

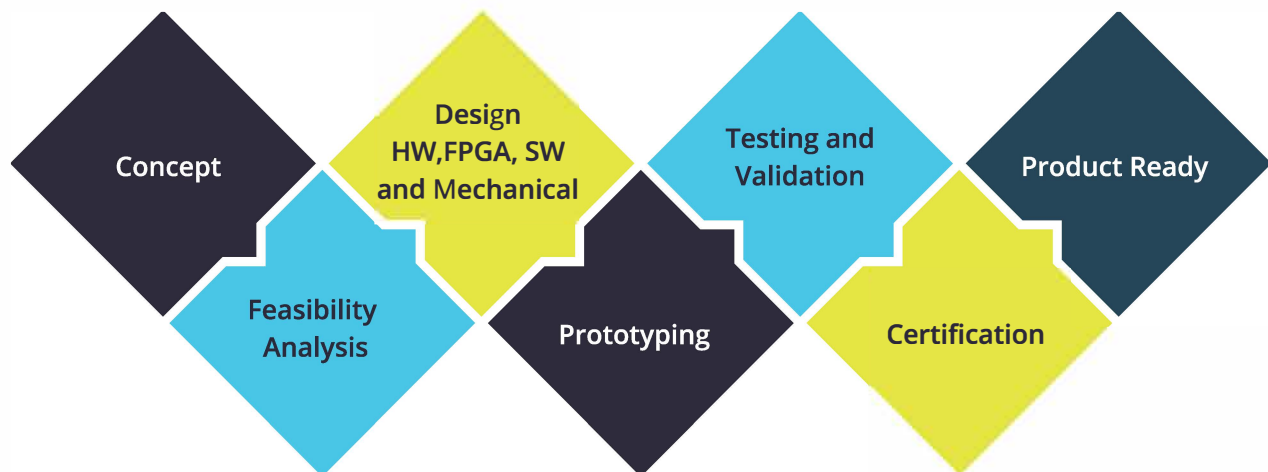
Engineering Innovation with End to End Embedded Design Services

www.happiestminds.com



Happiest Minds Technologies offers a wide range of Embedded Design Services that would help to transform an idea into a complete product. With expertise in every phase of the product life cycle, Happiest Minds Technologies brings in a wealth of people experience in designing a variety of products cutting across various domains such as:

- Computing
- Consumer
- Datacenter
- Defense
- Education
- Healthcare
- Industrial
- Internet of Things
- Storage
- Surveillance
- Telecom
- Test and Measurement
- Wearable



End to End Product Development

From miniature wearable devices to complex system designs, Happiest Minds is a one-stop-shop for any electronic product design requirement. As firm believers of first time right designs, we follow proven practices that ensure superior product quality, extended availability and manufacturability at an optimized cost. We undertake design of products such as:

- Single board computers: Custom Designs, Standards Based designs
- System on Modules and carrier boards: COM Express, SMARC, Qseven, PC/104 etc
- Test and Measurement Equipment and Accessories: Protocol Analyzer boards, Interposers and Adapter boards for PCIe Gen4/3, SAS-3, USB 3 and similar
- Wearable devices
- IOT Gateways, Edge Devices
- Healthcare devices
- Servers, Storage solutions
- Data acquisition I/O boards
- Industrial control systems
- Surveillance: IP cameras and Controller boards
- Networking devices – Modems, Routers, Switches etc
- System design: Custom and Standards based, Active/-Passive Backplanes, Add-on Cards, Mechanicals, Cooling/Thermal Simulation
- FPGA validation on hardware

Offerings

Board Design Services

- Feasibility Analysis
- Schematics & PCB Layout and Gerber Generation
- Pre & Post layout SI Simulation
- Power Integrity Analysis
- FMEA Analysis, MTBF Prediction
- Thermal simulation
- PCB Fabrication & Assembly
- Board bring-up & Functional testing
- Design Verification Tests
- Environmental, Shock and Vibration Tests
- EMI/ EMC & Regulatory certification
- Cost reduction, Obsolescence management
- Pilot production
- Production Support

Firmware Design Services

- Boot loader development
- Device driver development
- Board Support Packages (BSP)
- OS Porting / OS Migration
- Protocol stack porting/ integration
- Feature enhancement
- Cloud Connector (Azure IoT Edge, Amazon Greengrass, PTC ThingWorx)
- Messaging Protocols - MQTT, HTTPS, COAP, AMQP
- Embedded UI/UX
- Integration / Porting of Wireless Protocols
- Production test automation
- Manufacturing test software

FPGA Design Services

- RTL and Test bench design (VHDL and Verilog)
- Micro architecture definition
- Functional and timing simulation
- Platform migration
- Resource Optimization (Logic, I/O, Speed)
- IP core development
- Glue logic design
- 3rd party IP core integration
- ASIC prototyping in FPGA

FPGA/ ASIC Verification Services

- Test bench architecture and verification plan creation
- Verification environment design and development
- Test case development and execution
- System/ SoC/ IP/ Subsystem/ Block level verification
- Verification Services based on VHDL/ Verilog/ System Verilog/ UVM/ OVM
- Assertion based verification
- Code coverage and Functional coverage
- Gate level simulation

Mechanical Design Services

- Industrial design
- Rapid prototyping
- Sheet metal/ Plastic enclosures
- Drawing format conversion
- Packaging/ carton design
- Label design
- Thermal design and cooling solution

Success Stories

<ul style="list-style-type: none"> ● PCIe/104 SBC based on 6th Gen Intel processor with 20GB DDR4 RAM, multiple display interfaces, for industrial applications ● BIOS Customization to Support various LCD resolutions, Configurable boot sequence (Network, USB or SATA), Customizable splash screen. ● Linux/Windows OS support. 	<ul style="list-style-type: none"> ● IOT gateway and data logger for energy management - ARM9 processor with I/O such as Wi-Fi, Ethernet, 3G, RS485, uSD, NAND flash. ● Linux OS based design supporting multiple cloud connectivity options. 	<ul style="list-style-type: none"> ● Wi-Fi enabled LPG/PNG Gas Leak detector for safeguarding homes against gas leak hazards. ● Enhanced cybersecurity features - mbedTLS1.2 for secure operation with symmetric encryption, Secure boot, Flash encryption, Firmware signing using ECDSA P-256 secure keys. ● Free RTOS based design.
<ul style="list-style-type: none"> ● Low power, high performance Micro-server based on Intel Atom/Xeon processor for cloud hosting applications. ● Headless system implementation with static and dynamic PXE boot support. Dynamic PXE configured from management MCU through UART. ● Both Legacy and UEFI boot support. Linux Server OS. 	<ul style="list-style-type: none"> ● Real-time Industrial Data Acquisition system, based on Cortex-A9 processor with Analog and Digital I/Os, EtherCAT, FPGA based PID loops for error correction. ● TI RTOS, TI NDK (Light weight tcp/ip stack). ● Industrial sensing and controlling. 	<ul style="list-style-type: none"> ● Configurable Storage Array (SAS-3, NVMe, SATA or PCIe) with 96TB storage space, based on Intel's Buchanan Pass Mother Board. ● SAS-3 version based on Avago's SAS Controller, SAS3224 and NVMe version based on Microsemi's 96 Port PCIe Switch, PM8546.
<ul style="list-style-type: none"> ● Arria 10 GX FPGA based NVMe bridge for a storage server following custom RAID group configuration. ● Supports 2 NVMe SSD modules over x4 PCIe Gen 2 interface, proprietary dual data rate protocol @ 500MHz, NIOS II processor, DDR4. 	<ul style="list-style-type: none"> ● Verification of PCIe Gen 3/4/5 analyzer, exerciser and jammer products. ● PCIe Gen 3/4/5 VIP, HMC/DDR4 memory models integrated. ● Xilinx and Altera device libraries based environment 	<ul style="list-style-type: none"> ● Verification of Gen Z over PCIe analyzer, jammer products. ● Gen Z VIP, PCIe Gen 4 VIP, DDR4 memory models integrated. ● Xilinx device libraries based environment.

Happiest Minds Advantage



**Accelerate
Time to Market**



**End to End
Capability**



**Technology
Expertise**



**First Time
Right Design**

About Happiest Minds Technologies

Happiest Minds, the Mindful IT Company, applies agile methodologies to enable **digital transformation** for enterprises and technology providers by delivering seamless customer experience, business efficiency and actionable insights. We leverage a spectrum of disruptive technologies such as: Big Data Analytics, AI & Cognitive Computing, Internet of Things, Cloud, Security, SDN-NFV, RPA, Blockchain, etc. Positioned as "Born Digital . Born Agile", our capabilities spans across product engineering, digital business solutions, infrastructure management and security services. We deliver these services across industry sectors such as retail, consumer packaged goods, edutech, e-commerce, banking, insurance, hi-tech, engineering R&D, manufacturing, automotive and travel/transportation/hospitality.

Headquartered in Bangalore, India; Happiest Minds has operations in the U.S., UK, The Netherlands, Australia and Middle East.



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To know more about our offerings. Please write to us at business@happiestminds.com