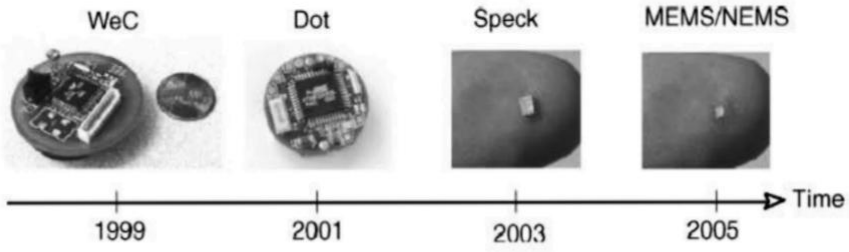
UNIQUE CONSTRAINTS AND CHALLENGES

- on-board battery power and limited network communication bandwidth
- Sensor networks extend the existing Internet deep into the physical environment. The resulting new network is orders of magnitude more expansive and dynamic than the current TCP/IP network and is creating entirely new types of traffic that are quite different from what one finds on the Internet now
- Limited hardware
- Limited support for networking
- Limited support for software development:

ENABLING TECHNOLOGIES FOR WIRELESS SENSOR NETWORKS

- First and foremost among these technologies is the miniaturization of hardware.
- Reduced chip size and improved energy efficiency is accompanied by reduced cost, which is necessary to make redundant deployment of nodes affordable.



ENABLING TECHNOLOGIES FOR WIRELESS SENSOR NETWORKS

- This requires, depending on application, high capacity batteries that last for long times, that is, have only a negligible self-discharge rate, and that can efficiently provide small amounts of current. Ideally, a sensor node also has a device for energy scavenging, recharging the battery with energy gathered from the environment – solar cells or vibration-based power generation are conceivable options.

ENABLING TECHNOLOGIES FOR WIRELESS SENSOR NETWORKS

- This software architecture on a single node has to be extended to a network architecture, where the division of tasks between nodes