



Ubiquitous Computing: A Brief Review of Impacts and Issues

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Abstract: The quick advancement of cutting edge innovations has mixed accidentally into the physical world that now offers more than pervasive accessibility of processing foundation and assets. Over the previous decade, we are seeing new standards of use driven registering abilities by consistent access to data and computational capacities. Application driven Ubiquitous computing has essentially changed the connection amongst people and computer systems, making them vital yet giving ceaseless association. The fast advancement of cutting edge innovations have mixed coincidentally into the physical world that now offers more than universal accessibility of processing framework and assets. Ubiquitous computing has brought about communication of regular interfaces, setting mindful applications, and computerized catch and get to. The object of this paper is to highlight the effect of presently accessible universal registering innovation on business forms in the assortment of spaces. It quickly talks about advancements and its drivers and gives a few cases of their application including programmed recognizable proof, restriction, and sensor innovation advances that seem to have affected business forms in an assortment of ways. The paper closes with some future points of view on ubiquitous computing applications and visits a few regions of issues and difficulties postured by it.

Keywords: Ubiquitous Computing; Pervasive Computing; RFID; Wireless Sensor Networks; Smart Card; IoT

I. INTRODUCTION

Ubiquitous processing has risen as a huge progressive figure the field of Information Communication Technology (ICT). It has unendingly picked up energy thus of most novel technological acceleration in the IT business the most recent decade. We witness many numbers of minor PCs inserted thus called, woven, into the texture of our everyday way of life. These minor PCs with locally available sensors and actuators speak with different gadgets in our live condition. These smaller than standard PCs give pervasive figuring assets that empower access to anything, by anybody, at whatever time and anyplace.

Mark Weiser begat the expression "ubiquitous computing" in 1988, to portray a future world where undetectable PCs will be altogether implanted in ordinary articles to empower regular routines. "Our PCs ought to resemble our adolescence: an undetectable establishment that is immediately overlooked however dependably with us, and easily utilized all through our lives." (Weiser). When he gave an account of his vision [1], another exploration field opened up. The expressions "pervasive computing", "ambient intelligence" and "everywhere" are additionally utilized equally, to concentrate on an alternate part of a similar worldview. Universal signifies "exhibit all around", while pervasive signifies "enter all over the place". Mobile, versatile, and sensor innovations have now turned out to be reasonable and installed into our general public which is presently underestimated and irreplaceable.

According to [2], Ubiquitous processing is considered as an encouraging technological way of development. Concentrated R&D exercises and political procedures are tending to the goal to cultivate attractive advancements and applications. Not just this processing has disentangled ICT applications down to the most reduced level yet has built up a solid adherence with social insurance frameworks, homes, coordinations, retailing, avionics, advanced education, and the past. Processing assets are circulated, and the gadgets no longer require a technically

knowledgeable individual to work them. These are frequently sufficiently smart to work freely. These days inescapable figuring develops from an exploration subject to a business reality [3].

Pervasive computing applications incorporate savvy homes, wellbeing checking and help, gaming, transportation, and coordinations. Another idea related to pervasive computing, is the Internet of Things (IoT) [4], [5], [6], [7]. The Things are remarkably identifiable ordinary everyday objects that will be bit by bit associated with the Internet somehow. They will be "decipherable, conspicuous, locatable, addressable, or potentially controllable through the Internet—regardless of whether employing RFID, remote LAN, wide-zone arranges, or different signifies". They will get data about their position on the planet and communicate with different items to trade, look at, and incorporate information [8].

II. LITERATURE SURVEY

Ubiquitous computing, pervasive processing, and encompassing knowledge are ideas advancing in a surfeit of utilizations in practically every setting. The pervasive computing is inexactly connected with the further spreading of scaled down mobile or embedded information and communication technologies (ICT) with some level of 'insight', system availability and propelled UIs. Due to its omnipresent and subtle systematic, analytic, strong, data and narrative capacities, pervasive computing is anticipated to enhance human-PC collaboration.

The capacity of pervasive computing makes it a device to propelling the move towards programmed documentation of exercises, process control or the correct data in particular work circumstances. Then again, the social, financial, moral, and security concerns on the utilization of pervasive computing are additionally a few zones that prevent and diminish its acknowledgment and attractive societal quality. This short paper highlights the constructive outcomes of omnipresent

processing by giving a systematic review, investigation of improvements, and usage of ubiquitous computing in various settings and its effect on deployment. This survey gives a constrained compressed asset of pervasive registering, however, numerous frameworks improvements and executions are not distributed in the literature. Along these lines, this article does not completely cover the field of pervasive and ubiquitous computing.

III. UBIQUITOUS COMPUTING TECHNOLOGIES

This area quickly talks about a portion of the imperative ubiquitous innovations that are thought to be the fundamental parts of any business procedure. Three ubi-comp advancements have an immediate and robust effect on business forms. Automatic identification, localization, and sensor innovation give the way to answer questions like: "Where is which item, what its present state is and what items are in its neighborhood?" [9]. Business procedures are revolutionised via Automatic Identification Technologies (AIT). It is an innovation that is ordinarily used to distinguish items or conveyance units.

A. Automatic Identification

Auto-ID frameworks are scanner tag, RFID, smart card, and biometric frameworks. Two functions are standard in the ID procedure for each Auto-ID framework: catching an outer flag from the element that ought to be distinguished (e.g. catching the picture of a standardized tag) and perceiving that flag by a PC examination (e.g. recovering the encoded data) [9]. Bar coded is regularly viewed as the "Optical Morse Code". The scanner tag frameworks are the most seriously utilized type of AutoID innovation in each industry worldwide for object detection.

Scanner tags are industry particular and extraordinarily recognized by its symbology. Items normally have it is possible that one-dimensional standardized tags with constrained information up to 10 bytes or two-dimensional scanner tags that can contain more information up to 1000 bytes. In a typical business setting scanner tag aids precisely recognizing raw materials, tracking work in process, overseeing stock, coordinating shipments, and giving lifetime distinguishing proof to administration and guarantee administration [10].

Radio Frequency Identification (RFID) offers a greater number of information limit than a straight standardized tag since it utilizes radio waves for ID rather than a picture or pattern. RFID reader can read imperceptible little chips (tags) connected to elements that store the identifier [11]. An antenna is associated with the chip so that if the tag is inside the read range of a RFID reader, the identifier can be read out without the requirement of line of sight. Dynamic arrangements have their vitality supply coordinated into the tag, which empowers them to transmit their identifier up to 100m. Interestingly, passive methods are usually ready to transmit their identifier up to 2m.

The rising RFID frameworks are a decent other option to scanner tag frameworks, since they needn't bother with human intercession and needn't bother with the line of sights between the tag and the reader [12]. RFID innovation works best with the end goal of tracking various objects and offers a few points of interest over bar coding. The magnetic stripe is another exceptionally standard type of automatic identification innovation. It is a piece of equipment that decodes the encoded

individual data housed in a magnetic stripe on the back of the plastic card. This innovation is being eliminated to the appropriation of more up to date and more intelligent smart card innovation.

Smart Card is additionally a plastic card that contains an embedded integrated circuit chip (ICC) or a microcontroller chip. These cards are more secure and hold part more data than magnetic stripe card and are skilled to perform encryption and shared verification strategies. They are utilized as a part of the assortment of utilizations worldwide as payment applications, media transmission applications, secure identity applications, and human services applications. There are two general classifications of smart cards accessible today: contact and contactless.

Biometrics Technology is a progressive sending of programmed identification innovation that is being actualized around the world. This change is accepted to be the most secure and correct type of Automatic Identification Technology (AIT). It is utilized to remarkably recognize and approve an individual's access to a PC or physical area using identifying natural qualities. (BBC) It exceptionally distinguishes a people's profile and behavioral conditions (fingerprints, hand geometry, earlobe geometry, retina and iris patterns, voice waves, DNA, and marks). This innovation is sought after to match worries over universal, business and individual security.

B. Localization

According to [13], wireless sensor systems (WSNs) are a critical innovation pulling in significant research intrigue. Recent advances in wireless communications and electronics have empowered the improvement of low cost, low-control and multi-useful sensors that are little in size and communication in short distance takes place. Cheap, smart sensors, arranged through remote connections and conveyed in extensive numbers, give phenomenal chances to checking and controlling homes, urban communities, and the earth. Also, organized sensors have a wide range of utilizations in the guard region, producing new abilities for observation and reconnaissance and additionally, other strategic applications [14].

Localization when all is said in done [15], is consolidated with programmed ID, since the sole area data is frequently pointless without the identity of the found entity [9]. In basic words, it is the way toward distinguishing physical area of sensor hubs. There are a few methods that supplement localization. We quickly examine a couple of them. The basic of all the localization procedures is closeness based confinement in wireless sensor networks (WSNs).

If an element can be seen inside a cell, such a framework can decide, to the point that the element must be in the vicinity of the known position of the checking device. Closeness can likewise be gotten from other Auto-ID frameworks.

For example, if a smart card is perceived as the last known area the smart card proprietor's area is distinguished at that specific area by then [9]. [16] argue that closeness based localization has a place with the gathering of without range limitation. Restriction utilizing nearness estimations is prominent when ease outweighs everything else in need over precision. Since messages necessarily go between neighbours, there is no extra data transmission required to nearness. Nearness estimations report regardless of whether two gadgets

are "associated" or "in range" and decides if a question is close to at least one known areas.

[17] says triangulation includes figuring the position of an object by measuring its separation from numerous reference points with known areas. Depending upon whether ranges or angles in respect to reference points are being derived, triangulation is divisible into lateration and angulation.

The Global Positioning System (GPS) is the main framework that is broadly utilized today which utilizes the lateration strategy with one GPS receiver and four visible GPS satellites. It can be utilized to track the location of objects over a scope of geographic and geometric scales. Sadly, this innovation is restricted for outside utilization.

C. Sensor Technology

The phenomenal development of electronic items and administrations prompted the improvement of sensors to work in various workplaces. The sensor innovation saturated into an assortment of spaces condition, solution, trade, and industry. [9] says that different sensor types incorporate thermal, acoustic, visual, infrared, magnetic, seismic or radar sensors to measure conditions like temperature, humidity, vehicular movement, lightning conditions, pressure, noise levels, the absence or presence of particular sorts of items, mechanical anxiety levels on joined items or current attributes, for example, speed, direction, and size of an item. Specialized advances in MEMS (micro electro mechanical systems), which manages machines in the nanometre scale, additionally impacts the outline of new sensors that are getting littler in size and utilize le power.

Present researches in sensor innovation concentrate on a more extensive issue: wireless sensor networks [18]. The advancements are the systems administration capacities of sensors, which enable the network to profit by being self-sufficient and autonomous because they are no longer straightforwardly associated with a central controlling computer, from usage in remote and obscure locales, and from synergy impacts through joint effort [9]. In [19], having a location and identity information empowers an assortment of applications and utilizations, however, including a detecting capacity can give frameworks 'eyes and ears' making intelligent systems that can gather a range of information and even react to events. Introducing sensors on RFID tags or wireless networks nodes upgrade working ability of ubiquitous systems to an enhanced level. Henceforth, network reacts to continually changing condition freely with no human intervention.

IV. PROS OF UBIQUITOUS COMPUTING

Mark Weiser's vision of indistinguishable processing devices to work undetectably mixed with the surrounding has turned into a reality. Pervasive computing and the Internet of Things are as yet visionary things before we would utilize them at their maximum capacity. In any case, this innovation has accompanied a cost. As a rule, there are worries about the intrusion of protection, trust and the security of frameworks. There is certainly need to move with the possibility of protection. Also, it is believed that ubiquitous computing produces humongous measures of complex information that affects the innovation itself to adapt to it bringing about

compromising with reliability and trustworthiness of the frameworks. Subsequently, there is a considerable measure of endeavors required to address the advancement of equipment, interfaces, framework models, norms for interoperability and battery life.

Ubiquitous computing, yet, poses many difficulties identified with the security of the data being transmitted amongst clients and devices. There are dangers of characterized data being gotten to by unintended and pernicious clients in the inescapable condition which can be abused for unlawful purposes. [19] brings up if the computational framework is imperceptible and in addition broad, it turns out to be difficult to comprehend what is controlling what, what is associated with what, where data is streaming, how it is being utilized, what is broken (versus what is working efficiently, however not helpfully), and what are the outcomes of any given activity (counting just strolling into a room).

In [19], even now, individuals can be followed through their cell phones, credit/loyalty cards, and CCTV, yet the comfort and advantages of these advances are regularly observed as exceeding the worries. Nevertheless, given the money saving advantage proportion of this new paradigm in processing, ubiquitous computing will overwhelm and be practical in the exact not so distant future.

V. CONCLUSION

Trustworthiness and consistent quality of ubiquitous computing and frameworks will dependably be a certain issue alongside its social effect and allure of such pervasive innovations. Ubiquitous computing innovation empowers an expansive number of new applications having sway on business forms. Numerous application areas and situations incorporate social insurance, logistics, generation, and inventory network that is achievable and useful, for the most part, because of automatic identification, sensor innovation, and confinement.

Ubiquitous processing and its different applications display an extensive test for the further advancement of information and customer protection [2]. The legal difficulties are in the protection of clients' informational self-determination in connection to the legitimately secured business interests of the administrators of Ubiquitous computing applications. Furthermore, inquiries may emerge from the regular usage of autonomous data frameworks under private law.

Then again it has a ton to offer as far as advantages. It can conceivably address the issues of the computerized gap, maturing populace and empower deep rooted learning. Besides, these advances are probably going to grow quickly after some time, and we will witness more noteworthy increment in the reception of ubiquitous computing. Later on, these advances will make more presence in empowering and incorporating human and computer system collaboration and context based learning where interaction occur between individuals, frameworks, places and objects. These are starting to permit new cooperations and methods for interfacing with computer frameworks, and also adding new insight to frameworks.

This paper quickly focuses around applications that can be acknowledged with today's innovation and have positive business impacts and recognized the excellent potential that of ubiomp advancements would increment later on. These advancements have phenomenally affected our regular day to

day existence; nonetheless, it additionally demonstrates that security issues can't be slighted and represents a test on ensuring it.

The primary objective for Ubiquitous computing is to give many single-action cooperations that together advance an integrated and ceaseless association amongst people and computational administrations [20]. The focus for the human at any one time is not a single interface to finish some assignment. Or maybe, the collaboration is all the more free flowing and integrative, much the same as our communication with the rich physical universe of individuals, places, and objects in our regular day to day existences.

VI. REFERENCES

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