Analysis of Mobile Based Pervasive Architecture - A Review

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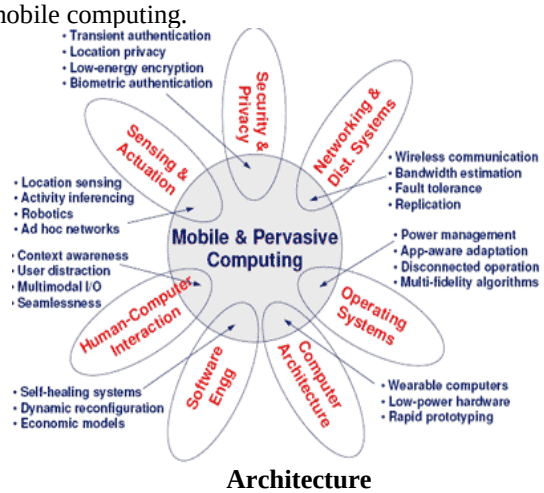
Abstract

This paper discuss about the mobile based pervasive computing, where these two technologies are interfaced to produce an advanced level of technology in which it moves to the human centred systems as while past technologies are depended on the machine centred systems, now in this paper the system is to turned fully on the human centred process and minimize the user to operate in limited presence and it would be applied in various multi-purpose process for the application of smart home, smart vehicle and smart industries etc.

Keywords: *Human Centred, Smart Home, Pervasive Computing.*

I. INTRODUCTION

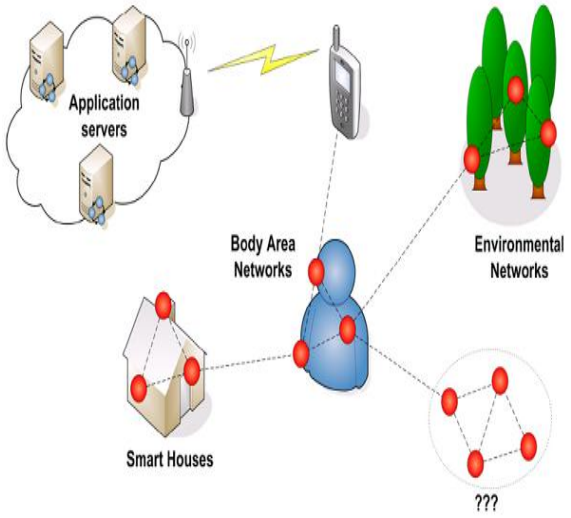
The ubiquitous computing is one the leading technology which reduces the human interface to operate the system where mobile based ubiquitous are formed to do the multi-design process, in our technology the seamless computing, analysing of raw information from unprocessed to processed. Where the mobile based pervasive technique is to applied in all cases of such as smart home which could do all the activities instead of human and smart vehicles can be designed for preventing accidents as well as protecting drivers and the ubiquitous is made to fully function in the industrial sectors. Usually the pervasive computing techniques are applied to the seamless computation purposes, in which this methodology is going to be progressed with the wireless communication, sensor technology and mobile computing.



Architecture

II. ARCHITECTURAL ASPECT

The architectural aspect of the pervasive computing and mobile computing is shown in figure 1 and it composed with other technologies such as computer architecture where it can be used for designing a wearable computer, constructing of low power hardware and it can achieve the rapid prototyping process. Operating System also plays a role which could be power management, app-aware adaptation, disconnected operation and multi-fidelity algorithms are analysed.



Nodes connections of pervasive & mobile computing

In the system the network communication is the process which could be handled for wireless communication, power management, fault tolerance and replication are acquired. As it comes for wireless medium security and privacy is the important process of the pervasive computing system, where it could be prevented by transient authentication, location privacy and low energy encryption and biometric authentication are carried out.

Sensing & actuation are the vital part of the pervasive computing technology such as location sensing for the identification of the area the target is presented, Interference of the one activity with the other activity connections, robotics in nature and ad-hoc based process. Mainly the pervasive computing is based on the human centre process mainly it deals with the process of context awareness it explains that changing of the system according to the environment

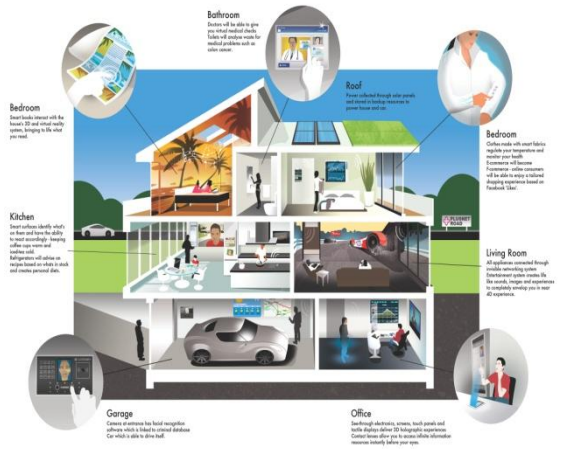
or location, user distraction are analysed by the system and multi-media inputs and outputs are accepted & main impact is seamlessness are executed. Software engineering also included in the with the concept of self healing system which can be recover by the system itself, dynamic reconfiguration for the current situations and economic models are achieved for the computing system.

III. CONTEXT AWARENESS

The context awareness is the process where the system are developed and installed and this system would be change according to the environment, this is the one of the main activities of the pervasive computing. For example if the man enters into the air conditioner should be open according to the human temperature but in the case of context awareness system the additional person came into the room but the conditioner is still in the same temperature and the conditioner should increase the temperature for two persons automatically in smart home system this process is known as context awareness services.

IV. SMART HOME APPLIANCES

The smart home is the pervasive based system and it is growing in a successful process where all the appliances are processed in a full automation process and the techniques used to work with the sensors, wireless and mobile computing. The sensors are used to sense the all conditions around the home which could used to analyse each and every process of the system, for example the sensors which is used to opening and closing of doors and preventing the door opens for the unknown process.



Smart Home System

The above figure 3 shows the sample view of the smart home system which is fully depended on the mobile based process for example a monitor is placed in room and the medical process are to be checked occasionally and in the kitchen a device is placed and the healthy tips and maintain food wastages also makes some guidance to produce a healthy foods and keep the food process according to the refrigeration to increase and decrease the temperature.

A. Sensing

Most of the process in the system fully based on the virtual system process and it is mostly connected with the internet to access the information anywhere & anytime and gather the information according which has the assigned task and office related work also have to be done in the any location through the virtual monitor and camera which could carry the data in the high speed process.

B. Wireless

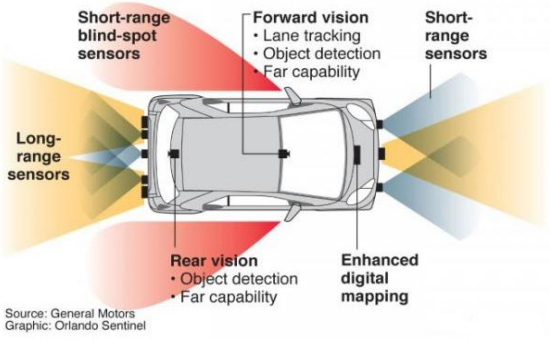
For the other process in the smart home technology where the products which has to be purchased in the online shopping are suggested by the system according to the high ratings of the process. And the vehicles are made to be drive in a self manner system for a fully function automation process where the energy to the system are combined and gathered by the solar energy panel system.

C. Mobile Devices

The mobiles devices are the important process of the pervasive based system where every process in the system is achieved by the internet and data are transferred through mobility and every devices which is presented in the home can be controlled by the mobile devices to do all the activities for the multi-purpose process which could be merge with the other devices to take the control path of the each and every devices for example a mobile phone can be able to control the air conditioner as well as the television of the smart home system.

V. VEHICLE SAFETY

Vehicle safety is now turned into the process of pervasive and mobile based technique which to could able to prevent and protect the vehicle from the accident zone and take caring of the persons who is on the vehicle, it is also based on the combination of the mobile and wireless process where it could take all the activities around the vehicle, the system is not to designed for the vehicle alone and it can be applied for the other transportation process.



Smart Vehicle with Advanced Technology

For example the vehicles are fully functioned of automation and computing process, if the user does not know the location of the place a GPS system will be activated according to the mindset of the persons at the required process. Also if the vehicle reaches the accident zone the system will intimate the persons/driver to drive slowly also the nearby tourist places, residential places will be notified then and there by the system. The air conditioner of the system will be adjusted according to the human in the vehicle motion control door and glasses are to be installed and the future process is the auto driving process.

The smart vehicle is shown in the figure 4 with the advanced methodology where it consists of long range sensors and short range sensors to identify the objects which get nears to the vehicle and also short range blind spot sensors is activated on the two sides of the car, forward vision and rear vision are attached with the smart vehicle where the forward vision is for lane tracking, object detection and far capability sensing are achieved and the rear vision is mainly designed for the object detection as well as far capability sensing.

VI. FUTURE WORKS

The pervasive computing is the growing and leading technologies and applied in all the homes and to make the entire system with the concept with the advanced technologies and new implementation is the electric based vehicles which could be possible for the heavy load trucks and buses where the motor can run in the electrical energy and it does not move out of the path.

VII.CONCLUSION

The mobile based pervasive architecture is one of the advanced technologies where two techniques are combined into the single process for the effective process, where sensors & wireless plays in the main role of the pervasive computing technique where electric based vehicle operating is the new implementation where it makes the vehicles into the smart processing methodology to work with the efficient and effective way.

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