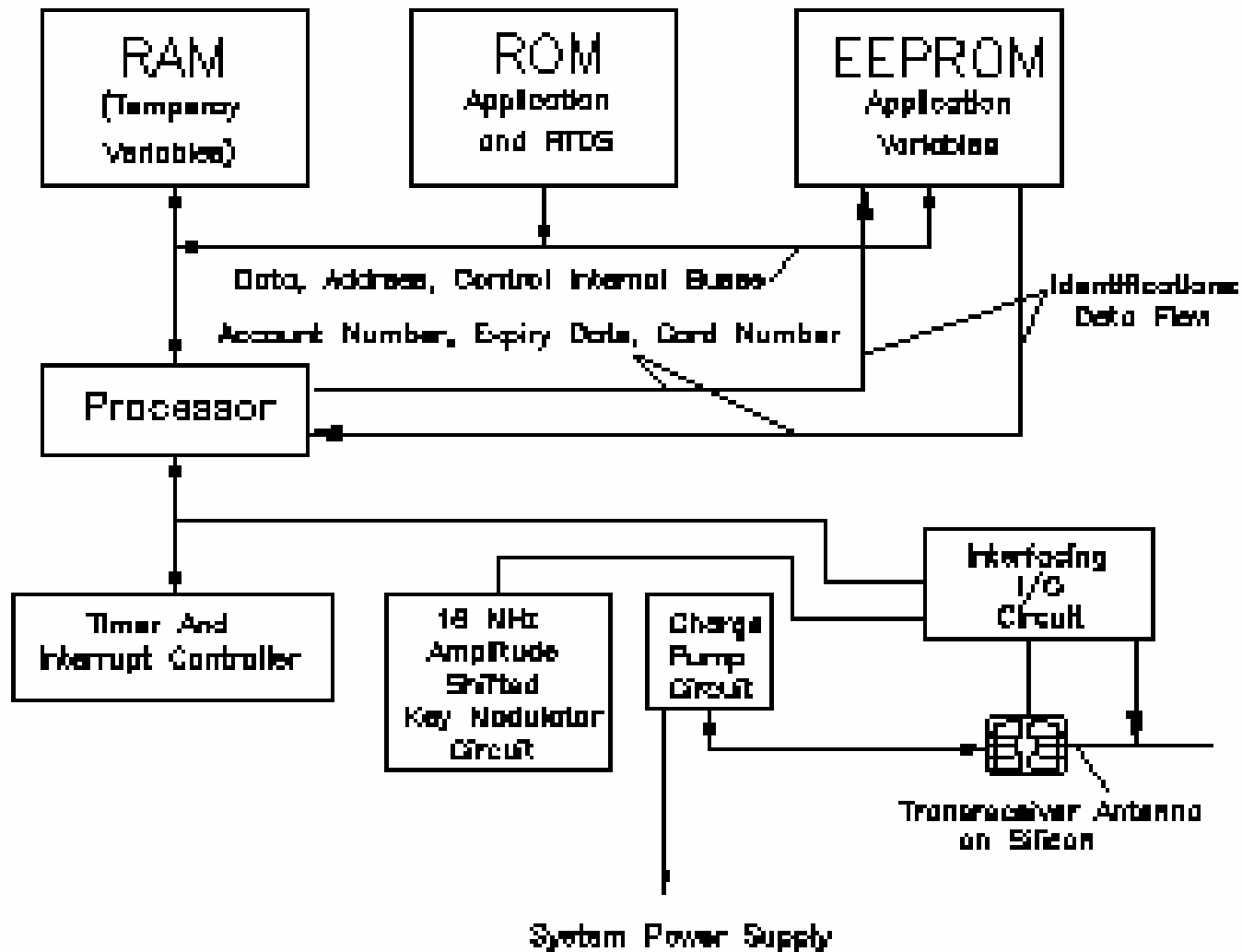# Lesson 6: EXAMPLES OF EMBEDDED SYSTEMS

Examples
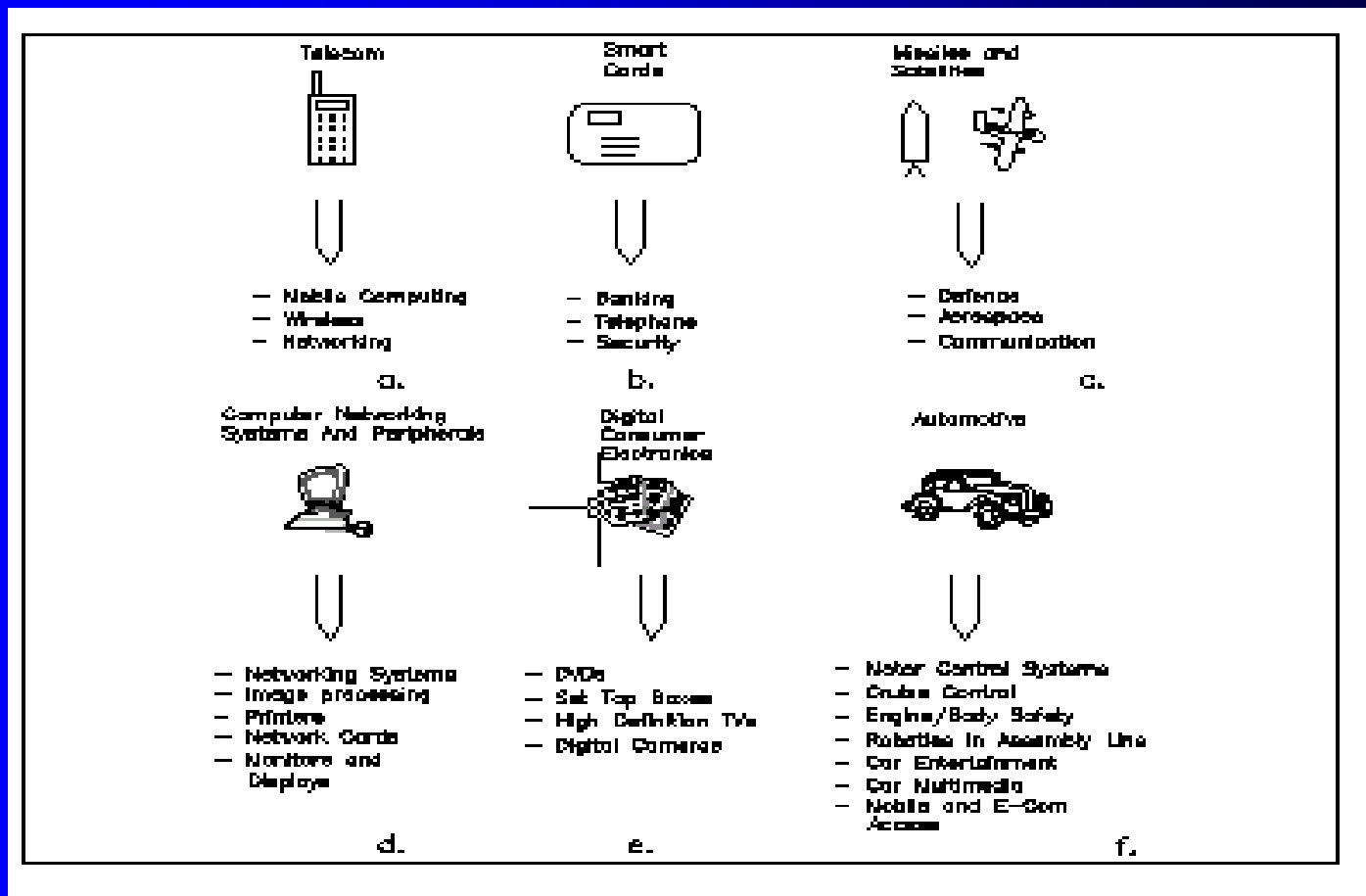
- Telecom

- Smart Cards,

- Missiles and Satellites,

- Computer Networking,

- Digital Consumer Electronics, and

- Automotive

AN EMBEDDED SYSTEM
Contact – Less Smart Card Components

Exemplary Application Areas

– **Also refer to Section 1.5**

Chapter-1L06: "Embedded Systems - " , Raj Kamal,
Publs.: McGraw-Hill Education

Applications

- Mobile phone
- Digital camera
- Robots
- Point of sales terminals
- Automatic Chocolate Vending Machine
- Stepper motor controllers for a robotics system
- Washing or cooking system
- Multitasking Toys
- Microcontroller- based single or multi-display digital panel meter for voltage, current, resistance and frequency
- Keyboard controller

Applications

- Serial port cards

- CD drive or Hard Disk drive controller

- Peripheral controllers,, a CRT display controller, a keyboard controller, a DRAM controller, a DMA controller, a printer-controller,

- a laser printer-controller, a LAN controller, a disk drive controller

- Fax or photocopy or printer or scanner machine

Applications

- Remote (controller) of TV

- Telephone with memory, display and other sophisticated features

- Motor controls Systems - for examples, an accurate control of speed and position of d.c. motor, robot, and CNC machine;, the automotive applications like such as a close loop engine control, a dynamic ride control, and an anti-lock braking system monitor

- Electronic data acquisition and supervisory control system

Applications

- Spectrum analyzer

- Biomedical systems - for example, an ECG LCD display-cum-recorder, a blood- cell recorder cum analyzer, and a patient monitor system service.

Chapter-1L06: "Embedded Systems - " , Raj Kamal,
Publs.: McGraw-Hill Education

Applications

- Electronic instruments, such as industrial process controller

- Electronic smart weight display system, and an industrial moisture recorder cum controller

- Digital storage system for a signal wave form or Electric or Water Meter Reading

Applications

- Computer networking systems $_2$- for examples, router, front-end processor in a server, switch, bridge, hub, and gateway

- For Internet appliances, there are numerous application systems- (i) Intelligent operation, administration and maintenance router (IOAMR) in a distributed network, and (ii) Mail Client card to store e-mail and personal addresses and to smartly connect to a modem or server

Applications

- Banking systems - for examples, Bank ATM and Credit card transactions

- Signal Tracking Systems - for examples, an automatic signal tracker and a target tracker

- Communication systems, for examples, such as for a mobile-communication a SIM card, a numeric pager, a cellular phone, a cable TV terminal, and a FAX transceiver with or without a graphic accelerator

- Image Filtering, Image Processing, Pattern Recognizer, Speech Processing and Video Processing

Applications

- Entertainment systems - such as video game, music system and Video Games

- A system that connects a pocket PC to the automobile driver mobile phone and a wireless receiver. The system then connects to a remote server for Internet or e-mail or to remote computer at an ASP (application Service Provider).

Applications

- A personal information manager using frame buffers in hand- held devices

- Thin Client to provide the disk-less nodes with the remote boot capability.. [Application of thin- clients is accesses to a data center from a number of nodes; or in an Internet Laboratory accesses to the Internet leased line through a remote Server]

Applications

- Embedded Firewall / Router using ARM7/multi-processor with two Ethernet interfaces and interfaces support to for PPP, TCP/IP and UDP protocols.

Sophisticated Applications

- Mobile Smart Phones and Computing systems

- Mobile computer

- Embedded systems for wireless LAN and convergent technology devices

- Embedded systems for Video, Interactive video, broadband IPv6 (Internet Protocol version 6) Internet and other products, real time video and speech or multimedia processing systems

Sophisticated Applications

- Embedded Interface and Networking systems using high speed (400 MHz plus), and ultra high speed (10 Gbps) and large bandwidth: . - Routers, LANs, switches and gateways, SANs (Storage Area Networks), WANs (Wide Area Networks),

- Security products and High-speed Network security. - Gigabit rate encryption rate products

Summary

We learnt:

- Number of Applications of Embedded Systems

End of the Lesson –5