

ELISA SMART FACTORY

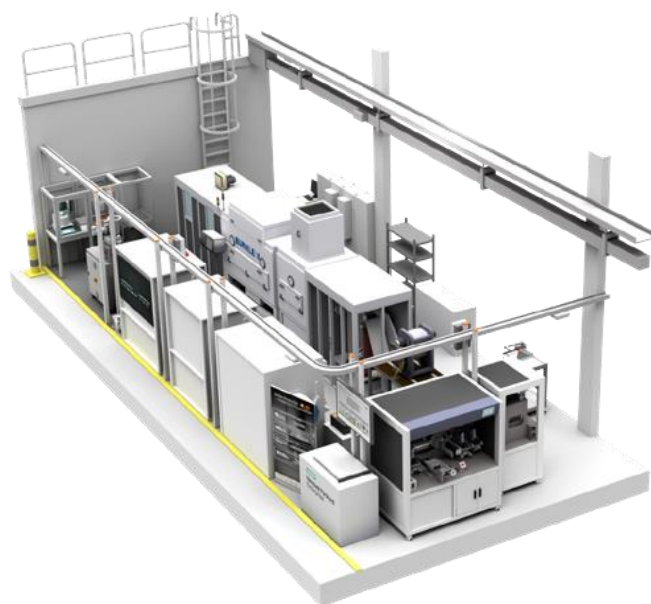
MAKING BETTER DECISIONS WITH REAL-TIME INSIGHTS



White Paper

Contents

MANUFACTURING IN THE DIGITAL AGE	3
MODERN MANUFACTURING CHALLENGES	3
ELISA SMART FACTORY – THE BRIDGE BETWEEN DATA SILOS	4
4 STEPS ON YOUR JOURNEY TOWARD SMART FACTORY	5
WE ARE KNOWN FOR RAPID DELIVERY OF REAL VALUE	8
DATA SECURITY IS OUR PRIORITY	9
CUSTOMER CASE: DAIRY PROCESSING COMPANY	9
CUSTOMER CASE	10



MANUFACTURING IN THE DIGITAL AGE

Like the Industrial Revolution impacted manufacturing, digital transformation is now responsible for changing the industry. Industrial manufacturers are joining their counterparts from healthcare to finance, revamping facilities in order to adapt to demands of today's digital world.

Digital transformation doesn't just mean implementing enterprise software to do things better, faster and cheaper. It refers to a transformation of the business with technology, and manufacturing companies are using technology to move from mass production to customized and on-demand production – and it's happening at a rapid pace.

Today, we find ourselves in midst of the fourth industrial revolution (or Industry 4.0), and at the center of industrial transformation is Internet of Things (IoT). The IoT is not only transforming the way manufacturers create products, but it also helps improve asset efficiency, production quality and factory productivity.

How significant is the potential impact of the Industrial Internet or Industry 4.0? According to the McKinsey Global Institute report, "Unlocking the Potential of the Internet of Things," factories have the greatest potential for value creation in the IoT era. The 1.2 to 3.7 trillion dollars in economic value projected to come from IoT in the factory setting in 2025 represents a massive 30 percent of all of the IoT business value across all the settings McKinsey identified. This dwarfs the opportunities associated with home automation, vehicles, and so on.

MODERN MANUFACTURING CHALLENGES

Today, manufacturers face mounting pressure to keep up with competition and shifting customer demands regarding customized goods, rapid delivery and customer service levels.

Regardless of the industry vertical, manufacturing executives are under continuous pressure to improve margins, improve quality, increase efficiency, and improve flexibility – all while transitioning to sustainable operations and ensuring worker health and safety.

The primary challenges facing modern manufacturing organizations face:

- **Connectivity.** During the last decades, most industries have developed and managed Operation Technology (OT) and Information technology (IT) as two different domains, maintaining separate technology stacks, protocols, standards, governance models and organizational units. While IT systems were designed to connect applications and share data, OT systems were designed as standalone entities and were originally not intended to be connected. Having segregated OT and IT environments is inherently inefficient and costly, and it can prevent OT organizations from taking advantage of new technologies, such as mobile communications or cloud-based services.

- **Visibility.** Massive amounts of data are generated by factory machines and sensors, operators, and manufacturing systems. However, that data is siloed and it is a challenge to get all data into one place to get full end-to-end (e2e) visibility into processes. Since visibility forms the basis for all decisions, it is one of the most important prerequisites for increasing factory-wide efficiencies.

● **Productivity.** Regardless of the organization, boosting productivity is essential to enhancing gross profits and maintaining competitiveness. Productivity on the shop-floor depends on a combination of efficient employees, machines and processes.

Siloed data and lack of real-time visibility into e2e processes affect the ability to make robust, data-driven decisions, making process optimization nearly impossible. Only after successful process optimization can manufacturing become more efficient, empowering people and resources to be more productive.

*In the new world,
it is not the big fish
that eats the small fish,
it's the **fast fish** that eats
the **slow fish**.*

*Klaus Schwab
Founder and Executive Chairman
World Economic Forum*



ELISA SMART FACTORY – THE BRIDGE BETWEEN DATA SILOS

The promise of Elisa Smart Factory is to address the challenge of insufficient visibility and flexibility by enabling real-time digital bridge across all factory equipment, systems and people. It bridges the gap between siloed data systems by adding a powerful solution that helps companies connect all machines and devices, stream and make sense of massive amounts of real-time and historical data, as well as implement predictive maintenance.

The Smart Factory is a cloud-based Industrial IoT solution that can run on Amazon Web Services (AWS), Microsoft Azure or as local/hybrid installation. This enables factory workers and management to make better, data-driven decisions that were not possible before, and ultimately increase operational efficiency. Specifically, Elisa Smart Factory helps manufacturers to:

1. Gain control of factory operations to make better decisions. Smart Factory connects virtually any machine, device and enterprise system across functional silos and harnesses streams of machine data for powerful analysis. The real-time factory data is visualized in an easy-to-understand 3D view that provides full visibility into all stages of operations, making it possible to respond faster and make better decisions.

In addition to the factory-wide 3D view, our strength lies in our ability to provision Elisa Smart Factory environment in less than a day, and deliver a working prototype with live customer data within a few weeks.

This offers customers the opportunity to start evaluating the business value of the current prototype immediately, rather than waiting for a finished product.

With this agile approach, we are able to save our customers' money, time and resources and deliver a customized solution that helps our customers simplify operations and work smarter.

2. Improve quality, reduce downtime and predict needs. Historical data, combined with continuous stream of real-time data help create a foundation for predictive analysis. With help of actionable insights from data analysis, manufacturers can make adjustments to improve quality, prevent unplanned downtime and anticipate future needs.

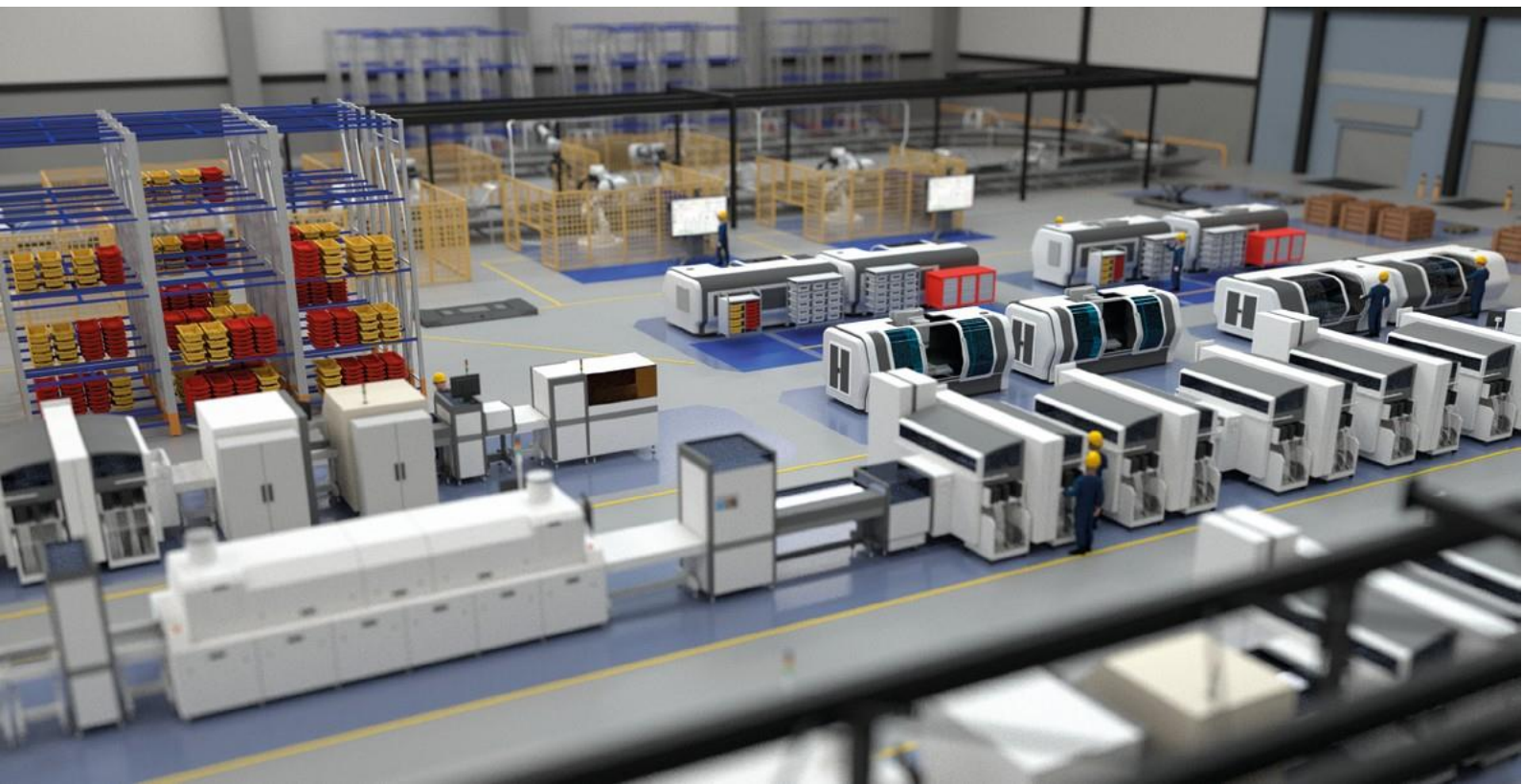
3. Increase plant efficiency and save costs. Unlike in traditional factories with siloed data, connected factory enables factory-wide process optimization, from inbound logistics and production to outbound shipments. Optimized processes translate into operational savings through reduced waste, downtime and labor costs.

4 STEPS ON YOUR JOURNEY TOWARD SMART FACTORY

Manufacturers can implement the smart factory in many different ways—both inside and outside the four walls of the factory—and reconfigure it to adjust as existing priorities change or new ones emerge.

In fact, agility is one of the most important features of Elisa Smart Factory, presenting manufacturers with multiple options to leverage digital and physical technologies depending on their specific needs.

While connected factory projects are unique to each business, there is a framework with phased approach towards smart manufacturing. This approach offers a starting point grounded in Elisa's experience working with leading manufacturers to digitally transform their business.



1. IDENTIFY AND DETERMINE YOUR SMART FACTORY OBJECTIVES

The decision on how to start or expand a smart factory initiative should align with the specific needs of an organization. The reasons that companies

embark or expand on the smart factory journey are often varied and cannot be easily generalized.

However, undertaking a smart factory journey generally addresses such broad categories as:

- Improved visibility across manufacturing operations
- Improved asset efficiency
- Reduced waste
- Improved quality
- Targeted cost savings

These categories, among others, may yield benefits that ultimately result in increased speed to market, better profitability, product quality, and reduced unplanned downtime.

Regardless of the business drivers, it is important to be able to determine the business targets. This helps provide the foundation for a business case and serves as a benchmark for proving value.

2. CONNECT AND VISUALIZE DATA

The value of connected equipment is the data it generates. With Elisa Smart Factory, manufacturers can link their machines and physical infrastructure to the digital world easily, quickly and economically. The Smart Factory solution can harness data from virtually any number of sensors, connected machines and enterprise systems into one, virtual data lake.

With Elisa Smart Factory you can:



Reduce downtime

5-10%



Improve yield

10-15%



Increase productivity

5-8%



Reduce costs

10-15%

In one factory, there can be thousands of sensors distributed throughout the physical manufacturing process collectively capturing data along a wide array of manufacturing dimensions: from behavioral characteristics of the machinery in progress to environmental conditions within the factory itself. With Elisa Smart Factory, these data are continuously communicated to the cloud and combined with real-life images of the factory, machinery and floor plans, enabling the creation of a 3D digital twin.

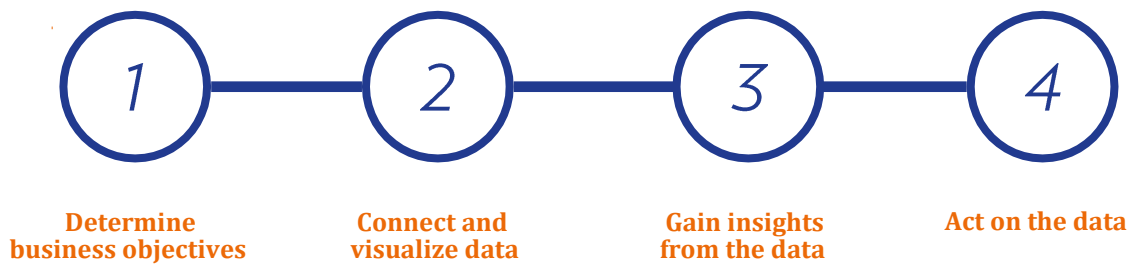
The 3D digital twin helps show what is happening in the factory at any given moment so that shop floor operators and management decisions can be based on real-time data.

The digital twin provides visibility across all production processes in one view with the ability to drill down into individual processes and machines. The 3D view makes it intuitive for both shop floor operators and factory management to spot critical areas needing immediate attention as well as detect anomalies and trends.

Users gain access to the most relevant information when they need it, helping them make more proactive and faster decisions. Users can access the information via computer, tablet and mobile, making remote monitoring and process managing easy.

Getting started with Smart Factory

12 Weeks



3. GAIN INSIGHTS FROM THE DATA

Over time, the 3D digital twin accumulates data of the connected assets, their operation and the environment in which they operate. On top of that asset data, valuable predictive capacity is developed using machine learning and artificial intelligence.

Once this stage is reached, the company is able to forecast what might happen in the future and how likely the forecasted outcomes are to happen. As a result, companies are able to anticipate future developments so that they can take decisions and implement the appropriate measures in good time.

Examples of insights:

- Predictive maintenance needs for machine parts e.g. pumps and valves to prevent a major breakdown that can cost companies millions of euros in production slowdowns or stoppages.
- Supply chain forecasts to help determine proper inventory controls to minimize overstock and out-of-stock events.
- Uncover sub-optimal operations, or bottlenecks, in the process that result in wasteful production. Raw material, energy, labor costs and machine time get wasted in such instances. Based on the insights, adjustments can be made to optimize the asset efficiency and to minimize waste.

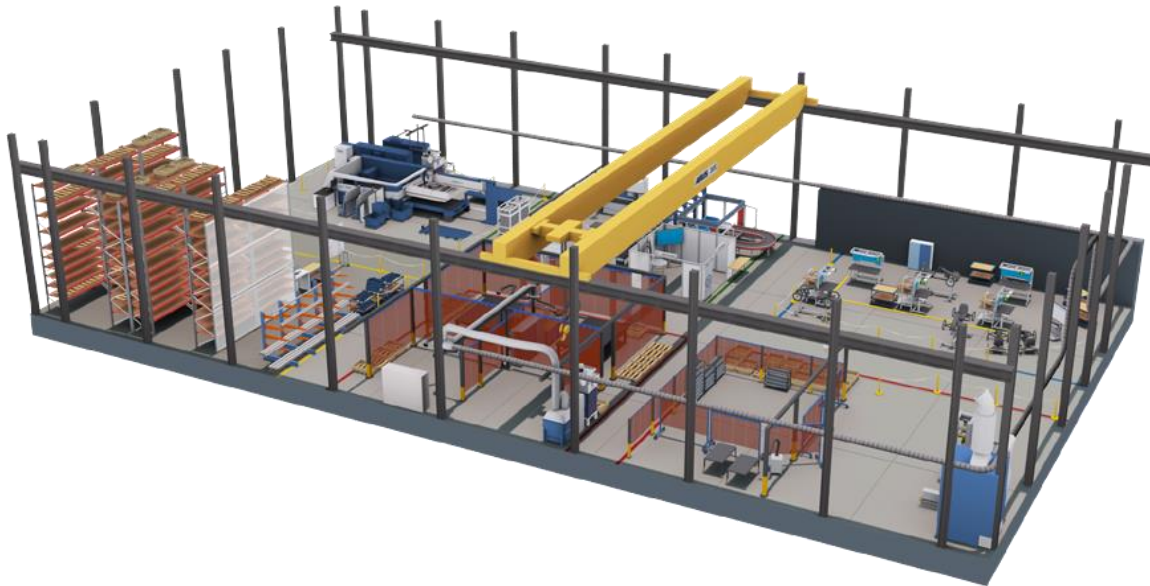
A company's predictive capacity is heavily dependent on the groundwork that it has previously undertaken. With using Elisa Smart Factory solution you can rest assured that the forecasts are of a high standard; we integrate all the relevant data across all the disparate systems to form a strong foundation that feeds directly into the accuracy of the prediction outcomes.

4. ACT ON THE DATA

Connected factory is ultimately useful when it drives changes. By using predictive analytics, anomalies can be quickly detected and fixed and maintenance schedules can be optimized based on need. This reduces unplanned downtime, lowers maintenance costs and as well as creates cost savings.

There is no limit to the kinds of data-driven improvements that become possible. Actions may range from sending a simple command to a machine, to tweaking operational parameters, to performing an action on another software system, to implementing company-wide operational improvement programs.

These are just a few examples of potential changes that connected factory visibility and analytics support. Other types of changes may include optimizing process to reduce waste and bottlenecks, replacing equipment and adjusting staffing. Once you start



collecting data automatically and gaining visibility, finding operational opportunities and making changes is a natural next step.

WE ARE KNOWN FOR RAPID DELIVERY OF REAL VALUE

Digital transformation is a journey, not an endpoint. The challenge to begin may seem daunting, but rest assured, Elisa Smart Factory can support on every stage of your digital journey.

If you are looking for a partner that can provide real economic value, look no further. We've gained understanding and expertise of where real value can be created based on data. While others might be talking about technical Proof of Concept (POC) to show that a working solution can be developed,

we focus on fast prototyping to visualize how the solution will function to provide the desired value. This saves time, money and resources.

Smart factory investments usually start with a focus on specific challenge, or opportunity. Once identified, a three-month long pilot proofing period can be started to prove the expected value is real and can be justified and measured.

Building and scaling a smart factory is agile and flexible. Value creation can begin with and scale from a single asset, and use an agile approach to adjust and grow. Once the desired value has been achieved, the solution can be scaled to additional assets, production lines and factories.

The true power of Elisa Smart Factory lies in its ability to evolve and grow along with the changing needs of the organization—whether they be shifting customer demand, more predictive and responsive approaches to operations and maintenance,

*THINK BIG,
START SMALL,
SCALE FAST*

incorporation of new processes or technologies, or near-real-time changes to production. Because of more powerful computing and analytical capabilities—along with broader ecosystems of smart, connected assets—Elisa Smart Factory can enable organizations to adapt to changes in ways that would have been difficult, if not impossible, to do so before.

DATA SECURITY IS OUR PRIORITY

We view security as a core competency based on decades of experience in securing reliable mobile and telecommunications services. In fact, for some customers, security (not cost savings) was the main motivation for moving to our cloud.

We have a dedicated security team on duty 24/7. All the data centers have access controls, guards, video surveillance to physically protect the sites at all times.

We've designed our data centers with security in mind. They are located deep underground with robust recovery measures in place. For example, in the event of fire or any other disruption, we shift data access automatically and seamlessly to another data center so that our customers can keep working, uninterrupted. Our emergency backup generators continue to power our data centers even in the event of power failure.

CUSTOMER CASE: DAIRY PROCESSING COMPANY

Background

Automatic valves are the hearts and lungs of a dairy processing plant. They direct liquids to the proper line and allow for simultaneous production and cleaning. Our customer, a leading processing company, has 12 factories with 120.000 automatic valves regulating the manufacturing processes. The valves are maintained based on manufacturers' guidelines, on average every 24-48 months.

Challenge

When a valve suddenly breaks, the related process will stop, resulting in costly, unplanned downtime. On a monthly basis, our customer uses 13 000 man-hours to repair broken valves. In addition to direct costs, the OEE is negatively impacted by process unavailability, being around 50%.

Solution

To reduce unplanned downtime and increase productivity, we have implemented a predictive maintenance solution for the customer. With the solution, the customer is transferring from time-based to condition-based maintenance, with the objective to reduce all maintenance events by 25% - without compromising the process quality. This will result in up to €1M savings in direct costs, and the increased asset efficiency will lead to further savings.



CUSTOMER CASE

Elisa Smart Factory helps boost e.GO factory efficiency

The German electric car company e.Go uses Elisa Smart Factory solution to develop cars more efficiently with help of 3D visualization and artificial intelligence (AI). The objective is to transform the way car manufacturing industry operates through digitalization. One of the goals is to eliminate the use of traditional paper reports, Excel sheets and manual work phases, which are examples of inefficient use of assets.

"Our purpose is to make real-time information, intelligent logistics, and IoT-enabled process optimization as the foundation for every stage of production. This allows us to achieve a whole new level of efficiency and productivity throughout the processes. Elisa Smart Factory provides us the end-to-end visibility we need get the entire end-to-process under control ", says Rupert Deger, CIO, e.GO.

For more information about Elisa Smart Factory,
please contact:

Kari Terho

General Manager

Email: kari.terho@elisa.fi

Phone: +358 50 50 65777

Satu Mesikämnen

Business Development Manager

Email: satu.mesikammen@elisa.fi

Phone: + 358 50 314 1663

Felix Jordan

Business Development Manager

Email: felix.jordan@elisa.com

Phone: +49 172 988 3793