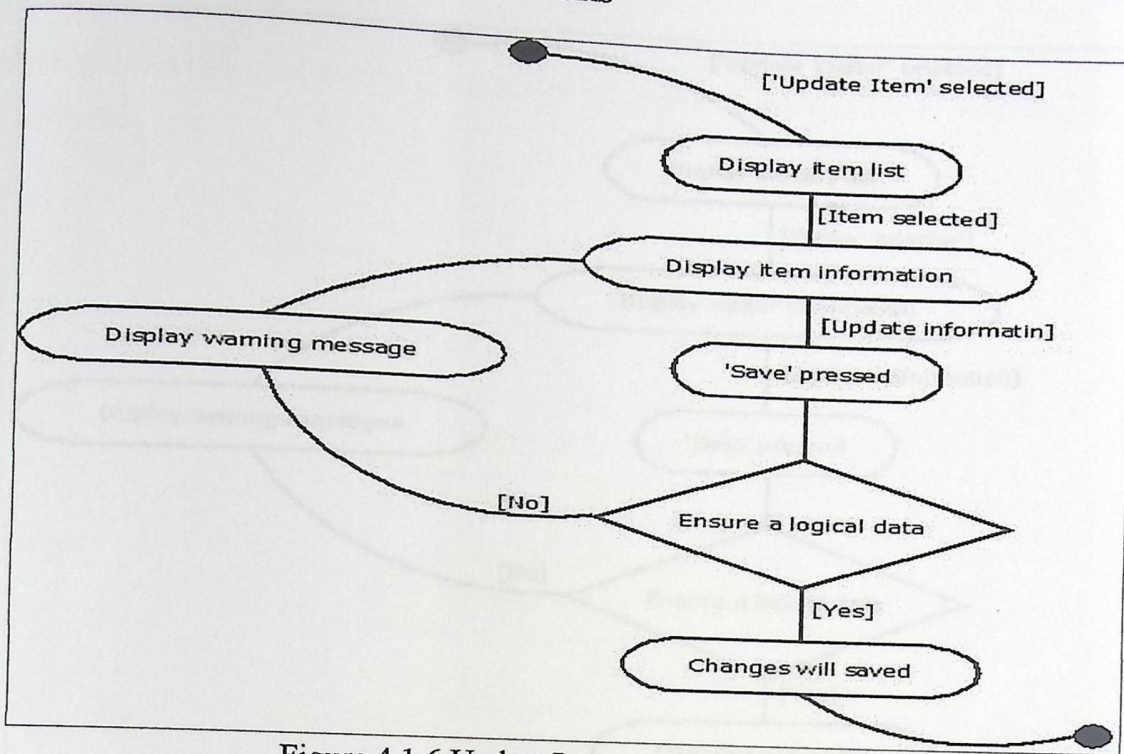


Figure 4.1.6 Update Item Activity Diagram

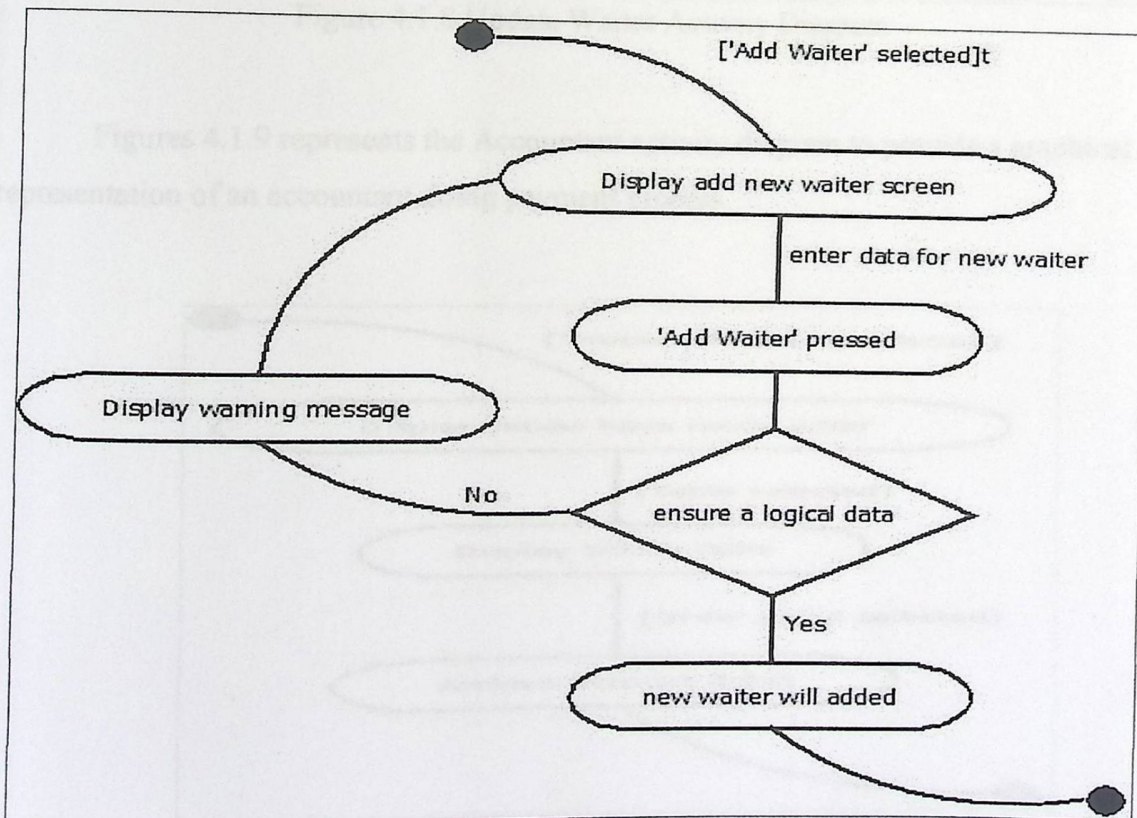


Figure 4.1.7 Add Waiter Activity Diagram

Mobile Menu
SRS

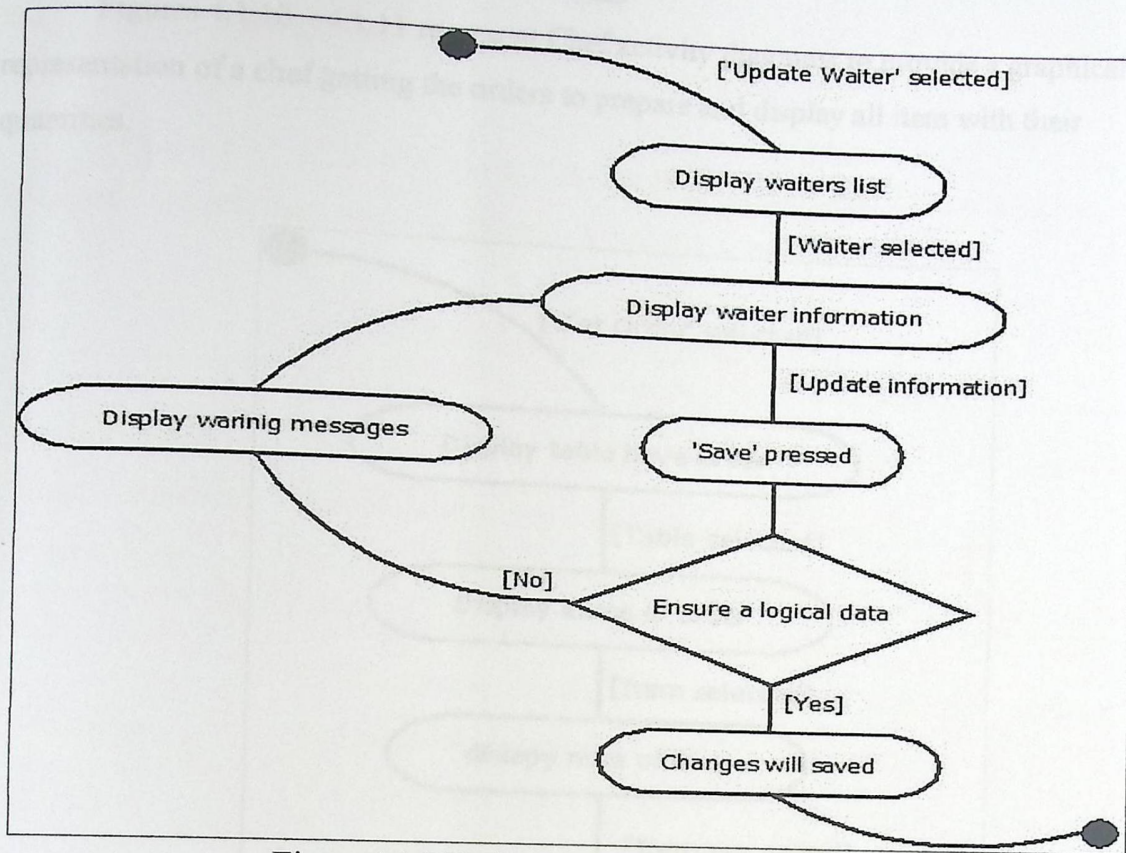


Figure 4.1.8 Update Waiter Activity Diagram

Figure 4.1.9 represents the Accountant activity diagram to provide a graphical representation of an accountant doing payment process

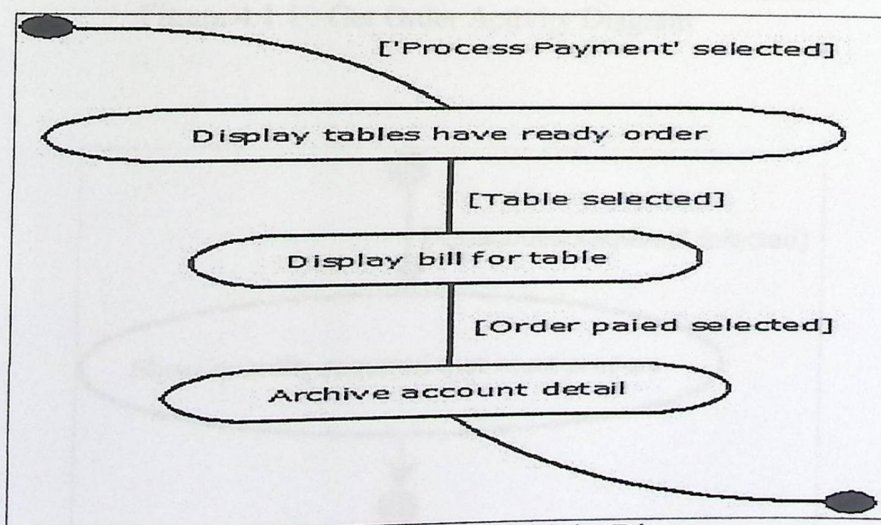


Figure 4.1.9 Process Payment Activity Diagram

Figures 4.1.10 – 4.1.11 represent Chef activity diagrams to provide a graphical representation of a chef getting the orders to prepare and display all item with their quantities.

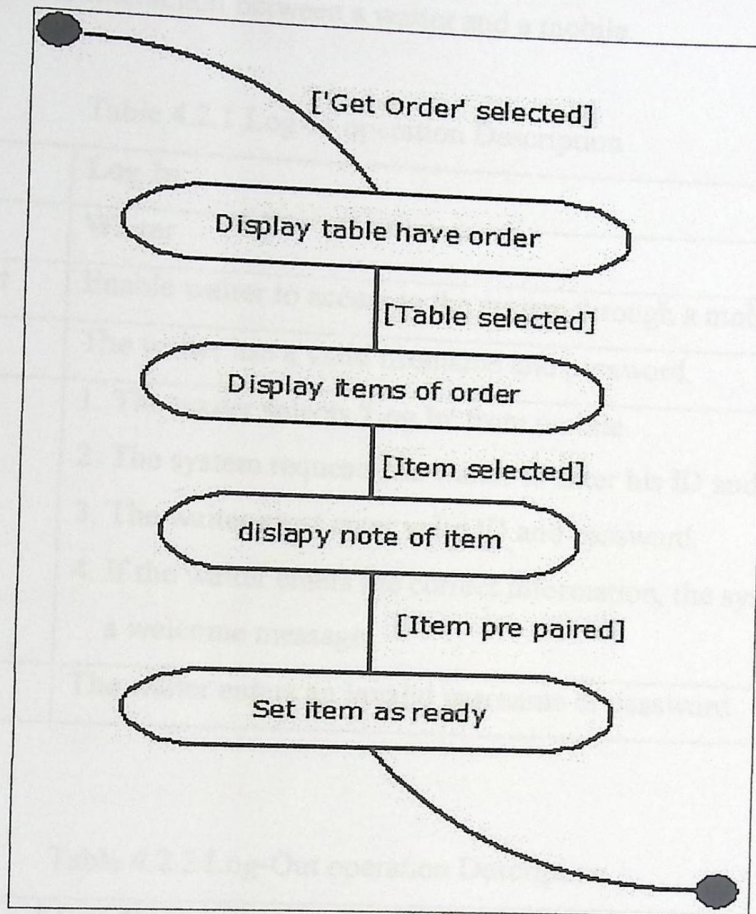


Figure 4.1.10 Get Order Activity Diagram

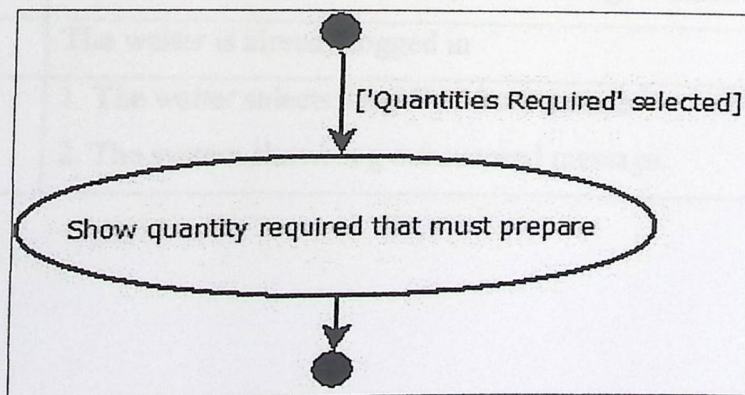


Figure 4.1.11 Quantity Required Activity Diagram

4.2 Activity Diagrams Descriptions

Tables 4.2.1 – 4.2.3 represent the Log-In, Log-Out and Add order operations description to show the interaction between a waiter and a mobile.

Table 4.2.1 Log-In operation Description

Operation	Log In
Primary Actor	Waiter
Goal In Context	Enable waiter to access to the system through a mobile.
Precondition	The waiter has a valid username and password.
Scenario	<ol style="list-style-type: none"> 1. The waiter selects 'Log In' from mobile. 2. The system requests the waiter to enter his ID and password. 3. The waiter must enter valid ID and password. 4. If the waiter enters the correct information, the system shows a welcome message.
Exception	The waiter enters an invalid username or password

Table 4.2.2 Log-Out operation Description

Operation	Log Out
Primary Actor	Waiter
Goal In Context	Disable waiter access to the system through a mobile.
Precondition	The waiter is already logged in
Scenario	<ol style="list-style-type: none"> 1. The waiter selects 'Log-Out' from mobile. 2. The system shows log out succeed message.

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Table 4.2.3 Add Order Operation Description

Operation	Add Order
Primary Actor	Waiter
Goal In Context	send the item that the customer chose from the restaurant menu to the kitchen to prepare
Precondition	A customer has chosen order
Scenario	<ol style="list-style-type: none"> 1. The waiter selects 'Add Order' form the mobile. 2. The system asks waiter to enter the number of table. 3. Waiter enters the number of the table. 4. The system shows the restaurant menu. 5. Waiter chose the item that ordered by the customer, and set it quantity, then sends it to the kitchen.

Tables 4.2.4 – 4.2.8 represent Add Table, Add Item, Update Item, Add Waiter and Update Waiter operations description to show the interaction between a supervisor and a supervisor application.

Table 4.2.4 Add Table Operation Description

Operation	Add Table
Primary Actor	Supervisor
Goal In Context	Add a new table to be available to waiter.
Precondition	The table is added to the restaurant.
Scenario	<ol style="list-style-type: none"> 1. The supervisor select add table operation. 2. The supervisor enters the number of seats. 3. The system auto-increment the number of tables.
Exceptions	<ol style="list-style-type: none"> 1. The supervisor enters a negative seats number. 2. The supervisor enters a textual seats number.

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Table 4.2.5 Add Item Operation Description

Operation	Add Item
Primary Actor	Supervisor
Goal In Context	Add a new item to the restaurant menu.
Precondition	The item is not in the menu.
Scenario	<ol style="list-style-type: none"> 1. The supervisor select add item operation. 2. The supervisor enters the item's informations.
Exceptions	<ol style="list-style-type: none"> 1. The supervisor enters a negative price. 2. The supervisor enters a textual price. 3. The supervisor keeps any field empty.

Table 4.2.6 Update Item Operation Description

Operation	Update Item
Primary Actor	Supervisor
Goal In Context	Update item informations.
Precondition	The item is already in the restaurant's menu.
Scenario	<ol style="list-style-type: none"> 1. The supervisor select update item operation. 2. The supervisor edits item's information.
Exceptions	<ol style="list-style-type: none"> 1. The supervisor enters a negative price. 2. The supervisor enters a textual price. 3. The supervisor keeps any field empty.

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Table 4.2.7 Add Waiter Operation Description

Operation	Add Waiter
Primary Actor	Supervisor
Goal In Context	Add a new waiter to work in the restaurant.
Precondition	The waiter is not an employee in the restaurant.
Scenario	<ol style="list-style-type: none"> 1. The supervisor select add waiter operation. 2. The supervisor adds the new waiter's informations.
Exceptions	The supervisor keeps any field empty.

Table 4.2.8 Update Waiter Operation Description

Operation	Update Waiter
Primary Actor	Supervisor
Goal In Context	Edit waiter's information.
Precondition	The waiter is already an employee in the restaurant.
Scenario	<ol style="list-style-type: none"> 1. The supervisor select update waiter operation. 2. The supervisor edits waiter's informations.
Exceptions	The supervisor keeps any field empty.

Table 4.2.9 represents the process payment operation description to show the interaction between an accountant and an accountant application.

Table 4.2.9 Process Payment Operation Description

Operation	Process Payment
Primary Actor	Accountant
Goal In Context	Make sure that each bill is paid.
Precondition	Order is already ready.
Scenario	<ol style="list-style-type: none"> 1. The Accountant gets all tables that have ready orders. 2. He selects a table and gets its bill. 3. If bill is paid, he changes the status of bill to (paid).

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Table 4.2.10 – 4.2.11 represents Get Order and Quantity Required operations description to show the interaction between a chef and a chef application.

Table 4.1.10 Get Order Operation Description

Operation	Get Order
Primary Actor	Chef
Goal In Context	Display all required orders and prepare it
Preconditions	There is at least one order required
Scenario	<ol style="list-style-type: none">1. The chef asks server to send him all required items.2. The chef can chose the table number to know the items of order.3. After preparation, chef sets order to be ready.
Exception	There is no order required.

Table 4.1.11 Required Quantity Operation Description

Operation	Required Quantity
Primary Actor	Chef
Goal In Context	Get the item with its total quantity in all required orders.
Preconditions	The order has been gotten by a chef
Scenario	<ol style="list-style-type: none">1. The chef selects Required Quantity operation.2. System will display a table shows each required item and the total quantity.

APPENDIX A: REFERENCES

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APPINDEX B:

PROCESS EVALUATION

To improve an engineering process, it must be recorded and analyzed. This appendix seeks to collate time data based on both the planned schedule and the actual time spent during the process. Furthermore, it discusses the problems encountered during the process of developing the subject SRS and to implement the MM.

Development Process

The team's original plan for using the Software Requirements Specification (SRS) in documentation was straightforward. Each team member was to search about SRS and learn how to write a full SRS document, supervisor also made a meeting with Mr. Mutaz Al-Qawasmeh to improve our ideas about SRS. team was to also research existing computerized restaurant menu/ordering systems to gather an idea of what already currently exists and what the requirements of the system would be (requirements elicitation). The list of requirements gathered from this were then to be refined in a meeting with all team members, which would result in a consistent and complete set of requirements defining the system. This would include a use case model; use case descriptions, activity diagrams and UML class analysis diagram.

From this set of requirements, the final SRS was to be developed written as a formal SRS as per the IEEE template. The requirements gathered in previous phases were collated and each section was to be written in turn making sure that later sections were consistent with previously written sections and then reviewed by all team members to check for any errors or inconsistencies. The completed SRS once agreed to by the supervisor was then to be submitted.

Problems Encountered

The most serious problem encountered was that of finding the time in which everyone could meet inside or outside of university, work hours and other commitments. With all of the team members having busy timetables, as well as other commitments, team was limited in the times that team was able to meet with supervisor. Second was the inaccurate estimation of time required to complete the writing of the complete document.

Mobile Menu

SRS

The time required for requirements elicitation was underestimated, delaying the schedule and leaving less time available for diagram production and report writing. This miscalculation occurred because the team had no previous metrics by which to estimate the time needed to complete documentation, and that is because of teachers strike, which was in many days in the term.

The team should to research about the Software Engineering Standards (SES) and learn how to use it in projects implementation. The team was met with Mr. Mansur Al-Qasbi and discussed the SES, specially the SRS. Team was also research for existing software engineering to collect an idea of what already currently exist and what the requirements of the system would be.

Requirements Analysis

During the analysis phase, team members will take the derived requirements and transform them into a complete set of requirements. This will include formulating a use case model, use case descriptions, activity diagrams and UML analysis class diagram.

Requirements Specification/Documentation

The outcome of this final phase will be the production of the final report, including the full Software Requirements Specification and an appendix containing process reflection. Details of the specification will be finalized and all requirements and diagrams will be collated and organized into a single coherent Software Requirements Specification document.

APPENDIX C:

PROCESS PLAN

Requirements Engineering Process

Research:

The team should to search about the Software Engineering Standards (SES) and learn how to use it in projects documentation. The team was met with Mr. Mutaz Al-Qawasmeh and discussed the SES specially the SRS. Team was also research for exciting restaurant system/ordering to gather an idea of what already currently exists and what the requirements of the system would be.

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Graduation Report
Mobile Menu

Using

Software Design Document

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Hebron – Palestine
Dec, 2011

ABSTRACT

The Project aims to design software application for touch-mobile that showing the menu of the restaurant (with prices), so that the waiter clicks on the required items and send them to a computer in the kitchen to be prepared. After preparation the accountant print a bill that contains table No. and the total price.

The goal from this idea is to enhance the restaurants services ,because of the problems that complain customers during the service, where many human mistakes happen during the service, like serving the customers meals they didn't ask, or that some customers lose their priority ,or latency in serving the client which causes the inaccurate and latency in the service system, which led us to find another system that decreases the problems and helps to provide the required services in a better performance and less time with more accuracy and less mistakes which makes the restaurant service more efficient and the customers more satisfied and more comfortable ,and returns more financial income for the restaurant.

This document is representing the Software Design Document for subject Mobile Menu, which includes all design issues that team choose in designing the final produced software of Mobile Menu.

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1. INTRODUCTION

“The Software Design Document is a document to provide documentation which will be used to aid in software development by providing the details for how the software should be built. Within the Software Design Document are narrative and graphical documentation of the software design for the project including use case models, sequence diagrams, collaboration models, object behavior models, and other supporting requirement information.” [1]

1.1 Design Overview

This document provides the Software Design Document for subject Mobile Menu (MM). The current chapter includes Document Overview and System Overview.

1.1.1 Document Overview

This Software Design Document (SDD) describes the architecture and system design of Mobile Menu (MM). SDD also gives a full description of system interface, user interface, and complete details about each component used to implement the software product of MM and a full description of the Database used.

1.1.2 System Overview

In current restaurants, they using static menus to provide the customers with their food and drink options. The scope of this project is summarized by two concepts. The first one is to exchange the static menus to electronic format using a mobile device; waiters will be able to use it to choose an electronic order. The second one is how transfer this electronic order to display screen in the kitchen to be prepared.

The main objective of MM will by usingan electronic format menu, make servicing in restaurants easier and quicker than using paper menus.

1.2 Nomenclature and Acronyms

Tables(1.2.1, 1.2.2) represent the acronyms of all terms, and the definition of all terminology used in SDD.

Table 1.2.1: System Acronyms

Term	Definition
IDE	Integrated Development Environment.
LAN	Local Area Network.
MM	Mobile Menu.
SDD	Software Design Document.
SQL	Structured Query Language.

Table 1.2.2: System Terminology

Term	Definition
Chef	Staff member whose primary job is preparing orders.
Customer	Restaurant patron that orders/pays for an order
Item	Single serving food/beverage.
Menu	All items that restaurant provides.
Order	One or more Items.
Staff	General restaurant employees.
Supervisor	Staff member whose primary job is controlling all restaurants issues.
Waiter	Staff member whose primary job is to take orders/serve meals to customers

1.3 SDD Structure

The rest of this document is structured as following. Chapter Two represents the System Organization. Chapter Three represents System Description Diagrams which provides some description diagrams of MM.

Chapter four represents Detailed Description of each Component which provides a full description of each hardware, software and internal communication detailed design. Chapter five represents User Interface Design which provides all images and screen that will be used by the end user of MM.

2. PROJECT ORGANIZATION

This chapter provides a description of system architecture and system interface with a discussion of alternative design.

2.1 System Architecture

This section provides system architecture of MM. The architecture includes all operations for each actor (Supervisor, Chef, Accountant and Waiter).

The following sections represent the System Architecture Design and System Architecture Description sequentially.

2.1.1 System Architecture Design

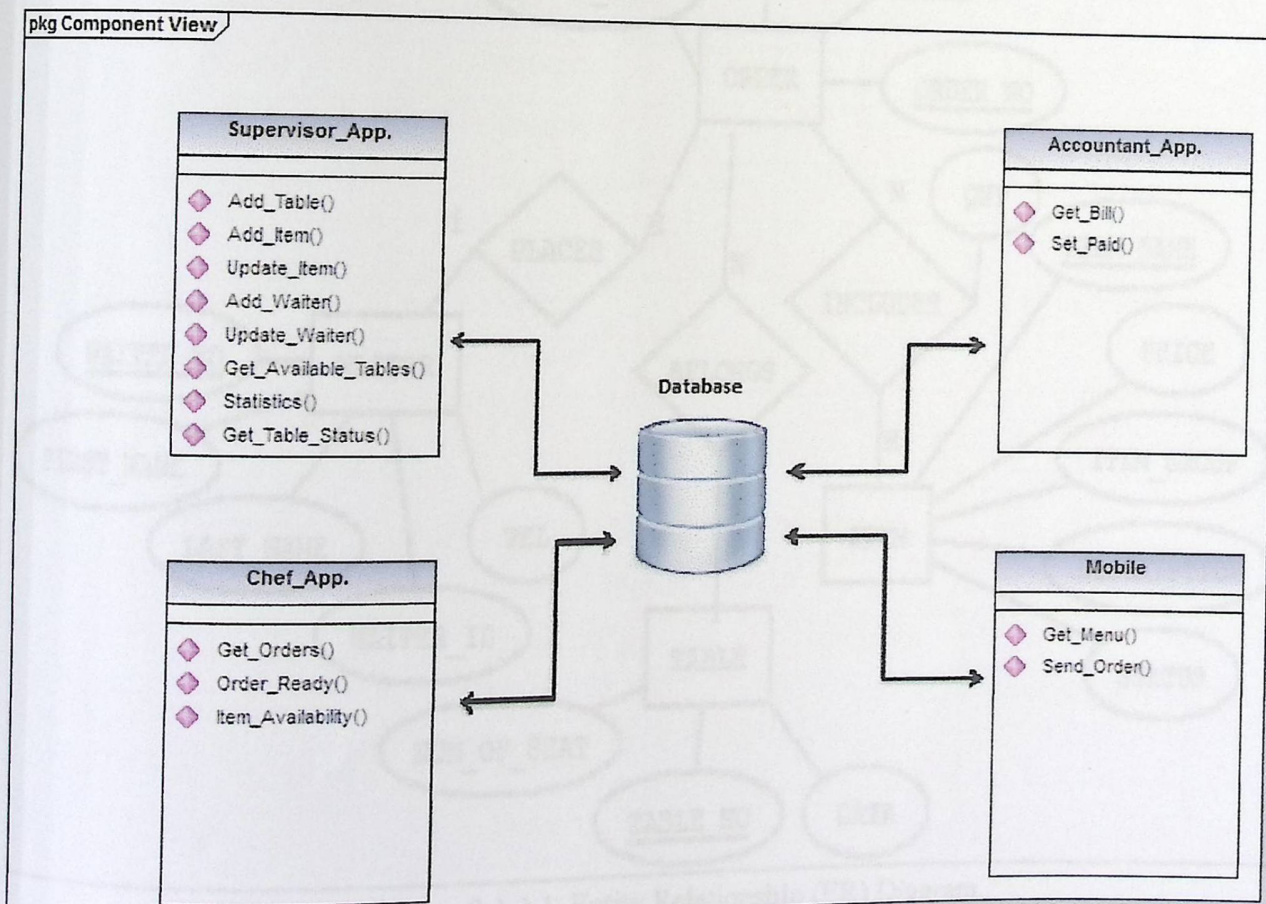


Figure 2.1.1: System Architecture Design

2.1.2 System Architecture Description

- Database of MM

Name: Database.

Type: Database.

Used By: Supervisor and Chef can access to database.

Description: The Database is built on the restaurant server. The Database will be created and maintained using "Oracle Database 10g Express Edition".

Tables and Attributes: The following figure represents the Entity Relationships between all tables in the database and shown their attributes.

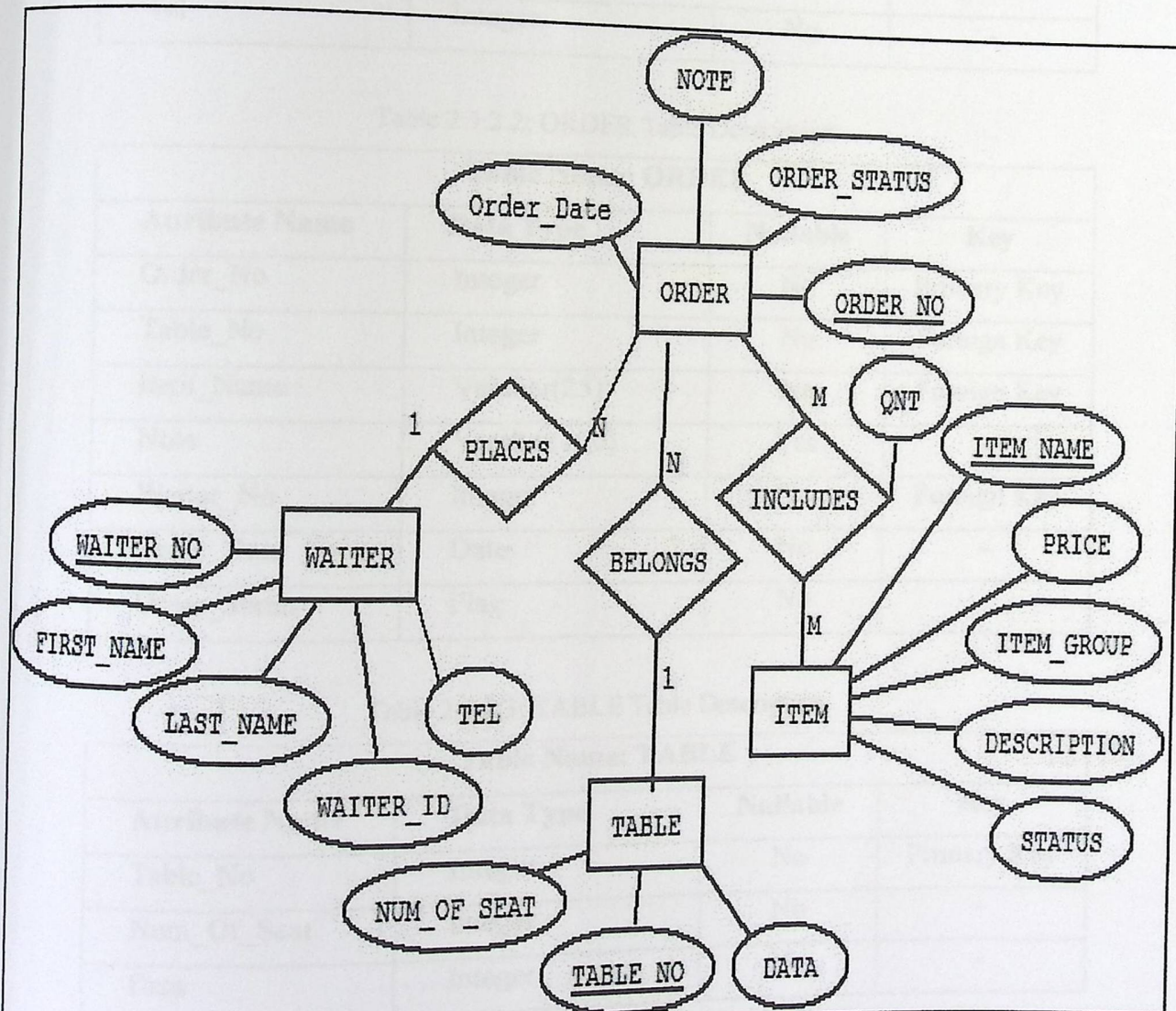


Figure 2.1.2.1: Entity Relationship (ER) Diagram.

Tables 2.1.2.1 – 2.1.2.4 represent all tables in the database and their attributes description.

Table 2.1.2.1: WAITER Table Description

Table Name: WAITER			
Attribute Name	Data Type	Nullable	Key
Waiter_No	Integer	No	Primary Key
First_Name	Varchar(25)	No	-
Last_Name	Varchar(25)	No	-
Waite_ID	Integer	No	-
Tel	Integer	No	-

Table 2.1.2.2: ORDER Table Description

Table Name: ORDER			
Attribute Name	Data Type	Nullable	Key
Order_No	Integer	No	Primary Key
Table_No	Integer	No	Foreign Key
Item_Name	Varchar(25)	No	Foreign Key
Note	Varchar(100)	Yes	-
Waiter_No	Integer	No	Foreign Key
Order_Date	Date	No	-
Order_Status	Flag	No	-

Table 2.1.2.3: TABLE Table Description

Table Name: TABLE			
Attribute Name	Data Type	Nullable	Key
Table_No	Integer	No	Primary Key
Num_Of_Seat	Integer	No	-
Data	Integer	No	-

Mobile Menu

SDD

Table 2.1.2.4: ITEM Table Description

Table Name: ITEM			
Attribute Name	Data Type	Nullable	Key
Item_Name	Varchar(25)	No	Primary Key
Price	Integer	No	-
Item_Group	Varchar(25)	No	-
Description	Varchar(25)	Yes	-
Status	Flag	No	-

Table 2.1.2.5: INCLUDES Table Description

Table Name: INCLUDES			
Attribute Name	Data Type	Nullable	Key
QNT	Integer	No	-
Item_Name	Varchar(25)	No	Foreign Key
Order_No	Integer	No	Foreign Key

The following figure represents the Relational Database Schema.

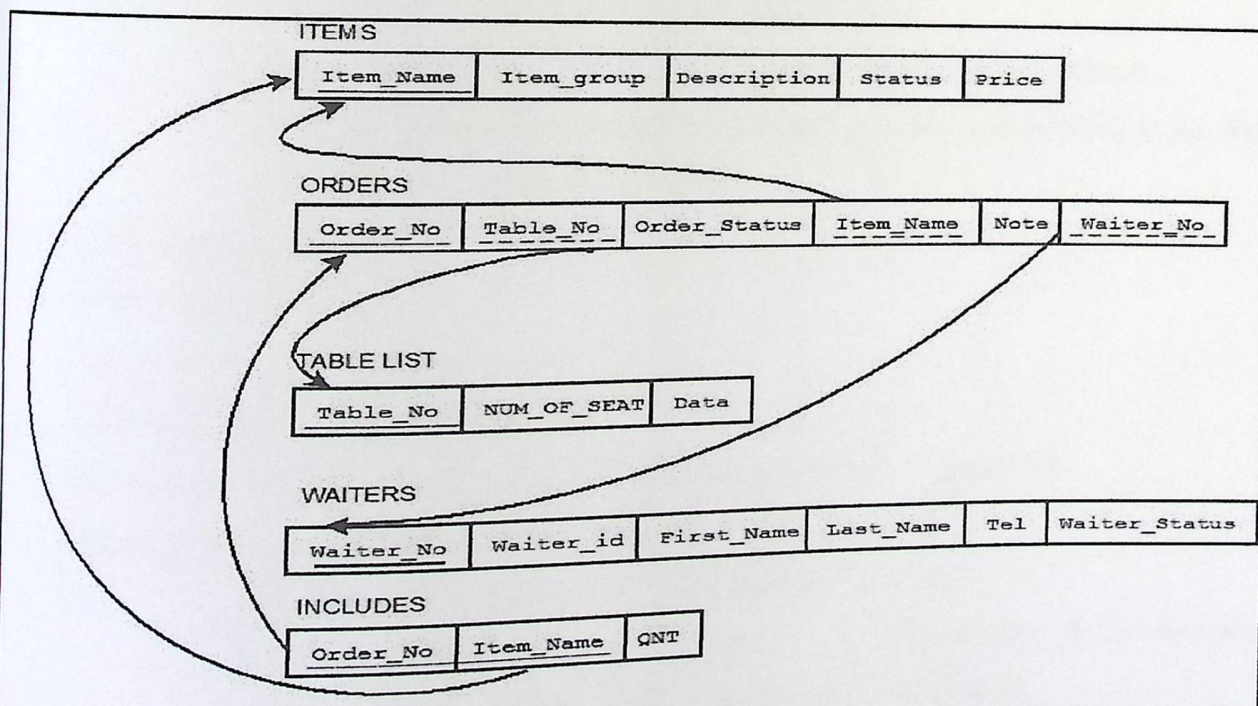


Figure 2.1.2.2: Relational Database Schema

- **Mobile Menu**

Name: Mobile.

Type: Mobile Application.

Used By: Waiter.

Description: The Mobile Device has an application installed on, which allows waiter to view restaurant menu, choose the table number, and its required order, then send the order to the Chef.

Operations:Get_Menu() : Waiter asks server to send him the available items of menu.

Send_Order() : Waiter sends the required orders to sever to be prepared.

- **Chef Application**

Name:Chef_App.

Type: Windows Application.

Used By: The Chef of restaurant.

Description: This application allows the chef to do some operations.

Operations:Get_Orders() : Chef asks server to send him all the current orders.

Order_Ready() : When chef prepares the order, he sends a notification to let waiter to bring it to the customer.

Item_Availability() : Chef edits the availability of each item of menu.

Quantity_Required() : Chef can deisplay each item separated with the sum of the quantitu required to all orders

- **Supervisor Application**

Name:Supervisor_App.

Type:Windows Application.

Used By:The supervisor of restaurant.

Description: This application allows the supervisor to do some operations.

Operations:Update_Item() : Supervisor can edit any item of menu.

Add_Item() : Supervisor can add a new item to menu.

Add_Table() : Supervisor can add a new available table that can be serviced

Update_Waiter() : Supervisor can edit waiter's information.

Add_Waiter() : Supervisor can add a new waiter and insert his information.

Mobile Menu

SDD

Statistics() : Supervisor can monitor waiter working, and get what did he do in a time period.

Get_Available_Tables(): Supervisor can display all available tables.

Get_Table_Status(): Supervisor can get the status of any table.

• Accountant Application

Name:Accountant_App.

Type: Windows Application.

Used By: The Accountant of restaurant.

Description: This application allows the Accountant to monitoring all bills of the tables and controls the financial management of restaurant.

Operations:Get_Bill() : Accountant asks server to send him bill, to be monitored and controlled.

Set_Paid() : Accountant changes the status of each bill (paid/not paid).

2.2 System Interface

2.2.1 User Interface

The user interface for the system allows the end user to easily use MM system. The final software product is used by four users

Mobile Device User

- Mobile is used by waiter to choose customer needs.
- It is a touch-screen mobile.
- It provides the waiter by the restaurant menu and allows waiter to send order to the chef.

Display Screens User

MM needs 3 display screens (1 touch screen for chef, 2 PC screens for accountant and supervisor).

Chef Touch Screen

- Display Screen is used by chef.
- It displays the items of all orders for the chef to be prepared and displays the quantity of each item.

Accountant PC Screen

- Accountant_App. is installed on the PC of the accountant.
- It allows the accountant to get all orders and calculate the bill of each, then print it and set its status (paid/not paid).

Supervisor PC Screen

- Supervisor_App. is installed on the PC of the supervisor.
- It allows the supervisor to do all operations that are specified in section 2.1.2.

2.2.2 Software Interface

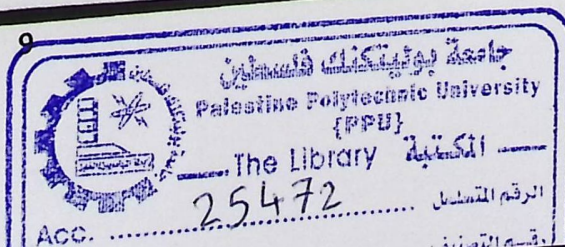
Two software programs are used to implement all subsystems of MM.

Oracle Database 10g Express Edition

The database is built by using Oracle Database 10g Express Edition, to store all employee's information, orders and items.

Netbeans IDE 7.1

- Netbeans IDE 7.1 is used for programming (write the code of each application).
- A fast fully-featured Integrated Development Environment (IDE) with support for Java.
- Compliant applications for accelerating development across all major OS platforms.
- Provides an open source, high performance, modular, extensible, multi-platform Java IDE for GUI, mobile tools, Web, and Desktop applications.



2.2.3 Communication Interface

- Wi-Fi network is used to connect the mobile with server.
- A LAN network is used to connect Supervisor, Chef and Accountant applications with the server.

Figure 2.2.3 represents the distribution system for communication interface of MM.

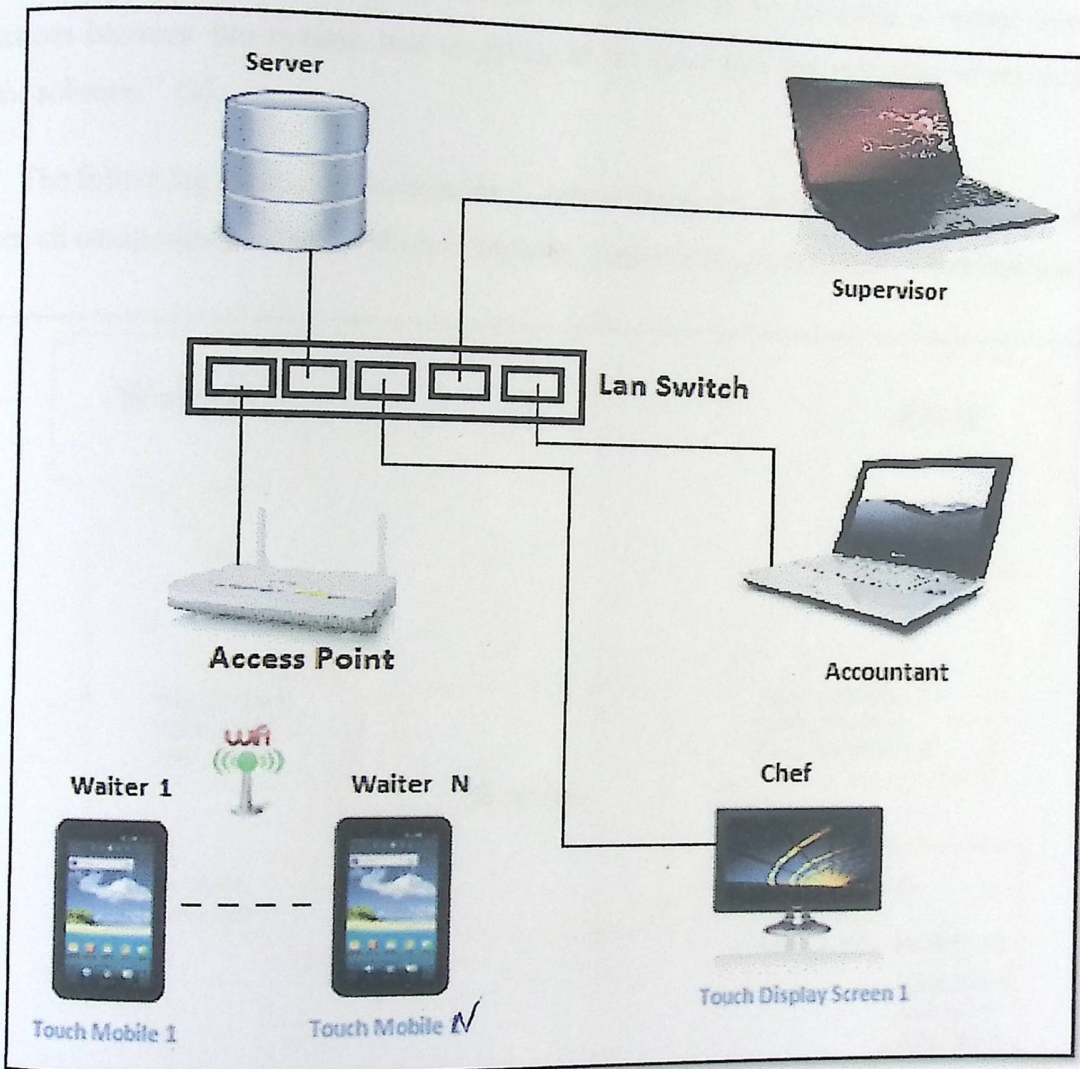


Figure 2.2.3: The Distribution System

3. SYSTEM DESCRIPTION DIAGRAMS

The following chapter represents some description diagrams of MM, such as, System Context Diagrams, Use-Case Diagrams and Sequence Diagram.

3.1 System Context Diagram

“Context Diagram is used to scope the project as it provides a visual model of the interactions between the system that is going to be built and the outside entities that interface with the solution.” [2].

The following figure represents the Context Diagram of MM, and shows the interactions between all components of MM (Waiter Mobile, Supervisor, Accountant, Chef and Server).

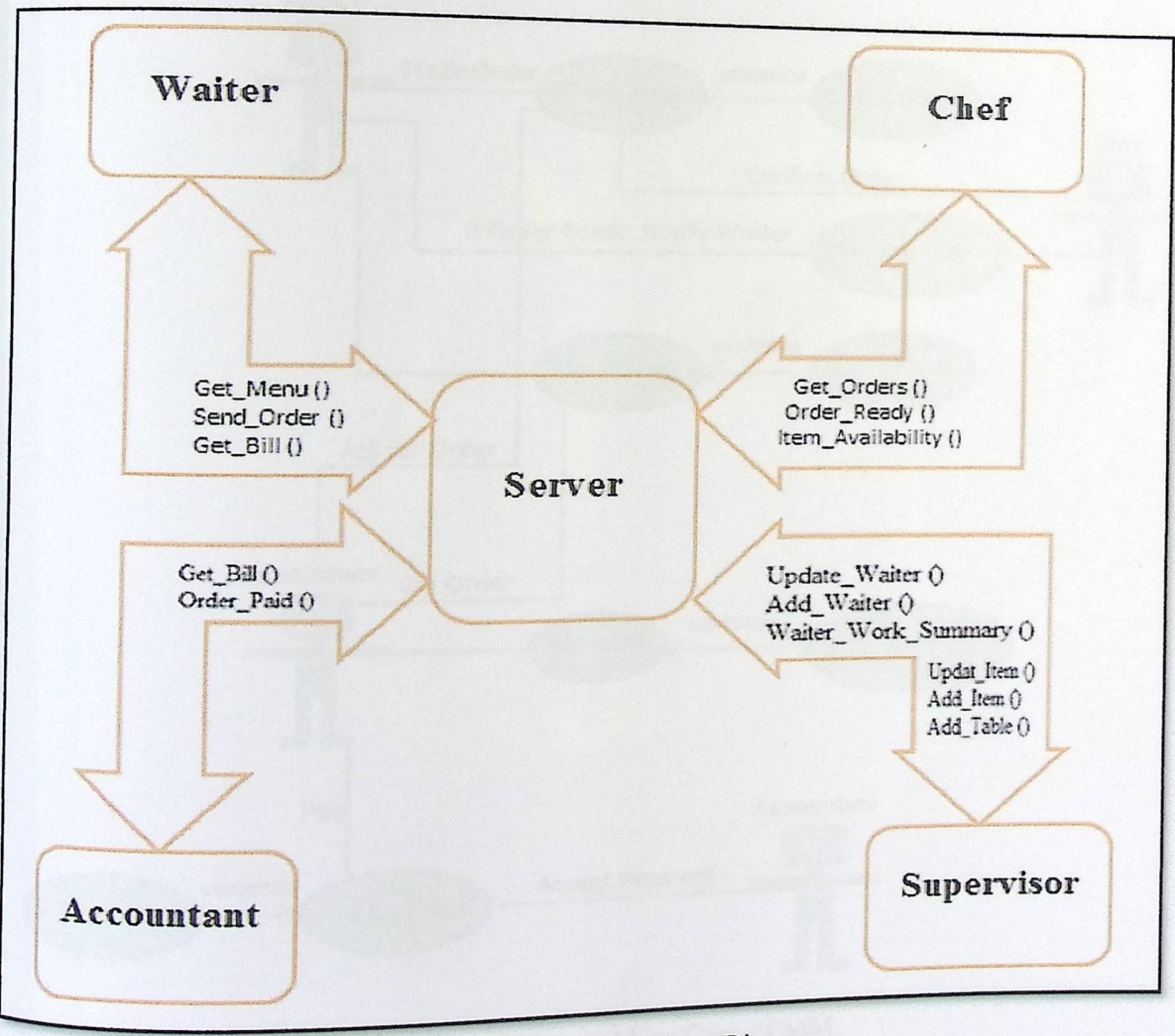


Figure 3.1.1: System Context Diagram

3.2 Use-Case Diagram

“A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases.” [3].

General Use Case Diagram for MM System

The following figure represents the Use-Case Diagram of MM, and shows how actions of each actor of MM are happened.

Super Viser

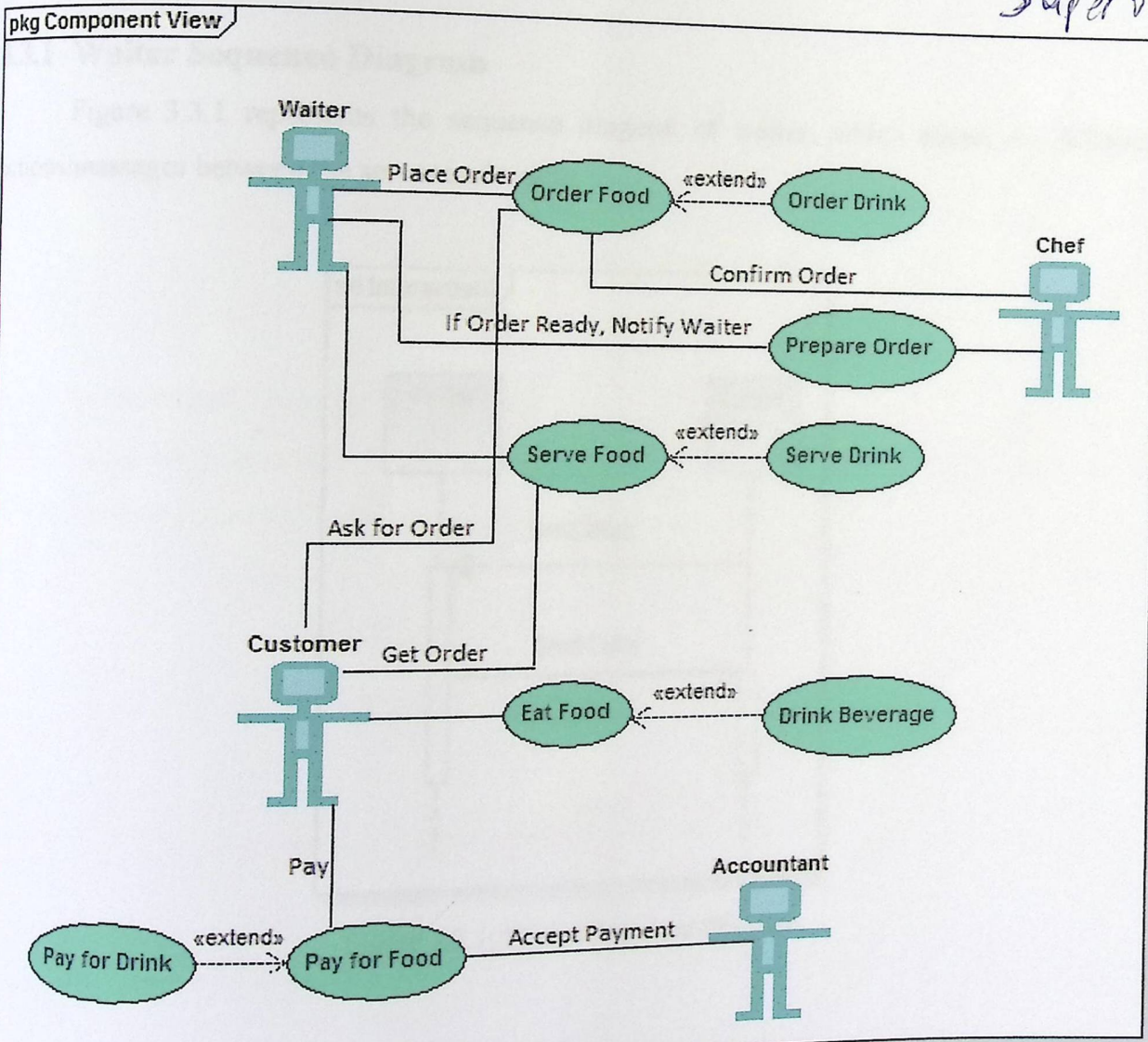


Figure 3.2.1: General Use-Case of MM.

3.3 Sequence Diagrams

“Sequence diagrams are used to represent or model the flow of messages, events and actions between the objects or components of a system.” [4].

Using AltovaUModel Program, Sequence Diagrams are made depending on the sequence of messages between each Waiter, Chef, Supervisor and Accountant with the server of MM system.

The following figures (3.3.1-3.3.4) represent how each action/massage will transfer between the server and each actor (supervisor, waiter, chef and accountant).

3.3.1 Waiter Sequence Diagram

Figure 3.3.1 represents the sequence diagram of waiter, which shows the following actions/massages between the server and waiter.

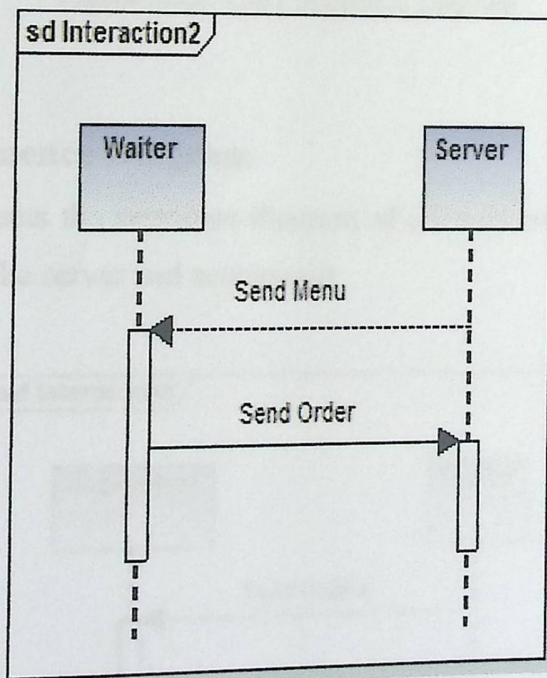


Figure 3.3.1: Waiter Sequence Diagram

3.3.2 Chef Sequence Diagram

Figure 3.3.2 represents the sequence diagram of chef, which shows the following actions/messages between the server and chef.

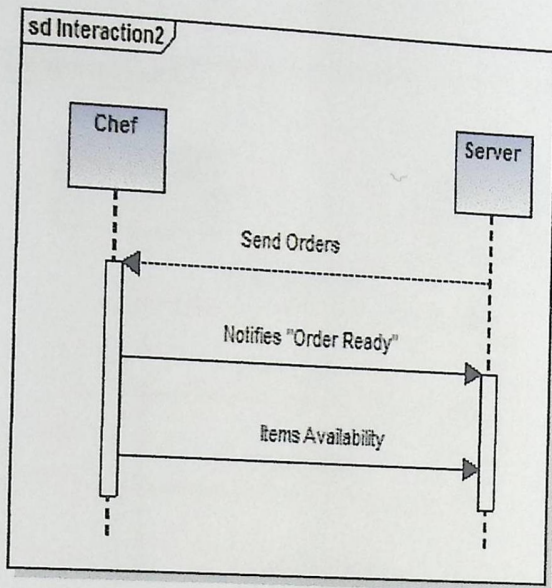


Figure 3.3.2: Chef Sequence Diagram

3.3.3 Accountant Sequence Diagram

Figure 3.3.3 represents the sequence diagram of accountant which shows the following actions/messages between the server and accountant.

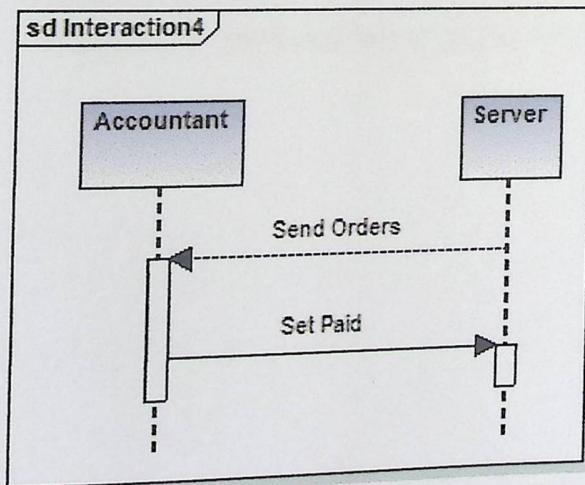


Figure 3.3.3: Accountant Sequence Diagram

3.3.4 Supervisor Sequence Diagram

Figure 3.3.4 represents the sequence diagram of supervisor, which shows the following actions/messages between the server and supervisor.

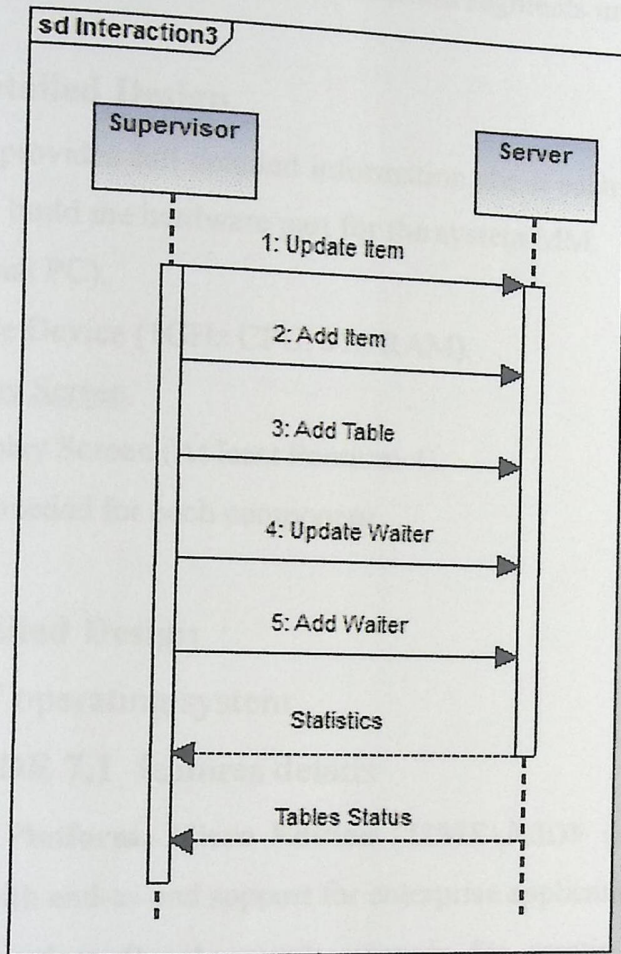


Figure 3.3.4: Supervisor Sequence Diagram

4. DETAILED DESCRIPTION OF COMPONENTS

This chapter provides the information needed for the system development which used to actually build and integrates the hardware components, code and integrates the software components, and interconnects the hardware and software segments into a functional product.

4.1 Hardware Detailed Design

This subsection provides full detailed information about each of the individual hardware components to correctly build the hardware part for the system MM.

- a) Server (Normal PC).
- b) Touch Mobile Device (1GHz CPU, 512 RAM).
- c) Touch Display Screen.
- d) Two PC Display Screen (At least Pentium 4).
- e) Power input needed for each component.

4.2 Software Detailed Design

- a) Windows 7 operating system
- b) Netbeans IDE 7.1 features details
 - Java 2 Platform, Micro Edition (J2ME), MIDP development: visual design editor with end-to-end support for enterprise applications.
 - Web Services Development: wizards for creating web services and web services clients, providing the basic (java/wsdl) code needed, and easy to use testing tools of existing web
 - XML: XML, DTD and CSS Text Editor and XML Productivity Tools Wizards to help user generate codes.
- c) Oracle Database 10g Express Edition (Oracle Database XE)
Oracle Database 10g Express Edition is an entry-level, small footprint starter database.

4.3 Internal Communications Detailed Design

This Section provides details about the communication components that used to transfer data between all parts of MM.

4.3.1 Wi-Fi Detailed

- There are lots of Wi-Fi Features which make it more easy and simple wireless network.
- Wi-Fi Technology is, in spirit, a version of Ethernet without wires in the form of a wireless local area network.
- Wi-Fi Technology can be used to connect two or more than two devices for various purposes.
- There are no needs of wires to connect with internet or to build a network.

4.3.2 LAN Detailed

There are some great features of a Local Area Network (LAN). Most are used for Business use. The primary features of LAN are:

- Fast connection
- Easy file sharing in a short distance
- Great for synchronizing data over many computers

4.3.3 XML File Detailed

XML File is used to transfer Menu's items from the server to the waiter.

What is XML File

- XML stands for Extensible Markup Language.
- XML is a markup language much like HTML.
- XML was designed to carry data, not to display data.
- XML tags are not predefined. You must define your own tags.
- XML is designed to be self-descriptive.

How can XML be used?

- XML separates data (Content) from HTML (Form)
- XML simplifies data sharing and transport
- XML simplifies platform changes
- XML makes your data more available
- XML is used to create new web technologies (e.g. AJAX, XHTML, RSS, ..)

5. USER INTERFACE DESIGN

This chapter represents the User Interface Design of MM, which includes description of user interface and all screen images that implements the MM.

5.1 Overview of User Interface

The end user of MM can use the system with all its features after the team finishes designing and testing the system.

The end users of MM are summarized by 4 actors (Supervisor, Chef, Waiter, Accountant) and each one has his own application that connected to the server.

5.2 Screens Images

Figures 5.2.1 – 5.2.17 represent the user screens interface for the supervisor of the restaurant.

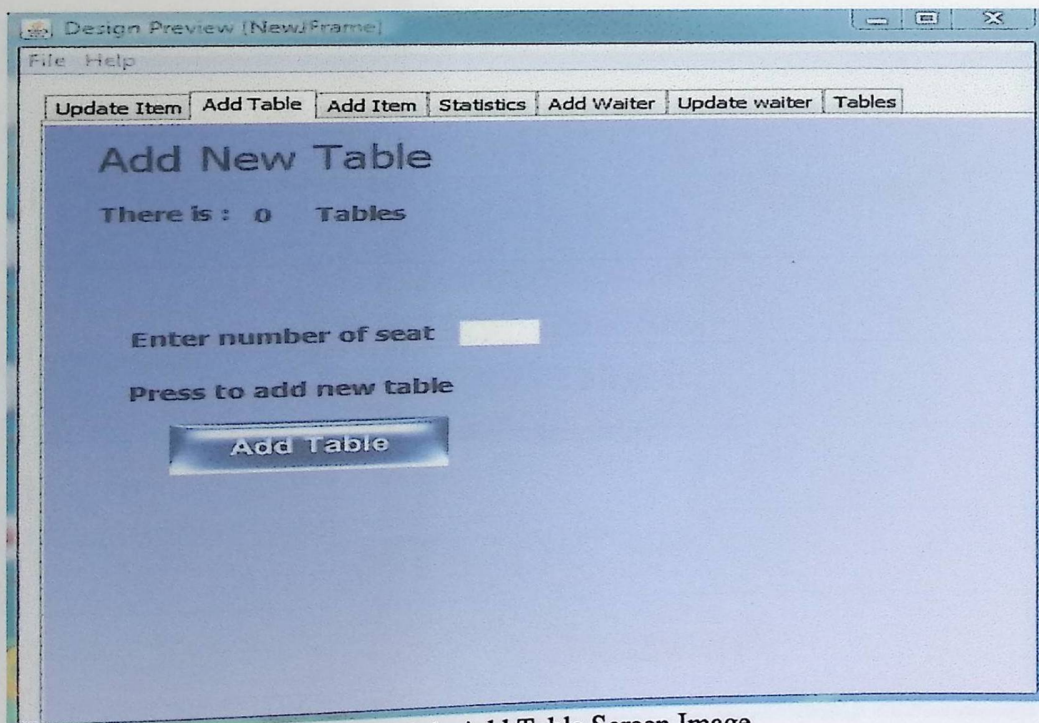


Figure 5.2.1: Add Table Screen Image

Mobile Menu
SDD

Design Preview [NewJFrame]

File Help

Update Item Add Table Add Item Statistics Add Waiter Update waiter Tables

Item Name

Item Price

Item Group dish

Description

Add Item

Figure 5.2.2: Add Item Screen Image

Design Preview [NewJFrame]

File Help

Update Item Add Table Add Item Statistics Add Waiter Update waiter Tables

Choose an Item To Update

Ok

Item Name

New Price

New Group dish

New Description

Save

Figure 5.2.3: Update Item Screen Image

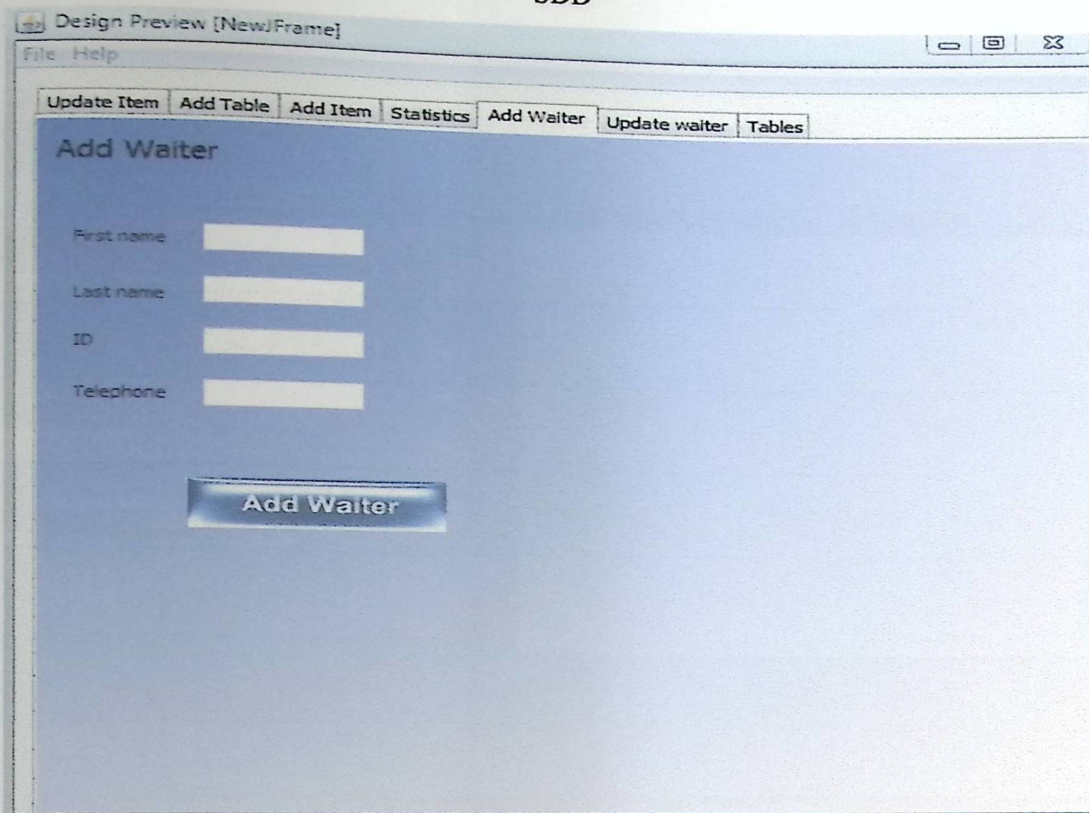


Figure 5.2.4: Add Waiter Screen Image

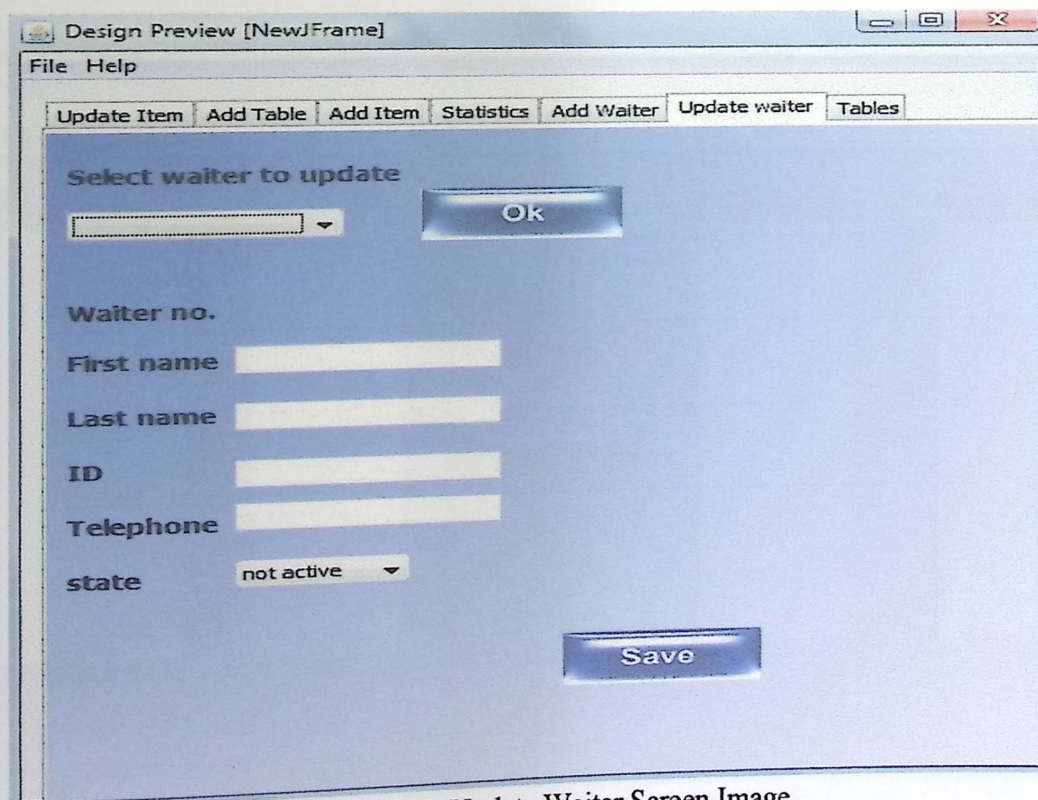


Figure 5.2.5: Update Waiter Screen Image

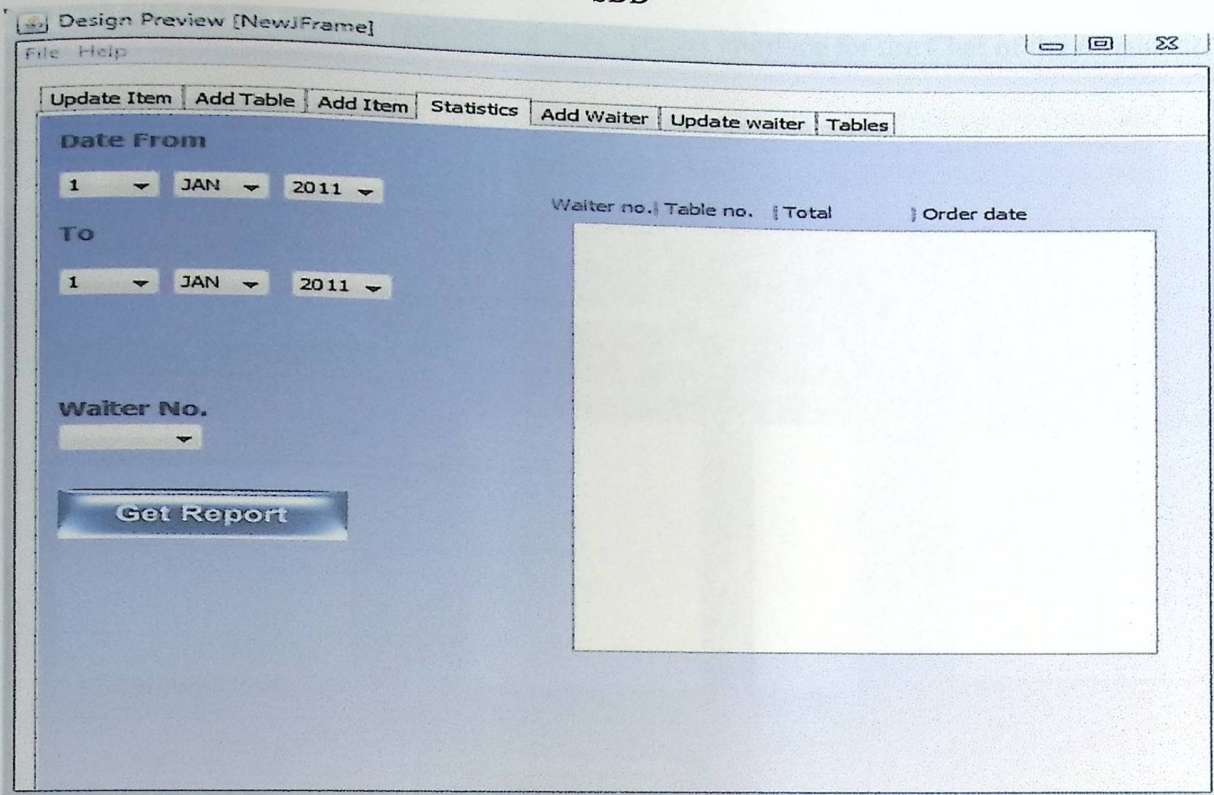


Figure 5.2.6: Waiter Statistice Screen Image

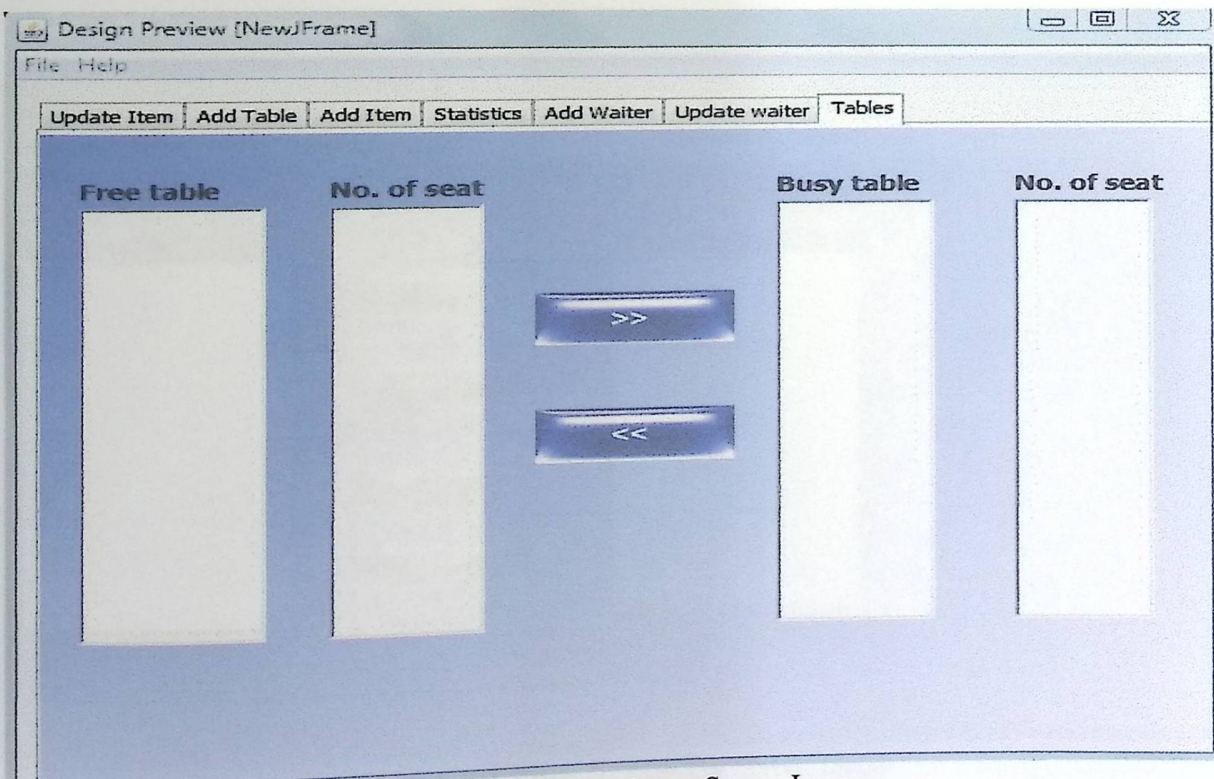


Figure 5.2.7: Tables Status Screen Image

Figures 5.2.8 – 5.2.10 represent the user screens interface for the Chef of the restaurant.

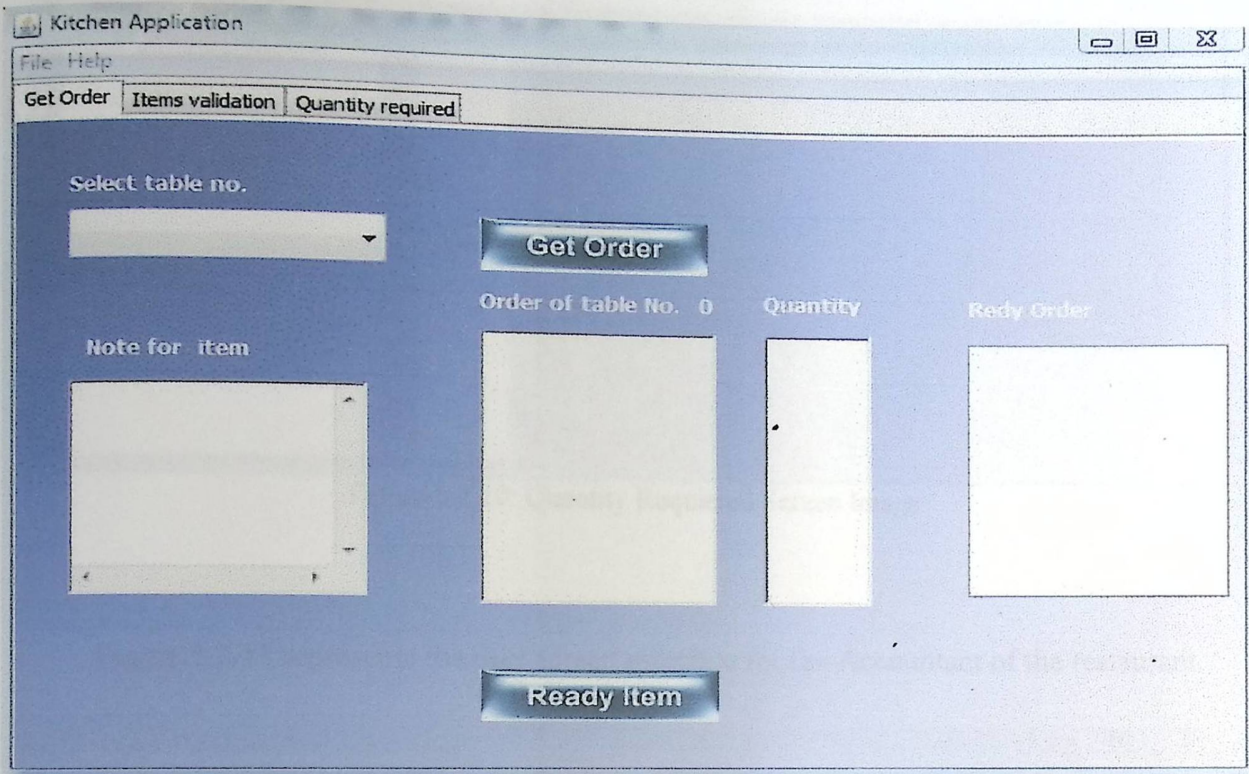


Figure 5.2.8: Get Orders/ Order Ready Screen Image

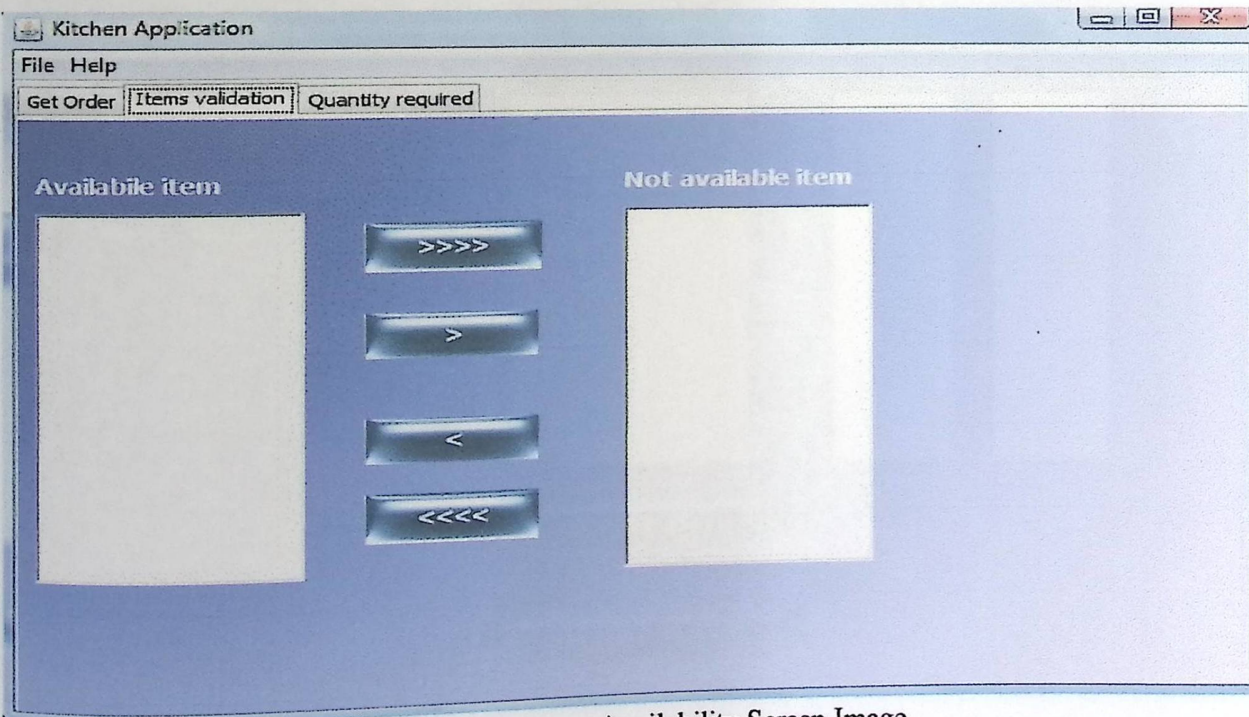


Figure 5.2.9: Items Availability Screen Image

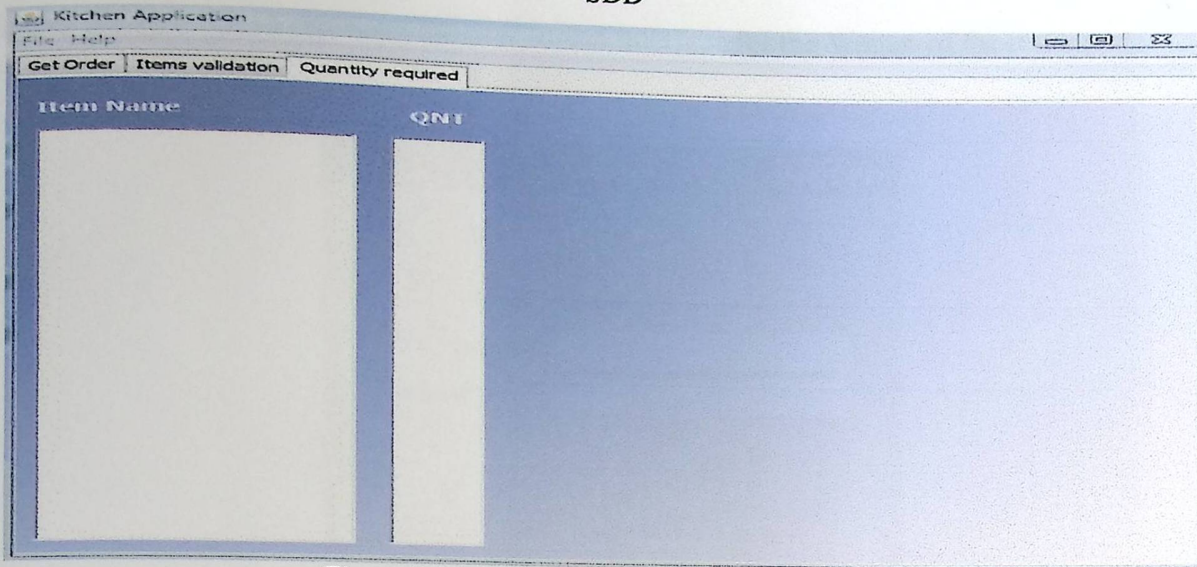


Figure 5.2.10: Quantity Required Screen Image

Figure 5.2.11 represents the user screen interface for the Accountant of the restaurant.

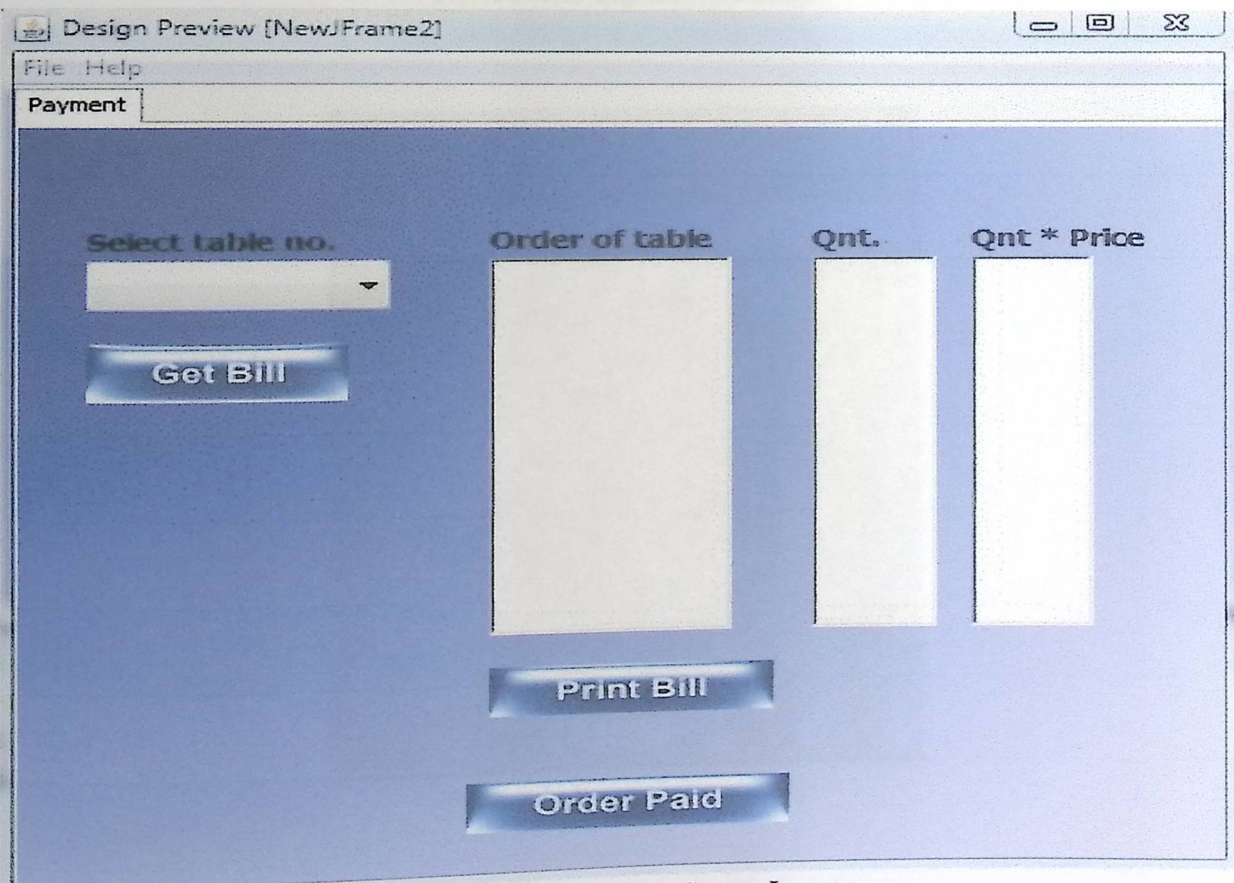


Figure 5.2.11: Payment Screen Image

Figures 5.2.12 – 5.2.15 represent the user screen interface for the Waiter of the restaurant.

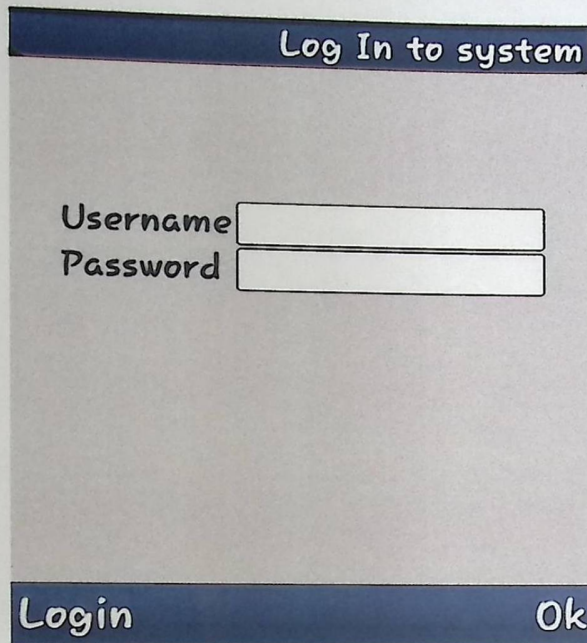


Figure 5.2.12: Log-In Screen Image

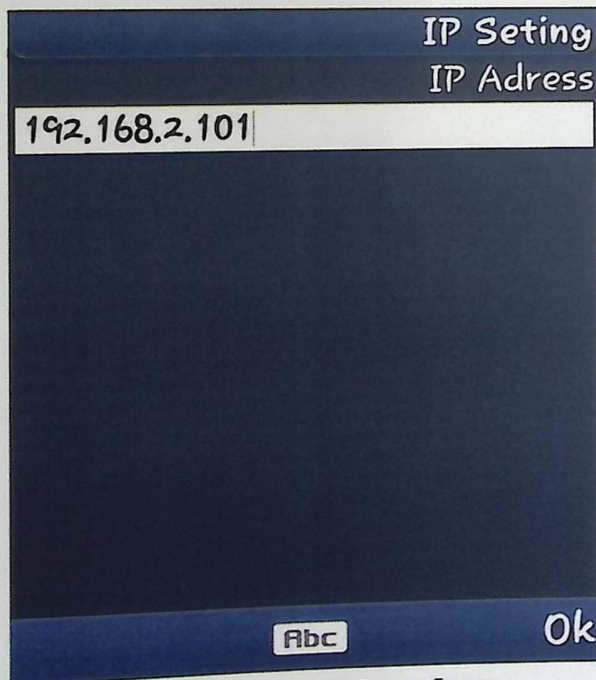


Figure 5.2.13: Set_IP Screen Image

SDD

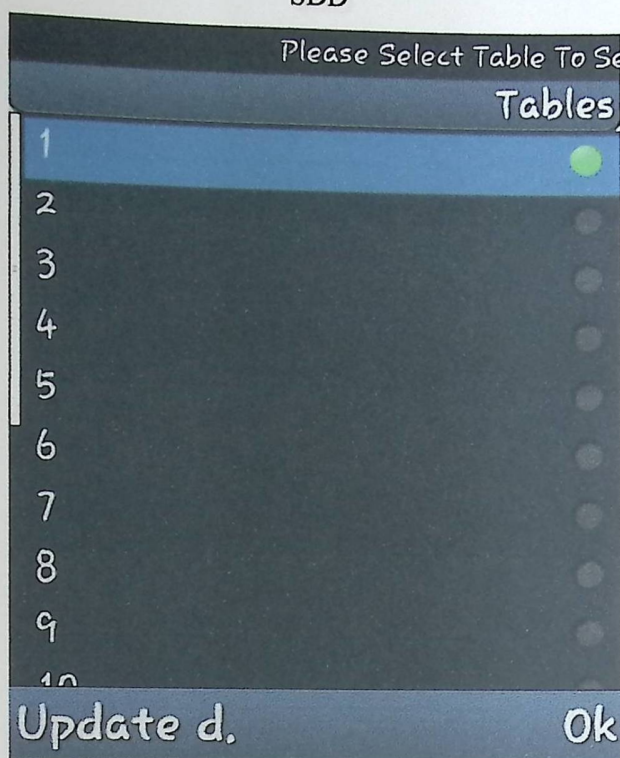


Figure 5.2.14: Table List Screen Image



Figure 5.2.15: Main Menu Screen Image

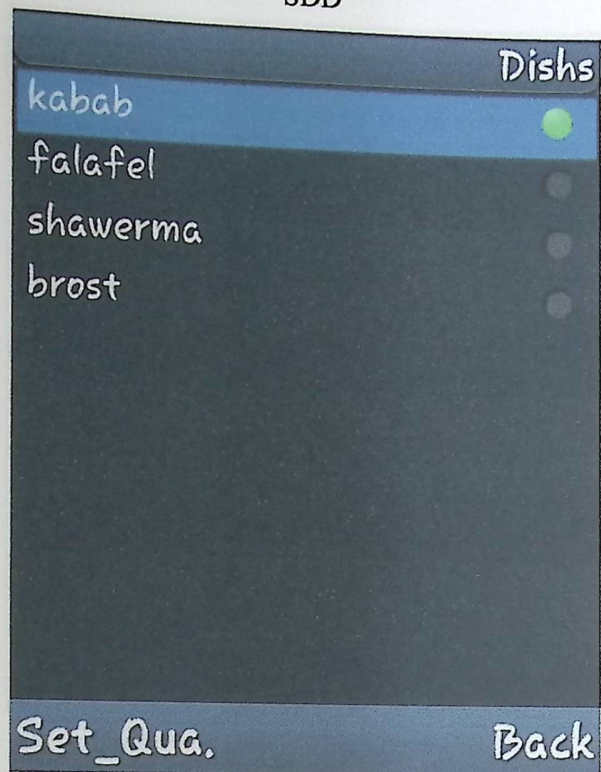


Figure 5.2.16: Dishes Screen Image

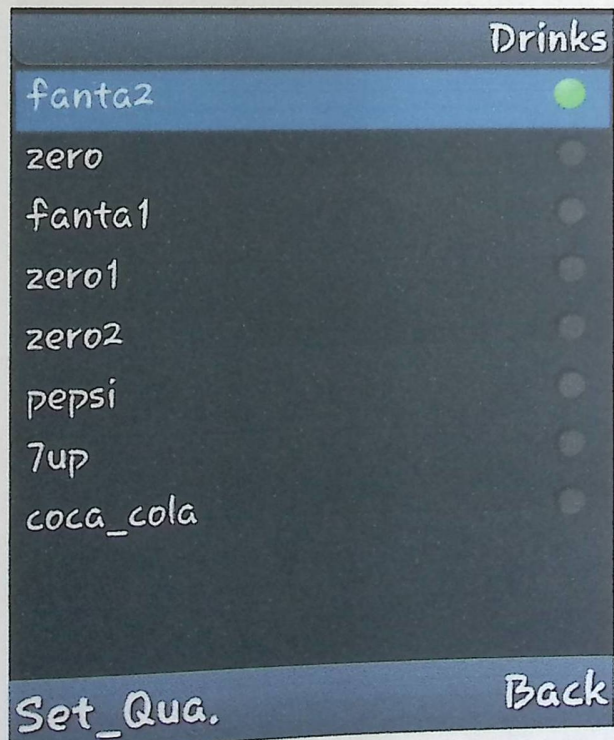


Figure 5.2.17: Drinks Screen Image

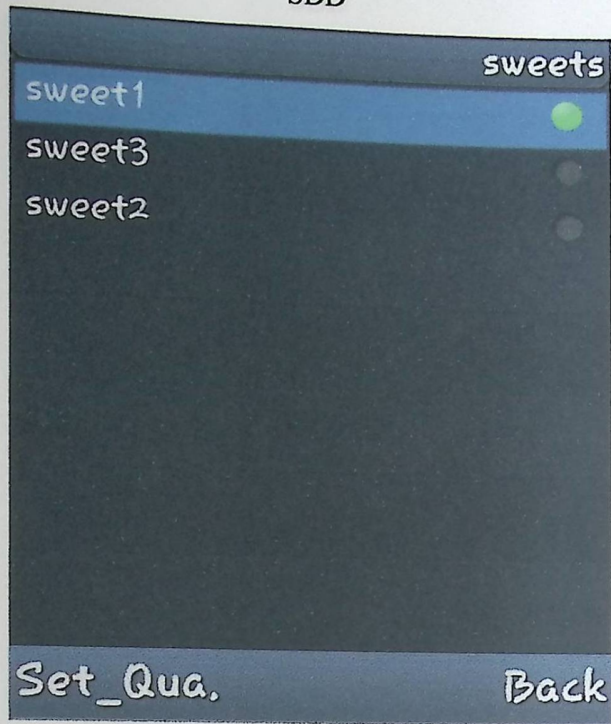


Figure 5.2.18: Sweet Screen Image

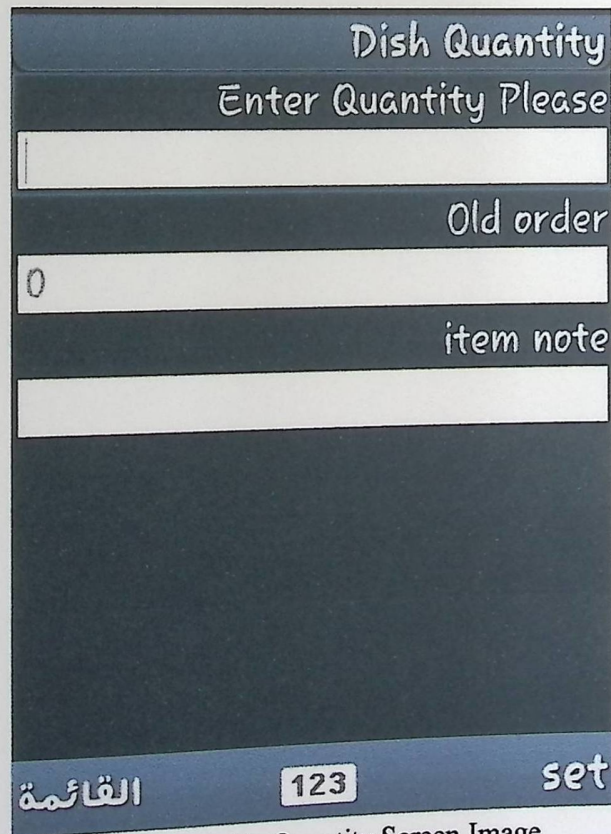


Figure 5.2.19: Quantity Screen Image



Figure 5.2.20: All Oder Items Screen Image

APPENDIX A: REFERENCES

1. <http://www.oasis-open.org/committees/download.php/24846/Example-SoftwareDesignDocument-LegalXMLUtility.pdf>
2. <http://www.modernanalyst.com/Community/Forums/tabid/76/forumid/18/threadid/1328/scope/posts/Default.aspx>
3. http://en.wikipedia.org/wiki/Use_case_diagram
4. <http://www.sequencediagrameditor.com/uml/sequence-diagram.htm>

APPENDIX B: SQL_COMMANDS**> SQL_Commands****CREATE TABLE ITEMS**

```
(ITEM_NAME VARCHAR(30) NOT NULL,  
PRICE NUMBER NOT NULL,  
ITEM_GROUP VARCHAR(20) NOT NULL,  
DESCRIPTION VARCHAR(100),  
STATUS INT NOT NULL,
```

```
PRIMARY KEY (ITEM_NAME));
```

CREATE TABLE TABLES_LIST

```
(TABLE_NO INT NOT NULL,  
DATA INT NOT NULL,  
NUM_OF_SEAT INT NOT NULL,
```

```
PRIMARY KEY (TABLE_NO));
```

CREATE TABLE WAITERS

```
(WAITER_NO INT NOT NULL,  
FIRST_NAME VARCHAR(25) NOT NULL,  
LAST_NAME VARCHAR(25) NOT NULL,  
TEL NUMBER,  
WAITER_ID VARCHAR(25) NOT NULL,  
WAITER_STATUS INT NOT NULL,
```

```
PRIMARY KEY (WAITER_NO));
```


CREATE TABLE ORDERS

(TABLE_NO INT NOT NULL,
ITEM_NAME VARCHAR(25) NOT NULL,
ORDER_STATUS INT NOT NULL,
NOTE VARCHAR(1000,

FOREIGN KEY (TABLE_NO) REFERENCES TABLES_LIST(TABLE_NO),

FOREIGN KEY (WAITER_NO) REFERENCES WAITERS(WAITER_NO),

FOREIGN KEY (ITEM_NAME) REFERENCES ITEMS(ITEM_NAME));

CREATE TABLE INCLUDES

(QNT INT NOT NULL,
ITEM_NAME VARCHAR(25) NOT NULL,
ORDER_NO INT NOT NULL,

FOREIGN KEY (ORDER_NO) REFERENCES ORDER(ORDER_NO),

FOREIGN KEY (ITEM_NAME) REFERENCES ITEMS(ITEM_NAME));

Palestine Polytechnic University
College of Engineering and Technology
Electrical and Computer Engineering Department

Graduation Report
Mobile Menu
Using

Software Test Document

Project Team
Munir Al-Sayid
Wissam Al-Din
Rasha Sabeh

Project Supervisor
Mr. Wissam Chamech

Hebron - Palestine
Dec, 2011



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Hebron – Palestine

Dec, 2011

ABSTRACT

The Project aims to design software application for touch-mobile that showing the menu of the restaurant (with prices), so that the waiter clicks on the required items and send them to a computer in the kitchen to be prepared. After preparation the accountant print a bill that contains table No. and the total price.

The goal from this idea is to enhance the restaurants services ,because of the problems that complain customers during the service, where many human mistakes happen during the service, like serving the customers meals they didn't ask, or that some customers lose their priority ,or latency in serving the client which causes the inaccurate and latency in the service system, which led us to find another system that decreases the problems and helps to provide the required services in a better performance and less time with more accuracy and less mistakes which makes the restaurant service more efficient and the customers more satisfied and more comfortable ,and returns more financial income for the restaurant.

This document is representing the Software Test Document which includes the test approach, whit-box test and black-box test

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1.1 Document Overview

This Software Test Document (STD) describes the test approach that will be used to complete all system test and unit test, and to make sure that team passed all critical points that may make any errors in the app using or running MM.

1.2 System Overview

In current restaurants, they using static menu to provide the customers with their food and drink options. The scope of this project is summarized by two concepts. The first one is to exchange the static menu to electronic format using a mobile device, waiters will be able to use it to check an electronic order. The second one is how transfer this electronic order to display screen at the kitchen to be prepared.

The main objective of MM is by electronic format menu, servicing to restaurants will be more easily and more quickly than using paper menus. It's also provides the restaurants to update their menus without needing to print a new menus.

1.3 Acronyms

This section provides the acronyms of all terms related to MM and used to write this document.

Table 1.3.1: Documentation Acronyms

Acronym	Description
STD	Software Test Documentation
MM	Mobile Menu
IP	Internet Protocol
API	Application Programming Interface

1. INTRODUCTION

“A document describing the scope, approach, resources, and schedule of intended testing activities. It identifies test items, the features to be tested, the testing tasks, who will do each task, and any risks requiring contingency planning.” [1].

1.1 Document Overview

This Software Test Document (STD) describes the test approach that will be used to complete all system test and unit test, and to make sure that team passed all critical points that may make any errors in the applying or running MM.

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MM	Mobile Menu.
IP	Internal Protocol
API	Application Programming Interface

1.5 Risks and Contingencies

Risk #1: The main risk that may breakdown working using MM in the restaurant is power outages. So, no device in the restaurant will work.

Contingency: The restaurateur shall to put a power generator in the restaurant.

Risk #2: The second risk that may be happened, an error or defect in the LAN switch or the access point, so no data will be transferred from any device to the server and vice versa.

Contingency: Keeping maintains the network.

1.5 STD Structure

The rest of this document is structured as following. Chapter Two represents test approach which includes white-box testing and black-box testing, then some test mages represented to show how are warning messages shown when an invalid value is entered.

2. Test Approach

2.1 White-Box Testing

“White-box testing is when the tester has access to the internal data structures and algorithms including the code that implement these.”[2].

White-Box testing allows the team to examine parts of a system that are rarely tested and ensures that the most important function points have been tested.

2.1.1 API Testing

In programming the code of MM, team has faced many critical situations, such as:

Programming Mobile Application

- IP Test: the IP that was set in the mobile should be the same server IP.
- XML File Test: team has ensured that XML file was successfully transferred from server to mobile through Wi-Fi connection.
- Sending Data Test: team has ensured that the exchange between the mobile and the server has succeeded.

Programming Web Applications

- IP Test: the IP that was set in all PCs should be the same server IP.
- Exchange Data Test: team has ensured that the exchange between all end-users application and the server has succeeded.

2.1.2 Static Testing

When team designed the code of each unit of MM (supervisor application, chef application, accountant application, mobile application), team have to check syntax of the code and/ or manually reviewing the code to find errors.

2.1.3 Mutation Testing

Mutation testing is used to verify the correctness of MM, for instant, when mobile application runs; it requires to set Server IP in order to exchange data between them. If there is any change in the IP, the exchange of data will not be possible.

The previous theory is true for web applications, any change in the IP, leads the requirements not to be sufficiently covered.

2.2 Black-Box Testing

“Black-box testing treats the software as a "black box"—without any knowledge of internal implementation.” [2].

Black-Box testing allows the team to examine the whole system as a one unit, without any knowledge of the internal programming of MM.

2.2.1 Specification-Based Testing

Table 2.2.1.1: Test Results Table

Given Input	Expected Result	Output Result
Supervisor Application		
Supervisor entered No. of seats = 5	New table added with 5 seats.	New table added with 5 seats.
Supervisor entered a numeric No. of seat = AA	Warning message shown	Warning message shown
Supervisor entered a negative No. of seat = -5	Warning message shown	Warning message shown
Supervisor entered new item's information.	New item added to the Menu	New item is added to the Menu
Supervisor updated an existed item's information.	Information updated	Information updated
Supervisor entered a negative price = -17	Warning message shown	Warning message shown
Supervisor entered a numeric price = AA	Warning message shown	Warning message shown

Mobile Menu

STD

Supervisor kept the Item Name and Price fields (one or more) empty	Warning message shown	Warning message shown
Supervisor entered new waiter's information.	A new waiter added	A new waiter added
Supervisor updated existed waiter's information.	Information updated	Information updated
Supervisor kept the First Name, Last Name, ID fields (one or more) are empty	Warning message shown	Warning message shown
Supervisor entered time duration to get what did a waiter work in this duration.	Information displayed	Information displayed
Supervisor monitored status of tables, tables is busy and wish tables is free		
Chef Application		
Chef Pressed Get Order Button	The new orders added to the list.	The new orders added to the list.
Chef edited the availability of items	Items updated in the menu	Items updated in the menu
Accountant Application		
Accountant Select table# 5 and got its order, application showed the bill.	Order and bill Shown	Order and bill Shown
Accountant pressed Print Bill button	Bill is printed	Bill is printed
Waiter Application		
Waiter entered his user-name and password correctly	Waiter accessed to the system	Waiter accessed to the system
Waiter entered his user-name and password incorrectly	Waiter couldn't access to the system	Waiter couldn't access to the system
Waiter selected table No. and place an order.	Order sent to the server	Order sent to the server

Mobile Menu

STD

The figures 2.2.1 – 2.2.6 show some warning messages that will be shown when user enter a wrong values.

- When the supervisor enters a negative price, warning message is shown.

The screenshot shows a software window titled "Supervisor" with a menu bar containing "Update Item", "Add Table", "Add Item", "Statistics", "Add Waiter", "Update waiter", and "Tables". The main area is titled "Help" and contains the following fields:

- "Choose an Item To Update" dropdown menu with "kabab" selected and an "Ok" button.
- "Item Name" text input field with "kabab" entered.
- "New Price" text input field with "-17" entered, circled in red. To its right, a red warning message "Invalid Price" is displayed, also circled in red.
- "New Group" dropdown menu with "dish" selected.
- "New Description" text area with "meal2" entered.
- A "Save" button at the bottom center.

Figure 2.2.1.1: Invalid Negative Price

Mobile Menu

STD

- When the supervisor keeps the item name field empty, warning message is shown.

The screenshot shows a software window titled "Supervisor" with a menu bar containing "Update Item", "Add Table", "Add Item", "Statistics", "Add Waiter", "Update waiter", and "Tables". The "Update Item" menu item is selected. Below the menu bar, there is a section titled "Choose an Item To Update" with a dropdown menu showing "falafel" and an "Ok" button. Below this, the "Item Name" field is empty, and a red warning message "Enter new name" is displayed next to it. Other fields include "New Price" with the value "3", "New Group" with a dropdown menu showing "dish", and "New Description" with a text area containing "sandwesh". A "Save" button is located at the bottom of the form.

Figure 2.1.2.2: Empty Item Name Field

Mobile Menu

STD

- When the supervisor keeps the waite ID field empty, warning message is shown.

The screenshot shows a mobile application window titled "Supervisor". The interface includes a menu bar with options: "Update Item", "Add Table", "Add Item", "Statistics", "Add Waiter", "Update waiter", and "Tables". The main content area is titled "Select waiter to update" and displays a dropdown menu with "mhmd mahmoud" selected. Below this, the text "mhmd mahmoud" is shown. The "Waiter no." is "2". The "First name" field contains "mhmd", the "Last name" field contains "mahmoud", the "ID" field is empty, and the "Telephone" field contains "123456". The "state" dropdown menu is set to "active". A red warning message "Enter waiter ID" is circled in red next to the empty ID field. There are "Ok" and "Save" buttons.

Figure 2.1.2.3: Empty Waiter ID

Mobile Menu
STD

- When the supervisor keeps the waite ID field empty, warning message is shown.

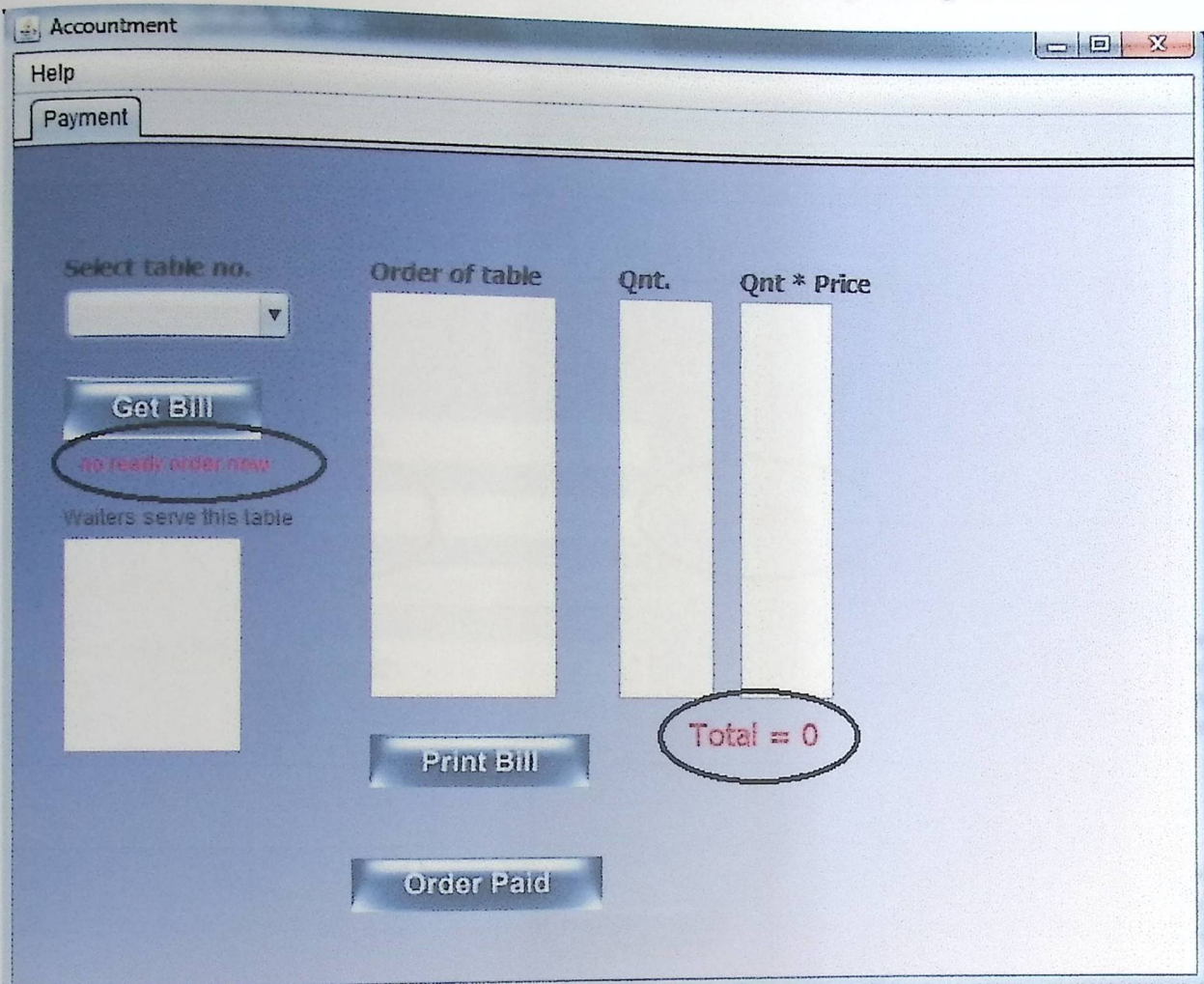


Figure 2.1.2.4: No Ready Order

Mobile Menu
STD

- When the supervisor keeps the waite ID field empty, warning message is shown.

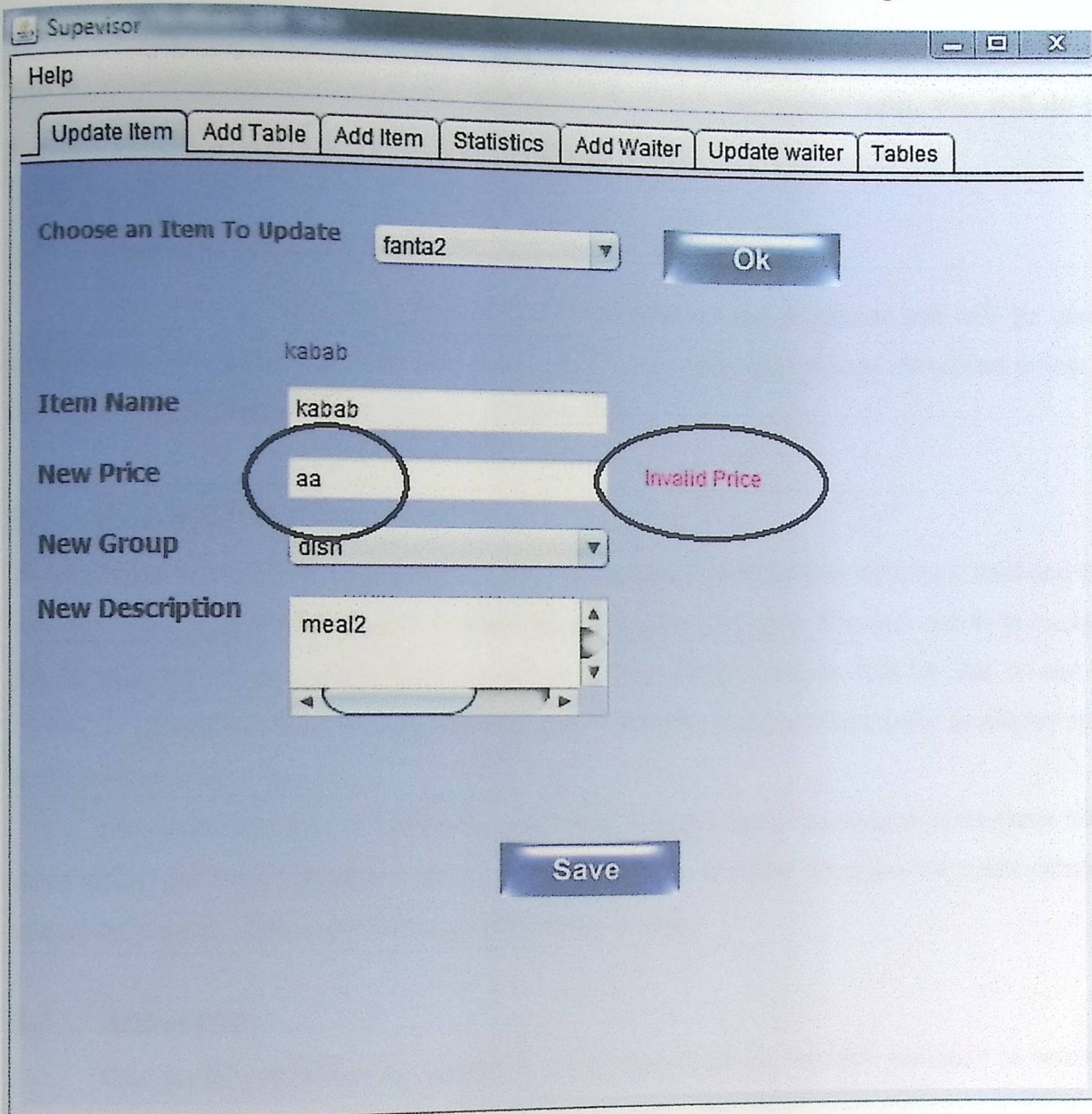


Figure 2.1.2.3: Invalid Numeric Price

1. INTRODUCTION

“A document describing the scope, approach, resources, and schedule of intended testing activities. It identifies test items, the features to be tested, the testing tasks, who will do each task, and any risks requiring contingency planning.” [1].

1.1 Document Overview

This Software Test Document (STD) describes the test approach that will be used to complete all system test and unit test, and to make sure that team passed all critical points that may make any errors in the applying or running MM.

1.2 System Overview

In current restaurants, they using static menus to provide the customers with their food and drink options. The scope of this project is summarized by two concepts. The first one is to exchange the static menus to electronic format using a mobile device; waiters will be able to use it to choose an electronic order. The second one is how transfer this electronic order to display screen in the kitchen to be prepared.

The main objective of MM is by electronic format menu, servicing in restaurants will be more easily and more quickly than using paper menus. It's also provides the restaurateurs to update their menus without needing to print a new menus.

1.3 Acronyms

This section provides the acronyms of all terms related to MM and used to write this document.

Table (1.3.1): Documentation Acronyms

Acronyms	Description
STD	Software Test Documentation.
MM	Mobile Menu.
IP	Internal Protocol

1.4 STD Structure

The rest of this document is structured as following. Chapter Two represents test approach which includes white-box testing and black-box testing

2. Test Approach

2.1 White-Box Testing

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