Digital Transactions Through Mobiles Using WAP

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Abstract: The main objective is to provide comfort to the mobile users by providing online information about various cities in TAMILNADU. The band width provided by the early networks are less leading to the network traffic and reduced data rate. In the past few years, circuit-switched networks showed a tremendous growth in data traffic due to the increasing popularity of the internet. Service providers need effective means to share the scarce radio resources between many subscribers. In a circuit-switched mode, a channel is allocated to a single user for the duration of the connection. Consequently new data applications are emerging and are reaching the mobile users. The existing mobile applications provide a text based information directory which is WAP (Wireless Application Protocol). The same can be developed as a GPRS (General Packet Radio Service) application that uses the global internet gateway through which it can be accessed in mobile devices.

Keywords: WAP, GPRS, Mobile services, Network.

1. Introduction

Advancement in wireless networking and portable devices is revolutionizing the way individuals and businesses view computing. Many industries are now trying to provide services to this market and mobile applications are expected to become the norm in the near future. Mobile devices with advanced features as in Smart Phones may not be affordable to all. The population of simple feature phones is considerable in India and has to be considered when applications are deployed.

2. Existing Systems

The existing system uses a separate server for storing the information's that its application is going to produce for the end user. It has its own server that handles the request and responds only to a limited number of users at the same time. The server has to handle the request, maintain the databases, process the requests and respond to the subscriber. It is not sure that the user makes the same type of request every time.

3. Proposed System

3.1 Proposed System Architecture

Our proposed system uses the existing internet facilities to access the required information. The information regarding the application are stored in the database and other online information's such as news, sensex and weather can be taken from other open access servers such as USENET and CYNAPTRICS. Moreover if the required information is not present in the application it can be redirected to other online resources.
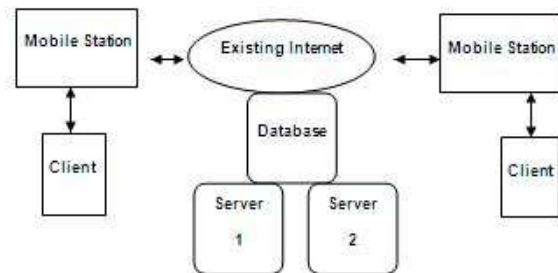

Figure 1: Proposed system architecture

The HUTCH provides the M-OFFICE functionality that allows access to any site when GPRS is being enabled in the mobile. Our proposed GPRS application "MOBILE TAMIZHAGAM" produce information's of the various cities that is developed as a web document. Our application can be accessed on all mobile devices that support GPRS facility.

Our system came up with an idea of providing entire information directory to a novice entering the city, instead of the mobile users requesting the particular information needed to the service provider. In turn the service provider has to send the reply for every request of the user. This increases the burden of the server and our system tries to reduce the burden by providing all the information to the subscriber as single application.

3.2 GPRS Mobility Management

The operation of the GPRS is partly independent upon the GSM network. However, some procedures share the network elements with current GSM functions to increase efficiency and to make optimum use of free GSM resources (such as unallocated time slots).
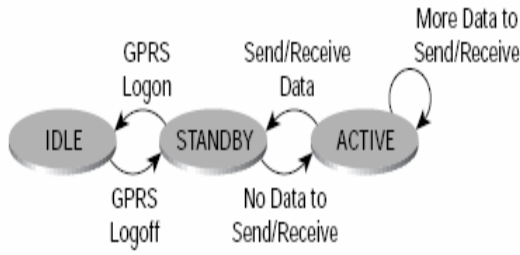
shown in the fig 4.

Figure 2: GPRS mobility management

An MS has three states in the GPRS system: idle, standby, and active. The three-state model represents the nature of packet radio relative to the GSM two-state model (idle or active).

Data is transmitted between a MS and the GPRS network only when the MS is in the active state. In the active state, the SGSN knows the cell location of the MS. However, in the standby state, the location of the MS is known only to which routing area it is in. (The routing area can consist of one or more cells within a GSM location area.) When the SGSN sends a packet to a MS that is in the standby state, the MS must be paged. Because the SGSN knows the routing area in which the MS is located, a packet paging message is sent to that routing area. After receiving the packet paging message, the MS gives its cell location to the SGSN to establish the active state.

The Mobile Office is supported by all the service providers which allow the mobile subscriber to access the internet without any restrictions. The mobile devices could also be connected to the PC or the LAPTOPS and could be viewed. The registration to the mobile office is explained in the fig3 below.
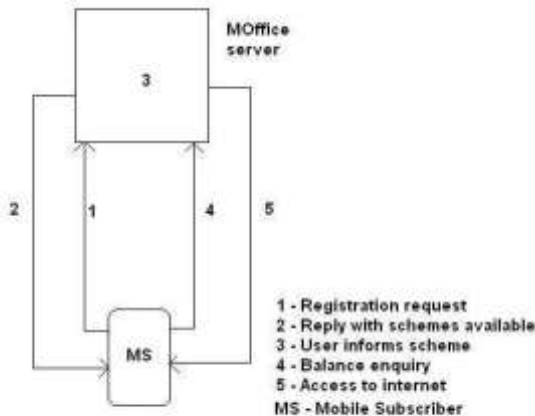

Figure 3: Mobile office registration

3.3 Storage Management

The entire application now runs in the space provided in the domain while hosting it in the internet. The storage space is now limited and when the service provided by the application increases the storage space also increases. The mobile service providers feel the decrease in performance when accessing a common storage space and subscribers are the ultimate ones to be affected. The information stored could be maintained by server of the service provider and other common application like the temperature status, sensex could be obtained from the   existing application server as
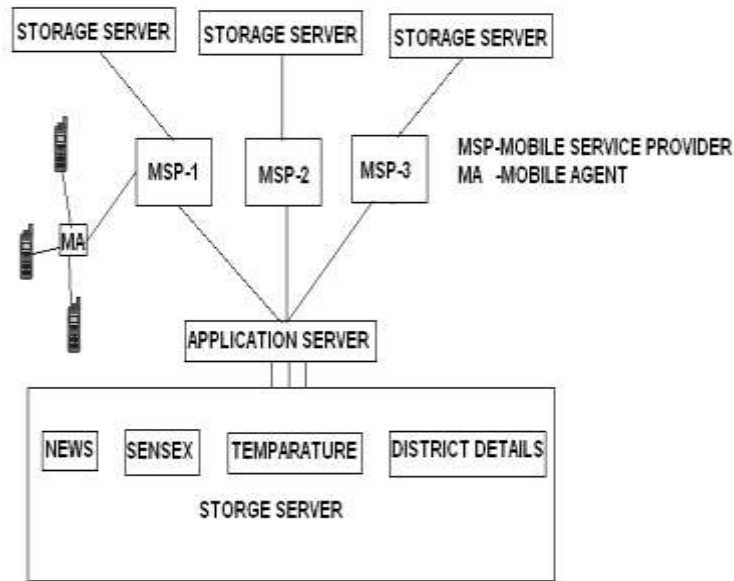

Figure 4: Storage management

When such a storage model is provided, all service providers like AIRTEL, BSNL and HUTCH could implement their own storage servers and can serve better to their mobile subscribers.

3.4 Multithreaded Server Management

The existing internet server is multithreaded and they usually provide the maximum bandwidth with a high speed data transfer serving multiple clients at the same time. But when a separate server is implemented by the different service providers it should also be multithreaded and it should serve multiple clients. The multithreading also has the problem of synchronization between the different threads. The TWO WAY HANDSHAKING could be provided substantially to increase the performance of the multithreaded servers. The fig 4.4 shows how the two way handshaking could be used between a server and a client.
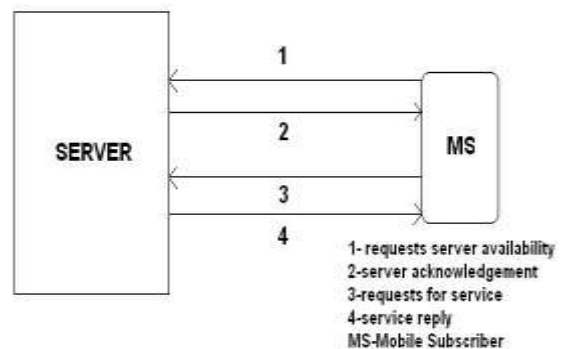

Figure 5: Two way handshaking
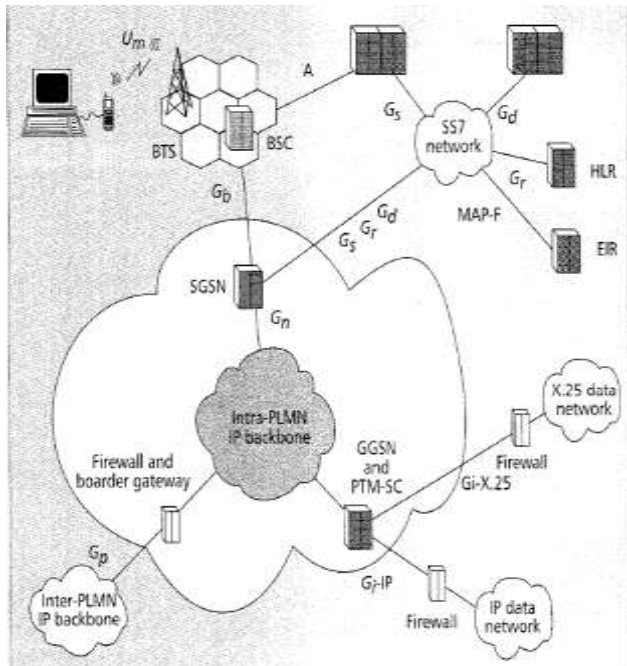
4. GPRS Architecture

Figure 6: GPRS architecture use for mobile tamilagam

4.1 GPRS

The General Packet Radio System (GPRS) is a new service that provides actual packet radio access for mobile Global System for Mobile Communications (GSM) and time-division multiple access (TDMA) users. The main benefits of GPRS are that it reserves radio resources only when there is data to send and it reduces reliance on traditional circuit-switched network elements. The increased functionality of GPRS will decrease the incremental cost to provide data services, an occurrence that will, in turn, increase the penetration of data services among consumer and business users. In addition, GPRS will allow improved quality of data services as measured in terms of reliability, response time, and features supported. The unique applications that will be developed with GPRS will appeal to a broad base of mobile subscribers and allow operators to differentiate their services. These new services will increase capacity requirements on the radio and base-station subsystem resources. One method GPRS uses to alleviate the capacity impacts is sharing the same radio resource among all mobile stations in a cell, providing effective use of the scarce resources. In addition, new core network elements will be deployed to support the high burstness of data services more efficiently.

In addition to providing new services for today's mobile user, GPRS is important as a migration step toward third-generation (3G) networks. GPRS will allow network operators to implement an IP-based core architecture for data applications, which will continue to be used and expanded upon for 3G services for integrated voice and data applications. In addition, GPRS will prove a testing and development area for new services and applications, which will also be used in the development of 3G services.

4.2 GPRS Applications

GPRS will enable a variety of new and unique services to the mobile wireless subscriber. These mobile applications contain several unique characteristics that enhance the value to the customers. First among them is mobility—the ability to maintain constant voice and data communications while on the move. Second is immediacy, which allows subscribers to obtain connectivity when needed, regardless of location and without a lengthy login session. Finally, localization allows subscribers to obtain information relevant to their current location. The combination of these characteristics provides a wide spectrum of possible applications that can be offered to mobile subscribers. The core network components offered by Cisco enable seamless access to these applications, whether they reside in the service provider's network or the public Internet.

- ➢ Communications—E-mail; fax; unified messaging; intranet/Internet access
- ➢ Value-added services (VAS)—Information services; games
- ➢ E-commerce—Retail; ticket purchasing; banking; financial trading
- ➢ Location-based applications—Navigation; traffic conditions; airline/rail schedules; location finder
- ➢ Vertical applications—Freight delivery; fleet management; sales-force automation
- ➢ Advertising

4.3 GPRS Subscriber Terminals

New terminals (TEs) are required because existing GSM phones do not handle the enhanced air interface, nor do they have the ability to packetize traffic directly. A variety of terminals will exist, as described in a previous section, including a high-speed version of current phones to support high-speed data access, a new kind of PDA device with an embedded GSM phone, and PC Cards for laptop computers. All these TEs will be backward compatible with GSM for making voice calls using GSM.
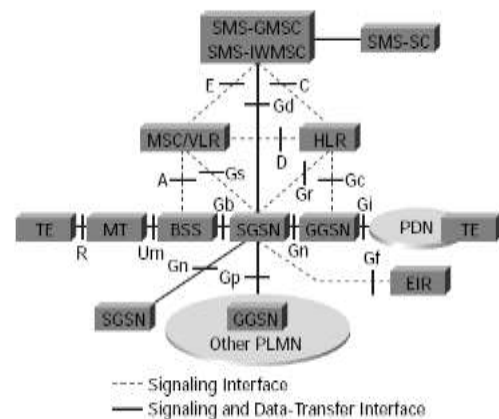

Figure 7: Generic GPRS Architecture

4.4 GPRS BSS

Each BSC will require the installation of one or more PCU's and a software upgrade. The PCU provides a physical and logical data interface out of the base station system (BSS) for packet data traffic. The BTS may also require a software upgrade, but typically will not require hardware enhancements.

When either voice or data traffic is originated at the subscriber terminal, it is transported over the air interface to the BTS, and from the BTS to the BSC in the same way as a standard GSM call. However, at the output of the BSC the traffic is separated; voice is sent to the mobile switching center (MSC) per standard GSM, and data is sent to a new device called the SGSN, via the PCU over a Frame Relay interface.

4.5 GPRS Network

In the core network, the existing MSCs are based upon circuit-switched central-office technology, and they cannot handle packet traffic. Thus two new components, called GPRS Support Nodes, are added:

➢ Serving GPRS Support Node (SGSN)
➢ Gateway GPRS Support Node (GGSN)

The SGSN can be viewed as a "packet-switched MSC;" it delivers packets to mobile stations (MS) within its service area. SGSNs send queries to home location registers (HLRs) to obtain profile data of GPRS subscribers. SGSNs detect new GPRS MS in a given service area, process registration of new mobile subscribers, and keep a record of their location inside a given area. Therefore, the

SGSN performs mobility management functions such as mobile subscriber attach/detach and location management. The SGSN is connected to the base-station subsystem via a Frame Relay connection to the PCU in the BSC.

GGSNs are used as interfaces to external IP networks such as the public Internet, other mobile service providers' GPRS services, or enterprise intranets. GGSNs maintain routing information that is necessary to tunnel the protocol data units (PDUs) to the SGSNs that service particular MS. Other functions include network and subscriber screening and address mapping. One (or more) GGSNs may be provided to support multiple SGSNs. More detailed technical descriptions of the SGSN and GGSN are provided in a later section.

4.6 GPRS Mobility Management

Mobility management within GPRS builds on the mechanisms used in GSM networks; as a MS moves from one area to another, mobility management functions are used to track its location within each mobile network. The SGSNs communicate with each other and update the user location. The MS profiles are preserved in the visitor location registers (VLRs) that are accessible by the SGSNs

via the local GSM MSC. A logical link is established and maintained between the MS and the SGSN in each mobile network. At the end of transmission or when a MS move out of the area of a specific SGSN, the logical link is released and the resources associated with it can be reallocated.

4.7 GPRS Data Communication

Some cooperation still exists between elements of the current GSM services and GPRS. On the physical layer, resources can be reused and some common signaling issues exist. In the same radio carrier, there can be time slots (TSs) reserved simultaneously for circuit-switched and GPRS use. The most optimum resource utilization is obtained through dynamic sharing between circuit-switched and GPRS channels. During the establishment of a circuit-switched call, there is enough time to preempt the GPRS resources for circuit-switched calls that have higher priority.

4.8 GPRS Service

The GPRS provides a bearer service from the edge of a data network to a GPRS MS. The physical radio interface consists of a flexible number of TDMA time slots (from 1 to 8) and thus provides a theoretical raw data rate of 171 kbps. A Media Access Control (MAC) utilizes the resources of the physical radio interface and provides a service to the GPRS Logical Link Control (LLC) protocol between the MS and the serving GSN (SGSN). LLC is a modification of a High-Level Data Link Control (HDLC)-based Radio Link Protocol (RLP) with variable frame size. The two most important features offered by LLC are the support of point-to-multipoint addressing and the control of data frame retransmission. From the standpoint of the application, GPRS provides a standard interface for the network layer.

4.9 Data Routing

One of the main issues in the GPRS network is the routing of data packets to/from a mobile user. The issue can be divided into two areas: data packet routing and mobility management.

4.10 Data Packet Routing

The main functions of the GGSN involve interaction with the external data network. The GGSN updates the location directory using routing information supplied by the SGSNs about the location of a MS and routes the external data network protocol packet encapsulated over the GPRS backbone to the SGSN currently serving the MS. It also de-capsulate and forwards external data network packets to the appropriate data network and collect charging data that is forwarded to a charging gateway.

GPRS operators will allow roaming through an inter-operator backbone network. The GPRS operators connect to the inter-operator network via a boarder gateway (BG), which can provide the necessary interworking and routing protocols (for example, Border Gateway Protocol [BGP]). It is also foreseeable that GPRS operators will implement QoS mechanisms over the inter-operator network to ensure service-level agreements (SLAs). The main benefits of the architecture are its flexibility, scalability, interoperability, and roaming.
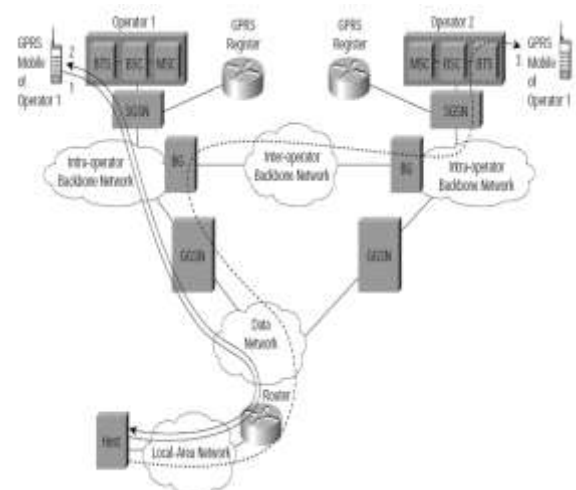
Figure 8: Routing of Data Packets between a Host and GPRS MS

5.Implementation

The proposed sample application, viz. Mobile Tamizhagam with information on various categories, is implemented in J2EE (Java Server Pages) with HTML as front end and MS SQL Server as back end. The applications implemented in J2EE provide a wide range of usage in standalone system as well as in the global internet. It also extends its reach to the mobile technology such that many applications can be viewed directly when hosted as a web document.

5.1 Mobile Services: Technology Track#1

The Basic Components that we use in implementing MOBILE TAMIZHAGAM are:

The Status code is an integer value that describes the status response. The status code can indicate a success or failure, or it can inform client software to take further action to finish the request.

The extra information's can also be send along with the request. This extra information's are embedded within the HTTP headers and are send as a part of the request.

For a HTML page, the response body is the HTML itself. For a graphic, the response body contains the bytes that make the image. A response body can be of any type and of any length; the client knows what to except by reading and interpreting the HTTP headers in response.
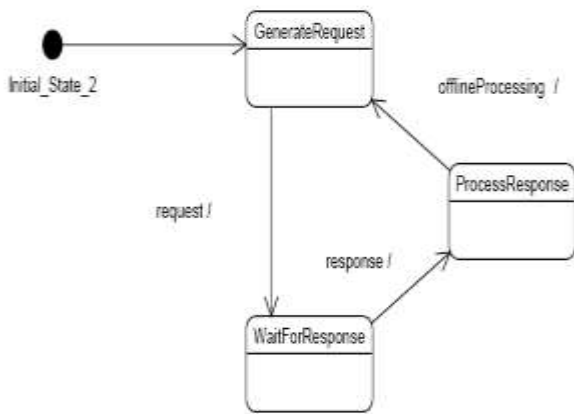
Figure 11: Client state diagram
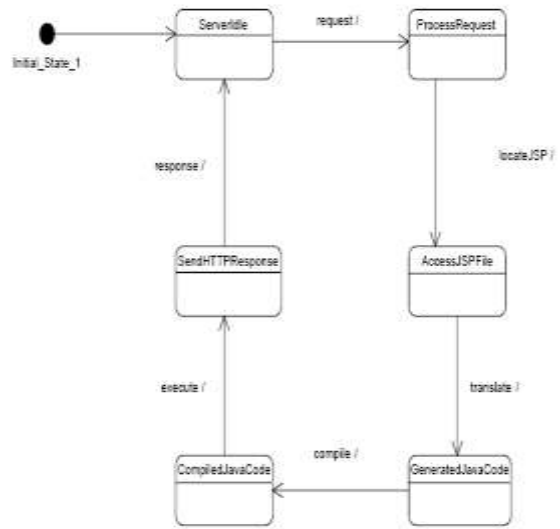
Figure 12: Server state diagram

The directory provides the following information about the various cities in TamilNadu.

- ➢ ATM
- ➢ College
- ➢ Hotels
- ➢ Tourism
- ➢ Shopping
- ➢ Help Lines

Online information's such as news and sensex details are also provided by requesting the specific news server and sensex server. The USENET News Server (news.ufl.edu) group provides open access to the news. The CYNAPTRICS server gives access to the sensex information.

Figure 15: Information Selection

CHENNAI

COLLEGES

MAHARAJI COLLEGE OF PHARMACY, CHENNAI

NATIONAL COLLEGE OF PHARMACY, TIRUVALLUR

SRI RAMACHANDRA MEDICAL COLLEGE AND RESEARCH INSTITUTE, CHENNAI

CHETTINAD HOSPITAL AND RESEARCH INSTITUTE, CHENNAI

KILPAUK MEDICAL COLLEGE, CHENNAI

MADRAS MEDICAL COLLEGE AND RESEARCH INSTITUTE, CHENNAI

SREE BALAJI MEDICAL COLLEGE AND HOSPITAL, CHENNAI

SRI RAMACHANDRA MEDICAL COLLEGE AND RESEARCH INSTITUTE, CHENNAI

SRM MEDICAL COLLEGE HOSPITAL & RESEARCH CENTRE, CHENNAI

STANLEY MEDICAL COLLEGE, CHENNAI

AALIM MUHAMMED SALEGH POLYTECHNIC COLLEGE, CHENNAI

S A POLYTECHNIC COLLEGE, CHENNAI

SRI SAIRAM POLYTECHNIC COLLEGE, CHENNAI

SRIRAM POLYTECHNIC COLLEGE, THIRUVALLUR

A.M.K. KOTHARI TECHNOLOGICAL POLYTECHNICAL INSTITUTE, CHENNAI

BHARATHI POLYTECHNIC COLLEGE, CHENNAI

C.P.C.L. POLYTECHNIC COLLEGE, CHENNAI

CENTRAL POLYTECHNIC COLLEGE, CHENNAI

VENKATESWARA HOMOEOPATHY MEDICAL COLLEGE, CHENNAI

VELS COLLEGE OF PHARMACY, CHENNAI

A.J. COLLEGE OF PHARMACY, CHENNAI

ANNAI VEILANKANNI PHARMACY COLLEGE, CHENNAI

C.L. BAID METHA COLLEGE OF PHARMACY, CHENNAI

JAYA COLLEGE OF PARAMEDICAL SCIENCE, TIRUVALLUR DT

K.K. COLLEGE OF PHARMACY, CHENNAI

CHENNAI NATIONAL COLLEGE (ARTS AND SCIENCE), CHENNAI

D.G VAISHNAV COLLEGE, CHENNAI

MADRAS COLLEGE OF PHARMACY, CHENNAI

MADRAS MEDICAL COLLEGE, CHENNAI

BHAKTAVATSALAM MEMORIAL COLLEGE FOR WOMEN, CHENNAI

GURU NANAK COLLEGE, CHENNAI

GURU SHREE SHANTI VIJAI JAIN COLLEGE FOR WOMEN, CHENNAI

K.C.S. KASI NADAR COLLEGE OF ARTS AND SCIENCE, CHENNAI

KUMARA RANI MEENA MUTHIAH COLLEGE OF ARTS AND SCIENCE FOR WOMEN, CHENNAI

LOGANATHA NARAYANASAMY GOVT. ARTS COLLEGE, PONNERI

LOYOLA COLLEGE, CHENNAI

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Figure 17: Mobile Services: Technology Track 1: Colleges

CHENNAI

UNIVERSITY

TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY, CHENNAI - 600 007. WWW.TANUVAS.COM

TAMIL VIRTUAL UNIVERSITY, CHENNAI - 600 007. WWW.TAMILVU.ORG

UNIVERSITY OF MADRAS, CHEPAK, CHENNAI - 600.005. WWW.UNOM.AC.IN

TAMIL NADU OPEN UNIVERSITY, GUINDY, CHENNAI - 600 025. WWW.TNOU.AC.IN

TAMIL NADU DR. AMBEDKAR LAW UNIVERSITY, "POOMPOZHIL", 5, GREENWAYS ROAD, CHENNAI - 600 028. WWW.TNDALU.ORG

ANNA UNIVERSITY, SARDAR PATEL ROAD, GUINDY, CHENNAI - 600 025. WWW.ANNAUNIV.EDU

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Figure 18: Mobile Services: Technology Track 1: University

atm	colleges	university	travels	ambulance	hospitals	hotels	tourisms	shoppi
SULUR THANG	Nehru Arts and	Bharathiyar Uni	Paneer Travels	Sheela Hospital	Government Ho	Inspection bungalow at Valparai wit	Kovai Kutrallam	TANSI Sa
KARPAGAM AIR	R.V.S College c	Tamil Nadu Agri	A.K Travels, G.I. - 2407567B		Ramakrishna Ho	Sholayar Agara, PWD bungalow at	The Siruvani Da	Big Bazaa
AIRPORT(NEAF	Angappa Colleg		City Travels, Ra		Sheela Hospital	Inspection bungalow at Attakatti (TI	Noyyal River	Raja Stre
PE NO.3860 ST	Bishop Ambros		karthik travels, I		Ganga Hospital	Nirar Agam PWD bungalow at Nirar	Vellingiri Hills	Sukravar
COIMBATORE	C.B.M. College					Township Rest House at Valparai (C	G.D.Naidu lodge	Chinthan
GANAPATHY,	C.M.S. College					Green Hills Hotel, PH - 04253 - 222	Bhavani Dam Te	Poompuh
R.S.PURAM,	C.S.I. Bishop A					Krishna Lodge, PH - 04253 - 22223	Vaidehi Waterfa	Co-optex.
R.S.PURAM (E	Chikkama Gove					Everest Lodge	Tiruppur Textile	Khadikraf
RACE COURSE	Dr. G.R. Damoc					Treat Lodge, PH - 04253 - 222361	Bethesda Praye	
REDFIELDS,	Dr. NG.P. Arts					BEL HOTEL, #24, Grey Town/Near	The Aramaala V	
SAIBABA COL(	Dr. S.N.S. Raja					Hotel Gati Pride, Gandhipuram, PH -	Valparai Hill sta	
SINGANALLUR	Emerald Height					Hotel Heritage Inn, Rannagar, PH -	Siolayar Dam	
IDOL SINGANA	Govt. Arts Colle					Hotel Nilgiri Nest, Avinashi Road, P	Parambukulam-	
PRB COIMBAT(	Govt. Arts Colle					Hotel Shogan Regency, Avinashi Rc	Nirar Dam	
S P.K V,	Govt. Arts Colle					Hotel Suriya International, Race Co	Monkey Falls	
VADAVALLI,	Hindusthan Coll					Hotel Sri Annapoorna, MTP Road, F	Top Slip	
	K.G. College of					Hotel Residency, Avinashi Road, PI	Indira Gandhi W	
	K.S.G. College					Hotel Park Inn, Near Railway Statio	Sidhi Vinayagar	
	Kairal Arts, Sci					Hotel Jenny Residency, Avinashi F	Balaji Temple	
	Karpagam Arts					Hotel Abirami, 100 Road, PH - 2455		
	Kongunadu Arts					Hotel Aiyyas, R.S Puram, PH - 245		
	Kovai Kalaimag					Hotel Blue Star, Rannagar, PH - 22		
	L.R.G. Govt. Ar					Hotel Cheran Palace, Gopalapuram		
	Lakshmi Naraya					Hotel Thai, R.H.R. Building, SBI Ro		
	Maharaja Arts a					Hotel Seetharam, Rannagar, PH -		
	Nallamuthu Gou					Hotel Meena, Rannagar, PH - 2235		
	Nehru College o					Hotel Deva, Gopalapuram, PH - 230		

Figure 20: Mobile Services: Technology Track # 2: Database

5.2 MOBILE SERVICES: TECHNOLOGY TRACK#2

The information centre is developed using WAP. This is implemented as a pilot project in a mobile service provider.

Test Case 1: General Information

The welcome deck is displayed. The screen which shows "welcome to Coimbatore" is displayed. The next deck welcomes the people to the "Manchester of south India". Then the control is passed to the Information centre

We can pick our needs from the mobile. It gives information such as

- Airways
- Bank
- Colleges
- Lodging
- Hospital
- Shopping complex
- Bazaars
- Public utility services
- Schools
- Theatres
- Tourist spot

Figure 21: Welcome Deck and Thank You

Test Case 2: Airways

Then the deck Airways is selected. The options such as Air France, Air India, British Airways, Delta Airlines, Gulf air, Gujarat Airways, Indian Air Peelamedu, Indian Air Enquiry, Indian Air Cargo, Jet Airways City Office, Singapore Airlines, Swiss Airways, Central Warehouse are displayed.

Any one of the option such as Delta Airlines is selected. Then the deck with "HI – FI" is seen with the "DIAL" option. When a call is to be made to the Delta Airlines the dial option is pressed and the number "0422 215237" for the Delta Airlines is displayed. The customer can make a call to the above number from his mobile.

Figure 23: Airways

Test Case 3: Contact Details

If the computer center option such as aptech is selected then the deck with the caption "we change lives" is displayed. Then the option "Rush To" is selected.

The options RS puram, Gandhipuram, Peelamedu are displayed. The user can select any one of the centers and they can contact the particular center by selecting the dial option.

Test Case 4: Schools

All the schools in the Coimbatore city are known to all by means of wap forum and the contact address are also given.

- Alvernia
- Avila Convent
- Angappa Higher secondary school
- Bharathi Matriculation school
- Bharatia Vidya Bhavan Matriculation school
- Carmel Garden Matriculation school
- Chinmaya International school
- GRD GoivindaRajulu school
- Good Shepeard Matriculation school
- Liseux Matriculation school
- MGM
- Mathar Kalvi Nilayam
- PSGR
- Presentation convent school
- RamNagar Suburn Matriculation school
- Rukmani Kannan Vidayalaya
- SBOA Matriculation school
- Saradha Vidayalaya Higher Secondary school
- Sri AvinashiLingam Higher Secondary school
- Sri Nehru Vidyalaya Higher Secondary school
- St Michaels Higher Secondary school
- St Pauls Matriculation school
- YWCA

Figure 23: School

Test Case 5: Public Utility Services

Public utility services are more important to the people. In the case of any fire accidents, road accidents, TN general, railway reservation, police station, commissioner office etc…the contact numbers are very important. Since the mobile phone is used by the maximum number of people in the city, the details stored in the wap forum are more useful to the people. The important contact numbers of PUS such as

- Police
- Fire-CBE Main
- Fire-CBE North
- Fire-CBE Mettupalayam
- Ambulance-CBE
- Ambulance-Mettupalayam
- EB-24 hr service
- KG Eye Bank
- CMC Blood Bank
- Heart Emergency Service
- Head-Post office
- Railway-general enquiry
- Railway-Reservation
- Telephone Commercial Enq
- TN Govt Transport Corp
- STD services
- ISD services
- Phonogram Enquiry
- Commissioner Office are displayed.

All the colleges in the Coimbatore city are known to all by means of wap forum and the contact address are also given.

- AirForce Admin
- Amrita Institute of Technology
- Avinashilingam university for women
- Bishop Ambrose
- CMS college of Science and Comm
- Coimbatore Institute of Tech
- Coimbatore Law College
- Coimbatore Medical College
- G.R.D College of Science
- Karunya Institute of Technology
- Karpagam College of Engineering
- Kongunadu College of Engineering
- Kumaruguru College of Technology
- Nehru college of Aeronautics
- PSG College of Arts and Science
- PSG College of Technology
- Sri NehruMaha Vidayalaya College of Arts and Science
- Sri NarayanaGuru Institute of Technology
- Shankara college of science
- Sri Ramakrishna Engineering College
- Sri Ramakrishna Institute of Technology
- Sri Ramakrishna college of Arts and Science
- Sri Krishna College of Engineering
- TamilNadu College of Engineering
- VLB Janakiammal College of Engineering

Figure 24: Public Utility Services

Test Case 6: Hospital

List of hospitals with the contacts are displayed which are useful to the patients at the most. The hospitals such as

- Coimbatore CMC Hospital,
- Aravind Eye Hospital
- Aswin Hospital
- Balakrishanan Hospital
- Coimbatore Kidney centre
- Ellen Hospital
- GP Hospital
- Ganga Hospital
- HS Hospital
- KG Hospital
- Kongunadu Hospital
- Kovai Medical Centre
- Krishna Nurshing Home
- Kugans Hospital
- Kumaran PolyClinic
- KTVR Group Hospital
- Kuppuswamy Naidu Memorial
- Lotus Eye Hospital
- MV Eyecare Centre
- Madurai KanMayam
- Masonic Medical Centre for Children
- NM Hospital
- NS Palaniappa Nursing home
- PSG hospital
- Shakthi nursing home
- Sheela hospital
- Sri ramakrishna hospital
- Vedanayakam hospital
- VG hospitals are stored with their contact numbers

Figure 25: Hospital

Figure 26: Tourist Spot

Test Case 7: Tourist Spot

The location and the details about the tourist are displayed in the mobile itself. We can easily get all the details of the tourist spots.

- Black Thunder
- Forest College
- Hill station
- Kovai kondattam
- Kodiveri dam
- Karamadai temple
- MaruthaMalai
- Perur
- Parambikulam-Aliyar project
- Siruvani Waterfalls
- Thirumoorthi hills
- Top Slip
- V.O.C.Park

Suppose if we select the black thunder the deck gives the details of the black thunder as Black Thunder is situtated at Mettupalayam 25 km from covai, The Hill stations such as Ooty, coonoor, kotagiri are situated in Western Ghats. Siruvani Waterfalls is 37 km from west of the city. Thirumoorthi hills are about 50 km from covai. Bhavani Pilgrim center is situated at confluence of the rivers bhavani and cauveri. The VOC Park is nearer to the Coimbatore junction. These are some of the details given by the tourist decks.

Test Case 8: Hotel

The tourists may not be aware of the lodging and hotels of the Coimbatore city. By means of the wap forum they can immediately have contact with the hotels and lodges. The records of the hotels and lodges of the city such as

- AARVEE Hotels Pvt ltd
- Geetha Lodge
- Heritage Inn
- Chanam International
- City Tower
- Gateway
- Hema Lodging
- Irane
- KK Residency
- Mangala International
- President Park
- Surya International
- Krishna Bhavan Lodging
- Lords Park
- Niligiris Nest
- Park Inn
- Sree Anjali Restaurant and
- The Residency are stored in the database and they are retrieved as they need them.

Test Case 9: Train Details and Shopping Complex

The passenger train, uptrains and the downtrain details are given in the database deck. The departure time, arrival time, starting and ending location of the trains are given

Figure 27: Train Details

The details of the following complexes are displayed.

- Ashoka Plaza
- Big Bell Complex
- Cheran Towers
- Dass Comple
- Devar group of Companies
- Lakshmi complex
- Music World
- Parvathy complex
- Rajesshvari Towers
- Sri Valli complex
- Singapore Plaza

The dresses, home needs, electronic goods, jewellery shop details are produced. The name and addresses of the shopping complexes are displayed. Reduction rates and special offers of various goods are displayed.

We can place advertisement in the mobile itself as if we are placing an advertisement in the internet and the TV.

Figure 28: Shopping Complex

Figure 29: Shopping Complex

6.Conclusion

Wireless Application Protocol (WAP) is a result of continuous work to define an industry wide standard for developing applications over wireless communication networks. The WAP forum, originally founded by Ericsson, Motorola, Nokia, and Unwired Planet was formed to create the global wireless protocol specification that works across differing wireless network technology types, for adoption by appropriate industry standards bodies, devices, including cellular phones and pagers.

- Independent of Wireless network standard.
- Open to all.
- Proposed to the appropriate standards bodies.
- Scalable across transport option.
- Scalable across device types.
- Extensible overtime to new networks and transport.

WAP, the Wireless Application Protocol , was designed to take the advantage of the several data handling approaches already in use. WAP integrates the Handheld Device Transport Protocol (HDTP) developed by Unwired Planet (now known as Phone.com), as well as Nokia's Smart Messaging Protocol (SMP), and Ericsson's Intelligent Terminal Transfer Protocol (ITTP).

WAP service can be hosted on Web servers using technologies such as Java Servlet and Java Server Pages (JSP). WAP and Java are complementary, not competing, technologies. WAP is meant for cellular phones, and Java aims at more sophisticated network terminals.

WAP is said to be a communication standard, which through its small size, considerable functionality and flexibility and very low cost, will find its way into many modern devices, offering control and information easily and simply.

The new Generation of cellular telephony systems while offering national coverage and mobility could never provide a cost effective interconnection of so many devices but coupled with the new technologies can be interconnected wherever they are and wherever they're going this will extend the reach and scope of cellular systems well beyond today's horizons.

7.FUTURE ENHANCEMENT
7.1 WAP in The Future

7.1.1 Handset Manufacturers and WAP Services

❖ WAP characteristics will shape the development of handheld devices

❖ Real-time applications and services demand small and key pieces of information that will fuel the success of WAP in the mobile marketplace. e.g. Stock prices, news, weather, and travel information can be provided via WAP

7.1.2 Telephony Integration

The Wireless Telephone Application (WTA) framework adds this feature to WAP.

7.1.3 WAP in the Competitive Environment

Competition for WAP protocols could come from a number of sources:

- Subscriber identity module (SIM) toolkit. The use of SIMs or smart cards in wireless devices is already widespread and used in some of the service sectors.
- Windows CE. This is a multitasking, multithreaded operating system from Microsoft designed for including or embedding mobile and other space-constrained devices.
- Java Phone ,Sun Microsystems is developing Personal Java and a Java Phone. API, which is embedded in a Java. Virtual machine on the handset. NEPs will be able to build cellular phones that can download extra features and functions over the internet; thus, customers will no longer be required to buy a new phone to take advantage of improved features.

The advantages that WAP can offer over these other methods are the following:

- open standard, vendor independent
- network-standard independent
- transport mechanism optimized for wireless data bearers
- application downloaded from the server, enabling fast service creation and introduction, as opposed to embedded software

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