Pervasive Computing: Vision and Challenges

‘ *M. Satyanarayanan*

“Whole is much greater than the sum of the parts. ”

There exists independent solutions to the challenges faced by pervasive computing scenarios (laptops, wireless-LANs, voice&image recognition, etc),but still it seems fiction rather than fact. Author states that the seamless integration of the technologies is needed. Distributed Computing and Mobile Computing, are a stepping stone towards solving the barriers of a fully ’immersive’ experience.

Using Project Aura’s case study, he defines the problems faced in realization of pervasive computing. User Intent, Context Awareness, Pro-activity and Transparency boil down to recognizing user’s surroundings and deciding what data to collect and how much of it to present to the user? Cyber Forging, High Level Energy Management and Adaption strategies have inter-linked questions on dynamic power and network access management. An interesting aspect is the client thickness which is the topic of having smart enough device to work in a dumb enough environment.

As compared to Weiser’s article where the scientific issues faced were mainly of the hardware kind (communication, network, memory), this paper is more focused towards the application oriented issues(network load management,layering, user-interaction). The author collates the issues that might be asked while designing the software stack for a wearable/pervasive device.

The Challenges of Wearable Computing

‘ *Thad Starner*

This reading focuses on wearables specifically as compared to the entire ubiquitous computing domain.

Sufficient power and charging media are still an active domains. Scavenging user’s environment for power and including inductive chargers in it, is an innovative solution but currently not feasible for production grade wearables due to high cost associated with it.

Cellular coverage, Wireless access, pre-caching services, memory and thin client size are already embedded in smart-phones today. Its the sheer amount of data and its interoperability with environments generated by the smart-phone is what we need to think about.

The author addresses the security-privacy design trade-off. He proposes physical(shielding), technological (encryption), legislative and social (horcrux like) ways of increasing security.

Another interesting discussion is about the intellectual tools like Twiddler, Xerox’s Forget Me Not and AR for Web(3-D Annotating & recognition, Holo Lens like) which were pretty interesting devices for rapid information capture and context aware systems respectively.
Even though hardware will be significantly better, there will be a need to discuss the design constraints to maintain balance between privacy, power, networking and interface.(AR displays - bulky interface, but power and networking intensive, Fitbit - minimal interface compensated by long battery life)