International Journal of Engineering and Advanced Technology (IJEAT)
ISSN: 2249 – 8958, Volume-2, Issue-4, April 2013

Intelligent Memory Augmentation and Pervasive Computing Techniques for Current Reminders, Recalls

J.S. Lather, Neeraj Garg, S.K. Dhurandher

Abstract*—Context-awareness is becoming an essential feature of services in smart environments in which various computing and sensing devices and position technologies are involved. Location, the most essential part of contextual information, is useful in many applications for determining position, navigation, routing, and tracking of person but if we embed memory recall activities with that particular location for that particular user like if a person had visited earlier to same place etc., then this can be called location with personal touch feel for user. Similarly remembering some works and getting notifications via some electronic gazette or getting reminder through that particular location database is also a big relief. This paper will try to cover all those existing works and applications which tried to relieve a user from tension to remember things or to-do works as it was made possible via application. This paper will also open different ideas with some methodologies to fulfill it to large number of researchers who are working in associative memory or cues for memory augmentation research works.

Index Terms*—: Memory cue, Associative memory, Context descriptor , Thought, Augmentation etc.

I. INTRODUCTION

The goal of building memory augmentation systems and all techniques to support those systems is to help users to remember and, more generally, to reinstate tasks initiated earlier, following some period of time after a disruption. These types of works may include(1) the automated recognition of critical events and content associated with a task, and (2) Display of components of previously suspended events or content in a manner that efficiently reminds and updates users about suspended tasks. This paper provides an overview of the works done since 1992 till today, in fields of memory reminders. This paper will cover many location and memory specific context frameworks and outlines the various approaches which are being followed up to now in different perspectives. By using a variety of technologies to track the current contexts, such as location and activity of the users (for example, whether walking or driving and whether in the office or home), we assume that future networks should be able to manage intelligently both the content and delivery of information with its association with previous recalls. It is well said about pervasive system that it has three basic functionalities that they can sense– finding and presenting information and services to a user • Reason - tagging of context to information to support later retrieval • Act– executing a service for a user[1].

Manuscript received on April, 2013.

J.S.Lather, Depatment. of Electrical and Electronics Engineering , NIT kurukshetra,India.

Neeraj Garg, Department of Computer Science engineering, MAIT, Delhi,India.

S.K.Dhurandher, Department of Information Technology NSIT, Delhi, India.

We are working on a model that suits user's needs as per situation and all pre-requisites which can help user to get best adaptability of context application. We are in a stage of defining an architecture for supporting memory related works reminder application that represents information with descriptions and give notifications. Section 2, presents our model with clear objectives that can be accomplished and suggestion that were delivered in Qualcomm Conference by learned professors and researchers in their works. Section 3, refers to existing application memory works cum frameworks for modeling human memory and behavior adaptation with a machine producing abstract contextual information. Section 4, refers to some common memory terms and explanation how these terms are used to clarify that in what manner, context information reaches an electronic gazette and is shown as alert or notification through use of all physical as well as software entities. Section 5, reports on all composition of different layers of memory with content regarding recording life events and creating cues to remember them. Section 6, gives noval idea of our framework that may be used for memory reminiscing purpose, having different context services in Automatic Adaptive Trigger(AAT), having features like context monitoring, adaptation, distribution and reasoning. Finally, in Section 7, a discussion related to recommendation and reasoning techniques are discussed. This section also concludes the discussions along with future considerations and open issues related to context-awareness in mobile computing environments.

II. OBJETIVE OF OUR MODEL

In particular, our objective is to support all the features of an ideal reminder tool:

- use of rich context for specifying reminders, beyond simple time and location and for proactively determining when to deliver them;
- ability to create reminders using a variety of input devices and software (speech recognition). Speech recognition means that software recognizes your speech, while you are talking about some meeting in coming 3-4 days and records it in alert/ to-do list and gives notification accordingly;
- ability to receive reminders using a variety of devices, appropriate to the user's situation; like teacher is taking class and mobile device checks busyness of person, if call not being taken, then automatically transferring caller's details i.e. phone number, time, previous frequency of calling etc., in email box and pops up message when you take mobile phone or laptop in your hands using touch sensors;
- Allowing users to revive back memories related to that particular location.
- Allowing users to view a list of all active reminders;

We may like to give some expert's comments in relation to location specific activities done by humans, recording by cameras and sensors and extracting that information for analysis, making it available for future use. Atthai Philipose from Microsoft talked about unobtrusive wearable cameras (such as those in eyeglasses or headsets), relied on computer vision as the primary source of information and using mobile phone sensors to duty cycle the vision system. This would bring applications such as face recognition, visual indoor navigation, and tracking interaction with objects within the reach of smart phone platforms. Although monitoring any human activity is possible only through some sensors and memory devices but still, in addition to using a phone's sensors, the system could leverage sensors in the environment when available but revert back to the phone only configuration when the user moves away from such sensors. Joy Zhang presented his work at CMU Silicon Valley, which framed mobile sensing as a statistical natural-language processing problem by converting heterogeneous mobile sensors into a text-like representation of a behavior. He explained NLP algorithms—such as language modeling and unsupervised grammar induction—in applications such as mobile life-logger, anomaly detection, and activity segmentation and recognition. For instance, a tourist called Neeraj is visiting shimla for second time in his life. Since his previous trip, if system could give long-term reinstatement effect, how that idea strikes you? It means, to provide tailored functionality of contextual details, the application determines from its own memory (a) the length of time since Neeraj 's last visit, (b) the information that was provided to him at that time and (c) his previous activities or visits to different places within that location. A key question would be: How will the application account for variability in human memory (e.g., a decline in cognitive function due to age)? A possible solution would be to use a memory- triggering process involving snippets of information. For instance, in the other scenario, where Neeraj is getting ready for train to visit a conference, if application gets just-in–time information through user's his to-do list and then checks message of train reservation details (train no. time, date, coach no. etc.) from his cell-phone inbox and then invokes train inquiry service. Now application informs to user that the train is delayed. Here Neeraj will look for information as a message and may not require this information again unless the status of the train changes. So a key issue would be: To what extent should the application construct Neeraj's context—how much should be left to her own interpretation? If Neeraj has some good enough time before train actually comes, should the application provide an inferred recommendations regarding nearest ATMs or Restaurants' or time-pass hot spots to nearby railway station or do nothing? That depends on priorities as set by person in his electronic device. Neuroscientists, however, have explored the differences between implicit and explicit memory (two types of memory discussed later in section 5) and learning, shed light on the mechanisms that process information in the human brain.

As we are in process of designing application framework of automatic getting reminded of things to be done in nearby places, then how service invoked and what type of service is selected on handheld device, is very important methodology?. Based on context-awareness, required applications can be identified as per activity of user in particular location like walking to the bus station - Bus schedule is invoked, Moving in a shop- Shopping list is displayed on terminals at helpdesk and going near to speak-box terminal in museum- instruments speaks and tourist gets information about hottest things in library with a tag 'must see'. Researchers observed walking of tourist, as DTG[4] determined the actual walking speed of the tourist, given the conditions of the sidewalks. Introductory information via a headset is given, suitable to the direction from which the tourist is approaching and within range of framework, the tourist received audio information locally and after this the DTG stopped the information provision and restarted the navigational guidance. The user can get guidance through navigation software, like Microsoft Map-point or Navigon[5] GOOGLE, Copernic, Msn Desktop Search, Blink X have also illustrated different works of searching some particular context in respect to desktop search engines. Tracking a person movement is an important work that contains every science so as to predict his mind position, whether he is static or dynamic(moving or running away from one location), is very difficult to compute. While mobile user is tracking, he can be provided information about place what he has predetermined, such as notification of a sale on men's suits at a store close to the user's current proximity. All fleet applications are based on same concept. Predicting emotions for old and bored people, when they are alone is challenging area as they will be camera seen, monitored and analyzed using face recognition as well as mood changing postures software. Most people actively deal with their personal memories and any person who has just returned from attending some conference or event, he would like to talk about his experiences with various people, which in fact is the rehearsal and perhaps the fixation of his memories. When he refers to other same types of meetings in the past, in the same conversation, he is trying to relate his new memories to other existing memories, thereby working on his old memories at the same time. There even is a fair chance that his listeners are doing the same thing. So we may quote that Reminiscing is a recurring process continuously shaping people's personal histories and identities. Although recollecting often goes unnoticed, it is an important phenomenon in people's everyday life. Today, with the increasing digitization of memory carriers, such as photos, this remembering or reminiscing can be aided in ways which was previously impossible. Human memory is used as a container term for all the diverse memory systems of which Autobiographical Memory is only a subset. Recollect, recall, remind, reminisce and remember are all used synonymously meaning "To bring an image or idea from the past into the mind"[28].

III. EXISTING RESEARCH AND THEIR APPLICATIONS

In making any type of memory reminder application, enabled via mobile device, Laptop, PDA, we need to make a framework which will guide the whole process of working. AAT, our framework aims to bring invoking of trigger that suits user's needs at that particular location. Context computing aims at designing applications that automatically adapt their behaviors to the available location information and the available nearby sensors and devices. Some of frameworks and models, already built up supporting desired services are given below. There is a context-aware meeting alert, which aims at alerting the user in time about upcoming scheduled calendar events, considering the state of the user's

context. This application integrates semantic web technology in RDF (for representing calendars), semantic web rules (for making a context dependent decision about the precise timing of the alert), and mobile technology for location sensing and message delivery[36]. Similarly LookOut [37] is an agent which parses the text in the body and subject of an email message, identifies a date and time associated with an event and attempts to fill in irrelevant heads in an appointment book. The system displays its guesses to the user and allows the user to edit its guesses and to save the final result. Verbmobil[38], is a speech- to-speech translation system (between German, Japanese, and English) for spontaneous dialogs in mobile situations, demonstrates the feasibility of processing spontaneous speech to retrieve appointment scheduling information. CybreMinder [39] allows users to create a reminder message for themselves (or some- one else) to be delivered using a mobile device when an associated situation has been satisfied. A similar project, the Memory Glasses [27], is an attempt to build a wearable, proactive, context aware memory aid based on wearable sensors. There are several physical context models which help or remind users when they are physically closed to those systems. Like word dictionary always tracks you while you type letter or alphabets in a word document. There are several desktop-based applications that meet the definition of a JITIR[15]-just in time information retrieval , ranging from domain-specific to general information applications. One domain-specific application is FixIt [22], a system that delivers repair-manual entries to a technician working with diagnostic software for copier repair. Another is Coach [24], which provides automatic help with LISP programming within the context of an integrated development environment. Lumiere[12], the basis for the Microsoft Office Assistant, is an example of a more general JITIR that provides help using a large number of Microsoft products based on Bayesian user models. More general still are Letizia [13], which suggests links to follow based on a user's web-browsing activities, Watson [14], which automatically performs web searches based on text being written or read in Microsoft Word, the Remembrance Agent [15], which suggests personal email and documents based on text being written or read in Emacs, and SUITOR [16], which displays stock market quotes, headlines, and other information based on text in a word processor or Web browser. The Remembrance Agent also helped[17] play the role of a memory augmentation agent by continuously displaying information relevant to the current physical context of the user. The RA differed from Forget Me Not in that it looked at and retrieved specific textual information rather than automatically summarizing the user's actions and context. RA augmented memory by autonomously presenting previous email and notes relevant to current email written by the user. Although the goal of the RA system was to remind users of potentially forgotten information, it made no attempt to discern whether or not those documents were truly likely to have been forgotten. Another wearable reminder system[27]), uses time, location, and activity to guide its delivery of reminders to its user. It focuses on the user's context and uses sensors (a camera and a microphone) to determine the user's activity (e.g., engaged in conversation, walking, etc.). If a contact is physically near someone wearing Memory Glasses, and has a profile that matches one or more of the wearer's interests, the system can alert the wearer to that effect. Interests are limited to names, personal interests and hobbies. Lamming et al.[20] studied the usefulness of a video diary as a memory prosthesis to help knowledge workers remember work activities that were intended for the future. They demonstrated that their participants indeed forgot quite a bit about their daily activities, and that video could be useful in aiding recall of past accomplishments and future intended activities. Full video was employed as the source of reminders in this study. Renaud's[7] discussion appears to assume that users perform tasks in a linear manner, rather than addressing the broader, common challenge of multitasking. She suggests that imagery and pictorial presentations are superior to verbal representations in aiding memory. She argues that a reminder system must be an "extra"-application, easily interpretable, and linked to explanations of system states and actions. Altmann and Gray [8] emphasize dynamic task environments in their research, in which users have to update their task continually with new instructions. An example environment included a fighter-plane cockpit. Their results demonstrate that new instruction updating depends on forgetting old instructions, and they study how forgetting places constraints on how the new information is encoded. They label this process "preparing to forget." Rekimoto et al.[9] has implemented what he refers to as "time machine computing." In this work, a user is provided with access to visualizations of what one's computer desktop looked like, at any point in time in the past, or even in the future. With this "time-traveling" desktop, it is argued that a user no longer needs a folder hierarchy. If a document is deleted from the desktop, the user can always time travel back to the date when the document was being used and retrieve it again. The basic idea is that when you travel back in time you can see the items that were open on the desktop when you were using that document of interest, thus helping you to reinstate the original past context of use for that document. Wagenaar [21] used only text as cue. He kept a diary of remarkable events happening each day over a duration of six years. He answered for each event the following questions: "who", "what", "when" and "where" and wrote them down. Later he tested which category of information was most efficient in cuing the complete set of information. He found that "what" information was most helpful in retrieving the other categories, especially when followed by "when" information. However, the presentation of "when" information alone appeared quite useless. Users will send themselves email to remind themselves of events of deliverables at a later date. One study of email tool usage showed that when reviewing their email, people often "flagged" messages that contained to do items in order to create a visual reminder [10]. In a related study, it was found that multiple inbox rules and strategies are leveraged to perform this reminder function, from altering the color of items to moving them to semantically labeled folders for using flags. Of course, just as with paper, these inbox reminder strategies do not proactively remind users as to their upcoming action items, so the inbox must be triaged continually. In addition, the manner in which these reminders are displayed, in order to help the user remember what the reminder pertains to, its priority and context, needs to be scrutinized. Taking an example from [3], SPECTER system which recorded both her navigation (e.g. using GPS logs) and her shopping behavior (e.g., using online credit card logs). It kept track of the places and shops visited, the (emotional) quality of the shopping experience (e.g., whether or not the sales representatives were friendly

and knowledgeable), and also what types of goods user actually purchased. Knowing about user's current shopping plans and her previous experience in that city, System can recommend shops and guide her to the right places while avoiding possibly unpleasant or dangerous locations. Additionally, system actively filters the large amount of advertisements and discount offers broadcast by the various shops using location sensitive information.

IV. TYPES OF MEMORY AND ITS RELATION WITH MODERN MOBILE COMPUTING SYSTEMS

We are talking about storing of events and retrieval from inside portions of memory, when it is needed most. Generally a human can't sore as much as required, may be case that he is burdened with many other works or he cannot always depend on electronic instruments, organizers which timely inform him and for those organizers to work ,he needs to give time those events to be scheduled which again is time consuming process. So basically we are looking for some assistant, who goes with you, records anything you had observed, spoken or want to accomplish because of your work profile and its duties. So we must understand memory system working and it will be executed that can be understood by term associative memory(AM) where memory is faint imitation of human brain's ability to associate patterns. So AM belongs single layer feed-forward and recurrent network architecture depending on association capability that exhibits Hebbian learning. An associative memory is a storehouse of associated patterns which are encoded in some form. When a storehouse is triggered or incited with a pattern, associated pattern pair is recalled as output. Even associative memory is divided between static and dynamic memory. Now any event enters the memory system from the environment and is stored. During the processing of this item, e.g., visual information is dealt with by so-called iconic memory and auditory information by echoic memory. This event is processed by the sensory memory system (SM). In SM, the event stays for less than one second. The working of sensory memory becomes apparent when one watches a movie in a cinema. The movie appears to consist of fluent and moving scenes, while in reality, still pictures alternate with brief periods in which the screen is black. The reason for perceiving motion is that SM stores the individual picture information during the brief periods of picture absence. After the sensory memory, the event information goes to short-term memory(STM) also known as working memory, named after its supposed function[25], where the event will stay between 1 to 25 seconds, depending also on the modality of the item. Short-term memory is used, e.g., whenever one reads a sentence, since the beginning has to be stored in order to be able to understand the end of the sentence. The same holds for speech: without STM, people would not be able to produce coherent utterances. After each sentence, STM is emptied again unless the item is rehearsed. If the event in STM is either rehearsed, appeared to be unique or important it will move to the Long-Term Memory (LTM). There the event will be stored for a longer time. Some researchers even believe that memories are stored permanently, they only become less accessible over time, depending on the strength of the associations. The first type of Long-Term Memories involve the content of the memories, since semantic memory stores general knowledge or organized facts (mathematical and historical data) and Episodic memory stores information relating to personal experiences. Two other types of Long-Term Memory, are more related to the process of remembering, are explicit Memory (sometimes called "direct memory"), which requires conscious recollecting, versus Implicit Memory (sometimes called "indirect memory"), which does not require conscious recollecting. If a person is asked, e.g., how was your weekend in some other place, then this requires explicit memory. On the other hand, if someone is cycling to work, memories might pop up without a specific request or search activity, and this is called implicit memory. The other type, concerns the future and the past, since prospective memory, helps remembering to carry out intended actions and retrospective memory remembers past events. A memory is easier to retrieve if the physical context during retrieval is (partly) the same as the physical context during encoding. A famous example of context-dependency comes from [25]. They instructed divers to learn words either under water or on the beach. They found that the number of words, recalled correctly was high if the retrieval context was the same as the encoding context, meaning if the words were learned underwater they were best recalled underwater and the same held for the beach condition. The category "unique memories" contains a specific type of memory which is remembered well, namely Flashbulb Memory. Flashbulb memories are memories for dramatic world events, such as the death of Lady Diana, and the 26th of Nov. 2008 Mumbai attacks**.**

Normally recollecting what we think or thought after looking at some object, or trying to extract, what conversation was done in my room, when I was talking to some other person on phone, is major problem with ageing people. Also it is not possible to narrate or note down all conceptual things exactly it was perceived by human brain waves. Recollecting something or some event , when you see some picture, scenery or object or some location or feel some odor of familiar kind then how things come to mind and very fast they vanish also leaving only small but fasting emotional thoughts in mind and keeping track of that is also very debatable issue. If we could fit some memory chip with brain cells and it keeps on recording different thoughts of mind with some picture and later if same chip is decoded later and analyzed then how that thought is framed and extracted to give a new memory reminiscing process. If we can attach some readymade fixed concept-thought stored in mobile(electronic device with you at time of thought) with thought that came to mind at that time. If later in evening, if you just look at recorded events with pictures or concept-thoughts, then you can mark it for future and that will be recorded in to-do list. Like if we want to trace out that who had visited our office when one of us was talking to some person and that was an irritating call. As time passed, we also forgot to call same person, who had come to our room for meeting us because person was busy talking on phone. So what an user can do, he can start tracing all-logs of any mobile and checking each number(dialed or received) and measuring importance of caller identity against irritation caused by phone. I can reach that number by scrolling down list of today's calls and get time of call, duration of call and can determine caller by checking schedules of teachers and others if they can visit me at that time and getting some details of my lost memory. According to the mobility of query (client) and the objects queried by the clients, information seeked by clients can be further classified into

three categories:- a) Mobile objects querying static objects (e.g. tourist services, m-commerce) b) Static clients querying mobile objects (e.g. fleet management, traffic control and management) c)Mobile clients querying mobile objects (e.g. tourist services, digital battlefield, mobile games[11].

V. COMPOSITION OF MEMORY LAYERS THROUGH REMINDERS AND CUES

This section gives an overview of relevant literature on augmented memory systems, or systems that help people recollect memories. The basic activities in recollecting are (1) recording life events and logs, (2) reminding tasks(in to-do list) or sub-conscious tasks in mind, (3) Recalling from cues and making them for remembering in future, and (4) Augmented memory systems (which can also include recording life and creating cues as tools for recollecting). The process of recording life is made possible with an automatic and, in these cases, electronic ‘‘diary’’, such as the familiar [18]. This system contains sensors, cameras and microphones, that try to record everything the user perceives or experiences. The process of recording life activities called life logging was exercised by different types of logs, web based logs –which cover manually annotated text and image based life logs. Blogger is based on making diary events using email messages in inbox of user. Similarly Flickr, Text America and Mobilblogg are other examples of different types of web logs already in the market. A similar study was done for the workspace [19], making use of cameras, sensors, displays and RFID tags, where specific activities with artifacts are recorded and replayed in order to make the user learn the location of that artifact. This project aims at extending human memory by recording events that are later shown to the user The very first ideas were already written down by Bush [2] who proposed the ‘‘memex’’: ‘‘a memex is a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory’’. According to Bush, this memex looks like an ordinary desk. A more recent description of such an idea is called ‘‘The Teddy’’ [23] which is a small portable device that each individual carries around his whole life. This device can record anything and the interaction necessary for retrieval, of e.g., telephone numbers, ID-numbers , or bank accounts, goes via speech recognition. Reminding tasks, reminding people of tasks concerns prospective memory, which helps people remember things they have to do, like the well-known knot tied in a handkerchief. Examples of investigations in this area include the MemoClip [26]: a pin worn by the user reminds of a location based task when this user walks into a specific area. Another example is the CybreMinder [39], a system using location sensors, cameras and speech recognition, which reminds users of specific conditions, e.g., to take an umbrella when going outside if it is cloudy. This type of function is not so much related to remembering in the sense of reconstructing an event, as well as remembering facts. Therefore, the AM-theory is not needed per se, but could be used to facilitate remembering these facts, e.g., by using cues. This is done in the following project. Memory Glasses [27] go along with a jacket full of computing, sensing and a speech recognition system. Reminders, depending on the context, are projected on the inside of the memory glasses. People use memory cues to help them remember. One way to create cues is to use a recording of an event, which is shown in the first project [29]. A digital artifacts comprising of usage history was created, where the traces of usage implicitly could help people remember what happened to the artifact. Another way of creating cues is by making them explicit and let the user decide how to use this knowledge. This was done in the Memory Palace project [30] that used software to recreate a mnemonic device. The idea is that it helps people’s recall if they place their to-be-learned material in an imagined house. Later when they recollect the mental images of the rooms a person is carrying are used as cues to help recall. The Personal Digital Historian [32] makes use of tabletop projection. Photos can be browsed by touching the categories who, what, when and where that are presented as text and based on metadata input. The system is especially suitable for multi-user interaction, since people can sit around the circular table and turn the GUI in any direction. However, the ceiling projector fixes it to one location. PenPal [33] is a communication device for children created for a design competition. With the PenPal, children can take photos and add sounds or voice annotations, they can create and send images across the internet. The prototype consisted of an LCD touch screen device with slots for memory cards, a camera and a microphone. The StoryTrack [34] is a portable touch-screen device which is meant for enhancing storytelling. The user can browse and display digital photos and add and play voice annotations on the prototype. The touch screen was not used; instead the authors mounted new input controls on the edges of the device. The user interface contained a display area, a scrollable thumbnail-overview and a section showing information and controls for possible annotations associated with the digital photo currently displayed. The Story-table is an art installation that combines digital photos, videos and songs [35]. This table contains three hidden PCs and three visible PC screens. The project aimed at the elderly user and was designed to have two large buttons in the vicinity of each screen[3].

VI. OUR FRAMEWORK AND ITS FUNCTIONALITY WITH MEMORY RECALL

We call our framework, AAT(Automatic Adaptive Trigger) , based on client requests for memory recall, given or invoked through Context DataStore, getting service response after data handling and service provisioning layer‘s functionality with context modeling agents. In simple terms, Client sends request to service provider (context database here), supported by user’s profile of user’s location, preference etc. The request after being seen through context data store passes through hardware devices (Location sensors, RFID Reader, Wi-fi Management system) installed in that context. The same request is also accessed by evaluation module logic utility to decide if client is changing location or having some movement and accordingly, it is transferred to data handling layer where it goes through several processing in task manager module and checking is done against some knowledge base or customized databases. Service provisioner stores client requested data in context DataStore and keeps tracking through trigger manager which is in two way touch with context database as well as task generator utility agent (two-way) which regularly checks for waiting tasks to be done. Each of task in task generator utility list, has a common structure of task id, task name, task completion time, task pre-conditions. As per user’s preference list, Preference agent associated with task generator utility gets particular tasks as per client’s requests and this agent works

in coordination with semantic analyzer agent which does work of acquiring task's contextual information. Data handling layer communicates with service provisioning layer so as to provide desired services to mobile user as per protocol of AAT. All work is done in four modules namely Client, Context DataStore, Data handler and Service Provisioner. If we talk of separate functionality of all four modules then Client requester, First layer consists of a client application and hardware cum software computing devices. Client applications are subject to adaptive behavior. Service handling (a service provider generates a general service response (i.e., not specific to a particular context) and relevant service customization knowledge) will look after discovery, composition and execution works where Context database service will look after aggregation of information and last but not least, data handling will see analysis, processing and filtering irrelevant data, data transformation according to time, identity, activity and location. As such client response from service handling will be regulated by business process[31]. Here our model can cater to memory recall requirement if Location sensors, Wi-Fi or WLAN systems and RFID tags give proper identification to nearest object seen by clients and are triggered through trigger manager utility through evaluation module logic. All this happens in coordination with context data store and matching with personal profile of user, which can call data handler utility to give task generation in process. . Normally information around user can be recorded using microphone, camera or Gyro sensor, GPS positioner, Acceleration sensor and then this information is analyzed to give different motion estimates, face detected gestures, compressed media audio and video files, all are stored in hard disk used for future retrieval.

Looking upon all factors like application selection, user profile, hosting application on device, we now come to conclusion that if we can analyze user's buying behavior, predict his movement then automatic processing is easily possible like taking concept example that John came to the department store to buy a birthday present for his girl friend then products for women are recommended only and remaining data like person, place and time are not collected. Another example is that of a user attempting to contact a colleague. A suitable context-aware application may determine that the colleague is in a meeting, implied by the fact that other users are present in the same room. The contact attempt may therefore be postponed until the colleague is alone. Once alone, the application may then determine whether video-phone equipment is deployed and unused near the colleague. If not the telephone may be used as an alternative communication device.

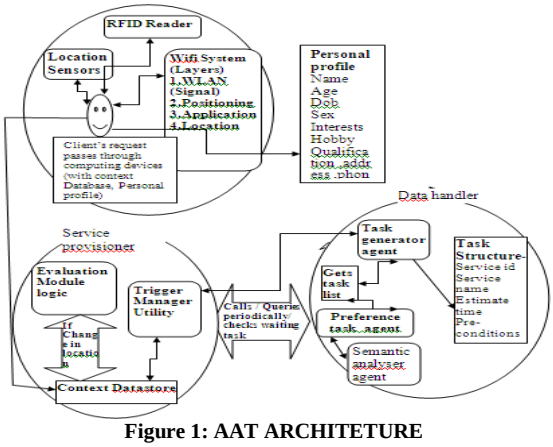

Figure 1: AAT ARCHITETURE

VII. DESIGN RECOMMENDATIONS

An augmented memory system should support memory cuing. It could cue the user automatically and continuously, as in daily life so it is very important that choosing explicitly functions of autobiographical memory should be very clear and supported by the augmented memory. If an augmented memory system has the goal to support people's remembering as much as possible, it should focus on event related activities and then make different folders in device and start storing activities and cues. If the goal is to support the general structure of memory, the focus has to be on lifetime periods. If the system should support the user through the whole process of remembering the presented information should relate to the recollection cycle with its supervisory attentional system (SAS) and all three levels of specificity[6]. Users of such a system should be able to use cues to initiate or facilitate this reconstruction process. They should (implicitly) steer the recollection process to fit their current ''vision'' on the events that have occurred, because there can be reasons behind memory changes and therefore they should be supported. Examples of memory cues are photos, sounds, smells, texts and souvenirs. Interesting areas for future research concern how the different functions of autobiographical memory can be supported by dedicated augmented memory systems and what the relations are between memory cues used and the (kind and strength of the) memories that are recollected (e.g., do the cues become memories?). Of course, longitudinal studies of augmented memory systems should give insights in all related aspects of everyday recollecting (e.g., the actual use of cues, physical and digital media).

We presented different cases that supports understanding context awareness for mobile computing We believed that a context-aware system ,if developed based on the input parameters and various issues can reduce the complexity of the traditional context acquisition and interpretation approach, by leveraging users' natural dialogue with mobile computing value-added services currently available on most mobile devices, such as GPS and messaging services, in enriching the context-acquisition and context-awareness patterns. We haven't tackled how the corresponding system awareness services of the users defined context profiles will be offered in reality. We believe that such issues need to be further explored as an important step in the direction towards applying any context-awareness framework in mobile and ubiquitous computing.

REFERENCES

[1] Mehran Najafi, Kamran Sartipi , ,A Framework for Context-Aware Services Using Service Customizer", Feb. 7-10, ICACT 2010, Department of Computing and Software, McMaster University.
[2] Bush V ,As we may think. Atl Mon 176(1):1945.pp101– 108.
[3] Thomas Kleinbauer and Mathias Bauer and Anthony Jameson DFKI, German Research Center for Artificial Intelligence, SPECTER: a User-Centered View on Ubiquitous Computing.
[4] R Klaus ten Hagen, Marko Modsching, Ronny Kramer ,"A Location Aware Mobile Tourist Guide Selecting and Interpreting Sights and Services by Context Matching ",2nd Annual International Conference on Mobile and Ubiquitous Systems: Networking and Services (MobiQuitous'05).
[5] Navigon :http://www.navigon.de", 2004.
[6] Elise van den Hoven Æ Berry Eggen,"Informing augmented memory system design through autobiographical memory theory", Pers Ubiquit Comput (2008) ,Springer-Verlag London Limited.

[7] Renaud, K.,'. Expediting rapid recovery from interruptions by providing a visualization of application activity. Proceedings of OZCHI 2000, 348-355.
[8] Altmann, E.M. and Gray, W.D. ,' Managing attention by preparing to forget. In Proceedings of the IEA 2000/HFES 2000 Congress. San Diego, CA: Human Factors and Ergonomics Society, pp. 152-155.
[9] Rekimoto, J. Time-machine computing: A Time-centric approach for the information environment. In Proceedings of the ACM UIST'99, 45-54.
[10] Gwizdka, J. ,' Timely Reminders: A Case Study of Temporal Guidance in PIM and Email Tools Usage. Extended abstract in Proceedings of CHI 2000, Human Factors in Computing Systems, Volume 2, 163—164.
[11] Georgia M. Kapitsaki, Dimitrios A. Kateros and Iakovos S. Venieris," Architecture for Provision of Context-aware Web Applications based on Web Services ",2008 IEEE.
[12] E. Horvitz, J. Breese, D. Heckerman, D. Hovel, and K. Rommelse, "The Lumiere Project: Bayesian User Modeling for Inferring the Goals and Needs of Software Users," 1998.
[13] H. Lieberman, "Letizia: An Agent that Assists Web Browsing," Proc. Int'l Joint Conf. Artificial Intelligence, pp. 924-929, 1995.
[14] J. Budzik and K. Hammond, "Watson: Anticipating and Contextualizing Information Needs," Proc. 62nd Ann. Meeting Am. Soc. for Information Science, pp. 727-740, 1999
[15] B. Rhodes and P. Maes, "Just-in-Time Information Retrieval Agents," IBM Systems J., vol. 39, no. 3, pp. 685-704, 2000.
[16] P. Maglio, R. Barret, C. Campbell, and T. Selker, "Suitor: An Attentive Information System," Intelligent User Interfaces, ACM Press, pp. 169-176, 2000.
[17] Rhodes B, Starner T. ," The remembrance agent: A continuously running automated information retrieval system". In Proceedings of the First International Conference on The Practical Application of Intelligent Agents and Multi Agent Technology (PAAM '96). London, UK, 487-495.
[18] Clarkson B, Mase K, Pentland A The familiar: a living diary and companion. In: Proceedings of the ACM conference on human factors in computing systems (CHI'01), pp 271–272.
[19] Ikei Y, Hirose Y, Hirota K, Hirose M ," iFlashback: a wearable system for reinforcing memorization using interaction records. In: Proceedings of human–computer interaction international (HCI-Int. 2003), pp 754–758.
[20] Lamming M, Flynn M ''Forget-me-not'' intimate computing in support of human memory. In: Proceedings of FRIEND21, '94 international symposium on next generation human interface .
[21] Wagenaar, W. A." My Memory: A Study of Autobiographical Memory over Six Years. Cognitive Psychology, 18, 1986, pp225-252.
[22] P.E. Hart and J. Graham, "Query-Free Information Retrieval," Proc. Conf. Cooperative Information Systems, 1994,pp. 36-46.
[23] Norman DA ," The Teddy, chapter 6 of the book: Turn signals are the facial expression of automobiles", Addison Weas-ley, but now out of print. Retrieved 14 Mar 2007, from http:/www.jnd.org/TurnSignals/TS-TheTeddy.html
[24] T. Selker, "Coach: A Teaching Agent that Learns," Comm. ACM, vol. 37, no. 7, 1994,pp. 92-99.
[25] Baddeley, A. D. ". Essentials of Human Memory", Hove, UK: Psychology Press.,1999
[26] Beigl M ," MemoClip: a location-based remembrance appliance. Pers Technol 4:2000,pp 230–233.
[27] DeVaul, R. W., Clarkson, B., and Pentland, A.,". The Memory Glasses: Towards a wearable context aware, situation-appropriate reminder system". In CHI 2000 Workshop on Situated Interaction in Ubiquitous Computing,2000.
[28] Merriam-Webster Online Dictionary , Retrieved 18 Nov 2003, from http://www.m-w.com
[29] Schu¨tte AA ," Patina: layering a history-of-use on digital objects, Masters thesis. MIT Media Laboratory, Cambridge.,2003
[30] Harman J ," Creating a memory palace using a computer. In: Proceedings of the ACM conference on human factors in computing systems (CHI'01), 2001, pp 407–408.
[31] Neeraj Garg, J. S. Lather, S. K. Dhurandher, "Smart applications of Context services using Automatic adaptive module and making Users Profiles", International Conference on Communication, Computing and Security in NIT Rourkela, India, 06-08 October 2012, ICCCS 351,Procedia technology..
[32] Shen C, Lesh N, Vernier F ," Personal digital historian: storysharing around the table. Interactions", pp 15–22,2003.
[33] Piernot PP, Felciano RM, Stancel R, Marsh J, Yvon M ," Designing the PenPal: blending hardware and software in a userinterface for children. In: Proceedings of the ACM conference on human factors in computing systems (CHI'95), pp 511–518.
[34] Balabanovic´ M, Chu LL, Wolff GJ ," Storytelling with digital photographs. In: Proceedings of the ACM conference on human factors in computing systems (CHI'00), 2000, pp 564–571.
[35] De Verhalentafel (n.d.) De Waag's website: http://www.waag.org/verhalentafel (in Dutch and partly., Mar 2007
[36] A context-aware meeting alert using semantic web and rule technology ,Author: Grigoris Antoniou, Antonis Bikakis, Anna Karamolegou, Nikos Papachristodoulou, Manolis Stratakis.
[37] Horvitz, E.," Principles of mixed-initiative user interfaces. In Proceedings of CHI'99, pages 159-166. ACM, Addison-Wesley.
[38] Wahlster,. Verbmobil: Foundations of Speech-to-Speech Translation. Springer-Verlag. Verbmobil is a speaker-independent and idirectional speech-to-speech translation system for spontaneous dialogs in mobile situations.
[39] Dey, A. K. and Abowd, G. D. ,". Cybreminder: A context-aware system for supporting reminders". In Proceedings of Second International Symposium on Handheld and Ubiquitous Computing, HUC 2000, pages 172-186. Springer-Verlag.