

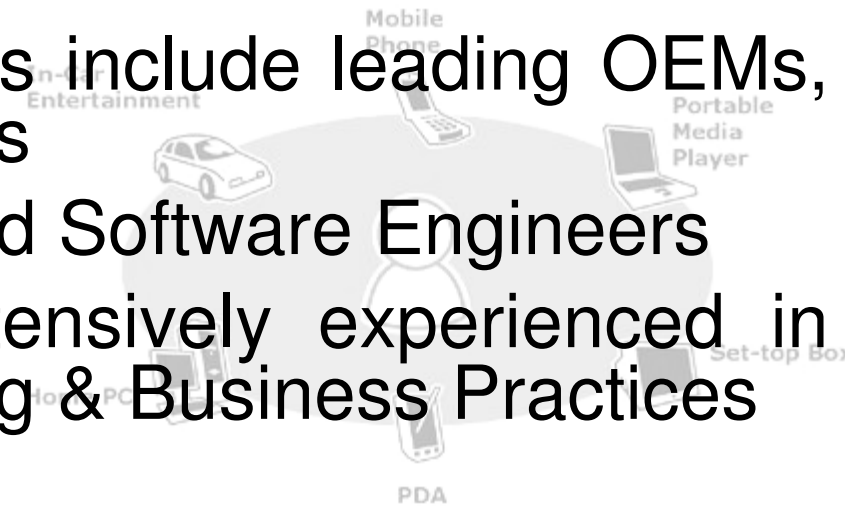
**PATHPARTNER**

# Product and Service Offerings on Android

12<sup>th</sup> October 2009

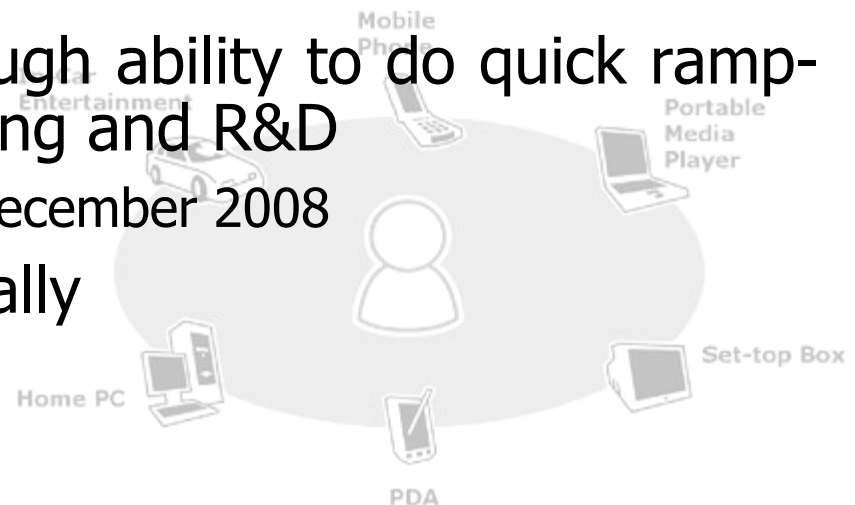
# Company Background

- ◆ HQ and R&D Center in Bangalore, India
- ◆ Sales & marketing presence in USA, Japan
- ◆ Provider of Consulting, Services and Solutions for digital media centric devices
  - ◆ Product Engineering/R&D & System Integration services
  - ◆ Solutions include Middleware, Apps & System solutions
- ◆ Customers and Partners include leading OEMs, Silicon and OS providers
- ◆ 90+ DSP and Embedded Software Engineers
- ◆ Management team extensively experienced in Technology, Engineering & Business Practices



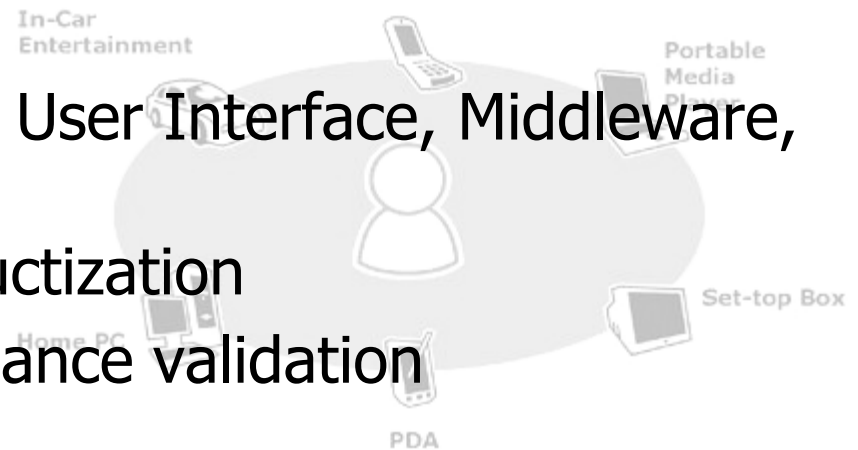
# Android Program Objective and Value Proposition

- ◆ Deliver vertical specific platform to OEM/ODMs
  - ◆ Value delivered through pre-integration of HW accelerators, software IP and key applications
- ◆ Provide Engineering services to Silicon customers and OEMs
- ◆ **Skill differentiation through extensive experience in multimedia, strong background in Graphics and Linux**
- ◆ Services differentiation through ability to do quick ramp-up enabled by internal training and R&D
  - ◆ Internal R&D program since December 2008
- ◆ Roadmap to ramp-up gradually



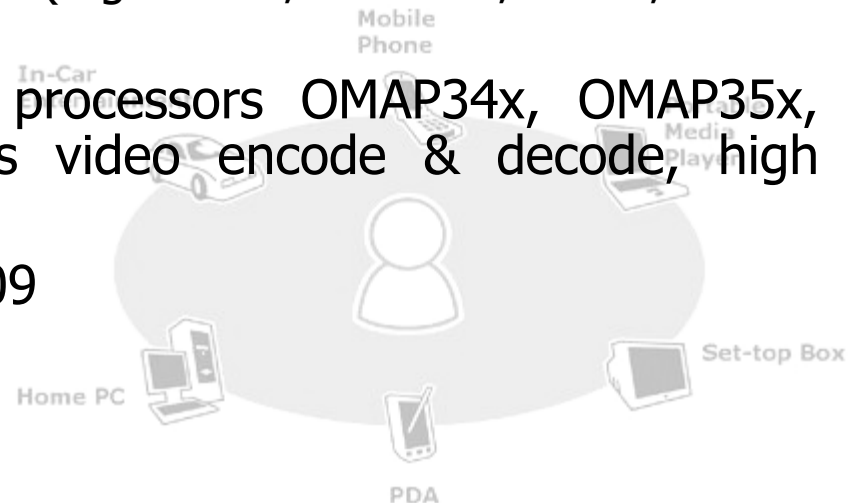
# Our Services

- ◆ Application Development
- ◆ Porting Application from conventional Linux platform (e.g. Mobile/LiMO, PC/Ubuntu) to Android
- ◆ Baseporting and Device Driver development
- ◆ System level performance optimization for multimedia and graphics
- ◆ Multimedia codec customization, Framework (e.g. OpenCore, Gstreamer) plug-in development & Optimization
- ◆ Platform customization (e.g. User Interface, Middleware, Localization)
- ◆ Open Source software productization
- ◆ System Testing and performance validation



# Products and Solutions on Android

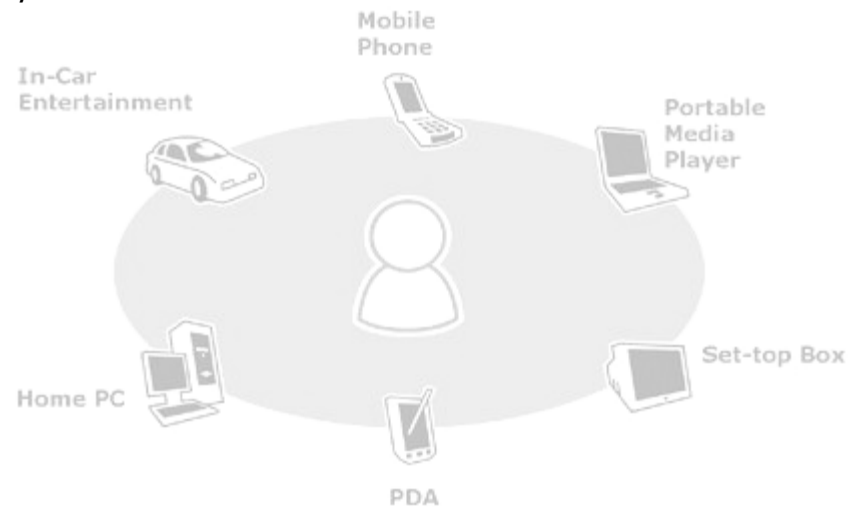
- ◆ Android based media phone system solution
  - ◆ Supports VOIP, Video Telephony, IM, Rich Media Services, Online Media\*
  - ◆ Networked Media Applications
    - ◆ Photo viewer with Flickr/Picasa, Home Network (PC)
    - ◆ Video Player with Youtube and other online video supporting TV, movie trailers etc.
    - ◆ Music Player with online music
    - ◆ Rich Media Internet Services (e.g. News, weather, stock, Ticket services, calendar etc)
  - ◆ Based on latest application processors OMAP34x, OMAP35x, iMX51 supporting D1 30 fps video encode & decode, high performance graphics etc.
  - ◆ Solution will be ready by Dec'09



# Products and Solutions on Android

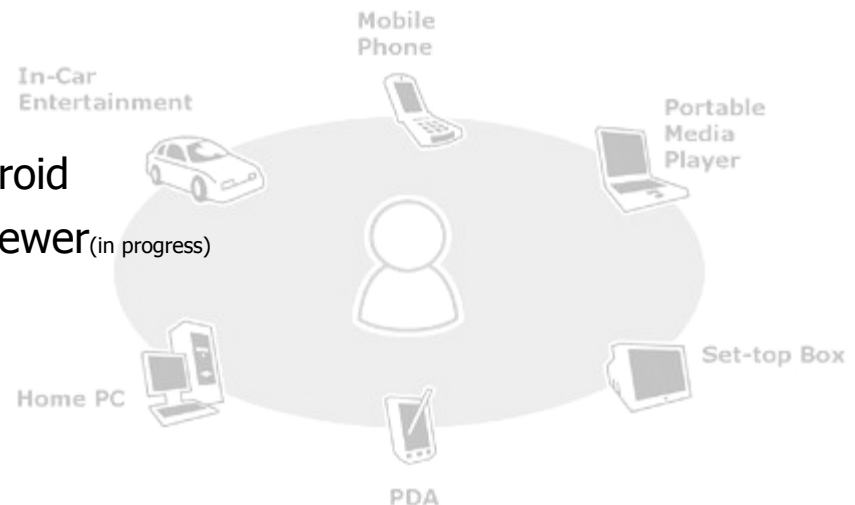
- ◆ Android core platform enhancement involving
  - ◆ Gstreamer, OpenCore
    - ◆ For Video, Audio
  - ◆ DLNA
    - ◆ For content sharing with-in the home
  - ◆ Graphics GPU/OpenGL ES/OpenVG
    - ◆ For SKIA, Webkit, Game Acceleration
  - ◆ SKIA, Surface Flinger, Copybit Library

*\*Seeking and in discussion with partners for key IP components*



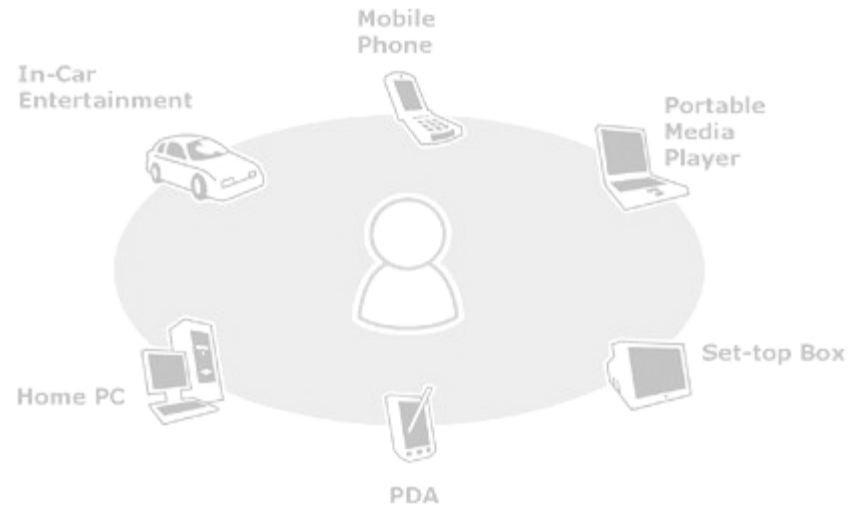
# Android Experience –Case Studies

- ◆ Fast boot: Boot-time optimization to ~8 seconds
- ◆ USB WiFi dongle driver integration
- ◆ Gstreamer Porting
  - ◆ Ported for Bionic, Integration with Android JNI
  - ◆ Integration of HW MPEG4 and H.264 Decoder
- ◆ HW JPEG decoder Integration with SKIA
- ◆ Copybit and Surface Flinger Acceleration using on-Chip display HW (blitter, Color Conversion, scaling, rotation, fast-copy)
- ◆ Open Source DLNA Integration
- ◆ Photo Viewer
  - ◆ 3D (SkIA based) Photo viewer on Android
  - ◆ High Performance networked photo viewer (in progress)
- ◆ Digital Post-it application (in progress)



# Future Roadmap

- ◆ SKIA acceleration using GPU (Graphics)
- ◆ Application acceleration using GPU(Graphics)
  - ◆ Applications that require Font , SVG , 2D/3D animated effects
- ◆ Video Telephony Application
- ◆ Video/Music Player integration with online video/Music service
- ◆ USB Host Framework integration
- ◆ Personalised service delivery
- ◆ Platform productization



# Wireless Handset System Integration –Case Study

- ◆ Windows Mobile 6.1 based on baseband processor
- ◆ Handset Board Bring-up
- ◆ Driver Development (NAND, LCD, Keypad, backlight, Audio, Camera)
- ◆ Driver Porting
  - ◆ SD driver from reference to handset hardware
- ◆ Connectivity peripherals
  - ◆ Peripheral (WiFi, Bluetooth, GPS) bring-up and system & performance testing
  - ◆ Feature addition to GPS stack (TLS in SUPL 1.0)
- ◆ Power management and optimization
  - ◆ Standby and active power optimization
- ◆ Multimedia system performance optimization
  - ◆ Multimedia sub-system, Camera/Video player Application
- ◆ More than 10 Member expert team
- ◆ Onsite support @ Customers locations at APAC
- ◆ Others – Cross platform porting of Webkit, 3D widget framework

