

# Technology Adopted

### 3.1 Introduction

The previous chapter described difference between the propose system and traditional methods and also about the existing similar systems. In this chapter, it will describe technologies that are going to use to solve the above stated problems and why /how technology is appropriate.

### 3.2 Multi tier architecture

Mobile/web based project, by nature has client server architecture. When developing this kind of a project the better approach is multi tier architecture. There, it is easily identified the logically separated processes named presentation, the application processing, and the data management which is called the three tier architecture [15].

To implement the tiered architecture for each tier, following technologies are used.

#### 3.2.1 Presentation tier

Here to render the screen on the mobile device it uses WML whereas the PC base uses HTML. Most of mobile devices are WAP and GPRS enabled, Delivering the content to those kind WAP is the better solution. Administrators of the restaurant system can log on to this system using their Personal Computers. Since it is easier to use HTML is used.

#### 3.2.2 Application tier

PHP is used to carry out the function of this tier. PHP is supported both Windows and Linux based system. It has built in facility to database management especially for mysql which used as the database server on this project. PHP runs on Apache web server as well as Windows IIS server. It means the system is platform independent [7]. This makes the project easily deploy in any kind of platform. The PHP is mostly designed to run on Linux and Apache, which are both open source software which have zero upfront

costs and zero ongoing costs and even future updates can be done for free of charge. This completely removes server maintenance cost to a fraction of Windows server's maintenance and upgrade costs. The PHP language is always up to date by a team of global experts who ensure that the language is always relevant to the requirements of today's websites. The PHP has ability to work with multiple databases such as mysql, Oracle, MSSQL and IBM DB2 [7]. So in future, it is easy to migrate from one database to another without spending lot of money. Event it is very easy to lean that person has very few programming background. It can be use many deferent development tools for free of charge to develop a project. It is very reliable language as java and ASP due to its age (more than fifteen years). It is very easy to access other web base tools via the PHP [7]. Due to the configuration facilities, that provides huge security measures.

### 3.2.3 Date tier

Here as the database server, mysql is used. mysql database server can run on windows based and the linux based machines. To manage mysql database server there are more Free and open source application available. This server is community developed and free to use.



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The mysql is used to implement a database for store and retrieve information. The following are the benefits from mysql [8].

- High availability
- High performance
- Scalability and flexibility
- Robust transactional support
- Web and data warehouse strengths
- Strong data protection
- Comprehensive application development
- Lowest total cost of ownership

### **3.2.4 Running web site**

The Apache is used as a web server for the system. There is no need to get permission from anybody to view or edit the software. Hence it allows any programmer to create his or her solution based on the core Apache program, or extend the features of the software. Apache is constantly being updated. Even apache has set of powerful features. It supports wide range of programming languages such as Perl, PHP and Python. The "SSL" and "TLS" are supported by apache [9]. So it provides more security to hosted web sites. Apache Web Server can be installed on a wide variety of servers and operating systems due to its portability.

### **3.3 Why these technologies are appropriate**

The project will be used mobile & web base technologies to overcome above mentioned issues. Even they are very poor to afford an internet connection due to the cost factor [10]. At present, mobile networks have rapidly spread all over the country. So the mobile phone is a very common device for every person in the country without considering economical ability. Hence most suitable device is mobile phone to convey information.

The Wireless Application Protocol (WAP) has become the standard for communication between server applications and its clients [10]. WAP layers can be explained as a set of protocols, which layers allow data exchange for mobile cellular systems and is the current world standard for the presentation and delivery of wireless information [10]. Further, it is device and network independent and design for micro browser. WAP is based on the Internet standards.

WAP is used as a standardized method so that handheld devices such as cellular phones can talk to a server among the cellular network that it belongs to. WAP technology not bound only to the services offered by the cellular networks. It has become the link of the internet to the mobile world, bridge a gap between two of the top industries of the world.

## **WAP gateway**

A WAP gateway is a server that transfer data from wireless devices (using WAP requests) to content sites (in WML format) and back again. It typically resides within the wireless carrier's network but may also reside within a corporate business environment.

WAP gives mobile phone users to access Internet or web services through mobile devices. WAP technology provides a solution to the growing demand for wireless mobile services across the world. WAP act as a bridge between the mobile world and the Internet. It offers WAP services like encoding of WML pages, end-user authentication system and WML script compiling.

WAP uses the underlying web structure to enable communication between content providers and mobile devices. This wireless protocol employs Wireless Mark-up Language (WML) for application content instead of Hypertext Mark-up Language coding (HTML).

### **3.3.1 WAP architecture**

WAP also follows a model similar to the Internet. The Internet itself has a layered protocol stack. The portable device using WAP has browser software that connects to WAP Gateway and sends requests to receive data from web servers. Data could be a web page or email. The content is then sent back to the portable device, and depending on the capability of the portable device to receive and view data, the data is received and viewable. An overview of the WAP architecture is depicted in Figure 3.1.

# WAP Architecture

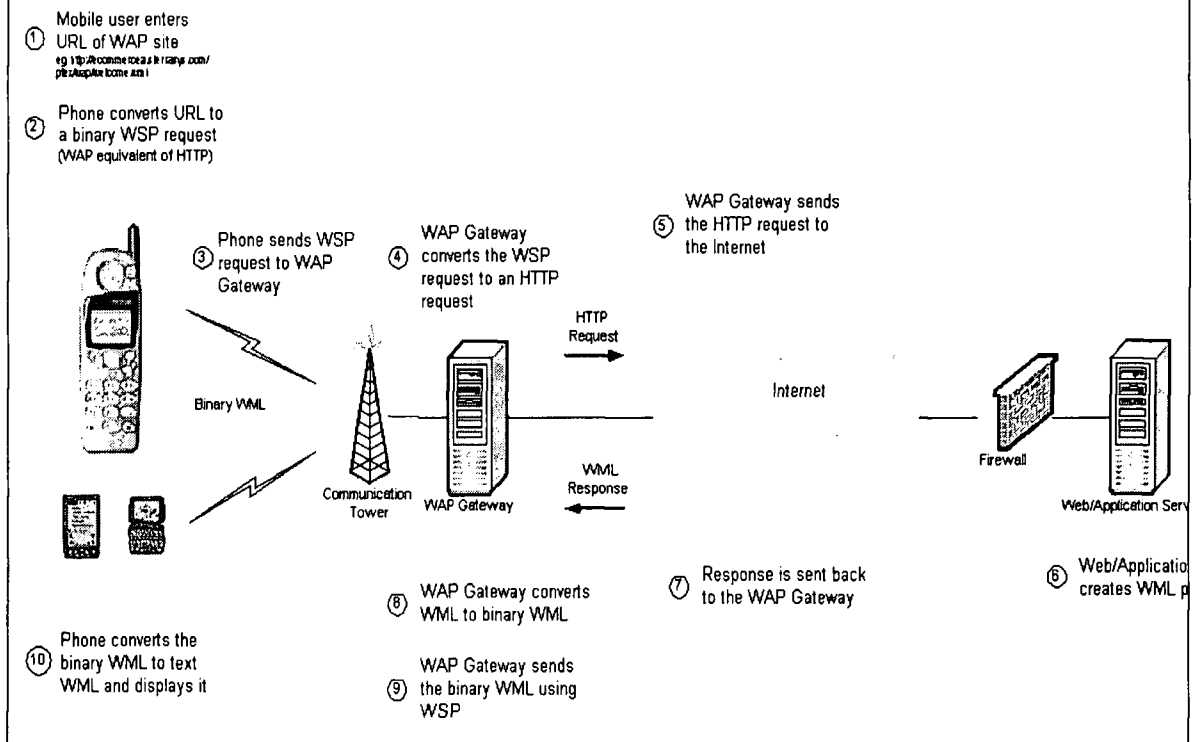
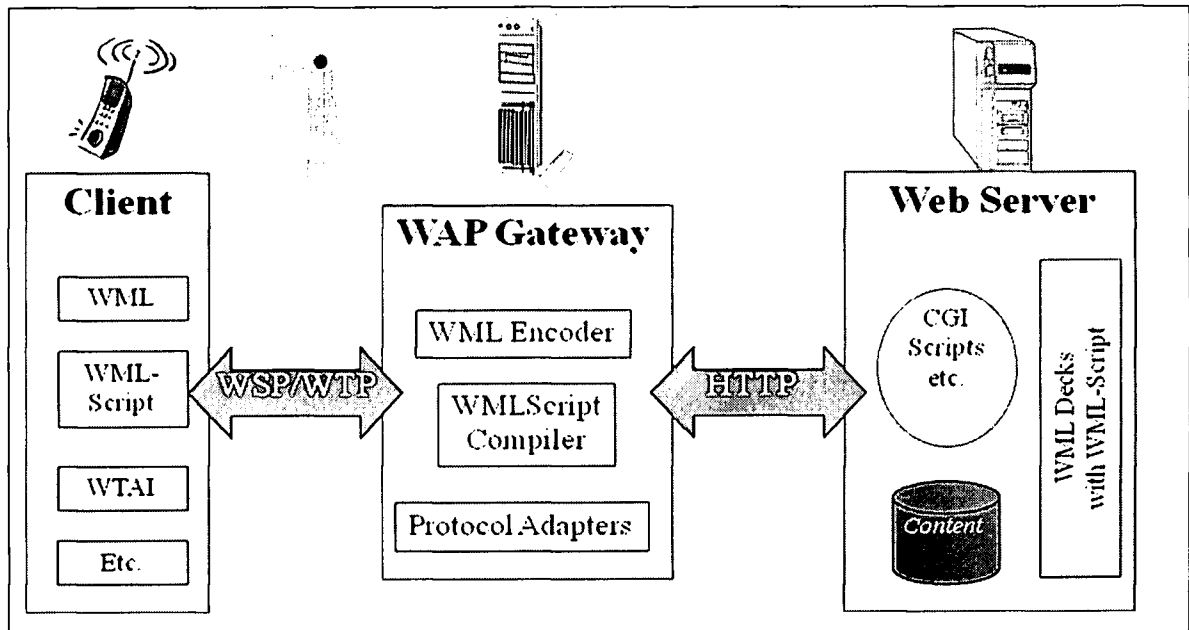


Figure 3.1 – WAP architecture [16]  
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Early adapter of WAP include Ericsson, Nokia, Motorola and Phone.com (formerly unwired Planet). In December 1997, these three large companies, all with strong influence on the Mobile market, formed the WAP Forum, an organization with open membership and now with over 300 members worldwide. The purpose of this forum is to make sure that the specifications of WAP do not go astray [11].

Basic specifications of WAP include micro browsing, scripting, wireless telephone applications and a layered protocol stack.

To create wireless Internet content, a Web site creates special text only or low graphic version of the site. A Web server sends the data in HTTP form to a WAP gateway. This system includes the WAP encoder, script compiler, and protocol adapter to convert the HTTP information to WML. The gateway then sends the converted data to the WAP client on wireless device.



**Figure 3.2 – Inside WAP [16]**

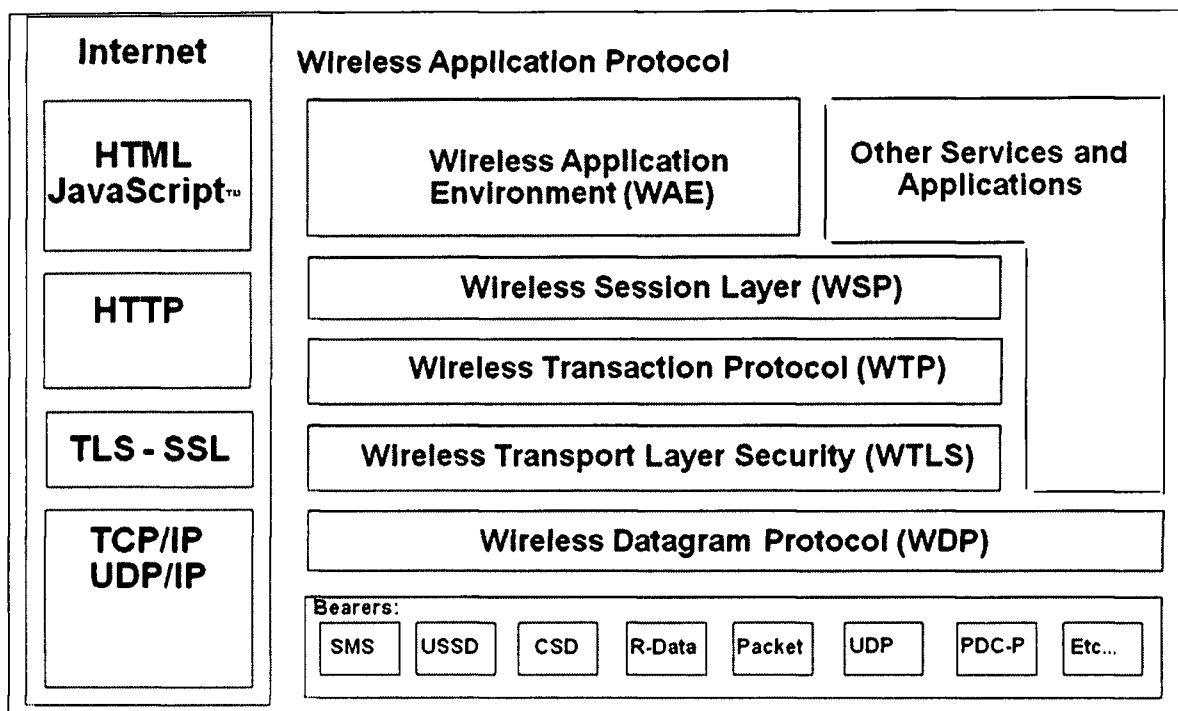
The World Wide Web model follows a three-layer protocol. Referring to figure 3.2 diagrams, the WAP model follows the World Wide Web model in that there is a Web server, a Client and Gateway. The main web server is where one would find and server side functions. The Web server also holds content that Clients will want to view.



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### 3.3.2 WAP layers

WAP is designed in a layered fashion so that it can be extensible, flexible, and scalable. As a result, the WAP protocol stack is divided into five layers [12]. The following figure 3.3 will give an indication about the layers of WAP and the description of each layer.



**Figure 3.3 – WAP layers [16]**

**What is WML?**

WML stands for Wireless Mark-up Language. It is a Mark-up Language inherited from HTML, but WML is based on XML, so it is much stricter than HTML. WML is used to create pages that can be displayed in a WAP browser. WML pages are called DECKS. They are constructed as a set of CARDS, related to each other with links. Structure of WML showed Figure 3.4. When a WML page is accessed from a mobile phone, all the cards in the page are downloaded from the WAP server. The phone computer-inside the phone does navigation between the cards without any extra access trips to the server.



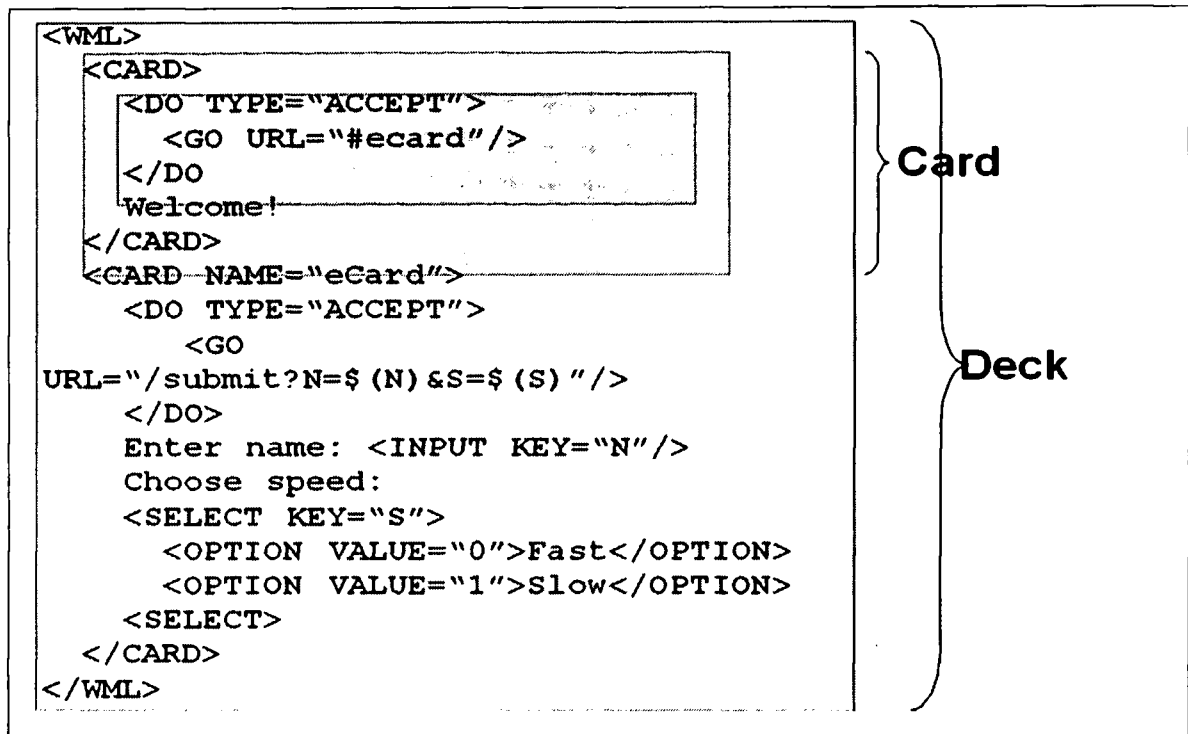


Figure 3.4 – WML coding structure [16]

### 3.4 Advantages of WAP

- WAP handles limited bandwidth
  - Minimizes traffic over wireless interface
  - WSP layer, too is binary encoded
  - WTP is not only designed to minimize amount of data transferred but also the number of transactions.
  
- WAP handles high latency
  - WAE uses scripting to avoid round trip delays eg. by validating user input locally
  - WTAI environment introduces a repository to hold services that should be started in response to an event in mobile network eg incoming call.



- WAP handles less stable connections
  - The sessions supported by WSP are assumed to be long-lived.
  - WTP layer has been kept very simple compared to TCP
- WAP handles small displays
  - WML structure its documents in 'Decks & Cards'
  - When an application is executed, user navigation through a series of cards

### 3.5 Summary

This chapter presented the WAP as a powerful tool in next new decades and the underlying structure of it. Mobile base customer care services will no different and non-existence of such system provided an opportunity to implement customer care services to address a real world problem. Next chapter will discuss analysis and design.



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