Windows Embedded and .NET

Introduction to Windows Embedded and .NET Framework

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Windows Embedded and .NET

– **About Me**

- Over Eight Years of Consulting Experience
- Co-Author of the following books:
    - Beginning ASP.NET Using VB.NET
    - Beginning ASP.NET Using C#
    - Teach Yourself ASP.NET in 24 Hours
- Columnist, www.asptoday.com

Windows Embedded and .NET

- **What is Windows Embedded?**

  - "Windows Embedded is a family of operating system software from Microsoft for use in non-personal computer devices such as cash registers, automated teller machines (ATMs), industrial controllers, gateways, Internet Protocol (IP) telephones, server appliances, Windows-based thin clients, advanced consumer electronics, and specialized handheld devices." – www.microsoft.com

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- **Embedded Computing**
  - **Using software application for a non PC system such as set top boxes, handheld scanners, device controllers among others**
  - **Usually dedicated to a specific task**
    - **E.g. ATM Machines**
      - » **Acts like a teller**
      - » **You cannot play a video game although some of the ATM machines are capable of.**
  - **Locking Down the functions**
    - **Reliable**
    - **Well Tested**
    - **Cost control**

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- **Two Embedded OS from Microsoft**
  - **Microsoft® Windows® CE .NET:** the robust, real-time operating system for rapidly building the next generation of smart mobile and small footprint devices.
    - Small FootPrint (PDAs, SmartPhones, Cameras)
    - For use in X86 and non-X86 Processors (E.g. ARM, MIPS and X86)
    - Platform Builder to build image faster
  - **Windows XP Embedded:** the componentized version of Windows XP Professional, enabling rapid development of the most reliable and full-featured, connected devices.
    - Same Binary as XP Professional
    - Use in Retail POS terminals, Advanced set top boxes
    - Only X86 Processors
    - Target Analyzer and Target Designer to build OS configuration and analyze footprint impact.

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- – **Application Development**
  - • **Windows XP Embedded supports .NET Framework.**
    - – **Use XP workstation to develop and test application**
    - – **Use Visual Studio.NET**
    - – **Minimum or no learning curve involved**

  - • **Windows CE.NET supports .NET Compact Framework**
    - – **.NET CF contains a subset of classes available in .NET FW**
    - – **Using CE.NET Emulator, develop and test application using workstation**

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– **What is .NET Framework?**

- **Common Language Runtime and its wealth of classes**
- **CLR provides**
  - **Memory Management**
  - **Cross-language support**
  - **Code access security**

- **Languages in .NET**
  - **VB.NET**
  - **C#**
  - **Several other such as C++, Eiffel, COBOL etc.**
- **Web Services**
  - **XML and HTTP**

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- **Visual Studio.NET**
  - **Powerful IDE**
    - **Develop .NET Application using language of your choice**
    - **Integrated support for VB.NET, C# and C++**
    - **Advance Debugging capabilities**
    - **Quick Development of Web Services**

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- **Automotive Industry [TODAY]**
  - **GM's OnStar**
    - **Air Bag Deployment Notification**
    - **Emergency Services** by press of a button
    - **Stolen Vehicle Tracking**
    - **GM® Goodwrench® Remote Diagnostics**
    - Etc.
  - **Toyota's G-BOOK (Japan)**
    - **Toyota's G-BOOK Using Windows CE for Automotive**
    - Information Network Service
      - » News/Sports/Stocks/Weather
    - Safety and Security Service
      - » Roadside Assistance
      - » Stolen Car Tracking
    - Update Maps at local convenience stores (E-Tower)

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- **Automotive Industry [TOMORROW]**
  - .NET Connected Car Initiative
    - Voice Activated Smart System
    - Schedule Meetings
    - Answer emails
    - Receive Phone Calls

  - Automakers Support
    - **BMW's 7 Series** includes a navigation application, part of the innovative BMW iDrive concept.
    - **Mitsubishi's Mirage Dingo, Airtrek, Lancer Cedia and Chariot Grandis** include expert navigation capabilities.
    - **Subaru's Legacy Lancaster ADA (Japanese model)** includes a leading-edge navigation system, part of the latest Active Driving Assist (ADA) feature, which helps drivers negotiate driving challenges such as sharp turns.
    - **Volvo's S60, S80, V70 and Cross Country models** include a high-performance Road and Traffic Information (RTI) navigation system that incorporates locally based services and the Traffic Messenger Channel (TMC).

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- **Truly Connected:**
  - Schedule Maintenance
    - Alert the driver of the maintenance appointment
    - Contact the Dealer for an appointment
  - Breakdowns:
    - Contact the closest Repair shop
    - Contact for tow and ride service
  - Home Appliances
    - Contact Refrigerator for inventory check
      » So you know to buy Milk while you are on the road
    - Turn down the thermostat at home on a hot day
      » To make the house cooler as you would like it
    - Turn the water sprinkler in the garden
      » So if you are going to be late to home that day the plants wont die.

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- **Summary**
  - Choice of OS
    - XPe
    - CE.NET
  - Developer Support
    - .NET Framework
    - .NET Compact Framework
    - VS.NET 2002/2003
  - Language Choice
    - VB.NET
    - C#
    - C++
  - Automotive Technology
    - Today (OnStar, G-Book)
    - Future (Connected Car and more)

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Q & A