Embedded Software
The Foundation of New- and Unconventional Growth in Automotive and Industrial Equipment
In short, these intelligent devices are the true workhorses of the IIoT. All, moreover, are dependent on embedded software—the lynchpin of the entire system.

Embedded software drives the connectivity and intelligence that characterizes the IIoT. Without it, and the engineering know-how that sustains it, companies could not develop the new products that enable new opportunities, while maintaining existing demands.

The IIoT maturity model and transformation journey

We see the IIoT transformation journey taking businesses through a roadmap that opens new opportunities as they mature.

In most cases, making the case for operational efficiency is a low-hanging fruit providing easy-to-estimate return. As strategies re-align over time, new top line opportunities arise thanks to previous investments and organizational realignment that provide truly disrupting opportunities.
opportunities to create more customer touch points, thus driving incremental revenues.

Siemens, for example, is providing utility companies with advanced smart grid solutions and services focused on data management and systems integration that will improve their energy efficiency and grid reliability. While GE Software is working on a groundbreaking intelligent pipeline solution that will help make the most of the US$40 billion the industry spends annually on infrastructure modernization by providing the data needed for workforce planning in real time and enabling improved pipeline safety.

Stage 1: Operational Efficiency

From shop floor to top floor, embedded software enables the connected and intelligent applications, machines, products and people that sustain a more operationally efficient enterprise.

Such digitally automated manufacturing can boost productivity by as much as 30 percent. In the mining industry, for instance, connected site equipment can identify degradation and predict necessary maintenance. And predictive maintenance not only minimizes plant downtime (by as much as 70 percent); it can also reduce overall maintenance costs by up to 30 percent.

Moreover, by optimizing their operations through connectivity, companies can gain opportunities to create more customer touch points, thus driving incremental revenues.

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Stage 2: New products and services

Embedded software also provides the foundation for the entirely new functionalities that can fuel innovation and faster time to market. It’s responsible, for example, for the success of the iPhone, which has revolutionized the user interface by enabling intuitive access to it.

Automotive and industrial equipment companies can leverage the power of embedded software to build new business models by providing service add-ons, bundling information services as subscription services, and treating these hybrids as input to R&D.

The user interface in a GPS receiver that allows car drivers to use navigational software in real time is one example of how embedded software can generate new value in the automotive sector. But in an era when half the value of a vehicle comes from software and electronics, carmakers could go much further. By providing drivers with the means to order in-car entertainment systems and other embedded services, directly, from their vehicle, for example, they could build a much closer relationship with them—and open a new sales channel.

In another example, Accenture is working with Caterpillar Inc. in using telematics to enable advanced connected equipment services for its industry segments and their customers. And leading healthcare companies are leveraging a network of connected devices, often coupled with the insights enabled by Big Data and analytics, to improve patient care.

Stage 3: The outcome economy

The connected, intelligent enterprise is perceptive enough to sense its own needs and those of its customers, and to relate intuitively to the outcomes that both seek. By exploiting embedded software to build a flexible ecosystem, it can share risk and create integrated, cross-industry product and service bundles that deliver those outcomes.

Consider, for example, the proof of concept from Accenture in partnership with Philips and Emotiv, the Australian electronics software company. The wearable, digitally enabled device puts muscular dystrophy sufferers in control of their environment by allowing them to use their own brain waves to turn lights on and off or change room temperature thermostats—a truly cutting edge application of embedded software.
Stage 4: Autonomous control and automation

This final stage of the Industrial Internet of Things journey envisions fully automated manufacturing. Human involvement is minimized in a system equipped, thanks to embedded software, with a real-time supply chain. And automation, which is also dependent on embedded software, takes care of such critical issues as skills shortages and safety in the manufacture of cars and industrial equipment.

Case in point: the award-winning Accenture Life Safety Solution, a wireless enabled multi-gas detection system developed in partnership with Aeroscout, Cisco and Industrial Scientific, which alerts plant managers to remote safety incidents and improves worker protection in potentially hazardous situations.

For most players, such fully automated manufacturing processes are a long way off. When Accenture recently surveyed more than 1,400 global business leaders, 84 percent confidently asserted that they could create new income streams from the IIoT. Yet 73 percent still hadn’t made concrete plans to do so, and only seven percent had developed a comprehensive strategy backed by matching investments.

Plenty, however, have embarked on the IIoT journey—and growing numbers recognize that embedded software is key to unlocking its value. Indeed, embedded software is changing not only perceptions of what industrial products and services actually are, but also how they are developed. By connecting devices continuously and in real time, and by enabling new functionalities, it provides the foundation of all that the IIoT promises to deliver.

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Why Accenture

Accenture is uniquely positioned to help industrial and automotive companies achieve the business model transformation they need to realize the full value of embedded software and the Industrial Internet of Things.

The IIoT is our strategic priority. Our dedicated technology R&D organization—a global operation with more than 250 researchers filing an average of 30 patents and innovation disclosures every year—works in close collaboration with Accenture Digital, Technology, Strategy, Operations and Consulting to test and pilot new capabilities and proofs of concept that eventually turn into new service offerings.

We recognize that the IIoT stands on integrated building blocks. Embedded software enables its connectivity, and analytics, unified application lifecycle management/product lifecycle management (Unified ALM-PLM), industrial automation, and as-a-service business models help unleash the full potential of its digital eco-system.

We have invested in every one of these building blocks, both through acquisition and the organic development of our own services, which include Accenture Product Lifecycle Services and Industrial Software Solutions, as well as such Digital services as Connected Vehicles and Connected Plants.

We have a full range of product development services in the embedded software space. These range from drive control development, through communication processors development, to specific embedded software development.

We understand the security implications of the IIoT. A complex distribution network characterized by multiple owners and creators of data is peculiarly vulnerable to attack. Which is why we’re committed to secure-by-design principles and to working with designers, operations teams and security organizations to develop the safest possible solutions.

We have deep technology transformation expertise. Our Connected Vehicles solution platform, for example, leverages technologies similar to those on smartphones and tablets to help some of the world’s leading carmakers diagnose data in real time—and gives their customers the software updates they need for more in-car control.

We have the partnerships in auto and industrial equipment to go forward and deliver on your goals. We are, for example, members of the Industrial Internet Consortium, which was formed to accelerate the development, adoption and use of the IIoT.

Yet we are also technology-agnostic. We partner with the industry-leading solution providers but will always find the right individual solution for each of our clients, regardless of provider. Our services are organized to provide an end-to-end solution, or to tailor a single element of a client’s industrial ecosystem.

You can rely on us to support your multi-year journey to full IIoT efficiency and effectiveness. We cover all of the five growth platforms that support the IIoT: Digital, Technology, Strategy, Operations and Consulting. We serve more than half of the automotive and industrial companies in the Global Fortune 500. We have the capabilities and experience to address your needs, globally, at scale.
Citations


About Accenture

Accenture is a global management consulting, technology services and outsourcing company, with more than 336,000 people serving clients in more than 120 countries. Combining unparalleled experience, comprehensive capabilities across all industries and business functions, and extensive research on the world’s most successful companies, Accenture collaborates with clients to help them become high-performance businesses and governments. The company generated net revenues of US$30.0 billion for the fiscal year ended Aug. 31, 2014. Its home page is www.accenture.com.

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