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A REVIEW OF AMBIENT INTELLIGENCE IN UBIQUITOUS COMPUTING

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ABSTRACT

The Ubiquitous computing is the advance interacting approach, which not only provide one to one communication attribute but also provide multiple collaboration of communication technology. The ubiquitous computing (ubicomp) is a post desktop model of human computer interaction in which information processing has been thoroughly integrated into everyday objects. The goal of ubicomp is to create an environment where the connectivity of devices is embedded in such a way that the connectivity becomes un-obstructive. It refers to the sorts of technologies which can reach every aspects of a user's life and then operate in the background of their activities.

KEYWORDS: ***Ubiquitous Computing, Artificial Intelligence, Ambient Intelligence, Virtual Reality.***

I. INTRODUCTION

Ubiquitous computing is a paradigm and an innovation in technology together. The true meaning of Ubiquitous is to exist everywhere, every-time and for everyone. Computing is any goal-oriented activity. It contains various kinds of information which is necessary to behave computer intelligently. By Ubiquitous computing we will not only be connected always, from everywhere, but we are approaching a time where smart devices will take actions by predicting user inputs. It is a short distance from mobility to ubiquitous computing. Ubiquitous computing devices are not personal computers, but very tiny even invisible devices, either mobile or embedded in almost any type of object imaginable. Location is one of the most important ingredients of user context for ubiquitous computing applications; aiding in inferring additional knowledge about the user such as user movements, social associations, behaviour, lifestyle etc.

II. HISTORY

The term ubiquitous computing was first introduced by the late Mark Weiser (1952-1999). He worked at the Xerox Palo Alto Research Center. PARC was more or less the birthplace of many developments that marked the PC era, such as the mouse, windows-based user interfaces, and the desktop metaphor, laser printers, many concepts of computer supported cooperative work (CSCW) and media spaces, and much more. This success is contributed (for other reasons) to the fact that PARC managed to integrate technology research and humanities research (computer science and "human factors" in particular) in a truly interdisciplinary way [1].

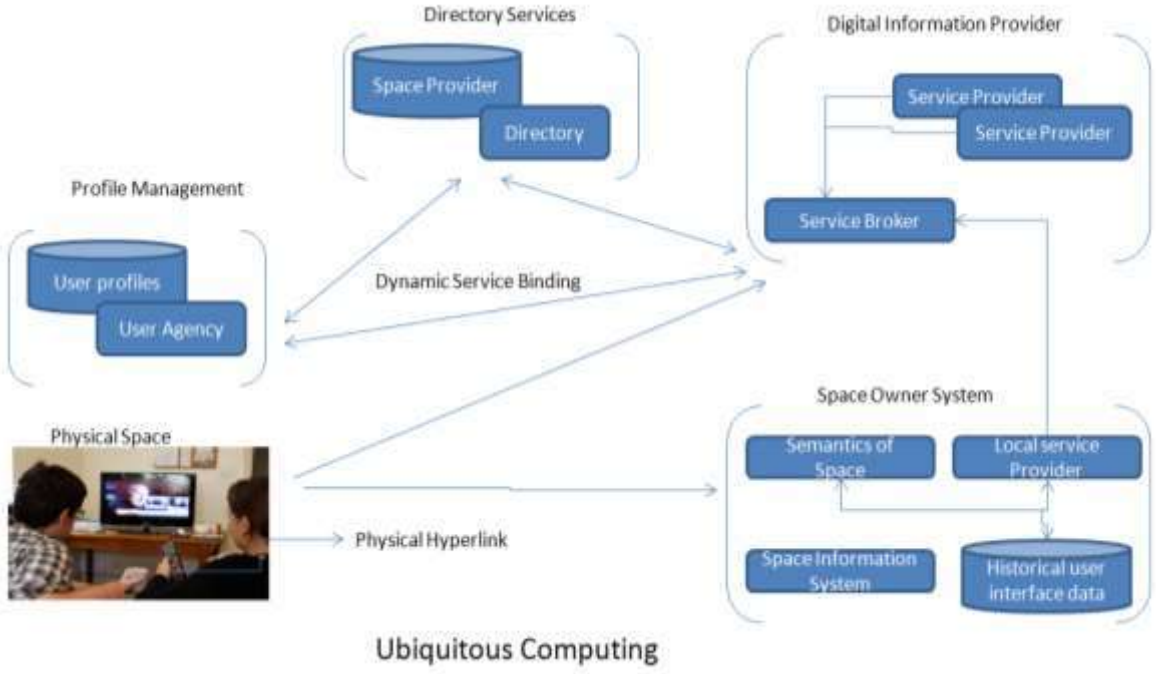

Fig. 1 Ubiquitous Computing

III. UBIQUITOUS COMPUTING (UC) V/S. VIRTUAL REALITY (VR)

According to Mark, (Virtual Reality)VR "brings the world into the computer", whereas (Ubiquitous Computing)UC "brings the computer into the world". He meant to say that VR technology is generally based on elaborating the models of an existing or imagined (excerpt of the) world. This model contains not only 3D (geometric) aspects but many more static and dynamic descriptions of what is modelled. For instance, digital mock-ups of cars have been pushed to the point of simulating crash tests based on the car /obstacle geometry, static, and dynamic material characteristics, laws of physics, and so forth[2]. As the level of sophistication of models grows, more and more aspects of the world are entered into the computer, finally almost everything happens in the virtual space and even the human becomes a peripheral device for the computer, attached via data gloves and head-mounted displays. Mark Weiser emphasized mainly at the central and peripheral roles of computers and humans, respectively. In this context, he used the term "embodied virtuality" as a synonym for UC[3].

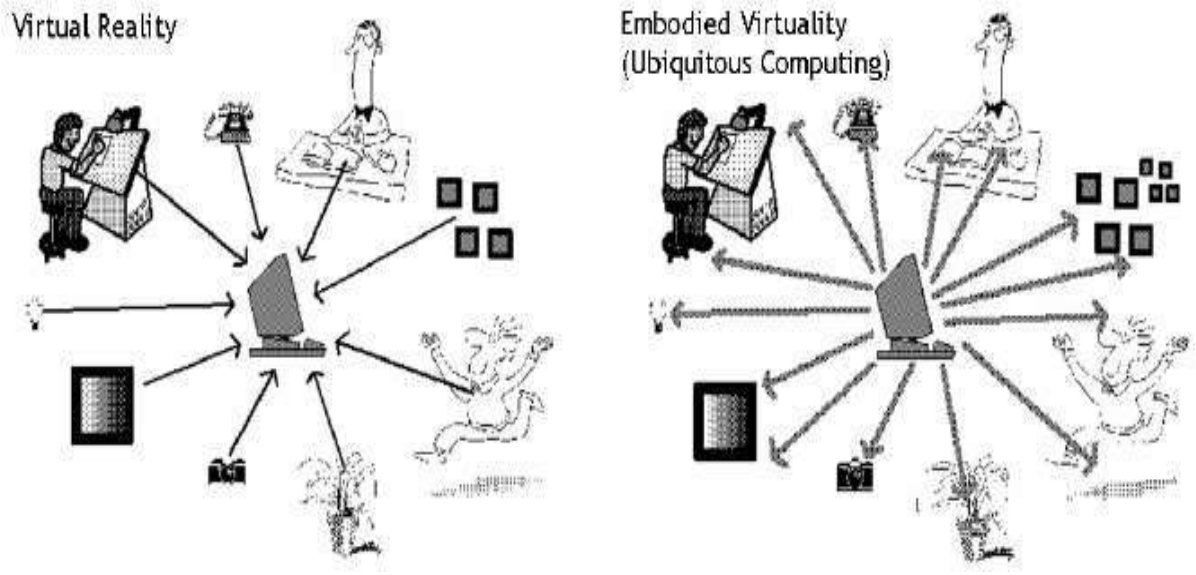

Fig. 2 Virtual reality versus Ubiquitous Computing

IV. UC V/S. ARTIFICIAL INTELLIGENCE (AI)

In addition, Mark Weiser criticized the overly high expectations associated with AI in the 1980's. The time when AI research had to undergo a serious confidence crisis, was the same time of development of his UC vision (late 1980's and early 1990's). Mark Weiser proposed to take a different approach towards a higher level of sophistication of computer-based solutions. He considered it a more reasonable objective to concentrate on small subsets of "intelligent behaviour" and to dedicate each computer to such a subset. Higher sophistication would be increased by interconnecting the special-purpose computers and by allowing them to cooperate with each other. This is the reason to emphasis on the term smart, than the term intelligent. An important role is played by Sensor technology in dedicating computers to a small subset of "understanding the world around us" (a key element of intelligent behaviour).

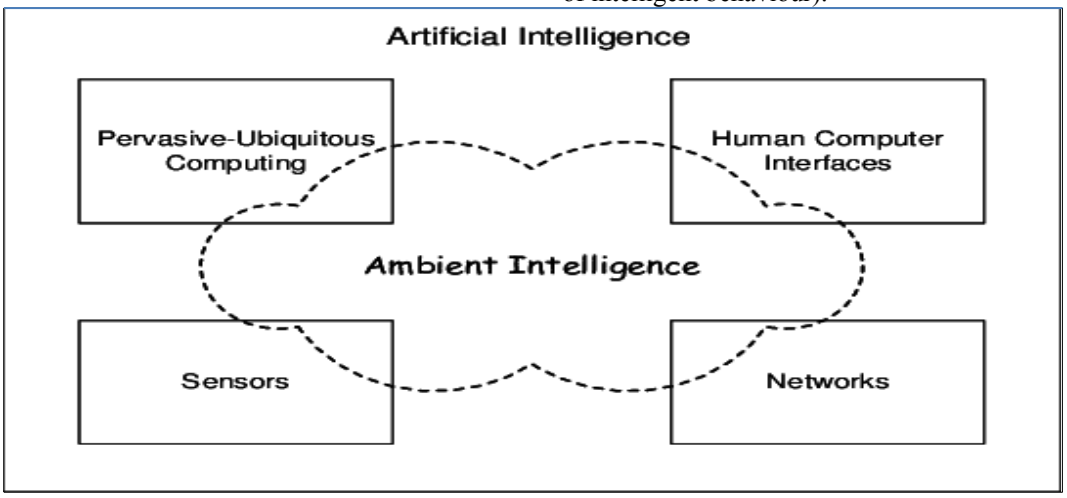

Fig. 3 Ambient Intelligence

V. UC V/S. USER AGENTS (UA)

The term *user agent* is not very well known in the general public, mainly in contrast to virtual reality. UAs were also known as intelligent intermediates between the user and the computer world, it means it is an approach towards increased ease-of-use or better human computer interaction[4]. UAs were installed as autonomous software components between applications and users, inspecting and learning from the user-software application.

VI. SYNONYMS FOR UBIQUITOUS COMPUTING

A. *Post-PC era*: The root of this term is obvious, it describes 'the era that comes

after the second, that is, the PC era. We suggest avoiding this term since it points at what it is not (PC's) rather than at what it actually is.

B. *Pervasive computing*: The differentiation between the word ubiquitous and pervasive is easy if artificial but difficult if not artificial. We suggest that pervasive computing and ubiquitous computing are synonyms, one (pervasive) being slightly more common in industry (its origin has been attributed to IBM), the other one (UC) being slightly more common in academia[6].

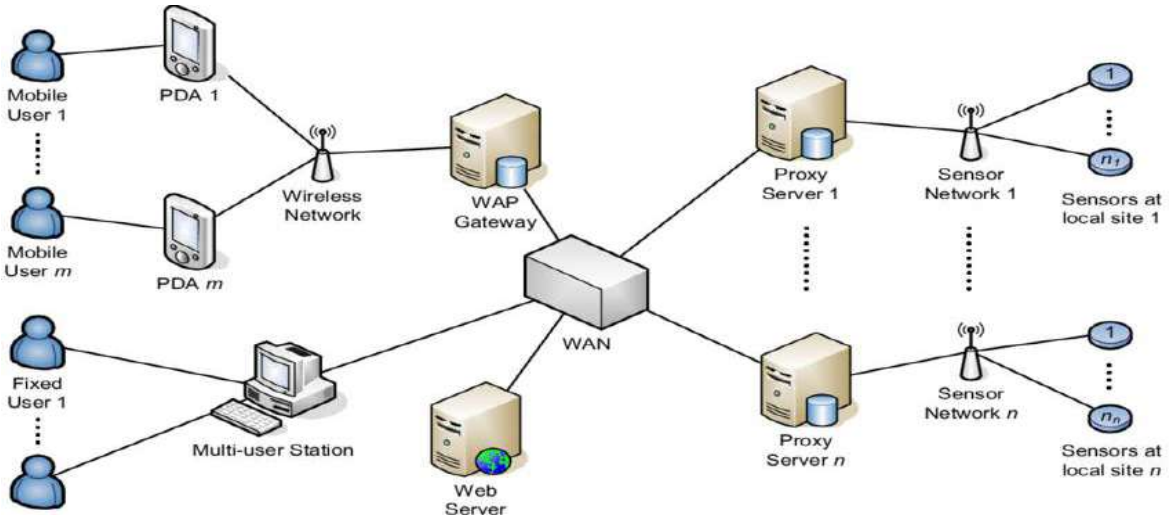

Fig. 4 Pervasive Computing

C. *Ambient intelligence:* In the context of the European Union's research framework programs the term was invented. As a positive argument, one may say that the two words reflect the grand challenges of UC as ambient may be associated with the challenge of human computing, making UC system an integral part of our daily life. Intelligence may be interpreted as the challenge of integrative cooperation of the whole that consists of myriads of interconnected UC nodes. On the downside, one should remember that Mark Weiser had intentionally avoided the term "intelligence" due to the over-expectations that AI had raised. Another reason of avoiding this term is still burdened with these over-expectations[7].

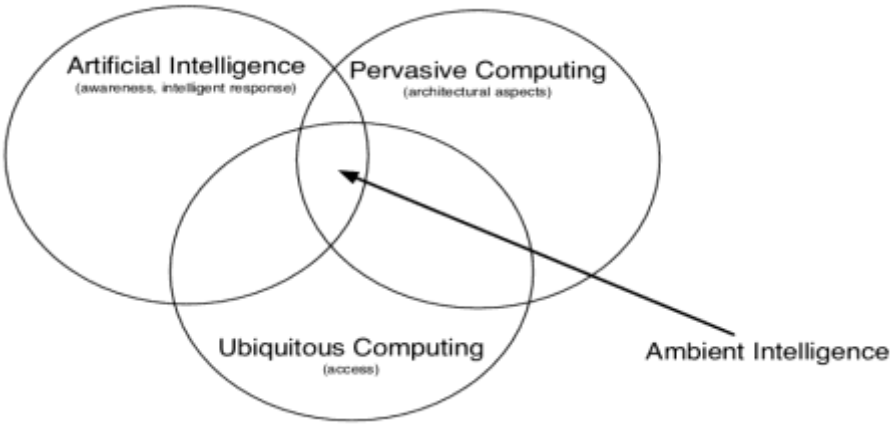

Fig. 5 Ambient Intelligence

D. *Disappearing/invisible/calm computing:* All three terms are less common than UC and pervasive computing. Disappearing narrates a process while "invisible" narrates a final state. Since we doubt that 100% satisfactory service to the user can be paid at all without leaving the customer, that is the user, the option to explicitly influence the service behaviour, we consider the term misleading. We favour again Mark Weiser's notion of computers.

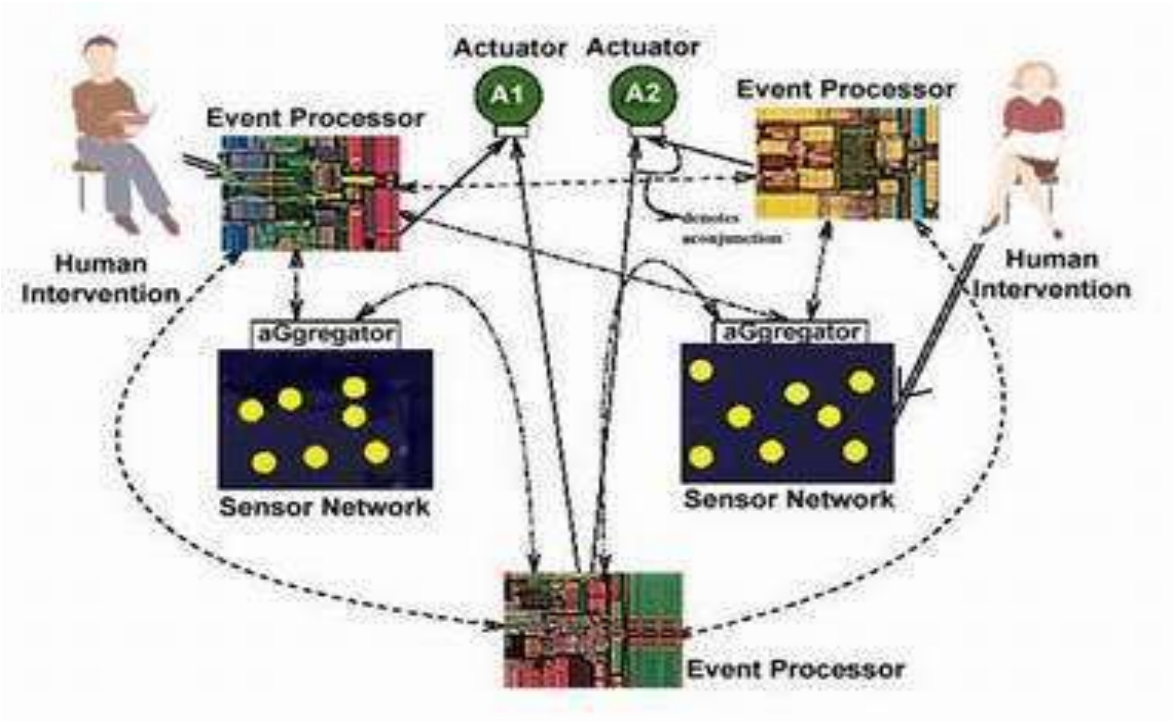

Fig. 6 Calm Computing

E. *Mixed-mode systems:* This is a term used to narrate the heterogeneity of UC nodes, in contrast to the rather resource rich, general purpose PC's of the last era. This term is even less common, but pops up every now and then and should not be used to describe UC as a whole since it emphasizes a particular aspect[8].

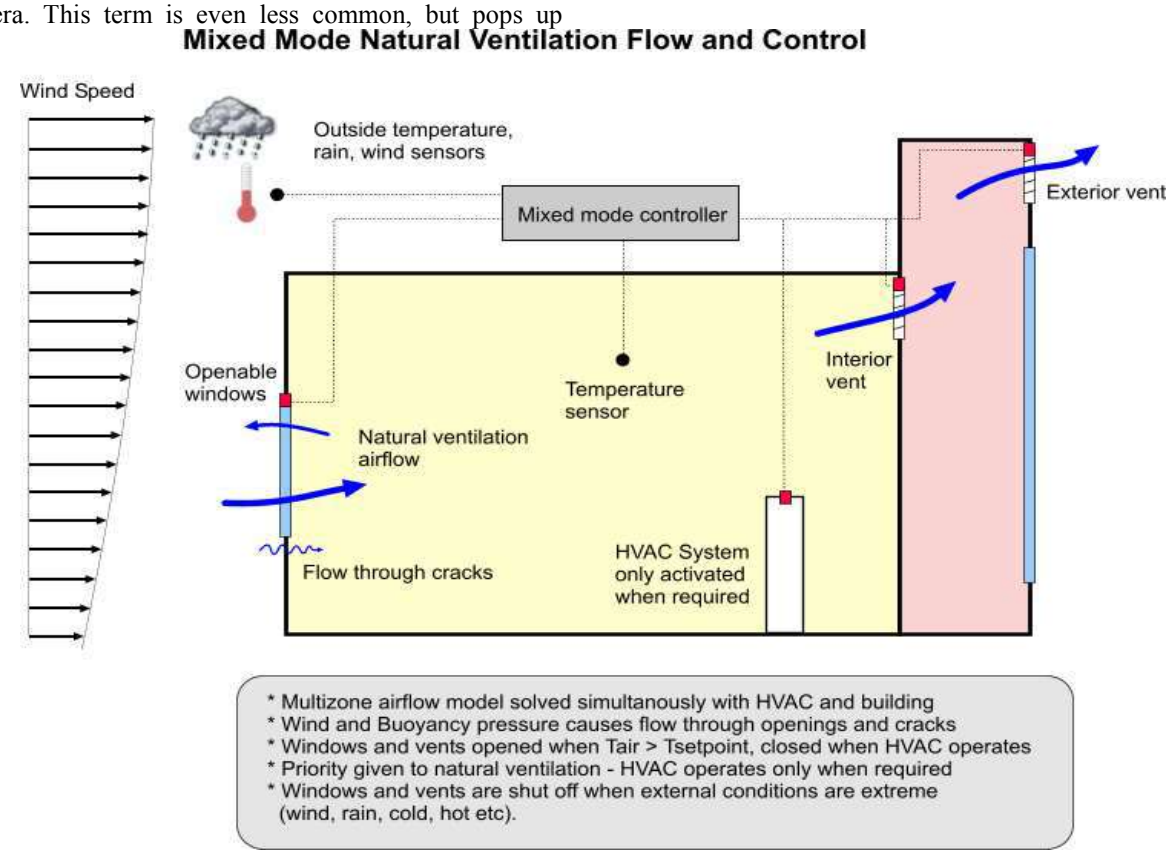

Fig. 7 Mixed Mode System

F. *Tangible bits:* This term has found some currency in the Netherlands and Japan, but remained same rather uncommon in general. It refers mainly to the fact that networked computers are becoming part of the physical world.

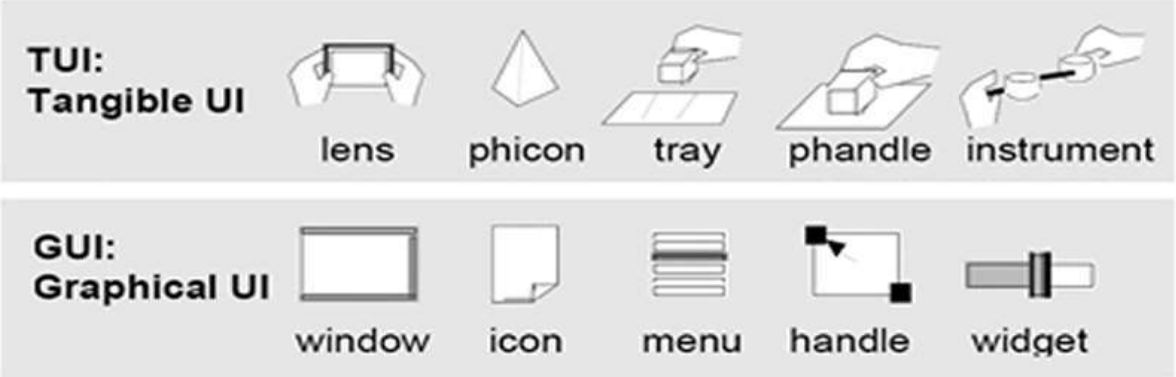

Fig. 8 Tangible Bits

VII. LAYERED ARCHITECTURES V/S. COMPONENT ARCHITECTURES

- *LAYERED ARCHITECTURE*: Layered reference construction works as a template for layered software architecture. In both layers, set off tasks working as virtual machines, just "what" (The functionality is provided and how it has access to it) users should go to more layers, As far as the inner "how" (concept) is hidden and it can be freely modified.Maximum function of the layer stack, where the range from which represents the range high sources "Which users and applications are needed near it" and less means "close."What hardware does"[9].Prevents high-layer components to access tough variables excluding a bottom layer which is immediate neighbor.
- *COMPONENT ARCHITECTURE:* Take the ingredient reference architects A bird's eyes appear on the globe. They explain the components of many collaboration instead of component types, and explore an interactive collaboration of some details. Again, a kind of art the size of the right exists: very little component types do not really help in understanding the relevant role and dedication joint in the world. The types of ingredients are more complicated architects and similarities issues Reference and Reality[10].

VIII. CONCLUSION

To combine cellular systems and Internet features, there is a wonderful architecture which Supports user movement. Transparency of space is one of the best basic requirements. Location transparency can be created in the computing internet infrastructure. The area is different for coverage of consumer movement. With the help of distributed service directory, services may be located from any place it the system. The middleware layer components provide service access to user devices anywhere in the ubiquitous computing environment. Ubiquitous computing is future of computing technology. There is a great scope of research in this field in addition to the points mentioned above.

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