Harness the Power of the Internet of Things in Manufacturing

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The Internet of Things is Here. Are you Ready?
The era of the Internet of Things (IoT) has dawned, propelled by the growth of cloud technology and connectivity. IoT solutions are here to stay, and they have – and will continue to – transform the way our world operates. Industry 4.0 is the term coined to explain this fourth industrial revolution we are seeing as ‘smart factories’ emerge. The Internet of Things is changing the way many manufacturers interact with their products and customers – influencing manufacturing giants to shift their emphasis from how well they manufacture their products to how well their customers consume and benefit from those products.

The applications and challenges of IoT solutions vary across each industry and organization. Enterprises today struggle to understand not only how to incorporate IoT solutions into their businesses but also how to calculate the associated costs. Many companies view these challenges as major inhibitors to even consider investment in IoT solutions. At the same time, they realize that neglecting to implement IoT solutions today will soon leave them behind the curve, holding them back from capitalizing on huge opportunities to penetrate new markets and provide deeper value to their customers. Organizations that do choose to incorporate IoT solutions must figure out which use-cases best fit their business needs and how they can properly monetize those applications to support continued innovation.

Applications
Today, we live in a world in which the Internet of Things has the potential to solve the major challenges of any industry. For heavy equipment manufacturers, the concept of sensing, tracking, and reporting vehicle telematics and machine health on local control panels has never been a foreign idea, but this capability was not possible for remote machines until IoT systems brought the power of remote data transfer. Now the ability to remotely monitor the activities and notifications from unplanned events or failures can improve the security of equipment and the safety of the people around it. Manufacturers using IoT systems leverage the data they capture over time to predict machine failures and maintenance requirements. They also analyze this data to understand when and how customers consume their products, providing them the insight to understand the specific needs of their customers to create customer-centric designs and products.

As the IoT market expands, more users adopt modern technology, and technology systems advance, the applications of IoT solutions will evolve beyond these basic use-cases. In fact, more and more business models utilizing IoT software are emerging, such as pay-
as-you-drive insurance offerings, smart waste bins on city streets, and remote healthcare services. IoT systems promise to soon deliver even more solutions to real business problems and, as a result, spur many enterprises to explore new ways of using these systems.

Organizations have progressed beyond mulling over the theoretical concepts and potential of IoT software to implementing real IoT solutions that generate quantifiable benefits for both internal and external use-cases. Businesses today drive down costs by using Internet-enabled products and generating new revenue streams through connected customer data. Gartner recently conducted a survey on manufacturers that have created IoT-connected systems to identify the top three drivers behind creating those products. The results showed “Improving total effective equipment performance” as the top choice with 37% resonance, followed by “creating new customer experience with the product” with 31%. This research illustrates the momentum among manufacturers to embed IoT software as part of their product or service offerings to maintain and increase competitive landscape and customer loyalty.

Challenges
While organizations embracing IoT solutions have huge opportunity to realize digital transformation, implementation data from IoT projects reveals that IoT initiatives often fail to live up to ROI expectations. Gartner predicts that by 2019, 50% of IoT-enhanced products will not have met planned financial objectives. Thus, it becomes critical for organizations planning to implement IoT to carefully review their solutions and take measures to avoid these common IoT failure points, such as:

- Creating solutions without quantifiable and measurable business benefits.
- Failing to properly estimate the full operating costs and maintenance expenses of solutions.
- Creating solutions that target multiyear financial payback time.

Given the Internet of Thing’s nascent and rapidly evolving nature, organizations must ensure that IoT solutions deliver on the financial goals and objectives that IoT technology promises its investors.

The Internet of Things encompasses an immense field with such an expansive scale of applications that it may seem unfathomable. As advancing technology disrupts our world, remember to start with smaller projects with agile solutions that build on each other over time to collectively create the best environment for the Internet of
Your Things. Through information transmitted via sensors, Big Data, and analytics, IoT will help us learn the language of our machines to enable us to understand them better and work together with them for the best results.

Industry 4.0
Over time, there have been several industrial revolutions including the advent of steam and electrically powered machines, mass production through the assembly line, and the beginnings of automation. We are currently entering into a fourth industrial revolution.

Industry 4.0 has emerged with a level of automation, connectivity, and decision making that will make the “smart factory” concept a reality. For a system to be considered Industry 4.0, it must contain a level of interoperability, information transparency, technical assistance, and decentralized decision-making. It is important to note that a critical part of this system is that the machines, things, and humans are all working as an interwoven web – and both man and machine are necessary for ultimate efficiency.

Industry 4.0 is a radical shift that is expected to evolve over time. As companies embark on this journey, it is important to mitigate potential risks to empower them to reap the benefits of Industry 4.0. Ensuring data security through this transformation is paramount since more systems will need access to actionable data in real-time.

Mazik’s Approach
Mazik has worked with many customers who are inspired to adopt Digital Transformation but are not 100% sure as to where to start or which approach to take. We work with Gartner to help customers identify use-cases and steps they
can take now to see success in Digital Transformation later. To do this, we work with our clients to map out their current business processes and imagine what their future processes should look like. Mazik provides an end-to-end approach to enable our customers to connect and analyze their data in a meaningful way. We employ an iterative and agile implementation methodology to bring our customers the benefit of IoT in record time. Mazik also helps customers understand Total Cost of Ownership from both short-term and long-term perspectives, so organizations can set proper expectations, and projects realize the ROI, TCO, and customer satisfaction goals.

**Mazik’s Solution: MazikThings**
MazikThings – Our end-to-end IoT solution is a secure, scalable system built on Dynamics 365 to manage, monitor, and track operations. Mazik takes a Sense-to-Action approach, bringing a pre-built, integrated solution developed on top of Microsoft Dynamics 365. We have built-in integration between Gateway platforms, MazikThings sensors, and other solutions to deliver an end-to-end solution for telematics & safety, predictive maintenance, and connected field service.

**Predictive Maintenance**
Predictive maintenance prevents wastage of data. MazikThings allows the storage and archiving of both historical and new machine data and performs artificial intelligence-based predictive analytics on Big Data in real-time with custom dashboards. The platform also enables identification of data-point series that indicate a machine is on verge of break down, preventing downtime, additional costs and long-term damage.

**Telematics & Safety**
MazikThings provides the ability to remotely monitor machines, view online and offline machine displays, patch and configure devices and gateways, gather data, and provide alert mechanisms based on anomaly detection. These embedded machine performance insights promote optimization of design and engineering processes for continuous product improvement. The platform manages relationships between you, your customers, and your machines. Through telematics, MazikThings minimizes machine downtimes, increases equipment lifetimes, and improves productivity to reduce costs and increase overall revenue.

**Connected Field Service**
Connected field services empower organizations to deliver predictive and proactive services to improve customer satisfaction, first-time fix rates, and resource productivity through automation and advanced scheduling, resource optimization, and mobile enablement capabilities. MazikThings helps reduce customer complaints, minimize operational inefficiencies, and plan field service efficiently.

*Source: Mazik Global*
Jump-Start Your Industrie 4.0 Initiative by Leveraging Business Moments

Business moments are a foundational building block for Industrie 4.0 and IoT initiatives, as physical and virtual data value chains blur. CIOs can benefit from business moments, especially in the early phases of planning digital transformation initiatives.

Key Challenges

- Organizations often misunderstand Industrie 4.0 as a purely technical discipline, as IoT vendors often overwhelm them with technology solutions instead of value-chain-driven IoT solutions.
- Even if a common understanding of the meaning of Industrie 4.0 exists, many businesses struggle with scoping their Industrie 4.0 initiatives based on real business outcomes, and they do not know how to start.
- Innovative and creative approaches for ideation and the development of new digital business scenarios may fall foul of risk-averse business leaders due to siloed thinking and static organizational structures.
- Despite knowing that business and IT have to work together on Industrie 4.0 initiatives, inadequate communication and documentation standards complicate collaboration in defining joint IoT requirements.
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- Despite knowing that business and IT have to work together on Industrie 4.0 initiatives, inadequate communication and documentation standards complicate collaboration in defining joint IoT requirements.
- CIOs who plan to initiate an Industrie 4.0 or industrial IoT initiative should:
  - Exploit a business moment approach when scoping Industrie 4.0 initiatives.
  - Embrace a coordinating role in creating and managing the business moment scenario team.
  - Use visual models to make the Industrie 4.0 scenario definition more transparent and efficient.
  - Conduct business moment workshops with business and IT stakeholders regularly to envision business opportunities.

Introduction

Manufacturing companies are becoming more aware of the benefits of the Internet of Things (IoT) for their business. Many of them have implemented digitalization strategies, and are now trying to get their Industrie 4.0 initiatives off to a flying start. However, a gap between strategy and the realization of Industrie 4.0 initiatives still exists. While the term digitalization becomes increasingly anchored in corporate strategies, the influence of IoT on value-generating processes and strategic key performance indicators (KPIs) is often not transparent. This leads to a situation in which IT departments...
start investigating the IoT technology that is available in the market and trying to connect it to business processes. They often start pilot projects with individual, technically oriented business stakeholders, resulting in isolated pilot solutions. When confronting business with this technology-driven and siloed approach, IT departments often experience acceptance problems, as business stakeholders often do not understand how to scale these IoT pilots to meet the business outcomes on which their performance is measured.

Hence, a business-driven approach, instead of a technology-driven approach, is the recipe for success. Gartner developed the business moment approach in order to envision how proven business processes and value chains can be more dynamic and efficient with innovative IoT technology, or can create completely new business designs to generate additional value, as shown in Figure 1, leveraging the integration of people, business and things. At their core, business moments are transient opportunities that can be exploited dynamically. They can act as the lens for IT, business and government leaders to spot opportunities in a rapidly changing digital future of people, business and IoT.

In the manufacturing industry, typical outcomes of the digitalization of existing business processes can include the automation of internal production, maintenance and supply chain processes using mature IoT capabilities, like the management of multiple connected devices and big data analytics.
What makes up Industrie 4.0 in this context is the value-chain-driven development of new business models in manufacturing industries that enable collaboration and data exchange across company borders in a global ecosystem of digital connections.

Analysis
Exploit a Business Moment Approach When Scoping Industrie 4.0 Initiatives

Industrie 4.0 addresses the digitalization of complex value chains, within companies, across companies and often across industries. Hence, IoT scenarios span multiple, integrated processes, especially around a product itself, and comprise engineering, production, product quality management, maintenance and service, supply chain management, and logistics processes, all in collaboration with external partners, enabling data exchange across global IoT ecosystems.

Therefore, creating scenarios to explore the implications of disruptive technology and Industrie 4.0 can take many forms. We encourage organizations to use a variety of methods to determine which one works best for their culture. Gartner believes using a business moment approach is a viable method to help organizations explore the possibilities of IoT and Industrie 4.0. The business moment approach is a creative method designed to define IoT scenarios from scratch. Applied to any real-life situation, visualized scenarios make tasks easier or more efficient for those involved with the help of digitalization. We have conducted numerous business moment workshops with clients since 2014, and clients have said the scenario framework was helpful to generate a wide range of ideas and new thinking.

As Industrie 4.0 can span multiple processes, companies and possibly industries, any constraints and silos should be avoided – if possible – in order to allow digital creativity. Any business moment discussions – regardless of whether they refer to existing or completely new business models – lead to the desired effect that new ideas or new subscenarios beyond the original scenario may come to light.
Decisions on the prioritization of and/or compromises on business moment scenarios will be made later, as soon as:

- The influences of the business moment scenarios on existing business infrastructure (strategy, organization, business processes, value chains and the information technology/operational technology [IT/OT] landscape) are fully understood.
- The technical feasibility of the scenario, availability of required skills and resources, and ROI have been evaluated.

**Embrace a Coordinating Role in Creating and Managing the Business Moment Scenario Team**

The CIO of an organization planning to start an Industrie 4.0 initiative should take on the coordinating role in defining business moment scenarios. One of the key tasks is building an interdisciplinary team consisting of business stakeholders (who will vary depending on the business moment scenario) and IT stakeholders:

- **IT Stakeholders**: For example, the CIO, business intelligence and information management, business process improvement, enterprise architecture, infrastructure and operations, and program management
- **Business Stakeholders**: For example, participants from engineering, manufacturing, supply chain, customer service, quality management and, depending on the scenario, maybe finance/controlling, HR and/or legal

Because an Industrie 4.0 initiative is an investment over many years, involving key resources from business and IT, the CIO must ensure an early buy-in from the CEO, from the definition phase of the Industrie 4.0 initiative (that is, from scoping based on the business moment approach). Prerequisites to convince the CEO include a clearly defined business-driven approach and commitment from business and IT stakeholders.

As soon as the CEO has given approval, and the business moment team is available, the CIO needs to ensure that the purpose and methodology of the business moment approach are understood.

Then, this team jointly builds relevant business moment scenarios, and should work together on any follow-up activities required for the scenarios’ implementation and governance.

The team size should be between five and 10 people. If a group has more than 10 members, the CIO should split the participants into two or more process teams, for example, for production, supply chain, or maintenance and service. If possible, these teams should work in parallel on their business moment scenarios and synchronize their outcomes with each other. Hence, after a team has defined a new scenario, it should be presented to the whole group. As different business moment scenarios are usually connected, changes due to integration aspects have to be considered immediately in order to avoid siloed thinking.

Although CIOs can act as a contributor when defining Industrie 4.0 business moment scenarios, their key role is to act as the integration manager between business and
IT during this process and for any follow-up activities defined in the overall digitalization initiative (such as upskilling, scoping, definition, implementation and governance of required IoT solutions). As IoT can be seen as an enabler for efficient business processes, and the added value of digitalization is a business outcome, the CIO has the coordinating role, while the ownership of digitalized processes remains in the business units.

The CIO must also ensure buy-in from key C-level sponsors of the Industrie 4.0 initiative, especially the CEO and/or CFO. The best way to get management commitment consists of:

- Clear scoping and transparent, easy-to-understand visualization, showing the KPIs are in-line with the corporate strategy.
- Positive feedback from all the business stakeholders who are defining business moment scenarios about the methodology and relevance for their particular operational areas.
- Positive end-user feedback based on live demos, test beds or references that are already available (for example, published by IoT consortia or IoT vendors).

Use Visual Models to Make the Industrie 4.0 Scenario Definition More Transparent and Efficient

A business moment approach is a foundational method for the manufacturing industry when defining Industrie 4.0 scenarios, often leading to completely new business outcomes. Visual models make it much easier to understand how people; things (products, devices and production lines); and business applications (such as computer-aided applications [CAx], product data management [PDM], ERP and manufacturing execution systems [MES]) interact in a digital network of manufacturers, suppliers, customers and end users who are collaborating and exchanging data from multiple sources across full, end-to-end value chains. CIOs should introduce standardized, easy-to-understand modeling conventions for IoT scenario visualization in order to ensure efficient collaboration between business and IT. These scenarios should be validated against the existing business infrastructure. Otherwise, the potential to be successful and scalable cannot be determined, so that value can be added for the business.

Therefore, the CIO should consider reference architectures and standards provided by IoT and Indus-
as comprehensive frameworks allowing different views on people, business, things and multiple connections; these elements can then be integrated into the business moment scenarios. Therefore, CIOs should join an IoT consortia or seek the help of an IoT service provider in order to demonstrate initial business moments’ success. Consortia not only provide reference architectures and opportunities for networking, many also provide access to test beds (such as IoT use cases implemented as demos) and reference projects for a large number of IoT scenarios provided by members of the consortium.

This foresight increases the acceptance of defined modeling conventions by all business moment team members from the very beginning.

**Conduct Business Moment Workshops With Business and IT Stakeholders Regularly to Envision Business Opportunities**

Gartner recommends that the CIO engage with the teams developing business moment scenarios regularly, and makes this form of scenario planning a standard part of your IoT and Industrie 4.0 innovation process.

The purpose of the workshop is to help IT and the business organizations understand what business moments can be, and how they can be recognized and developed into solid Industrie 4.0 business opportunities. The workshop can be run either as IT-only, as a part of internal development or planning, or as a cross-functional workshop that involves functions such as marketing, sales, supply chain, HR and finance.

As a first step, the CIO should identify a specific business objective, strategic planning project or other opportunity that would benefit from exploratory work on how Industrie 4.0 will create opportunities for the enterprise. For example, this could be how to gain more customer engagement at the moment of a decision. Inspiration for these ideas can come from many sources. Gartner recommends reviewing examples from multiple industries. Even though the scenarios might not be completely adopted, they can provide inspiration and ideas. As the contained scenarios are classified by industries and outcomes, synergies can be identified, and by connecting the scenarios, new business moment scenarios can be derived.

Second, the CIO should invite appropriate IT leaders and business partners (including trusted outside agencies) that could participate in an ideation discussion. Have a mix
of personalities and thinking styles to ensure a good creative dynamic.

Third, the CIO should select a strong facilitator to run the workshop, preferably someone with an innovation background who is able to get people to think differently. Often, the enterprise architecture team has individuals who are skilled in this type of facilitation. Be sure to capture the outputs, feedback and next steps to investigate in the next workshop. With the insights from the discussion, determine what additional actions IT can take to leverage business moments in your Industrie 4.0 strategy. Like many innovation activities, this will be an iterative process. As a sponsor of a series of business moment workshops, the CIO can play a key role in driving innovation discussions with the business, which can lead to tangible business outcomes.

Evidence
The business moment approach was the subject of more than a thousand interactions between Gartner and its clients over the last 12 months. A substantial part of these interactions had a focus on Industrie 4.0 and industrial IoT. In addition, numerous business moment workshops – a Gartner standard – were executed in 2016 with clients of different vertical industries. The workshops not only provide an introduction to the business moment approach, they also comprise hands-on exercises that enable clients to build business moment scenarios on their own.

Source: Gartner Research, G00314187, Alexander Hoeppe, Don Scheibenreif, 28 November 2016
About Mazik Global

Mazik Global (http://www.mazikglobal.com/) is an experienced and visionary IT solution development and implementation company. A key developer of cloud-based products on the Microsoft Dynamics platform, we offer a unique combination of skillsets and experience in IoT, ERP, and Cloud for a variety of organizations. Our experts are integral in the development of our Cloud-based products using Microsoft Dynamics AX 2012, and we have continued to develop on the current platform, Dynamics 365.

Our developers, testers, consultants, and implementers have deep expertise across all industries, from service to technology. We have more than 300 consultants serving 100+ customers worldwide, including Fortune 100 companies. Mazik is proud to be a multi-year recipient of Microsoft Dynamics President’s Club award, an honor that highlights high customer satisfaction. Since its inception 15 years ago, Mazik has been recognized for exceptional customer service, technology capabilities, and extensive industry knowledge.

Looking ahead, we will continue to maintain a sharp focus on our guiding principles and commitment to innovate, improve, and extend our products in the markets we serve today.

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