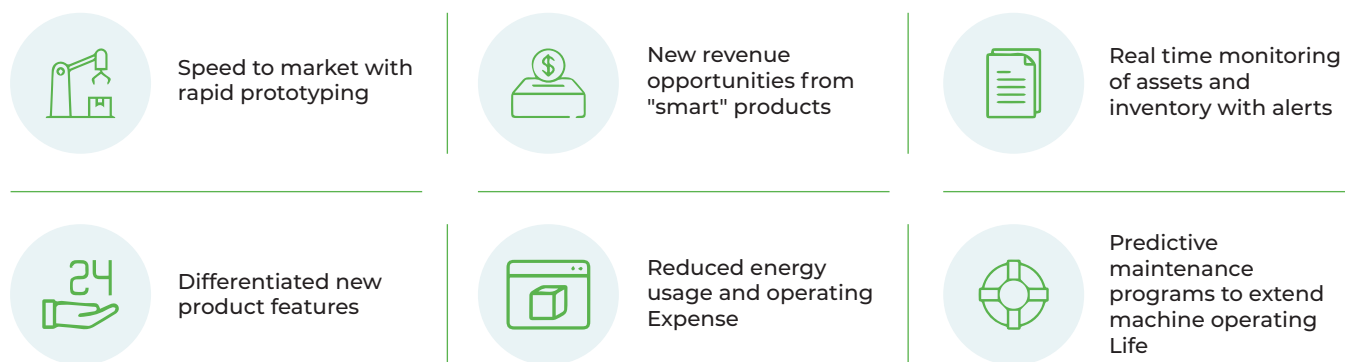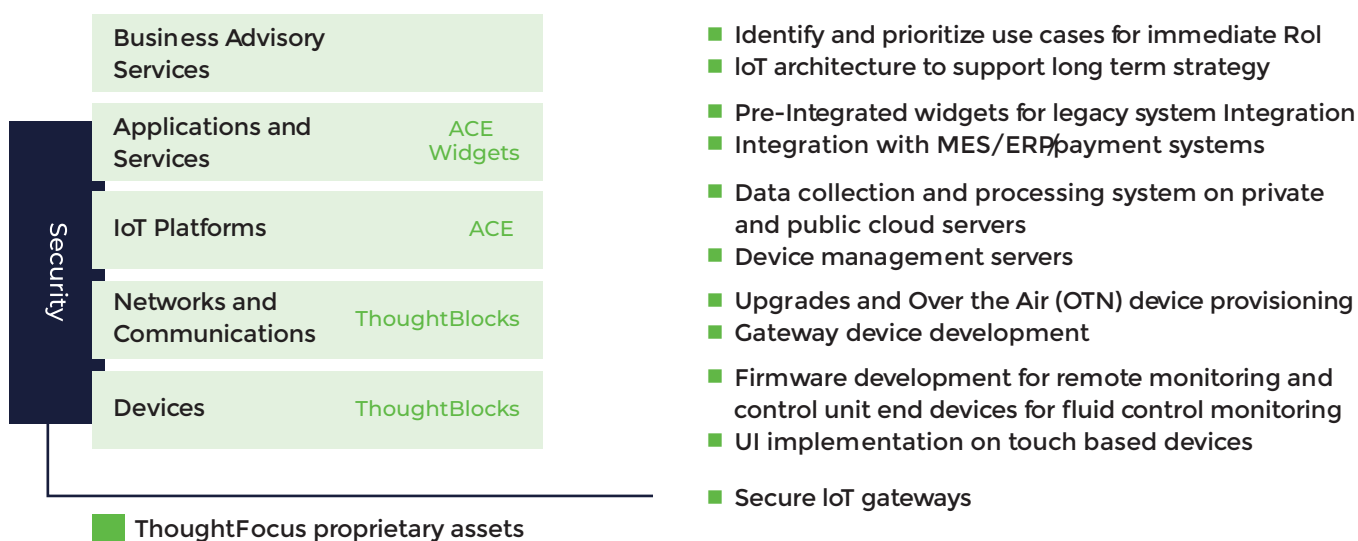# THOUGHTFOCUS

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 road map 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.

Security	Business Advisory Services	
	Applications and Services	ACE Widgets
	IoT Platforms	ACE
	Networks and Communications	ThoughtBlocks
	Devices	ThoughtBlocks

■ ThoughtFocus proprietary assets

- ■ Identify and prioritize use cases for immediate RoI
- ■ IoT architecture to support long term strategy

- ■ Pre-Integrated widgets for legacy system Integration
- ■ Integration with MES/ERP/payment systems

- ■ Data collection and processing system on private and public cloud servers
- ■ Device management servers

- ■ Upgrades and Over the Air (OTN) device provisioning
- ■ Gateway device development

- ■ Firmware development for remote monitoring and control unit end devices for fluid control monitoring
- ■ UI implementation on touch based devices

- ■ Secure IoT gateways

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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 effciency 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

ThoughtFocus helps forward-looking companies and organizations in the financial services, manufacturing, and higher education/public services sectors innovate and achieve a better future faster. ThoughtFocus' innovative and cutting-edge technology solutions enable its customers to deploy new capabilities faster, deliver better user experiences, and drive operating efficiencies. We do this through executional excellence and mitigating the risk of change. With headquarters in the U.S., the Company has more than 2,100 employees in locations spread across five countries.

For more information, please visit the company website www.thoughtfocus.com.

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