







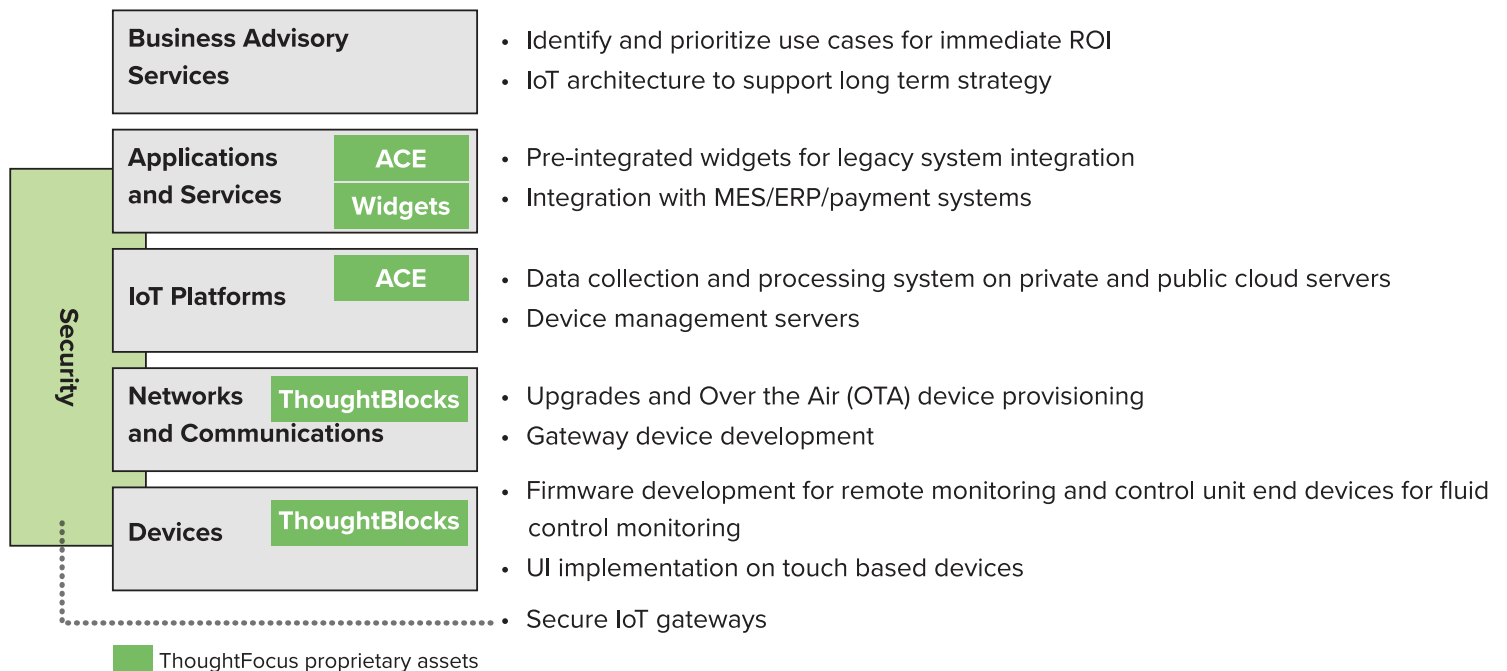
Internet of Things (IoT) and Embedded Engineering

Our IoT and Embedded Engineering services enable manufacturers to optimize their existing systems and drive innovation. Whether it's reducing energy costs, creating new customer experiences or even developing a new line of "smart" products, we can help.

We take a business outcome approach to IoT and Embedded Engineering

-  **Speed to market with rapid prototyping**
-  **New revenue opportunities from "smart" products**
-  **Real time monitoring of assets and inventory with alerts**
-  **Differentiated new product features**
-  **Reduced energy usage and operating expense**
-  **Predictive maintenance programs to extend machine operating life**

We establish a clear solution roadmap and IoT architecture enabling companies to get immediate and long term ROI on their IoT projects. Pre-built IoT integrations, widgets, and assets speed deployment time and reduce risk. We focus on business outcomes and not any particular technology stack, or on our own technology platforms. This enables us to approach the business problem with a unique perspective.



Examples of Our Work

Smart Product Development



Overview

ThoughtFocus worked with Kohler, a leading kitchen and bath manufacturer, to produce a line of “smart” fixtures that automate user preferences for water temperature, shower heads, body sprays through a UI that incorporates touch, gestures, and voice activated commands. A mobile app for personalization was also developed.

Benefits

- Ability to roll out quick prototypes
- Enhanced user experience

- Assured product compliance to industry standards
- New product development cost reduced by 10-25%

Solution Highlights

- We took end-to-end product ownership, including regulatory compliance. The solution included:
- Firmware development for different devices
- UI Implementation on Touch based devices
- IoT Secure Gateway

Manufacturing Process Automation



Overview

ThoughtFocus worked with an industrial components manufacturer to improve production efficiency and increase worker productivity. Production floor materials monitoring and tracking were introduced using an active RFID system, including geo fencing. Alerts and notifications are triggered by repositioning materials /machines. A new job card management system based on RFID replaced a legacy counter based system.

Benefits

- Effective equipment monitoring
- Improved manufacturing performance with faster throughput

- Manufacturing and product intelligence capability established

Solution Highlights

- Production floor display modification for notifications required development of gateway, sensors, and servers for monitoring the machines and materials
- Material tracking in production floor to the SAP DB required development of HMI system based on ARM processor with open source HMI application
- Firmware development for protocol converters across different protocols like Modbus, Wi-Fi, Zigbee, BLE, GRPS / 3G.

Home Automation Equipment



Overview

ThoughtFocus partnered with a consumer products company to develop an automation services platform for a smart home. The system can be integrated with other home devices.

Benefits

- Rich user experience through gesture control and voice based control
- Remote control of home functions

- Improved functionality impacting energy savings, security, comfort

Solution Highlights

- Firmware development for different protocol stacks like Zigbee, BLE, PLCC
- Integration of security devices to visitor management system
- Development of home automation gateway based on embedded Linux on ARM processors

About ThoughtFocus

ThoughtFocus is a privately held technology and services company serving middle market to large enterprise clients in Professional Services, Manufacturing, Financial Services, Higher Education and Aerospace. Clients look to ThoughtFocus for innovative solutions in product engineering, knowledge process outsourcing, and digital transformation. The company has over 1,900 employees globally and is one of the fastest growing technology services companies. ThoughtFocus is a technology partner and portfolio investment company of Blackstone, a leading private equity firm.

ThoughtFocus has its US offices in New York City, Milwaukee, Atlanta, Dallas and Irvine with delivery centers in India at Bengaluru, Mysuru, Gurgaon, Hyderabad and in the Philippines at Baguio City.