Lesson 02
Handheld Pocket Computers and Mobile System Operating Systems
Handheld Pocket Computers

- Come in many manifestations
- For example, the smart phone
- Pocket-sized PCs
- Differ from smart phones and multimedia phones in that they can be programmed for customized applications
Handheld Pocket Computers

• Offer a variety of application and programming tools not included in new generation mobile phones
• Unlike smart phones, which usually use the text-on-nine-keys format, handheld computers have full text keypad or a touch screen keypad.
• Stylus generally used to enter data into handheld devices such as PDAs and palmtops.
Handheld Pocket Computers

• Some allow the user to write on the screen using a stylus and incorporate special software for handwriting recognition
Palm Top

- Programmable pocket computers
- Include word processors and spreadsheet software as well as PIM software
- QWERTY keyboards or touch screens with stylus for data inputs
Handheld Pocket Computers differences with Laptop

- Pocket PCs no CD drives and hard disks
- Use flash memory
- Allow the insertion of a memory stick (A memory stick is a removable flash memory card.)
- Clock speeds of pocket computer processors are limited up to 200 MHz due to considerations about battery life
Handheld Pocket Computers differences with Laptop

- Unlike laptops and notebooks, which use regular microcomputer operating systems, pocket computers have specially designed operating systems.
- OS scaled to the requirements of the software, hardware, and peripherals used in handheld computers.
Windows CE

- An operating system from Microsoft
- Support multitasking on handheld devices
- Real-time operating system meant for handheld computers and embedded systems
Windows CE

- Kernel different from the kernel of the desktop versions of Windows
- Computing devices with low storage and can be run in about 1 MB of memory.
- But the Windows CE OS memory needs are larger as compared to Palm OS
- Support a wider range of hardware than Palm OS.
- Support different CPUs such as NEC MIPS, Intel StrongARM, AMD X86, etc.
Features in Windows CE devices

- High resolution colour/display, touch screen and stylus keypad
- Complex APIs
- Gives the user a PC like feel and Windows like GUIs
Features in Windows CE devices

- PIM, MS Office, Internet Explorer features on handheld mobile system
- The CompactFlash card slots to extend memory and extension card slots
- OS memory requirement is large but scales to the requirement of the device peripherals
Features in Windows CE devices

- Digital camera card
- Games
- Microsoft Windows Media player and other media players
Active Sync Feature in Windows CE devices

- Synchronizing mobile data with PC using a USB, serial port, PC infrared port, or Ethernet LAN for interfacing
Windows Mobile (formerly known as PocketPC)

- A suite of basic applications for handheld devices along with a compact operating system
- Based on the Windows CE platform
- Application software suite includes the pocket (small screen display) versions of Excel, MSWord, PIM, Internet Explorer, and Outlook
Windows Mobile (formerly known as PocketPC)

- Supports JavaScript and ActiveX programs
- Includes the Windows Media Player for playing files of various audio and video formats
- Bluetooth communication with PCs and neighbouring devices
Palm OS

- An operating system from Palm Inc
- Used in smart phones and handheld computing devices
- Optimized to support a very specific range of hardware — CPU, controller chips
Palm OS

• Screens of Palm OS based devices cannot be much different from the hardware reference platform designed by Palm Computing without major changes in the operating system itself.
Palm OS

• Advantageous in that that, because it is compiled for a specific set of hardware, its performance is very finely tuned
• Inability to adapt to different sorts of hardware
Palm OS

- Does not support multitasking
- Is definitely not a great platform for running multimedia applications
- Works efficiently when running small productivity programs but doesn’t offer much expandability.
- Palm OS devices usually have wide screens and input of data is facilitated by a touch screen
Highlighting features of Palm OS devices

- Simple APIs compared to Windows CE
- OS memory requirement is low (16MB memory in the system suffices)
- Needs lesser processor clock speed and, therefore, has lesser energy requirements
Highlighting features of Palm OS devices

- PIM, address book, data book for task-to-do and organizing, memo pad,
- SMTP (simple mail transfer protocol) e-mail download, offline creating and sending POP3 (post office protocol 3) e-mail,
- Internet browsing functions,
- Windows organizer, and PDA (personal digital assistant)
Highlighting features of Palm OS devices

- Wireless communications including email, messaging, and browsing the web and multimedia applications such as playing music
- A cradle connects to PCs
Highlighting features of Palm OS devices

• HotSync software for synchronizing with PCs through a serial port or infrared port
• HotSync resolves conflicts in different versions of files during data exchange
Highlighting features of Palm OS devices

- Infrared port for communication with mobile phones and external modems
- Extension card slots
- Most compatible with the Dragonball processor from Motorola
Highlighting features of Palm OS devices

- Most Palm OS devices offer a display resolution $160 \times 160$ and 256 colour touch screen.
- Palm OS devices can be integrated with GSM/CDMA cellular phones.
- Devices easily serve as platforms for third party games, travel and flight planner, calculators, graphic drawings, preparing slide shows, etc.
The PalmOne Tungsten T5 handheld

- Uses the Palm OS
- Includes Palm desktop software for Windows and Mac both and other essential software
- 256 MB internal flash memory
Highlighting features of Palm OS devices

- Expansion slot support to MMC (multimedia card), SD (secure digital) memory card, and SDIO (secure digital input/output) memory card
- Doubles as a flash drive that enables quick drag and drop of files from a PC to the handheld
Symbian OS

1. Most widely used operating system for smart phones
2. Runs exclusively on ARM processors
3. Structure much like that of some desktop operating systems
Symbian OS

4. Offers pre-emptive multitasking, multithreading
5. Memory protection
6. Initially designed for handheld devices with limited resources, strongly emphasizes on memory conservation
7. Embodies event-based programming and when applications are not directly concerned with events, the CPU is switched off

8. Such techniques are very useful in conserving battery life
Features of a recent version of Symbian OS

- Support for WLAN Hindi and Vietnamese language support to serve a larger range of consumers
- Native support for Wi-Fi
- Support for FOTA (firmware over-the-air)
Features of a recent version of Symbian OS

- Improved memory management
- Low boot-time
- Native support for Push-to-talk
Symbian OS Based Nokia 9300
N9300

- Provides high-speed data-connectivity using EGPRS (EDGE)
- Advanced voice features such as a hands-free speakerphone and conference calling capability.
- A large storage memory which includes 80 MB of built-in memory plus a multimedia card (MMC) slot
N9300

- Compatible with most Lotus and Windows programs.
- Supports Microsoft Office formats (MS Office 97 onwards)
- Supports viewing of slide shows
- PIM interfaces for applications such as calendar, contacts,
N9300

- Internet connectivity for Web browsing
N9300

- PC synchronization feature
- Synchronizes and chains to a PC in the vicinity
- Integrates corporate solutions IBM WebSphere EveryPlace Access, BlackBerry Connect, Oracle Collaboration Suite
- Secure Mobile Connection using NVVPN Client
N9300

- Symantec Client Security 3.0
- Fujitsu Business Process Mobilizer
- Includes the Adobe Reader
- Sports the HP Mobile Printing software which enables Bluetooth connectivity with compatible printers for wireless printing
Linux for Mobile Devices

- Linux can be modified easily to suit different sorts of hardware and software applications
- Being an open source OS, it enables the user to customize their device to suit their specific needs
Linux

- Considered to be more secure than most other operating systems.
- Linux support is easily available from the many forums and associations that promote this OS.
- Many international mobile phone manufacturers turning to Linux for their OS requirements.
Summary

- Handheld Pocket Computers
- Pocket-sized Differ from smart phones and multimedia phones in that they can be programmed for customized applications
- Windows CE
- Active Sync for synchronization

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Summary

- Palm OS
- HotSync
- Symbian OS
- Linux
End of Lesson 02
Handheld Pocket Computers and Mobile System Operating Systems