1. INTRODUCTION

1.1 Problem Definition:

We are going to build a software restaurant automation system that will have several features such as:

- Stock management
- Internet online reservation
- Online ordering via network enabled handheld computer
- Customer management
- Accounting
- Executive information system

In addition to those features, we are planning to add

- Statistical data about sales using graphics
- Customer profile (customer name, address, preferences, etc.)

1.2 Problem Solution:

We tried to make the problem more obvious. Because of the fact that the project is in abstract state now, we tried to concretize the project. To achieve that, we tried to think about the similar software examples that are used in real life, like restaurants. One of the reasons to do that was to draw the borders of the problem, how much we can achieve. After drawing the borders of the problem we divided the solution into several parts, which may change during the development of the project:
Online Reservation: Customers will be able to give their orders via internet. In order to achieve this we are planning to build this part of project in .NET, as this platform has many facilities in this area.

Wireless Connection: This type of connection will be used to establish the connection between the hand terminals and main computer. We are planning to use .NET platform as it has many facilities to generate source code for PDAs. Hand terminals are going to be used for getting the orders from customers and transforming these to the main computer.

Statistical Analysis: In this part statistics about the products and their sales will be generated. These statistics will be displayed by graphics. This is an extra part for the problem solution in order to ease the sales management.

Customer Profile: This is another extra part in order to know the customer and his/her preferences better. The information such as customer’s name, favourite food, address, phone number, birthday (system will send automatic greeting via SMS) will be hold in database.

Database Management: At the moment we are going to use MySQL as database management system. Database will hold the information and data coming from online reservation system, hand terminals, stock management system and customer profiles. Database management is going to be the most frequently used part of the project.
Graphical User Interface: GUI will be used in several parts such as online reservation system, hand terminals, stock management system, statistical analysis and customer profiles. .NET platform again is going to be used for designing this part of the project.

1.3 Software and hardware requirements

In order to satisfy Microsoft Visual Studio .NET requirements, hardware and software that can be of concern are:

- Microsoft Windows XP Home or Professional, Microsoft Windows NT 4.0 Server, Microsoft Windows 2000 professional or Microsoft Windows 2000 server
- Microsoft Desktop Engine (MSDE) installed and configured if you are running
- Microsoft Visual Studio.NET Enterprise, or access to Microsoft SQL Server 2000 or later if you are running Microsoft Visual Studio.NET Professional Edition
- Microsoft Internet Information Services 5.0 installed and running
- Minimum 450 MHz Pentium-class or compatible processors 3GB available hard disk space
- Minimum 64 MB RAM
2.MODELLING

2.1 Data Model

2.1.1 Entity Relationship Diagram
Online Request

- request ID
- request time
- requested to when
- request
- user ID

PDA

- ID
- purchasing date

table

- ID
- status
- schedule

stock

- ID
- amount
- type
- price
2.2 Data Description

**Customer**

1.ID
This attribute is the primary key. Every customer will be specified with this string property.

2.Password
This string field holds the entry password of the customer.

3.Name
This string characteristic of the entity is the real name of the customer.

4.Surname
This string field holds the surname of the customer.

5.Address
This attribute holds the address of the user as a string.

6.Phone number
This is a string that specifies the phone number of the customer.
7. **Birthday**
This property holds the birthday of the user as a string.

8. **Job**
This string field holds the job of the customer

9. **E-mail**
This string field holds the e-mail of the customer

**Employee**

1. **ID**
This string attribute is the primary key for this entity. It holds the identification of the employees.

2. **Name**
This string field holds the name of the waiter/waitress

3. **Surname**
This string field holds the surname of the waiter/waitress

4. **Address**
This string field holds the address of the waiter/waitress

5. **Phone number**
This string field holds the phone number of the waiter/waitress

6. **Date of employment**
This string field specifies the date of employment of the waiter/waitress

7. Employee type
This string field holds the employee type of the waiter/waitress. Payments are given with respect to this attribute.

Payment

1. Payment id
This numeric field is the id of the employee and it is the primary key of this entity.

2. Amount
This string field holds the amount of the payment that is to be paid.

3. Due-date
This string field holds the date of the payments

4. Type
This string field holds the type of the payment

Stock

1. ID
This string field is the primary key for this entity.

2. Amount
This string field holds the amount of the stock that is available in the store.
3. **Type**  
This string field holds the type of the goods that are left in the store.

4. **Price**  
This string field holds the price of the goods.

---

**PDA**

1. **ID**  
This string field is the primary key for this entity

2. **Purchasing date**  
This string field holds the purchasing date of the PDA

3. **Waiter no**  
This string field holds the number of the waiter that uses the PDA

---

**Online Requests**

1. **Request id**  
This string field is the primary key for this entity. It holds the user identification number.

2. **Request time**  
This string field holds the request time of the user.

3. **Reservation time**  
This string attribute holds the reservation time of the table.
4. Request
This string field holds what is being requested by the customer.

Monitor

1. ID
This string field is the primary key for this entity. It holds the monitor ID number.

2. Type
This string attribute holds the type of the monitor.

3. Purchasing date
This string attribute holds the purchasing date of the monitor.

Statistics

1. Category
This attribute constitutes the primary key for this entity with the time interval attribute. It holds the category of the goods in the database.

2. Time interval
This attribute constitutes the primary key for this entity with the category attribute. It holds the statistics of the goods in the database in a specified time interval.

2.3 Explanation of Relations

Connect relation between database and database server
This relation connects database and database server. A one to one relationship exists between them.

**Connect relation between DB Server and PDA**

This relation connects PDA and database server. Many to one relationship exists, which means that there may be more than one PDA. Also, PDA is not obligatory that is there may not be any PDA.

**Connect relation between DB Server and Online requests**

This relation connects DB Server and online requests. It is a one to many relationship which means that there may be more than one online request at the same time on a single database server. Also, there may not be any online requests and in order to have an online request DB Server is necessary.

**Uses relation between employee and PDA**

It is a one to one relationship. Whenever there exists a PDA there must be an employee who uses it.

**Has relation between payment and employee**

It is a one to many relationship. Whenever there exists an employee there should also be payment. There may be more than one employee who get the same payment.

**Has relation between database and stock**
It is a one to one relationship where database is necessary for this relation

**Receive relation between employee and monitor**

It is a many to many relationship. There may be several monitors that are used by several employees, also there may not be any monitors.

**Send relation between monitor and DB Server**

It is a many to one relationship. There may be more than one monitor connected to the database server. Also there should be a database server and there may not be any monitors.

**Holds relation between DB and statistics**

It is a one to many relationship which means that there may be more than one statistic in a database. Also the database may not contain any information about statistics.

**Login relation between Customer and online requests**

It is a many to one relationship which means that there may be several customers that are connected.

2.4 .Functional Model
2.4.1 Data Flow Diagram

Level 0 DFD

Level 1 DFD
Level 2 DFD

- Monitors Request Signal 4.1
- Add New Items to Order List 4.2
- Delete the Selected Item from Order List 4.3
- Update the Selected Item from Order List 4.4
- Display Messages 5.0
2.4.2 Data Dictionary

Level 0 DFD

<table>
<thead>
<tr>
<th>Name</th>
<th><code>\</code>Input Package` Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where it is used</td>
<td>Restaurant Software Input</td>
</tr>
<tr>
<td>Description</td>
<td>Gets the related data from the customers and PDA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th><code>\Regulated Requests\</code> Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Where it is used | Restaurant Software(output), effective soft.
| Man.(input)

Description | Gets the related data from the customers and PDA

---

**Level 1 DFD**

<table>
<thead>
<tr>
<th>Name</th>
<th>“Input Package” Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where it is used</td>
<td>Process Password ID input</td>
</tr>
<tr>
<td>Description</td>
<td>Gets the input from the customer in order to process password</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>“Input Package” Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where it is used</td>
<td>Database Input</td>
</tr>
<tr>
<td>Description</td>
<td>Gets the input from the customer in order to access the database</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>“Password Valid” Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where it is used</td>
<td>Display online requests</td>
</tr>
<tr>
<td>Description</td>
<td>This enables the access to the members area</td>
</tr>
<tr>
<td>Name</td>
<td>“Related Data” Signal</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Where it is used</td>
<td>Display Online Requests</td>
</tr>
<tr>
<td>Description</td>
<td>Gets the matching data from the database</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>“Request” Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where it is used</td>
<td>Show the display order screen</td>
</tr>
<tr>
<td>Description</td>
<td>This signal displays the saved data and is invoked from display online requests</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>“Request” Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where it is used</td>
<td>Show the order screen output of the PDA</td>
</tr>
<tr>
<td>Description</td>
<td>This signal is used to retrieve the data from the PDA</td>
</tr>
</tbody>
</table>
3. QUESTIONNAIRE

Company Name: Biltek Yazılım ve Bilgisayar Sistemleri
Software: Resto
Address: Selanik Avenue No: 30/7 Kızılay – Ankara
Phone Number: (312) 418 00 33

Question 1: Have you examined similar projects in the market before building your own software? If yes, from which aspects?
Answer 1: Yes, we looked at some projects and examined especially features of them. Graphical user interfaces were also under consideration. Indeed I think analyzing similar projects is an important step in producing a software product. But I think one should better design something different, than the other projects in the market.

Question 2: How many people have implemented the software? How long did it take to build it?
Answer 2: It took two years to develop the project. Three programmers have implemented it during this time.

Question 3: What kind of modules did you divided the projects into?
Answer 3: We divided it into three modules: Database module, PocketPC module and RCL module.

Question 4: Were there any changes in design after the analyses? If yes what kind of?
Answer 4: As the requirements, technology and science is developing, as the time passes our software also changes. Lately we released 1.8 version of Resto.
In this version we combined all modules into one. Accounting module and package management system are now available for use.

Question 5: Which platforms, programming languages did you use for the project?
Answer 5: C# used for PDA’s. CBuilder is used for the other parts. Generally C# and .NET is preferred because they have useful API’s for PDA’s.

Question 6: Which part of the project was most challenging and time confusing?
Answer 6: Stock management was the most difficult part. It took considerable amount of time for us. In addition to this, bill management was another part that was another problem.

Question 7: Do you have technical support? Have you received any complaint or request about the program?
Answer 7: We have very effective technical support. We provide technical support within two hours only. Customer satisfaction is very important for us. We did not get any complaint about the program. But we get lots of request about reporting module. There are various suggestions and demands especially on this subject.

Question 8: What about documentation?
Answer 8: As there was no enough time we could not prepare any documentation. But with coming versions we are planning to add an extensive documentation to our program. On the other hand we teach our customers how to use the program in a couple of courses.
Question 9: Are you going to add new modules or features to Resto? What kind of changes will be done?

Answer 9: Some restaurants are trying to get ISO2001 quality control certificate. Therefore they want to change our reporting. At the moment we are working on this module.

Question 10: Do you have any advertisement about the program? What kind of strategy do you follow to sell this kind of product?

Answer 10: No, we have no such an advertisement. Such kind of advertisements is already abandoned. In order to sell the product we go to the customer and present it.