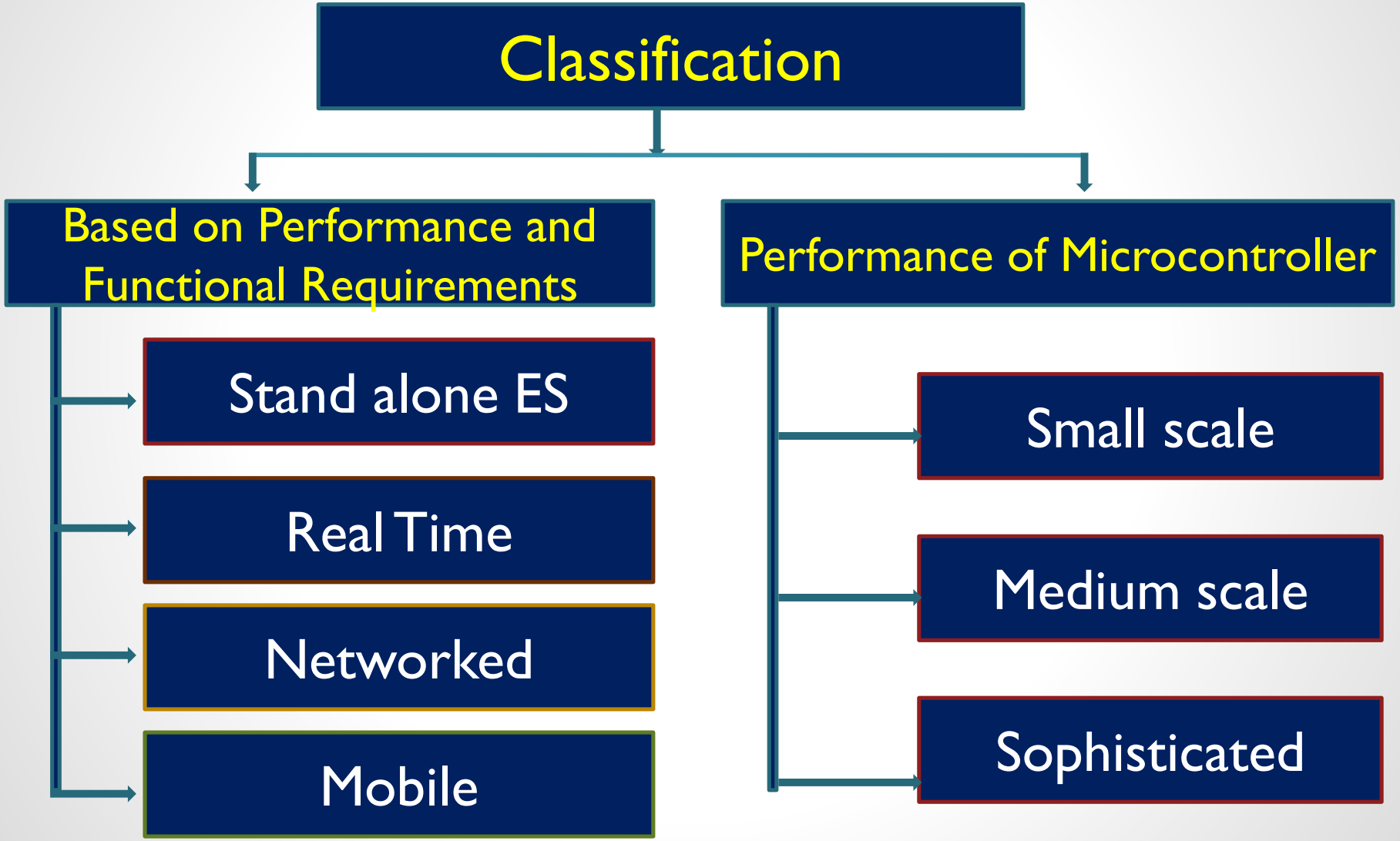
CLASSIFICATION OF AN EMBEDDED SYSTEM



CLASSIFICATION OF EMBEDDED SYSTEM

Stand-alone Embedded System

It does not require a host system like a computer, it works by itself. It takes the input from the input ports either analog or digital and processes, calculates and converts the data and gives the resulting data through the connected device-which either controls, drives or displays the connected devices.

Examples: mp3 players, digital cameras, video game consoles, microwave ovens and temperature measurement systems.

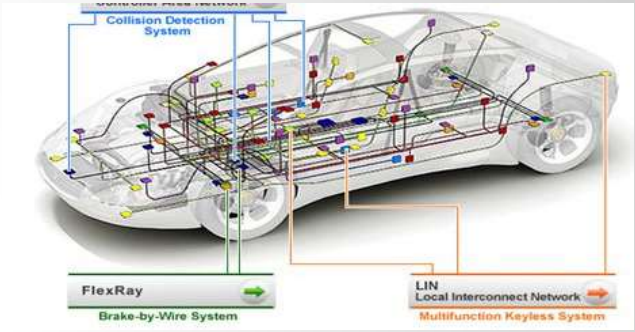
CLASSIFICATION OF EMBEDDED SYSTEM

Real Time/ Reactive Embedded System

It is a system which gives a required o/p in a particular time.

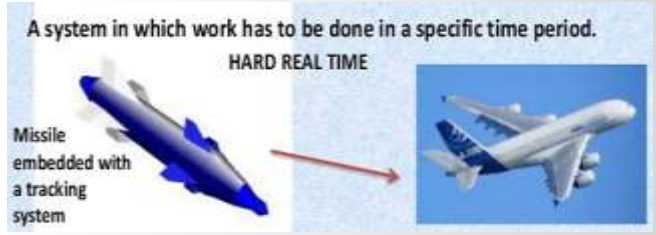
It follow the time deadlines for completion of a task. types : a) soft and b) hard real time systems .

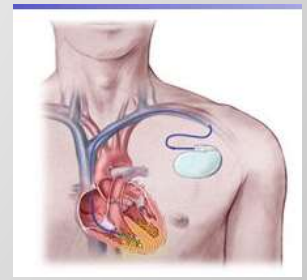
Example: Autopilot system in a flight.



Hard Real Time: System gives absolute Guarantee. Strictly adhere to each deadline. Depends on environment

Soft Real Time: Statistical Guarantee. Dead line are mostly met, depend of computer.

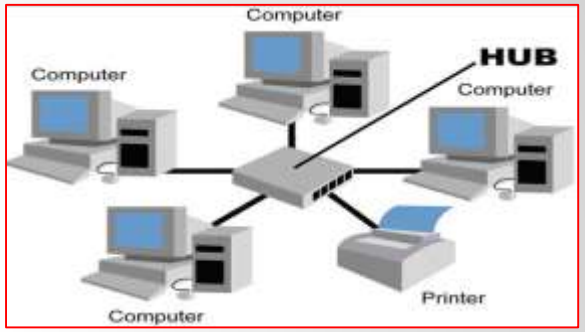




CLASSIFICATION OF EMBEDDED SYSTEM

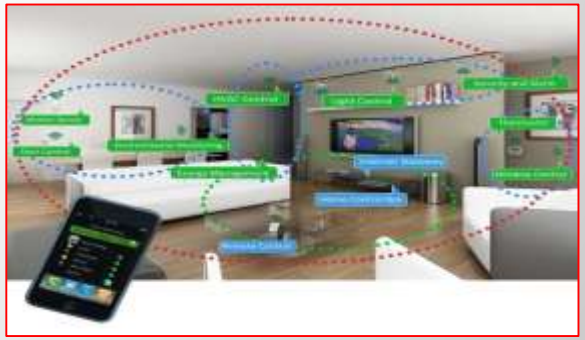
Networked Embedded System

They are related to a network to access the resources. The connected network can be LAN, WAN or the internet. The connection can be any wired or wireless.



It is the fastest growing area in embedded system applications. The embedded web server is a type of system wherein all embedded devices are connected to a web server and accessed and controlled by a web browser.

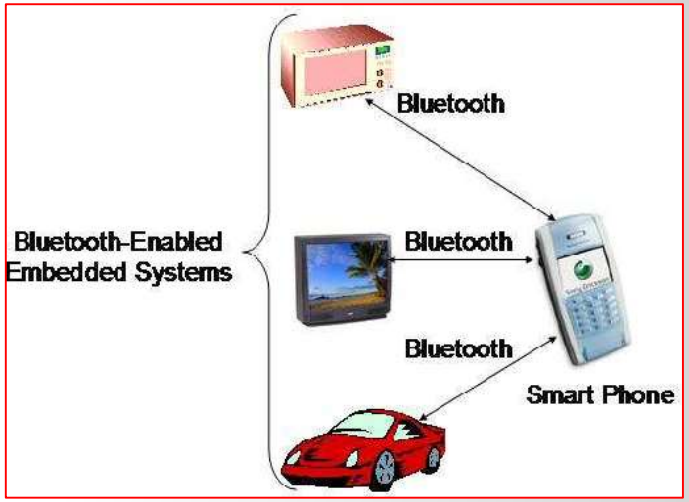
Example: home security system wherein all sensors are connected and run on the protocol TCP/IP Embedded System



CLASSIFICATION OF EMBEDDED SYSTEM

Mobile Embedded System

They are used in portable embedded devices like cell phones, mobiles, digital cameras, mp3 players and personal digital assistants, etc. The basic limitation of these devices is the other resources and limitation of memory.



CLASSIFICATION OF EMBEDDED SYSTEM

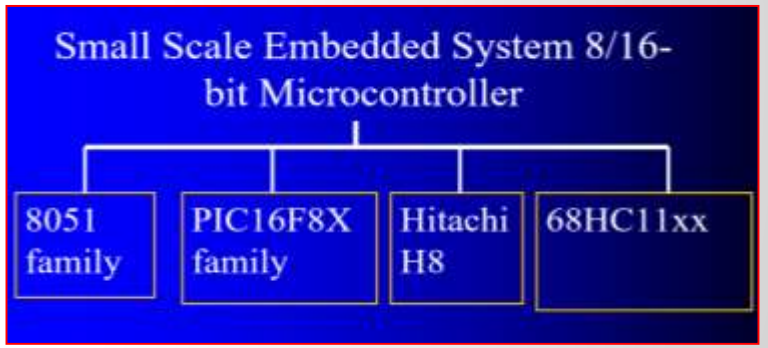
Small Scale Embedded System

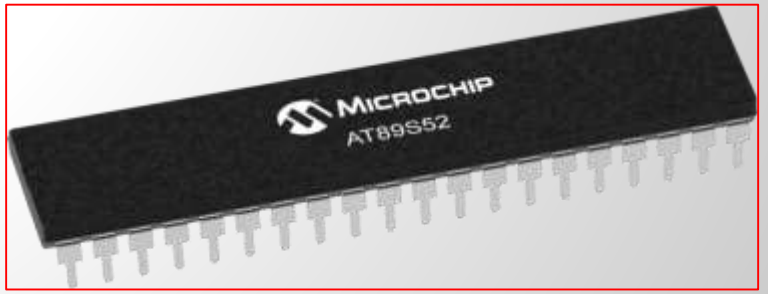
8 bit or 16 bit microcontroller is used.

designed with a single 8 or 16-bit microcontroller that may even be activated by a battery.

Main programming tools are an editor, assembler, cross assembler and integrated development environment (IDE). Using 'C' language programs are complied into assembly and executable codes are appropriately located in to the system memory.

The software has to fit into the available memory and keep in view for power dissipation while the system is running.

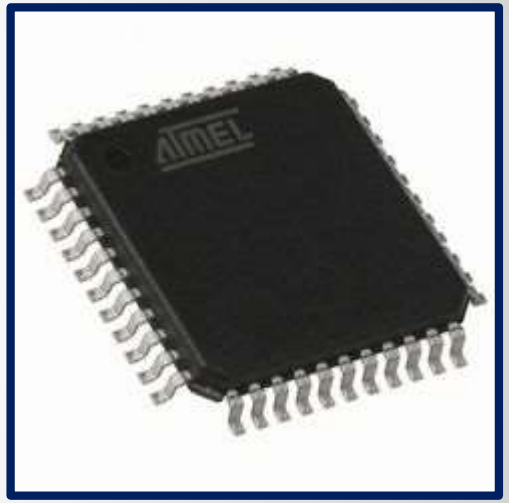




CLASSIFICATION OF EMBEDDED SYSTEM

Medium Scale Embedded System

16 bit or 32 bit microcontroller or microprocessor is used. Such as DSP, RISC. These types of embedded systems are designed with a single or 16 or 32 bit microcontroller, RISCs or DSPs



These types of embedded systems have both hardware and software complexities. For developing embedded software for medium scale embedded systems, the main programming tools are C, C++, and JAVA, Visual C++, and RTOS, debugger, source code engineering tool, simulator and IDE.

CLASSIFICATION OF EMBEDDED SYSTEM

Large scale or sophisticated Embedded system

They have enormous hardware and software complexities, that may need ASIPs, IPs, PLAs, scalable or configurable processors.

ASIP (Application Specific Instruction Processor), ARM (Advanced RISC Machine), IP protocols are used. Encryption, Decryption, various transforms are used

They are used for cutting edge applications that need hardware and software Co-design and components which have to assemble in the final system.

Development tools are not readily available at reasonable cost.

ASSIGNMENT

- List various types of Embedded system and explain in brief