The end of the beginning for ubiquitous computing

People have been predicting the coming of the ubiquitous (or universal) computer-everywhere environment (UCEE, or “you-see”) for years now, and we have finally come to the point where we can finally say that we have reached the end of the beginning of its development. Intelligent systems and smart devices address applications unthought-of of in the past, with technology miniaturization and functionality convergence placing abilities in the hands of consumers that previously existed only in science-fiction stories. We still have a way to go to get to the desired level of functionality, but one can safely say that the beginning is over and it is time to commercialize and develop this technology to properly operate and integrate into both society and the marketplace.

The core technologies have existed for some time, but there were several significant developments that were needed in order to create the environment to foment true UCEE development. UCEE goes beyond smart systems in every device and an interface to the cloud on any convenient surface. We need to have the hardware and software, of course, but we also need the operating philosophies and paradigms to enable people to properly use the abilities given them by the technology.

Image Source: EU DC-Initiative

Technology development and convergence gave us portable smart devices. Market needs and functionality requirements put logic into products and appliances. The internet has created the network backbone and provided an environment for social interaction. Each cannot function without the other. Let’s take the situation in North Africa. Without a cellphone/camera, pictures from the ground can’t be captured by the average person. Without the network, the images can’t be sent outside of the country, and without the social networks, the information can’t be disseminated and acted upon by the people outside of the influence of controlling interests and governments.

The most important aspect of the migration to UCEE is the social paradigm and operating philosophy regarding computers and information devices. This migration can be directly linked to display technology, as vision is our primary data interface and increasing the ability of a device to show the user things (potentially) increases the utility. Until very recently, information display was bound to desktops by heavy glass cathode-ray tubes (CRT) and the bulky systems required to create an image using one. It was only the advent of flatscreens of a high quality in small frame sizes that enabled computing to break free of a gravity-bound operating philosophy.

The tablet is the latest and best example of this freedom. Tablets are a completely new device category, neither a light laptop nor a heavy smart phone. With a tablet we can now completely raise our eyes from looking down at data presented in a desktop format using a gravity-bound typing surface. Along with our eyes we raise our concepts of what computing is, with the tablet providing a computer-driven window to the world in front of them (for good, ill, or indifference). Add to that powerful and energy-efficient microcontrollers and wireless SoC-based systems and you've got a smart interface in every device running common apps through the cloud.

The tablet shows us how an interface embedded into device surfaces instead of bound to a desk would interact with them, and app technology is teaching us not only how to compartmentalize our tasks, it allows products to provide similar operating experiences and expectations regardless of manufacturer. As we move

towards more devices having smart interfaces, the ability of these devices to provide a common user experience is vital.

Initiatives such as the smart grid and technology developments like solid-state lighting and digital TV only speed the development of a UCEE as they make it even more important that products, especially white goods, are smart for efficient operation and monitoring. The systems that create that level of functionality also support secondary abilities that will enable them to participate in the UCEE as well.

We do have a long way to go before we have a true UCEE where you can change your doctor's appointment from your washing machine (by talking to it) because you forgot about the recital until you saw the update from your daughter's cell phone reminding you to wash her uniform, but we can finally say we are truly on our way.

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