Pervasive computing (ubiquitous computing)

Pervasive computing (also called ubiquitous computing) is the growing trend towards embedding microprocessors in everyday objects so they can communicate information. The words pervasive and ubiquitous mean "existing everywhere." Pervasive computing devices are completely connected and constantly available.

Ubiquitous computing is making many computers available throughout the physical environment, while making them effectively invisible to the user. Ubiquitous computing is held by some to be the Third Wave of computing. The First Wave was many people per computer; the Second Wave was one person per computer. The Third Wave will be many computers per person. Three key technical issues are: power consumption, user interface, and wireless connectivity.

The idea of ubiquitous computing as invisible computation was first articulated by Mark Weiser in 1988 at the Computer Science Lab at Xerox PARC.

Pervasive computing relies on the convergence of wireless technologies, advanced electronics and the Internet. The goal of researchers working in pervasive computing is to create *smart* products that communicate unobtrusively. The products are connected to the Internet and the data they generate is easily available.

An example of a practical application of pervasive computing is the replacement of old electric meters with smart meters. In the past, electric meters had to be manually read by a company representative. Smart meters report usage in real-time over the Internet. They will also notify the power company when there is an outage, reset thermostats according to the homeowner's directives, send messages to display units in the home and regulate the water heater.

Benfits of Peravise Computing

1) **INVISIBLE:**

   "Smart" environments will be embedded with computing technologies that will be mostly out-of-sight. Architecture will gain many more capabilities - with less visual clutter.

2) **SOCIALIZATION:**

Interactions with architecture will be more social in nature. "Smart" buildings will illicit a more social response from occupants as computers user interfaces embed themselves within architecture.

3) **DECISION-MAKING:**

"Smart" environments will help occupants to make better choices as they go about their everyday lives. At key moments within architectural experiences, a good architectural design will make "smart" environments helpful. Such architecture will be more proactive than passive.

4) **EMERGENT BEHAVIOR**

Buildings are now becoming more and more kinetic in form and function. Their movements and constructed designs come together dynamically to yield behaviors that make them more adaptive. Buildings will learn how to learn - in order to run efficiently and aesthetically.

5) **INFORMATION PROCESSING:**

Since architecture will be gaining a type of "nervous system", information processing will be gaining a whole new meaning. Architecture will go from crunching data to making sense of data; therefore, eliminating our need to constantly input adjustments.

6) **ENHANCING EXPERIENCE:**

As computers ubiquitously embed themselves in our environments, sensors and actuators will create "smart" environments where architectural space will be goal-oriented. Therefore, more occupant needs will be better met.

7) **CONVERGENCE:**

Much of our environment will be supplemented with interconnected digital technologies. Such interconnectivity will allow for a new type of "sharing" that will serve to eliminate many mundane tasks. Also, fewer errors will occur as systems pull data from shared digital locations (instead of having numerous copies to keep up-to-date).