

Progetto di Ricerca & Sviluppo “DX - The New Paradigm”
finalizzato all’analisi delle Tecnologie Emergenti e identificazione delle modalità
operative per l’ottimizzazione delle performance attraverso l’innovazione dei Processi
Industriali nell’ambito del paradigma pervasivo della Digital Transformation
in osservanza alle Linee Guida del Piano Nazionale Industria 4.0

Smart Factories

Progetto DX - The New Paradigm

INTRODUCTION

Manufacturers in Europe today are facing macroeconomic headwinds, with some economists predicting that some European economies may be heading towards a recession.

Under such pressure, many manufacturers are looking to technology, specifically what the industry refers to as Smart Factory or Intelligent Factory, to enable them to be more efficient and profitable.

It will no longer be enough for manufacturers to sell products and innovations to customers and produce them at reasonable costs. In fact, global competition has put a lot of pressure on manufacturers to increase the efficiency of shop-floor operations to further reduce product costs and to be competitive in global markets.

WHAT IS SMART FACTORY?

Smart Factory is a concept borne out of research around 'Industry 4.0' – the name given to the current trend of automation and data exchange in manufacturing technologies.

It includes cyber-physical systems, the Internet of Things (IoT), cloud computing, Artificial Intelligence and more.

The basic principle of the Smart Factory is that by connecting machines and other systems, businesses are creating intelligent networks throughout the manufacturing process that can control each other autonomously, or at least semi-autonomously.

WHAT IS SMART FACTORY?

Within modular structured Smart Factories, cyber-physical systems monitor physical processes, create a virtual copy of the physical world (a 'Digital Twin') and make decentralized decisions. Over the Internet of Things (IoT), cyber-physical systems communicate and cooperate with each other and with humans in real time, both internally and across organizational boundaries, even extending to suppliers and partners in the value chain.

This Europe-wide survey shines a light on the latest challenges and opportunities around the Smart Factory concept, asks where manufacturing firms are on their journey to the Smart Factory, and questions how companies plan to invest in technologies, skills, and processes to help them transition to a future-ready Smart Factory.

WHAT IS SMART FACTORY?

But is the concept even real, and not mere hype from IT and operational technology (OT) vendors?

To find out, teknowlogy Group surveyed IT and OT decision-makers at 204 European manufacturing companies with more than 500 employees, which have at least some Smart Factory initiatives in place. The study was conducted in May and June 2019. Interviewees were drawn from the UK, Central Europe (Germany and France), Southern Europe (Spain and Italy) and the Nordics (Finland, Sweden and Denmark). A detailed breakdown of respondents can be found in the Methodology section.

KEY FINDINGS



Most companies are increasing investment in Smart Factory initiatives

An overwhelming 63% of companies said that they plan to increase their investment in Smart Factory in the next three years.



Smart Factory is a key strategic objective

Smart Factory is a very strategic objective for most companies. Most respondents, 66%, ranked Smart Factory a 7 out of 10 or higher on their list of strategic priorities.



Return on Investment

56% of our respondents are yet to see ROI but many are still in the early stages of their roll-out. 44% have achieved an ROI already, and of those, 45% saw ROI in less than one year.

KEY FINDINGS



Many Smart Factory initiatives have already come of age

8% – higher than we had expected – consider themselves to already be in the advanced stages of deployment, where they have an organization-wide Smart Factory initiative.



Maturity of the market overall

37% said that they are in the planning and evaluation stages of their Smart Factory initiatives. 19% consider themselves in a medium phase of deployment, which is what we describe as having the first live Smart Factory initiatives that are generating business impacts.

KEY FINDINGS



Edge Smart Factory data analytics is currently limited, but growing

Most companies (46%) analyse Smart Factory data in their own datacentre, while 40% said they analyse data in the cloud. 14% said they analyse data at the edge – i.e. close to plant machinery on the production floor. However, when asked about their plans for the future, 35% said they want to be analysing data at the edge in five years' time – so edge analytics is set to more than double in that time-frame.



Internal goals of Smart Factory strategies

Companies said that they are primarily doing Smart Factory to improve product quality, support digital transformation and enable easier and more efficient customization of products.

KEY FINDINGS



External goals of Smart Factory strategies

The number one external benefit of a Smart Factory strategy according to our survey was improving customer satisfaction. Next came improving supply chain management (51%) and better monitoring and management of products after they leave the plant (39%).



Challenges of Smart Factory initiatives

The number one challenge (58%) was the high level of investment required. With manufacturing facing macroeconomic head-winds, perhaps we should not be surprised. After that the challenges included building the business case, lack of skilled staff, complexity of analysing data, the cost of implementing and managing Smart Factory and challenges integrating IT with operational technology (OT).

KEY FINDINGS



Smart Factory and the cloud

Most companies' Smart Factory deployments are evenly split between public and private clouds (46%). The rest use multi-vendor public cloud, single-vendor public cloud, or their own private cloud.



Smart Factory data is not always analysed – yet

When asked if companies are using Smart Factory data in business decision-making, 28% said that they are, and 29% said that they plan to inside three years. Most (69%) analyse less than half of their Smart Factory data. Only 22% said they analyse around two-thirds of their Smart Factory data, and only 9% analyse over 75% of their Smart Factory data. Companies cited cost, complexity and lack of analytics skills as holding them back.

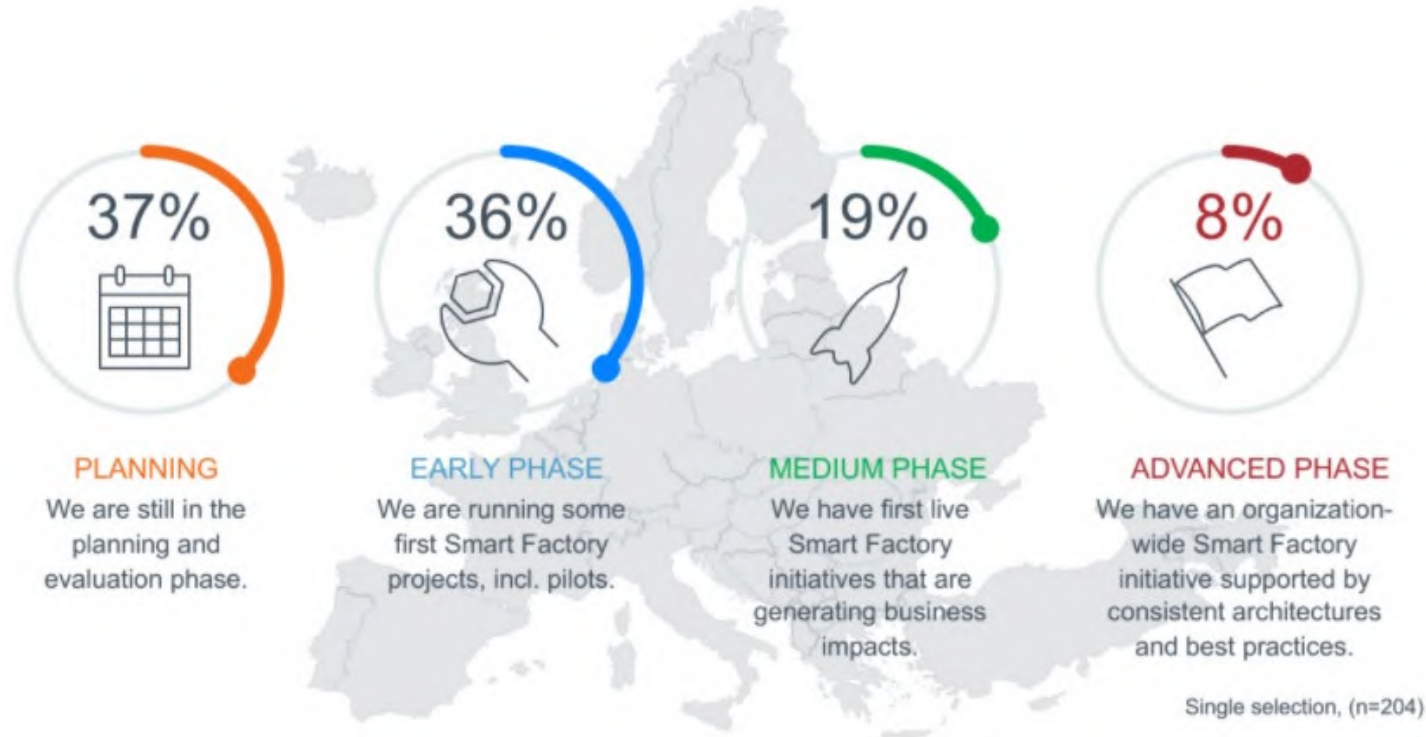
KEY FINDINGS



Looking to the future

The organizations that we surveyed already have some ideas about bleeding-edge technologies such as distributed ledger technologies blockchain, deep learning using artificial intelligence and quantum computing. Asked which are of major relevance, 59% said distributed ledger technologies such as blockchain; half said deep learning using artificial intelligence and 19% said quantum computing.

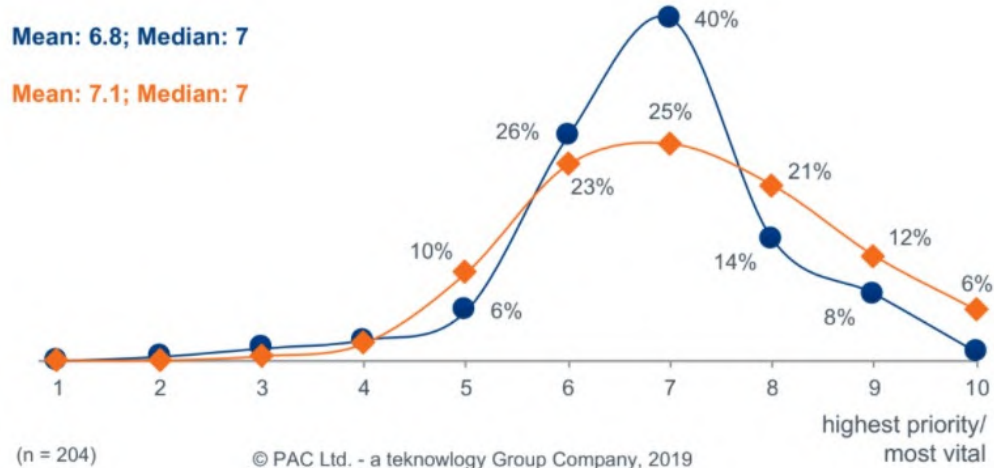
Where is your company with regards to Smart Factory initiatives?



How high (on a scale of 1-10 where 10 is the highest priority) do you consider Smart Factory to be on a list of your company's key strategic objectives?

How vital (on a scale of 1-10 where 10 is the most vital) do you consider Smart Factory initiatives to be to ensure your company's future competitiveness?

- Consideration of Smart Factory to be on the list of the company's key strategic objective
- ◆ Vitality of Smart Factory initiatives for the company's future competitiveness



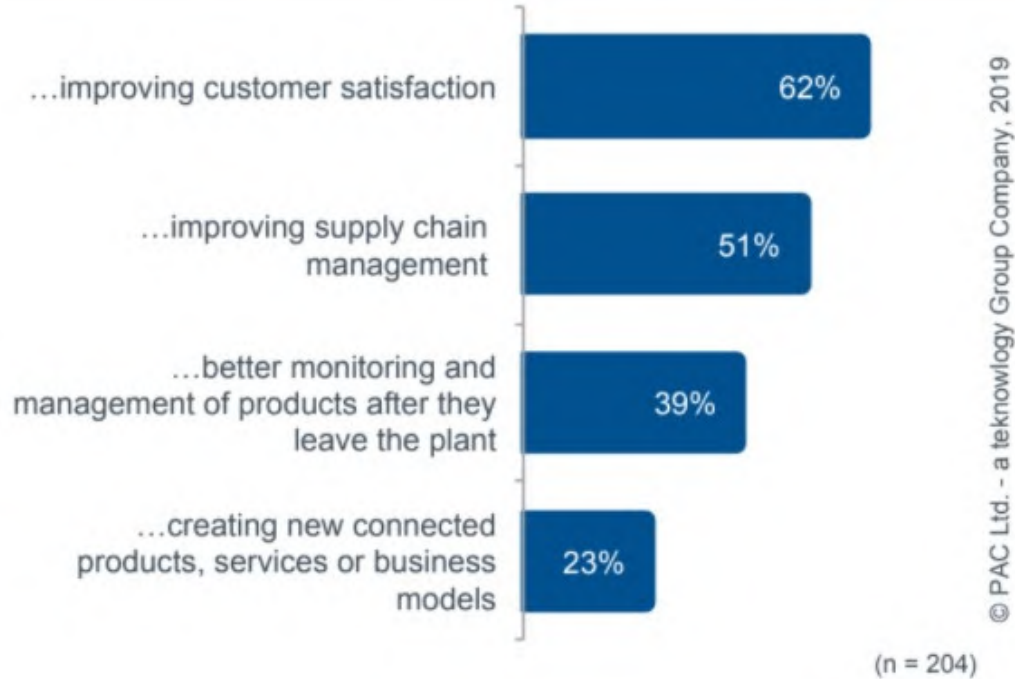
What is the vision for introducing digital solutions into the factory over the next 3 years with respect to **internal** capabilities,...



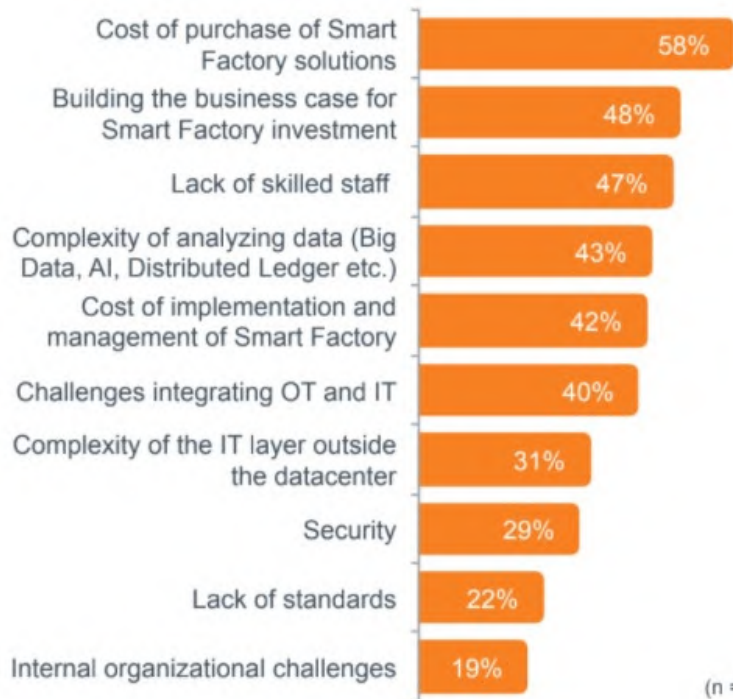
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(n = 204)

What is the vision for introducing digital solutions into the factory over the next 3 years regarding **external** capabilities,...



Which of these do you consider to be a significant challenge in your Smart Factory initiatives and strategy?



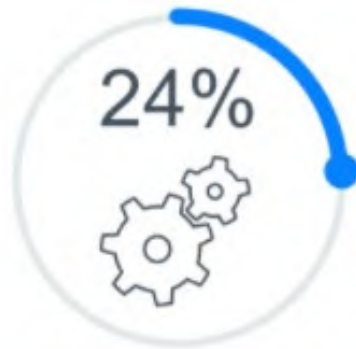
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(n = 204)

In which of the following departments of your organization are the budget decisions made for Smart Factory initiatives?



IT department



Production department



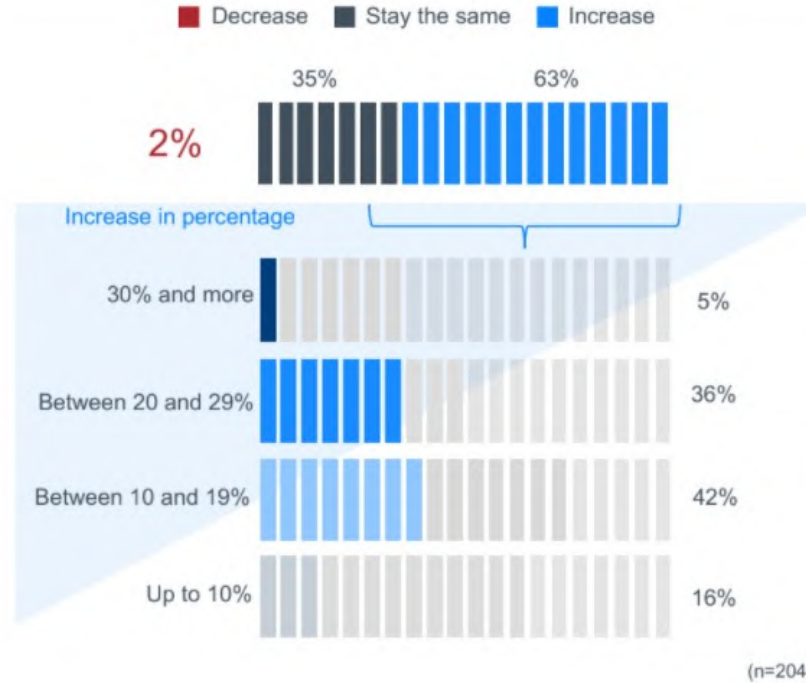
Digital Business Unit



CxO management office

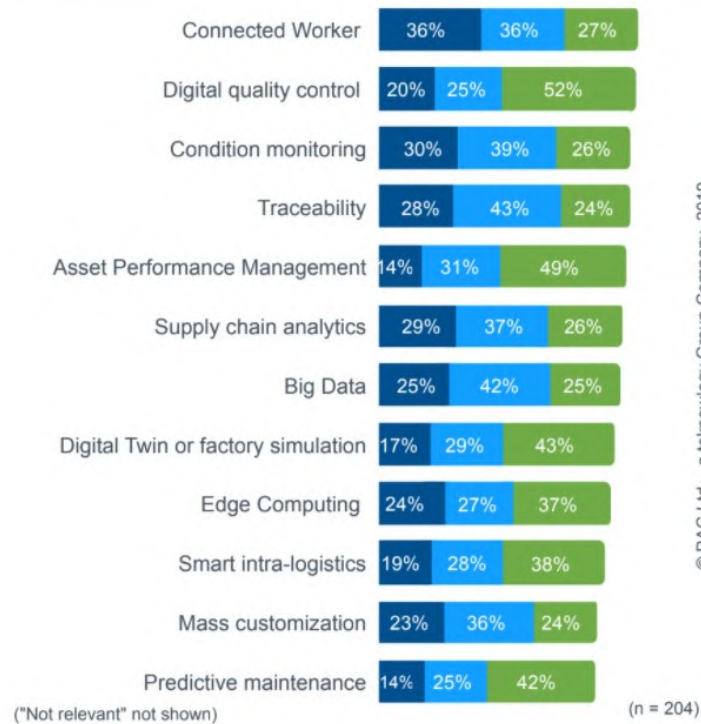
Multiple selection, (n=204)

Will your Smart Factory investment increase, stay the same or decrease in the next 3 years? If there is an increase: to what extent do you expect your organization to increase its investments in Smart Factory?



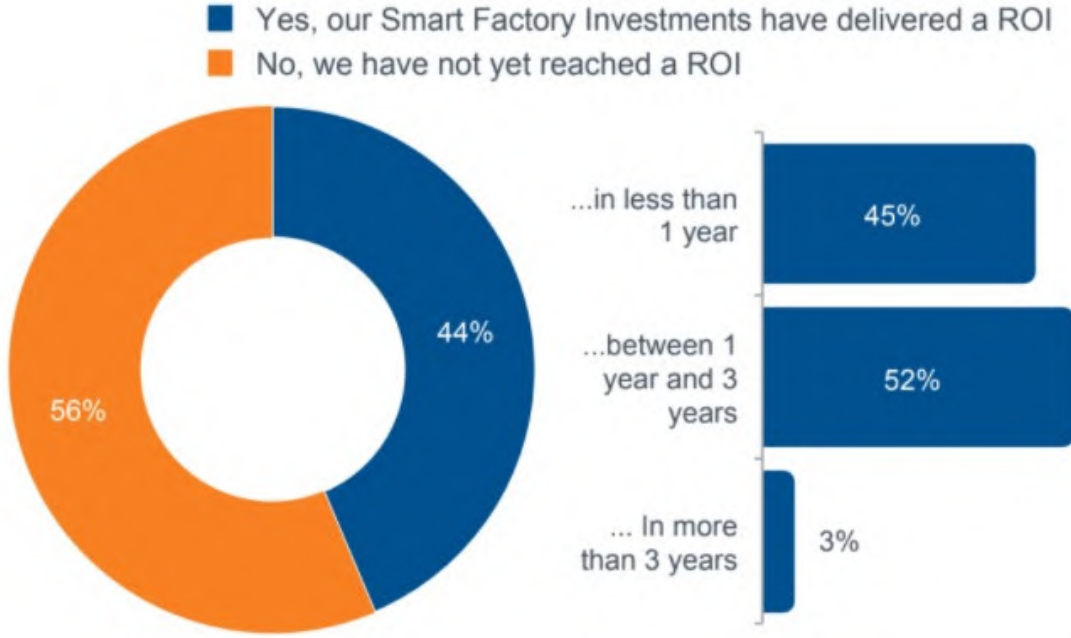
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Which of the following Smart Factory initiatives has your organization evaluated, planned or already deployed?



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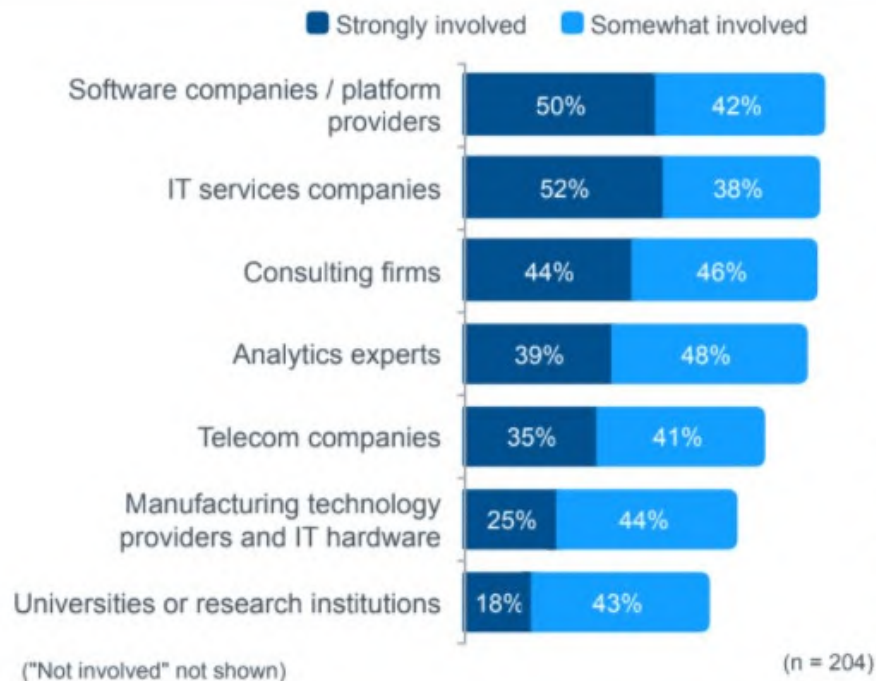
Has your Smart Factory initiative so far delivered a Return on Investment (ROI)? If yes, how quickly do you think that your Smart Factory projects delivered ROI?



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(n = 204)

Which of the following Smart Factory initiatives has your organization evaluated, planned or already deployed?



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Regarding your cloud landscape, are your Smart Factory solutions built primarily...



In your own
private cloud



In a single-vendor
public cloud



In a multi-vendor
public cloud

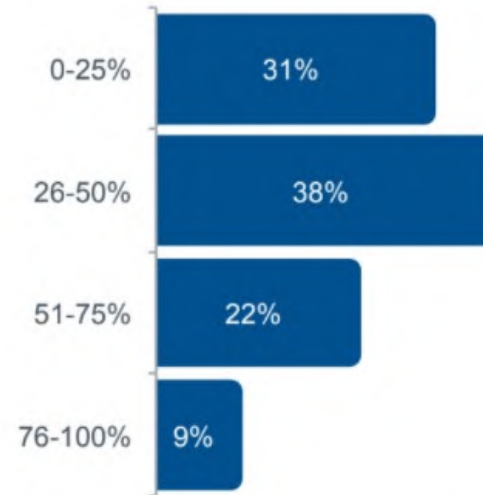
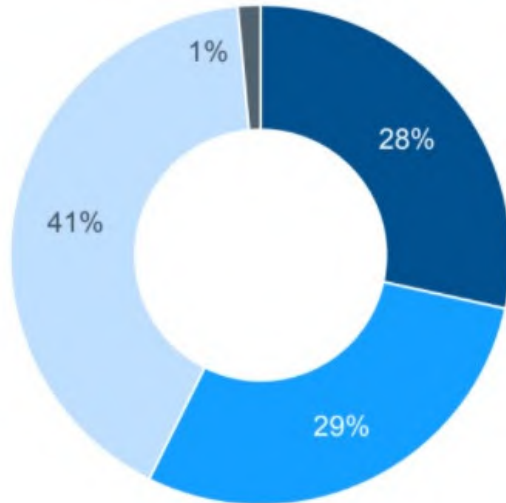


Even split between
private and public cloud

Single selection, (n=204)

A) Are you currently analysing and using your data which you gained from your Smart Factory solutions in business decision-making? Is it planned within the next 3 years, or at least discussed, or is it currently not relevant? B) Approximately what percentage of total factory data is currently analysed?

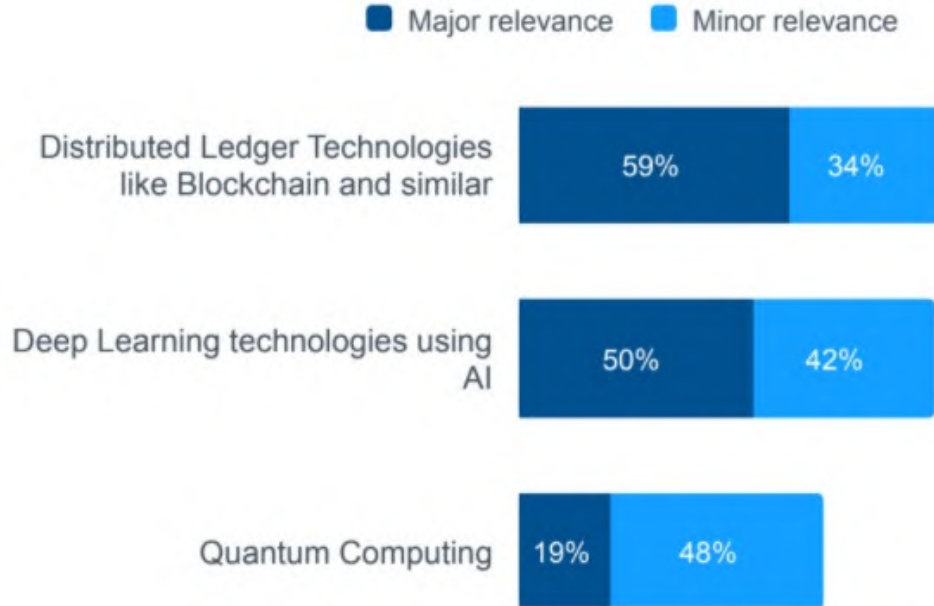
- Yes, we are analyzing and using data from our Smart Factory solutions
- Not yet, but we plan to do it in the next 3 years
- Not yet done or planned, but discussed
- Currently not relevant



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(n = 204)

Which of the following Smart Factory initiatives has your organization evaluated, planned or already deployed?



(n = 204)

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CONCLUSIONS



Most companies (63%) are increasing investment in their Smart Factory initiatives.



A small but growing proportion of Smart Factory initiatives have already come of age and are enterprise-wide.



Smart Factory is a key strategic objective – most respondents rated it 7/10 where 10 is most strategic of all their projects.



Most companies said that they are primarily doing Smart Factory to improve product quality, support digital transformation and enable easier and more efficient customization of products.



The number one external goal of Smart Factory strategies is to improve customer satisfaction.

CONCLUSIONS



The biggest perceived challenge with Smart Factory projects is the high level of investment required.



Smart Factory projects are said to produce ROI in under three years for 44% of respondents; 56% are yet to see ROI but many are in the early stages of their rollouts.



Smart Factory data is not always analysed, partly due to a lack of internal resources. When asked if companies are using Smart Factory data in business decision-making, 28% said that they are, while 29% said that they plan to inside three years.



Organizations are already investigating Distributed Ledger Technologies, Deep Learning/AI and Quantum Computing as part of their Smart Factory plans.