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Ingenuity for life

Digitalisation

Unlocking the potential

Digitalisation Survey Ireland 2017 | Results Report

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Digitalisation at Siemens

Foreword

Gary O'Callaghan

CEO, Siemens Limited Dublin

Dear readers,

Change is a basic principle of today's world. It's creating new perspectives for the future, calling into question long-established ideas, inspiring new maxims for action and providing increased momentum for entrepreneurial decision-making.

Once such change – Digitalisation – is having a growing impact on daily business operations and it can serve as a catalyst for achieving significant progress toward higher levels of competitiveness.

Siemens was one of the first companies to recognise the opportunities that Digitalisation offers and to rigorously orient its business activities accordingly. As a global technology company and a world-leader in automation, we're convinced that this megatrend provides a major opportunity to better understand our customers, to better meet their requirements and to drive their development – and ours.

The Digitalisation of Ireland's industrial landscape presents a window of opportunity for boosting competitiveness by increasing productivity and enabling Irish companies to achieve greater integration into the global value chain. To enable that growth, increasing the efficient use of resources, skills and expertise should be the primary aim of all stakeholders in the economy.

Digitalisation will also be a key factor in the choice of business location in the years ahead and policy makers as well as business leaders need to ensure that Ireland is "ahead of the curve" as Digitalisation transforms the global economy.

With these factors in mind, Siemens conducted this survey of executives in 135 Irish based companies. In order to obtain an all encompassing picture of the challenges Irish business leaders face, survey participants included both technology and strategy oriented decision-makers from companies of all sizes and across all industrial sectors. The results illustrate for the first time the complexity of the digital transformation in the day-to-day business arena.

The survey provides a comprehensive overview of Digitalisation as seen by Irish business leaders. Participants were asked who is responsible for digital strategy at their company, what challenges they face in the area of Digitalisation and what requirements they anticipate for the future.

But the survey also demonstrates something else: the solutions that customers now want are often highly individualised. That means they can only be developed through close partnership.

Working together to develop trendsetting technologies and business models jointly with our respective customers is the only way we can remain successful over the long term.

Siemens is – and will remain – an active participant in Ireland's digital transformation. On that note, I'd like to encourage you to take a closer look at our survey results. I hope you'll find them interesting and stimulating reading.

With best regards,

Gary O'Callaghan

Introduction

Digitalisation is fundamentally changing our working environment and society. Billions of intelligent devices and machines generate massive amounts of data, creating a bridge between real and virtual worlds. An ability to leverage this data to add value creates a real source of competitive advantage for both businesses and economies. However, the level of preparedness for this change varies widely from country to country and company to company.

Against this backdrop, Siemens has been conducting surveys among companies in several countries, including Brazil, Mexico, Germany, Portugal – and now also in Ireland, where the company conducted telephone interviews with Irish business leaders. The questions were not only about what Digitalisation means to them, but also to what extent the companies have already become digitalised, where do the respondents see potential, where there are barriers, and what are their current plans for Digitalisation.

On an international comparison, the surveys verify commonalities as well as individual differences. Additionally, respondents in Ireland reveal not just local Digitalisation trends, but also varying assessments depending on industry sector, on where the respondents are positioned within the companies' structure or whether the companies are international or indigenous.

In general, many companies in Ireland still have room to grow when it comes to implementing an holistic Digitalisation strategy and should therefore seize this potential in order to improve their internal processes, productivity and cooperation with suppliers and customers. While international companies in Ireland are often more advanced in terms of Digitalisation, they see their achievements in this area more critically.

As economic considerations are paramount for companies deciding whether to go ahead and invest with Digitalisation, more companies need to carry out economic feasibility studies. Given that a globally competitive economy matters to Ireland, there is significant space for improvement: In 2017, the European Commission ranked Ireland 8th in the EU in terms of digital development. In its effort to drive Digitalisation forward, though, Ireland finds itself in an enviable position: The country has the highest concentration of STEM graduates in Europe – 25 per 1,000 inhabitants.

Siemens is, of course, perfectly positioned to help customers grow their businesses digitally. Today, 17,500 Siemens employees are software developers (in 351,000 workers worldwide), who develop a wide range of industry-specific IT and software solutions, including Product Lifecycle Management (PLM) and Manufacturing Operations Management (MOM) software, systems and services with more than 140,000 customers worldwide.

Executive summary and key results

01 A comprehensive survey on the state of Digitalisation among Irish companies.

A telephone interview survey of 135 management and business leaders – primarily drawn from Ireland's food and beverage, pharmaceuticals and electrical and electronics industries – was conducted, with the aim of discovering how they understand Digitalisation and they value their place on it. Participants were asked who is responsible for digital strategy at their company, what challenges the company is facing in the area of Digitalisation and what requirements they anticipate for the future.

02 Importance and expectations: Digitalisation is primarly viewed as a vehicle for improving everyday operations. New business models seen as lower priority.

Participants from large companies as well as those from small and medium-sized companies have similar views: all see Digitalisation primarily as entailing automation, data management, the transition from analog to digital processes and the creation of networks. They expect these developments to result, above all, in enhanced quality, better decision making and improved service and resource efficiency. They cite new software developments, the Internet of Things (IoT) and cyber-physical systems such as automation technologies for factories or smart solutions as as the most important trends in digital technology.

03 Digital strategies: Foundations laid but still more to do.

43% of the companies surveyed have defined digital strategies for portions of their business, but less than one third has such a strategy for the company as a whole. A further 29% have no strategy at all. Only about one quarter have already conducted an economic feasibility study or an analysis of workflows with a digital focus. Moreover, nearly half of respondents could not identify any specific Digitalisation project on their immediate time horizon.

Executive summary and key results

04 Barriers to digital development: Costs and expertise.

The primary barriers to the further implementation of Digitalisation are high costs and a lack of know-how. Financing issues regarding access to relevant data or financing technologies as well as not enough know-how and experience are the biggest company-specific barriers. The cost factor relates firstly to the cost of collecting the right data needed to make decisions about Digitalisation projects and secondly the costs for software licenses and updates. Another factor is the lack of expertise among the workforce, especially when it comes to specialisations such as data analytics or prototyping. For many surveyed, the most important point to be addressed when driving Digitalisation is employee involvement and training / continuing education. Costs and the lack of expertise are also seen as the main obstacles in other countries, as evidenced by the results of the surveys in Mexico (2015), Portugal (2015) and Germany (2014). But respondents also report external barriers: lack of demand by customers, lack of technical standardisation, concerns about cyber security and the public debate around data privacy.

05 Responsibility for Digitalisation is usually centrally anchored.

Decisions related to Digitalisation are usually made at senior board level. For nearly two thirds of respondents, commercial considerations are the main driver for assessing Digitalisation projects. For more than half of those customers surveyed, the responsibility for decisions relating to digital strategy is centralised. Responsibility does not necessarily lie with the CIO or CTO. Digitalisation is usually a “tone-from-the-top” topic, with senior management or the Board usually being responsible for Digitalisation issues.

06 International comparisons: Ireland lagging behind.

Most of the respondents are not very far along in terms of implementing Digitalisation. In a comparative study in Portugal, four in ten respondents already conducted a process or an economic feasibility study, compared with only 23% in Ireland. Unsurprisingly, the implementation of Digitalisation strategies mirrors this situation: four in ten respondents in Portugal see implementation rather far along compared with 27% of Irish respondents.

In order to drive further implementation of Digitalisation, a better understanding of methods for analysing and adapting processes, getting employees involved and trained, enabling data comparability, embedding Digitalisation as a process, and the implementation of an economic feasibility study are cited most often.

Survey results

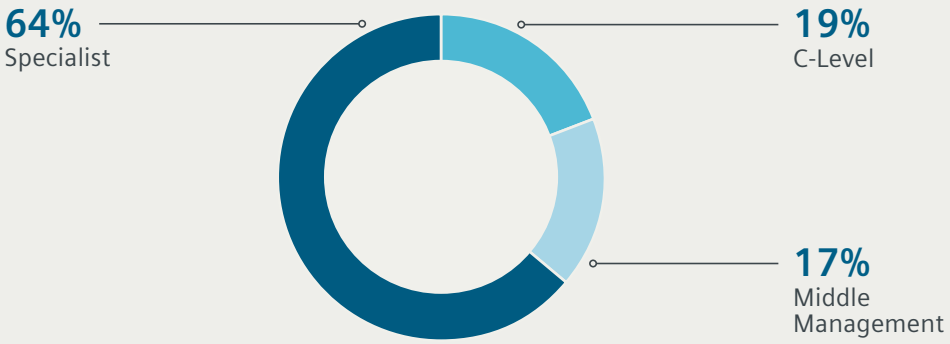
The survey questions covered a wide range of issues relating to Digitalisation and its outstanding importance for the future of the economy. In conducting the research, Siemens focused, among other things, on two key aims:

Siemens' first aim was to find out which aspects of Digitalisation are the most important to survey participants, which trends they see as particularly important in their individual business environment, and whether they see hurdles and barriers related to increasing Digitalisation.

The second aim was to prompt discussion among Irish business leaders as to how we can unlock the potential of Digitalisation for our organisations and move quickly to take advantage of the new opportunities from digital business models.

Surveyed: A cross section of Irish industry

Position (N=135 persons surveyed)



Siemens conducted the survey through phone conversations with 135 organisations in 2017 using a questionnaire. Small and medium-sized enterprises represent nearly three quarters of respondents, with large enterprises of more than 500 employees accounting for the remaining 27%. Nearly two thirds of respondents are involved in operational implementation of the company strategy, especially in engineering; 19% work in top management and 17% in middle management.

Company size (N=135 persons surveyed)

36

Large (27%)

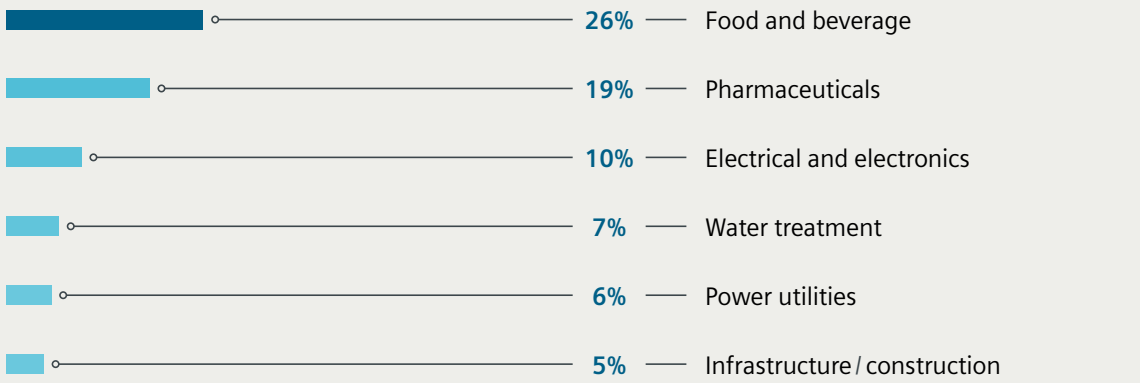
98

Small and medium-sized (72%)

no comment=1%

18 industry sectors represented

Industry that the company is in (N=135 persons surveyed)

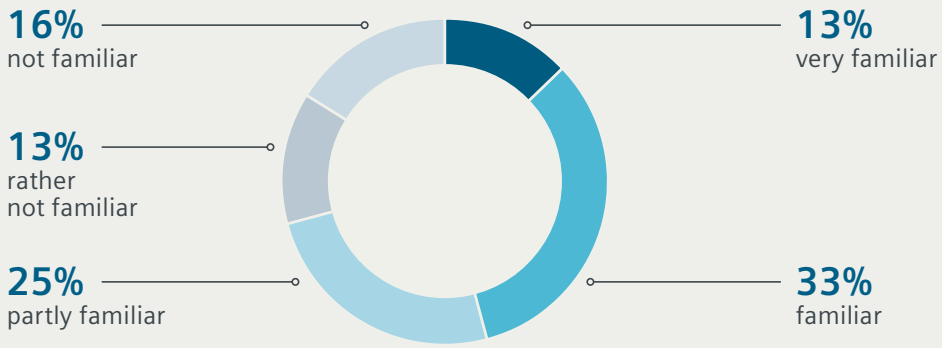


The respondents can be categorised in a total of 18 industries: The largest representations are found in food and beverage (26%), pharmaceuticals (19%), and electrical and electronics (10%). Other industries represented include water treatment (7%), power utilities (6%), and infrastructure / construction (5%).

Almost half of the respondents indicate that they are familiar or very familiar with Digitalisation

Question: How familiar are you with the concept of Digitalisation in general?

(N=135 persons surveyed)



Nearly half of respondents describe themselves as either familiar or very familiar with Digitalisation, but almost one third (29%) know very little about it. The distinction by industry is clear: About three quarters of respondents from the electrical and electronics industry describe themselves as familiar with the concept of Digitalisation, but this was the case for less than half of those in other industries.

Almost one third know very little about Digitalisation.

Digitalisation in focus: Energia

Gary Ryan

Managing Director,
Energia Retail

"We have embraced the initial phase of Digitalisation… the next phase will be more challenging in terms of devising new business models and a range of energy services to match this new digital environment."

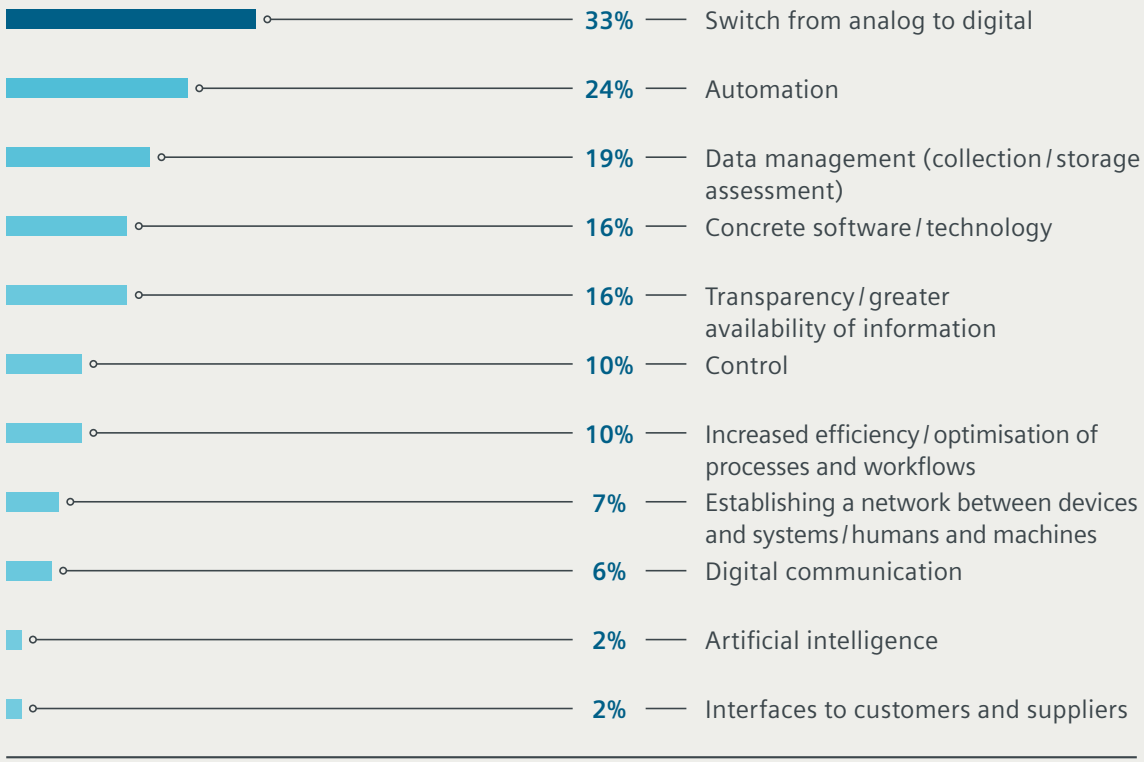
As an energy utility, Energia is facing major industry disruption primarily caused or facilitated through new and emerging digital environments. Digitalisation of the electricity network and the home will facilitate decentralisation of energy production and consumption and through advances in the Internet of Things (IoT), give rise to the rapid adoption of power management based connected business and home technologies. The rollout of smart meters to over 2.3 million Irish premises between 2019 – 2023 will act as a catalyst for greater connectivity of data, systems and customers. It will facilitate greater participation in the energy market by a wider group of customers, not just specialist energy suppliers. It will enhance the benefit of intermittent generation sources, such as wind, through optimising demand management and new storage opportunities.

At Energia, we have embraced the initial phase of Digitalisation in terms of online communications channels and services. The effective use of new data analytics tools has also allowed us personalise products and messages to ensure that they are relevant to the customer, thereby enhancing customer relationships. The next phase will be more challenging in terms of devising new business models and a range of energy services to match this new digital environment. There will also be an explosive growth of data and the challenge of creating insight that can generate real value for our customers and our business.

Broad understanding of Digitalisation

Question: What does the term “Digitalisation” mean to you?

(N=135 persons surveyed, multiple answers possible)



no concrete idea=4%, values under 2% not displayed

In their own words, respondents demonstrate a broad understanding of Digitalisation. For about one third, the most important aspect is the conversion of analog information into digital formats. Automation is a core part of Digitalisation according to 24% of all respondents and a full 40% of those in middle management. 19% of respondents also cite data management, while 16% point to software and technology and an equal number to transparency and the greater availability of information as enablers of Digitalisation.

“Digitalisation” understood to include automation, data management and the usage of software and digital technology.

Digitalisation in focus: Coillte

Gerard Murphy

Managing Director,
Coillte Forest

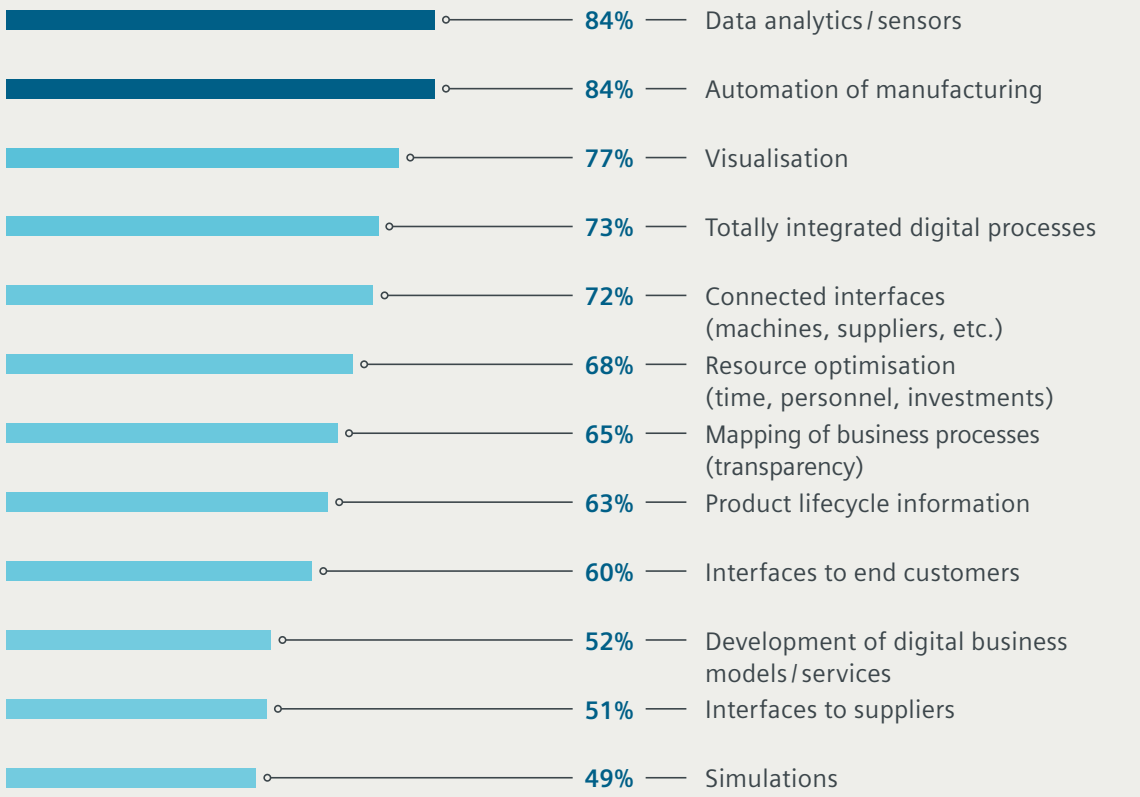
"We are starting to leverage the large amount of data captured in ways that improves decision making and alters our business model to meet future needs of customers."

Over the last five years, Coillte has invested considerable resources into developing a strong technological platform to drive both efficiencies in its business and improve value based decision making in its resource planning. The first phase of work was introducing digital data collection technologies such as data loggers for field based personnel and the use of satellite imagery and Lidar for stand based inventory measurements. This phase also included introducing optimisation tools that identified the best management options for our forests. The second phase of the work has focussed on our supply chain by introducing electronic capture of data from harvesting heads to tracking devices on haulage systems. This stage has enabled us to produce more streamlined information flows from production to our customers and improve cost efficiencies. Currently we are investing significantly in developing a Forest Management System (FMS) which gives us the platform to link and connect the various technologies we have introduced. It also has led to improvement in our business processes. We have called this stage our 'Connected Forest Strategy', which aims to link our people to our forests. It also has involved introducing greater work mobility though, for example, use of apps on our phones and a new unified communication system linking voice, video, attribute and spatial data. The final data analytic stage will be to start to leverage the large amount of data captured in ways that improves decision making and alters our business model to meet future needs of customers.

Key aspects of Digitalisation identified

Question: How important are the following areas of Digitalisation to you?

(N=135 persons surveyed)



other factors=2%

84% of surveyed companies assign equal importance to the automation of manufacturing and the reading of data from machines and sensors as the most important applications of Digitalisation. An impressive 77% emphasise the visualisation of complex processes, 73% the establishment of totally integrated digital processes, and 72% connected interfaces between machines and suppliers.

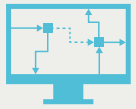
The most important technology trends

Question: Which trends are currently important in your business environment?

(N=135 persons surveyed)

67%
Software and apps

66%
Connectivity and/or Internet of Things



66%
Cyber-physical systems (software, electronics, mechanics)

52%
Cloud computing (for example: software licenses, efficient use of distributed resources, etc.)

47%
Big/smart data and advanced analytics (acquiring business insights)

47%
Mobile applications (mobile integration of business and production processes as well as the service business)

40%
Smart "worlds" (such as smart factories, smart grid, smart buildings)

Two thirds of surveyed companies see the development and use of new software and apps as the number-one trend. An equal number regard the development of cyber-physical systems and the IoT – the integration of people, products, and devices – as the digital technology of tomorrow. Just over half of respondents rank cloud computing, mobile apps, and advanced analytical tools that turn big data into smart data as significant. In general, respondents in upper management are more likely than middle managers to see these trends as significant. This discrepancy is illustrated vividly (60% vs. 30%) in the category of "smart worlds."

Software, cyber-physical systems and Internet of Things are among the most important technology fields.

The most important technology trends

Question: What importance do you assign to Digitalisation trends and what applications do you see in your business environment?

"We are applying connectivity and/or Internet of Things in common systems to coordinate business activities and to communicate with customers. It is important for the platform to get access to all engineering requirements."

— **Project Manager**
Food and beverage

"We are already using mobile applications for the remote management of our computers."

— **Director**
Electrical and electronics

"We are using software and apps for everything: for our software and online data as well as for the controlling of equipment, for troubleshooting and for optimising our resources."

— **Technical Expert**
Pharmaceuticals

"I think that cloud computing is one of the most important technologies in a business, because the cloud is the exact storage for all the data we have and use. It should be applied in all aspects of the business."

— **Managing Director**
Food and beverage

"Big/smart data and advanced analytics are important for us. We already use it to continue improvements in the resource management department."

— **Principal Engineer**
Electrical and electronic

The trends ranked as most significant – software, apps, and cyber-physical systems – have been implemented by only about one third of respondents, while about one quarter have made good progress in relation to IoT. However, over half of respondents are still in the initial/planning phase when it comes to the implementation of technologies.

Digitalisation in focus: Siemens

Domhnall Carroll

Head of Digital Factory Division,
Siemens Ireland

"We're investing locally in a data analytics application centre to build capability for digital services."

Siemens is preparing for a complete organisational transformation as a result of Digitalisation not only in the way we work and manufacture products but also the transformation of our customers' value chain and where we impact it.

Right now, in addition to significant software acquisitions, we're adding digital services to our existing business, learning by doing, with each business area encouraged to do pilots, working with customers, using data to solve problems or realise new opportunities. For example, Mindsphere, our global IoT platform that connects Siemens and non Siemens equipment is being used to capture performance data and also host new services based on that data and the associated analytics. One application is where our traditional service business is moving from a call out model to remote connections for data based diagnostics: some issues that required a site visit can now be rectified remotely saving time and cost for the end user.

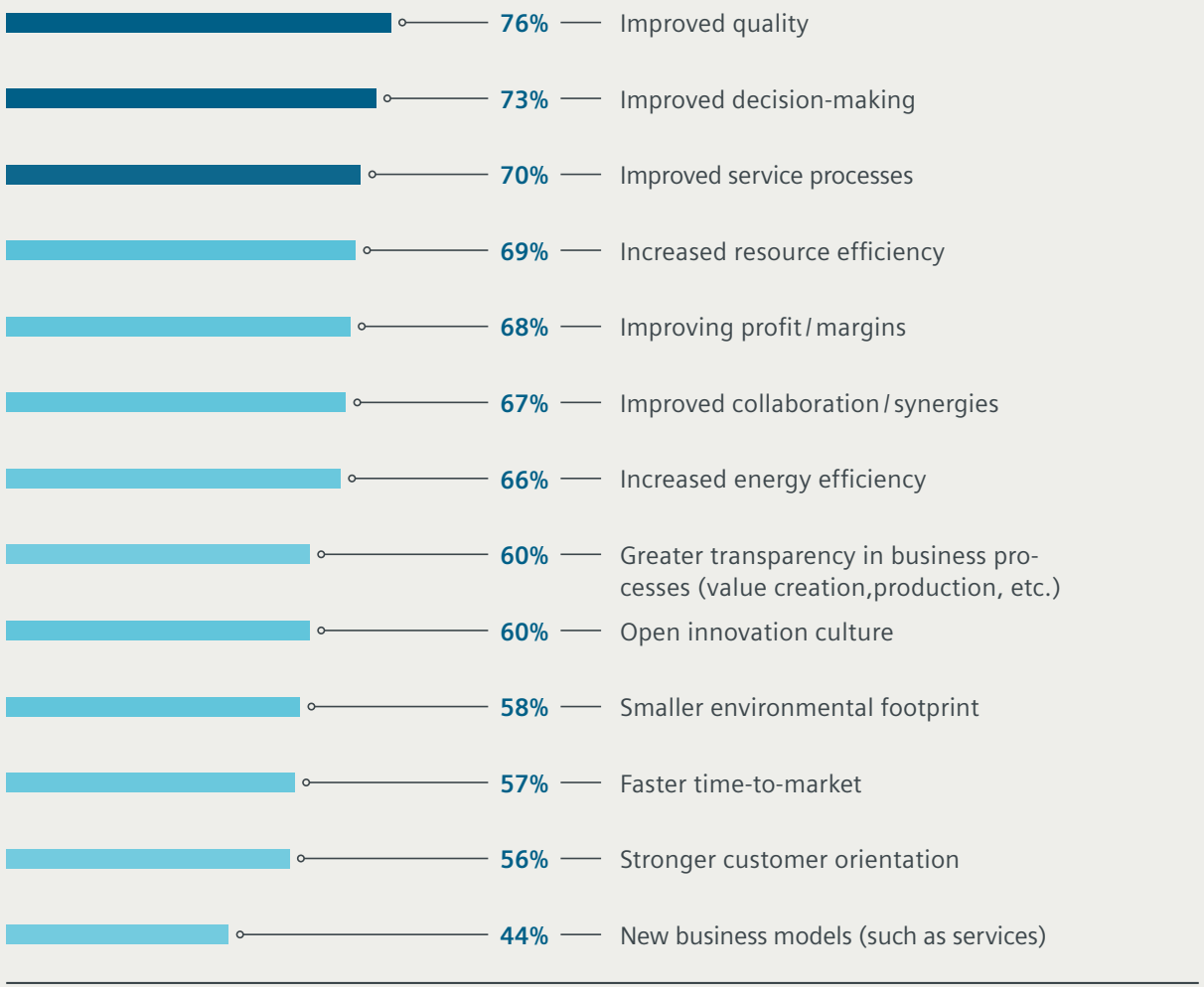
For new business areas, we're also 'learning by doing', building on our own ideas and importing some ideas from other parts of Siemens. We're investigating new business models such as servitisation, where we charge based on the performance of a product and service rather than as a one time capital cost. Data analysis provides insight on the performance and use allowing us to charge in a way that's matched to usage over the life of the system.

We're investing locally in a data analytics application centre to build capability for digital services. Already we are working with several companies in Ireland and also in other European countries on projects that are based on data analytics and domain knowledge in a manufacturing environment. We hope to expand this in the near future to address additional Siemens business areas.

The benefits of Digitalisation

Question: What do you expect from Digitalisation?

(N=135 persons surveyed)



Three quarters of surveyed companies expect Digitalisation to enhance quality and improve decision-making processes, while seven in ten hope for better service and a more efficient use of resources. Two thirds place a premium on greater profitability, improved collaboration, and greater energy efficiency, while six in ten assume that Digitalisation will enable an open culture of innovation and greater transparency for their business processes. "Every company needs software and apps to simplify its business," says the Managing Director of a company from the food and beverage industry. "And I believe we will be able to make good use of Digitalisation technologies in food and beverage production as well."

Different industries have different priorities, of course: 79% in the electrical and electronics industries hope that Digitalisation will deliver stronger customer orientation, while only half of those in the pharmaceuticals industry consider this important.

Improvements in daily operations expected. New business models a lower priority.

Digitalisation in focus: DAA

John Heffernan

Chief Development Officer,
DAA

"We are preparing to embrace these challenges to maximise the benefits that these transformational technologies will bring."

Almost all aspects of Digitalisation are impacting the aviation industry – particularly airports. For the immediate future, we see three key areas where our airports will be making use of digital technologies – passenger journey, operational efficiency and retail revenues. Passengers are now expecting a journey which fits with their online lives. It is important for the airports to be able to accommodate this through wifi, apps and online processes which allow the sharing of information between the passenger and the airport therefore allowing for a better passenger journey.

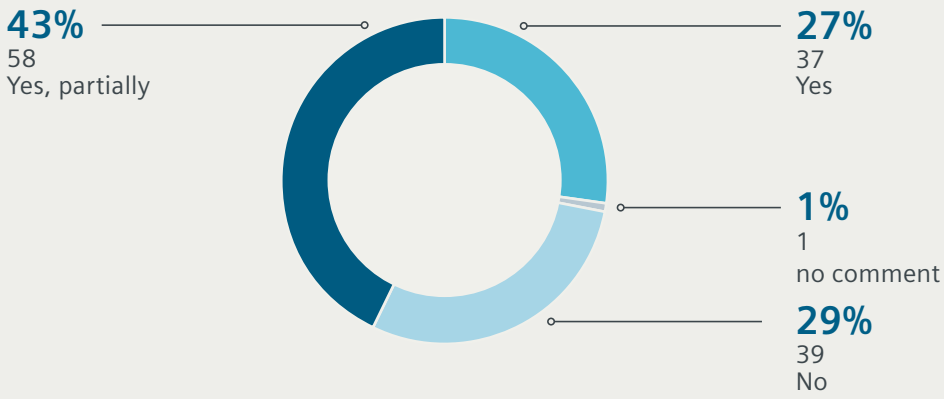
Our airport management teams are exploring automation in opex driven activities in both security and operations. These technological solutions could help the Dublin airport overcome the capacity constraints that it is currently facing. An area of opportunity for Digitalisation is in retail revenue growth through the sharing of data, online retail opportunities and strategic partnerships with other commercial bodies.

We are aware that Digitalisation has the potential to significantly disrupt long standing airport procedures and processes however we are preparing to embrace these challenges to maximise the benefits that these transformational technologies will bring.

Digitalisation and business strategies

Question: Have you already developed an overarching digital strategy?

(N=135 persons surveyed)



Digitalisation can only produce significant business benefits if a company's efforts are backed up by a corresponding plan that is also integrated into the general business strategy.

The majority of surveyed companies have fully (27%) or partially (43%) developed an overarching digital strategy. Worryingly, 29% have no strategy in place. The results vary by industry, with eight of ten pharma companies in possession of a digital strategy, compared to only six of ten food and beverage companies.

Almost one third have no strategy in place.

Digitalisation in focus: Irish Water

Eamon Gallen

Head of Customer Operations,
Irish Water

"We see Digitalisation as a key enabler from an number of perspectives to improve our decision-making and planning processes."

We in Irish Water have been tasked with bringing together 34 Local Authority managed water bodies to operate as a single public utility, one of the largest and most complex transformations ever undertaken in the Irish Public Sector. We see Digitalisation as a key enabler from a number of perspectives including remote visibility and control of assets using SCaDA and Telemetry to Automatic Meter Reading (AMR) and national databases to improve our decision-making and planning processes.

Digital technologies will contribute to achieving operational efficiencies of €1.1bn and capital efficiencies of €0.5bn and ensure that we deliver the best value possible for the people of Ireland, as we invest €5.5bn on their behalf between now and the end of 2021.

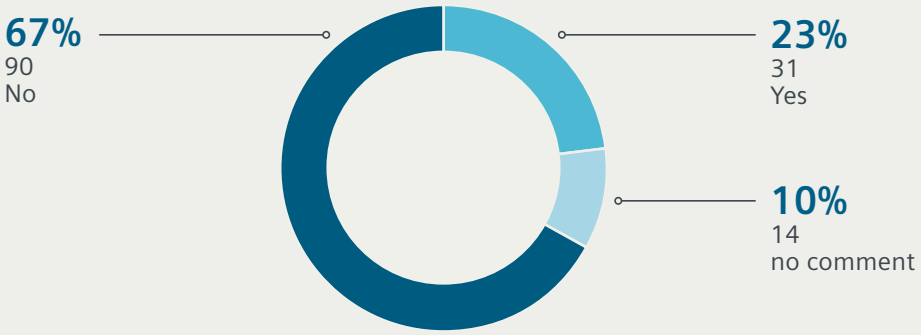
Given the scale and spread of our Water and Wastewater networks, it is vital that staff have access to the latest Geographical Information Systems (GIS) and work management systems readily available on hand held devices which feed live information to and from site, so that our Contact Centre has visibility of developments in the field.

We are working towards a future where analytics will be used to identify and predict leakage and where our customers can easily access real-time information on network issues that affect them, so that their experience is in line with, or exceeds, worldwide best-practice standards.

Implementation measures show potential for improvement

Question: Has a process analysis or an economic feasibility study already been performed?

(N=135 persons surveyed)



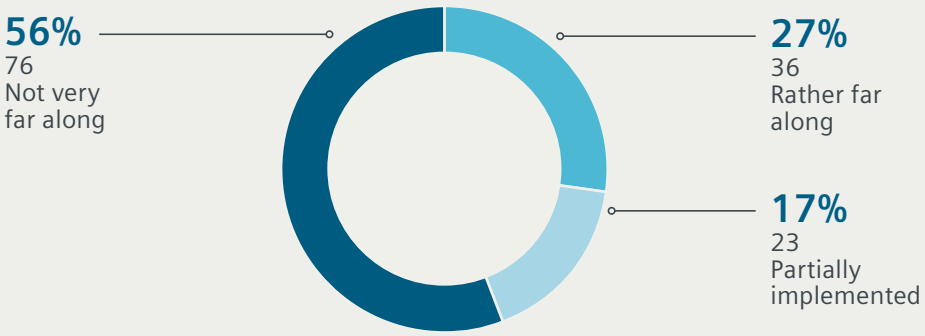
Only about one quarter of respondents have conducted an economic feasibility study – a cornerstone of digital strategies.

Two thirds have not yet performed an economic feasibility study.

Significant gap in the progress of implementation

Question: How far along are you currently with regard to implementation within your company?

(N=135 persons surveyed)



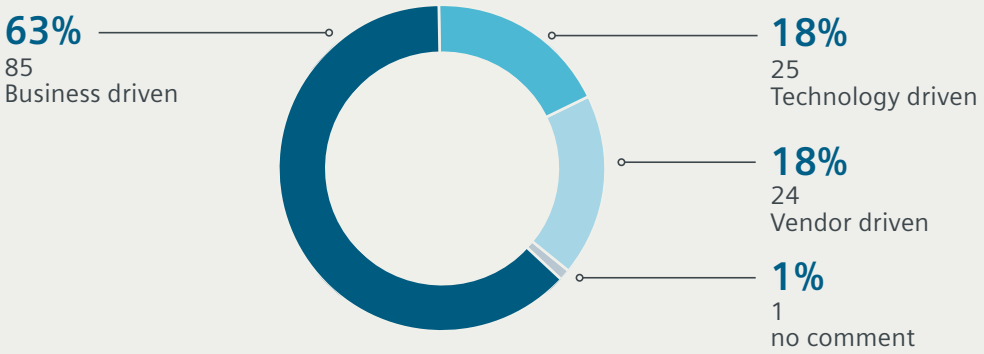
The majority (56%) are not yet very far along in implementing their Digitalisation strategy. 17% have partially implemented such a strategy, and 27% are further along the process. The company size plays a role, with large enterprises further along than small and medium-sized enterprises. The industry is also a factor: those in food and beverage (37%) and electrical and electronics (36%) are further along here than those in pharmaceuticals (19%).

Most are not very far along in regard to implementation.

Approaches to adopting new technologies

Question: How do you characterise your approach to adopting new and emerging technologies?

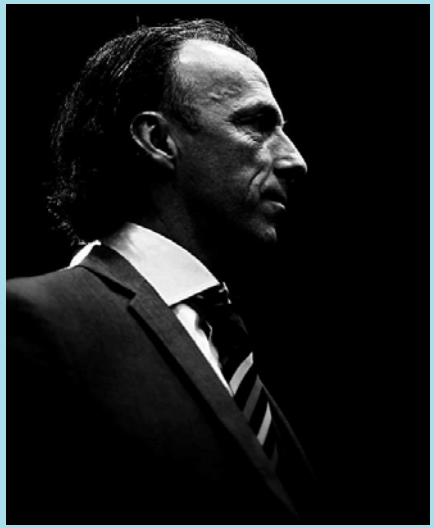
(N=135 persons surveyed)



Six in ten respondents cite business concerns as driving the implementation of new technologies, while two in ten are waiting for a technology to first establish itself on the market and then be introduced through the strategic vendor of the company. An equal number of respondents has a technology driven approach.

Digitalisation projects are mostly commercially driven.

Digitalisation in focus: SSE Airtricity



Roy Baker

Director of Retail Efficiency,
SSE Airtricity

"Analytics is key in driving our future business by showing how our customers think, what they want, and how the market views your brand."

Unprecedented change is happening in our industry with the planned implementation of Smart Meter technology and the evolution of connected homes. SSE Airtricity will succeed by being adaptive to industry and marketplace shifts and we will incorporate new technology into our company and culture in an agile, dynamic way.

Proactive innovation is required to remain competitive in an evolving marketplace. Emerging technology needs to be adeptly assessed, tested, analysed, and judged more quickly than ever. We can no longer afford to waste time and resources implementing new tools that offer no real value. This means a "Fail fast, to succeed faster" mentality.

Customer experience (CX), is the ultimate goal of any digital transformation. Customers are more cautious than ever; they'll turn away from brands that don't align with their values and needs.

Key to that CX shift is the mainstream shift toward AR and VR which provides us with new ways to connect with customers and offer unique, memorable interactions. The popularity of AR and VR also open up the gates for workplace gamification which I predict that by next year will go from a footnote to a core business strategy.

There is an ever-growing and dizzying amount of valuable data in the world, but few companies are using it to maximum effect. Analytics is key in driving our future business by showing how our customers think, what they want, and how the market views your brand. In the age of digital transformation, almost everything will be measured. In the coming year this will be a cornerstone of how our businesses operates.

Potential projects

Question: What Digitalisation projects are you planning for the next year?

"We plan to install eco-friendly technologies in our business."	**Technical Support Engineer** Water Treatment
"We are going to apply new technology for big data analysis and management."	**Engineering Manager** Pharmaceuticals
"We want to set up a new technology in data recovering systems."	**Maintenance Manager** Food and beverage
"We are going to implement some projects related to artificial intelligence."	**Business Intelligence Director** Electrical Distribution
"We have several projects related to capturing data in all devices. Also, we are building a platform that will provide solutions for all clients, no matter which kind of industry they are in."	**Managing Director** Electrical and electronic
"We are not planning anything at the moment."	**Senior Plant Engineer** Pharmaceuticals

Nearly half of those surveyed have planned Digitalisation projects within the coming year. There is a diverse range of projects given the short time frame. A manager from the electrical and electronics industry comments: "We have several projects related to capturing data in all devices. Also, we are building a platform that will provide solutions for all clients, no matter which kind of industry they are in." However, the other half of respondents are unaware of any specific Digitalisation projects.

Half of the respondents are without specific plans.

Plans for the future

Question: What Digitalisation projects are you planning for the next three years?

"We want to implement remote control operations into manufacturing."	**Director** Water Treatment
"We are planning to implement automation for all of our systems."	**Principal Engineer** Electrical and electronic
"We are going to make new upgrades in the energy efficiency department by using Digitalisation."	**Instrumentation Manager** Food and beverage
"I don't know for sure, I'm not aware of any project"	**Sales Manager** Pharmaceuticals
"We will focus on the development of new technologies and combine them in one control system."	**Development Manager** Power Utility
"We would like to implement new digital strategies."	**Automation / IT Director** Pharmaceuticals
"We will expand monitoring and managing equipment and also implement policies for equipment maintenance."	**R&D Manager** Machine Building
"I am not aware of any projects."	**Sales Engineer** Food and beverage

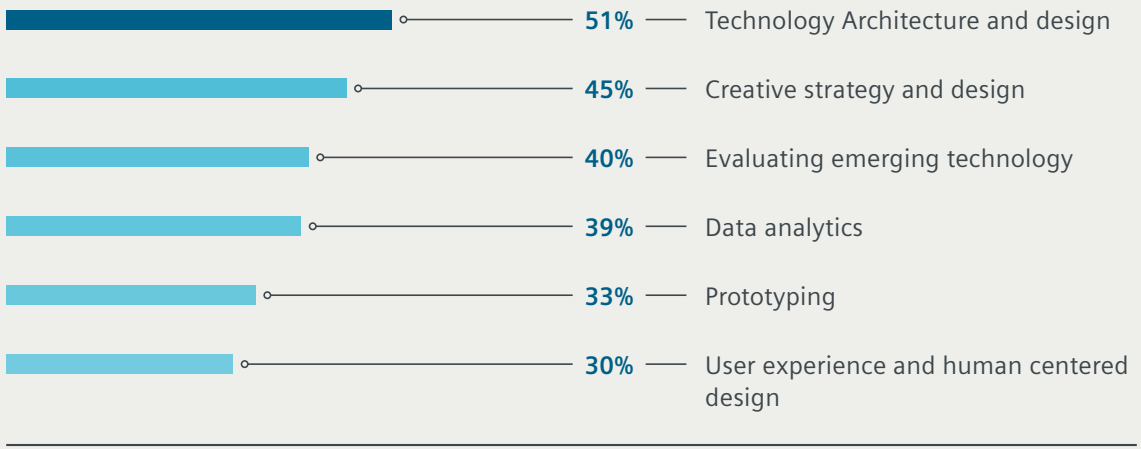
The forecast over the next three years is similar. About half of respondents point to major projects. A Principal Engineer for a company in the electrical and electronics sector cites "automation for all of our systems," the Director of a water treatment company talks about "remote control operations," and the company of a manager in the food and beverage industry is planning digital upgrades to further enhance energy efficiency. However nearly the same number of respondents do not know of any plans for Digitalisation projects in this extended time horizon. This could mean that there are none, but also that the respondents are not aware of them – both options show potential for improvement.

To some extent, a longer perspective is missing.

Digital skills and capabilities

Question: How would you rate your organisation's digital skills in terms of its capabilities in the following areas?

(N=135 persons surveyed)



Only half of respondents trust in their company's digital skills – especially when it comes to the architecture and design of digital technologies. 45% are confident that their company can implement a creative strategy and design. A full four in ten are confident that their company is capable of evaluating emerging technology and has adequate data analytics skills, but only three in ten feel that existing capacities for prototyping and design of the user experience are well developed. The conditions for bringing new expertise on board are positive: after all, Ireland has the highest density of STEM graduates in Europe (25 per 1,000 people).*

Companies in the electrical and electronics industry are better positioned than other industries in almost all aspects.

Digital skills sets have room to grow.

*European Commission, Digital Economy and Social Index, 2017

Digitalisation in focus: Iarnród Éireann

Damien McConnell

Technical Manager,
Iarnród Éireann

> **"Digitalisation has provided transparency and an abundance of data that is enabling us to rethink how we operate and maintain our trains."**

Iarnród Éireann is a large organisation that is divided up into a number of separate departments all working together to deliver transport services that continually adapt meet our customers' requirements and help drive Ireland's economic development.

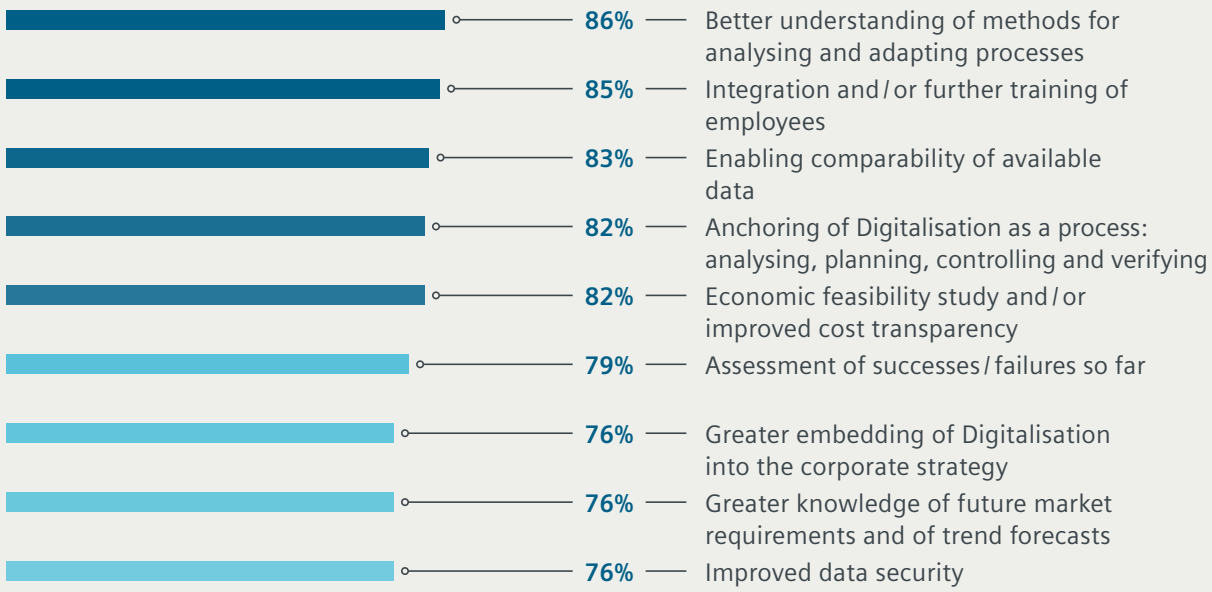
The CME department is an important cog in the Iarnród Éireann wheel with responsibility for maintaining the company's fleet of trains to the highest standards of safety and quality. In order to help us optimise fleet maintenance whilst at the same time improving fleet performance and reliability we have turned to technology. We have embarked on an ambitious project to fit our fleets with real time remote data collection and condition monitoring systems.

Digitalisation has provided transparency and an abundance of data that is enabling us to rethink how we operate and maintain our trains. The challenge going forward is to be able to effectively analyse and interpret this data and use it to optimise how we work, saving time and cost while at the same time increasing the safety, reliability and availability of the fleets.

Driving the futher implementation of Digitalisation

Question: What would you have to do or what would you need to have in order to be able to drive implementation further?

(N=135 persons surveyed, multiple answers possible)



others=1%

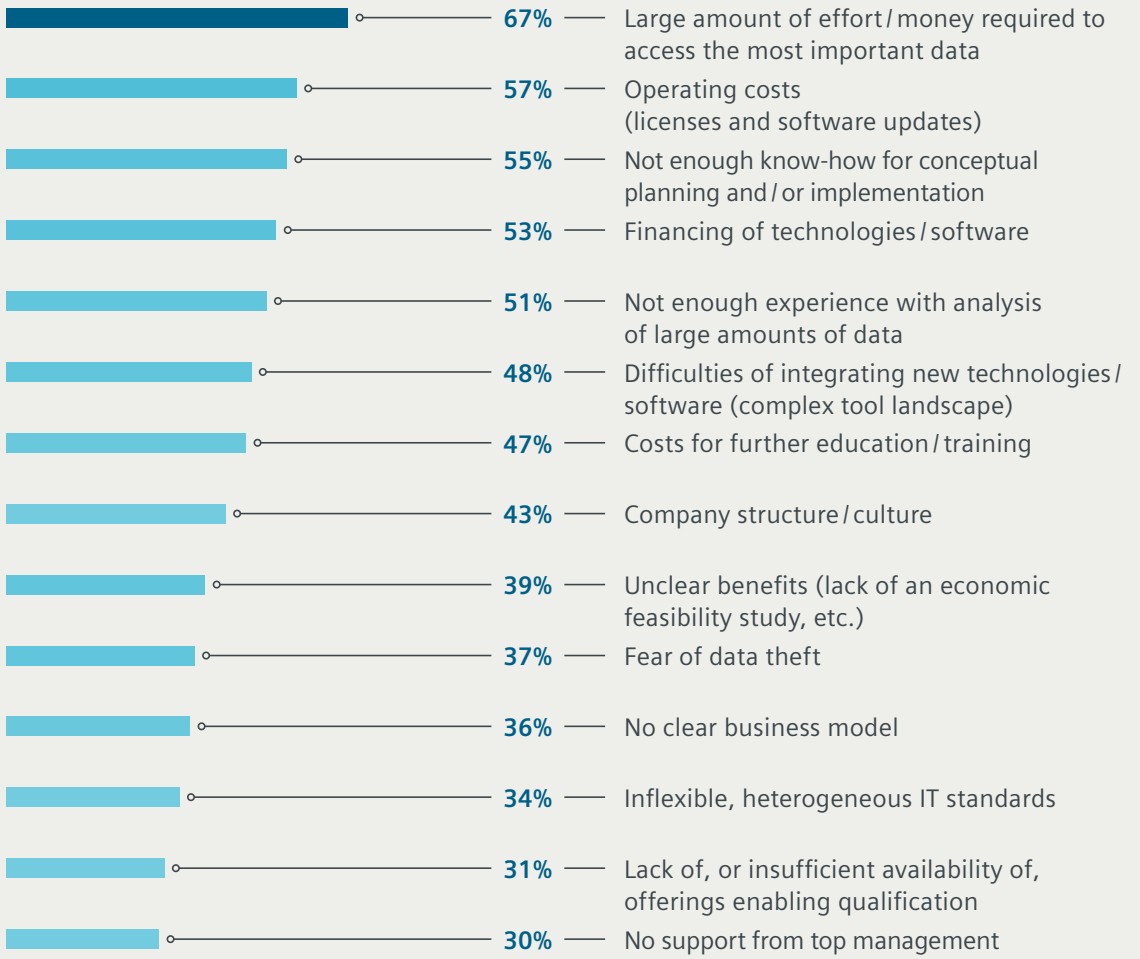
To drive Digitalisation forward, most respondents – 76% to 86% – therefore see a need for various improvements: Most respondents perceive the need for a better understanding of the methods for analysing and adapting processes, for example, along with the closely related need to integrate and further train employees in digital workflows. Other perceived needs include economic feasibility and case studies, the Digitalisation of internal processes, greater embedding of Digitalisation into the corporate strategy, a greater knowledge of future market requirements, and improved data security. Respondents who are middle managers and specialists appear to be more aware of the potential for improvement than those in top management. They are often closer to the daily business and therefore might see more directly than top management what Digitalisation could drive forwards.

Deficits identified in all areas of implementing Digitalisation.

Barriers and challenges: Internal

Question: What holds you back from making even greater use of digital technologies and processes at your company?

(N=135 persons surveyed, multiple answers possible)



We currently have other priorities=1%

Respondents see the greatest barriers to advancing Digitalisation as internal ones: in the lack of expertise and above all in the costs of accessing key data (67%), paying for software licenses and updates (57%), and providing employees with additional training (47%). Surveys conducted in Mexico (2015), Portugal (2015), and Germany (2014) yielded similar results.

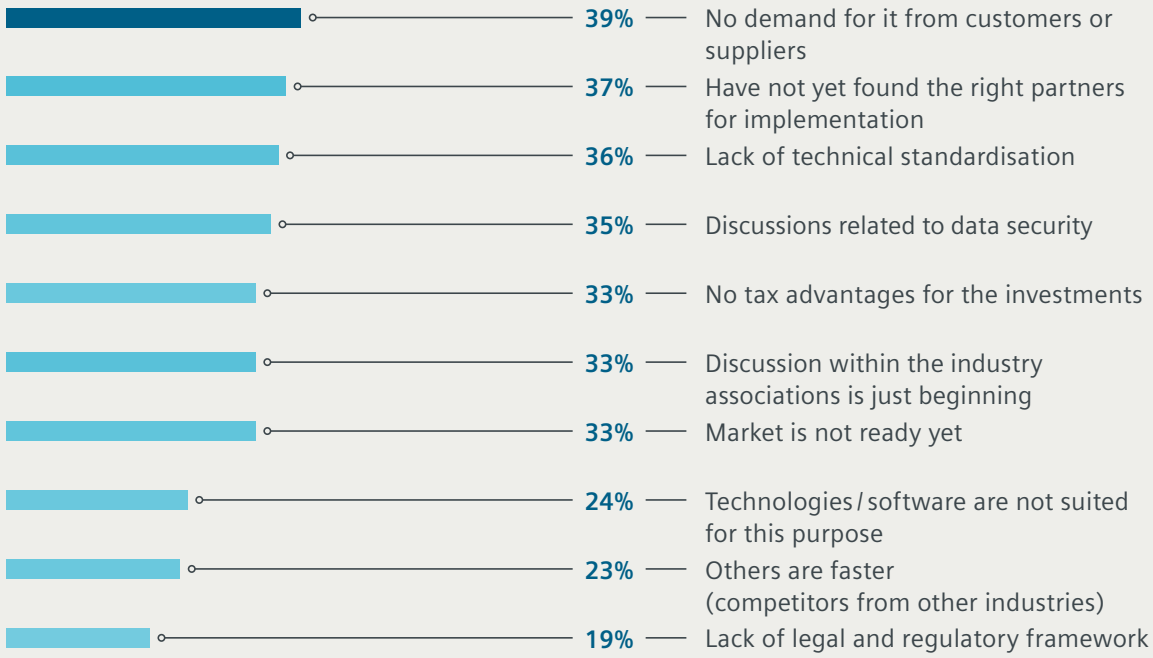
However, respondents also cite external factors – though to a lesser extent. This includes lukewarm demand from customers and suppliers (39%) and the lack of partners to implement new technologies (37%). Some also cite the lack of technical standardisation (36%), which was seen in Germany as the greatest external barrier (46%). A third of respondents are also concerned about data security issues – and not just because of the international debate surrounding this issue. A full three in four organisations in Ireland (72%) report being the victim of a cybersecurity incident in the past two years, for example – compared to 57% worldwide ("Global Information Security Survey," Ernst&Young, 2017).

Implementation inhibited by cost concerns and lack of know-how.

Barriers and Challenges: External

Question: What holds you back from making even greater use of digital technologies and processes at your company?

(N=135 persons surveyed, multiple answers possible)



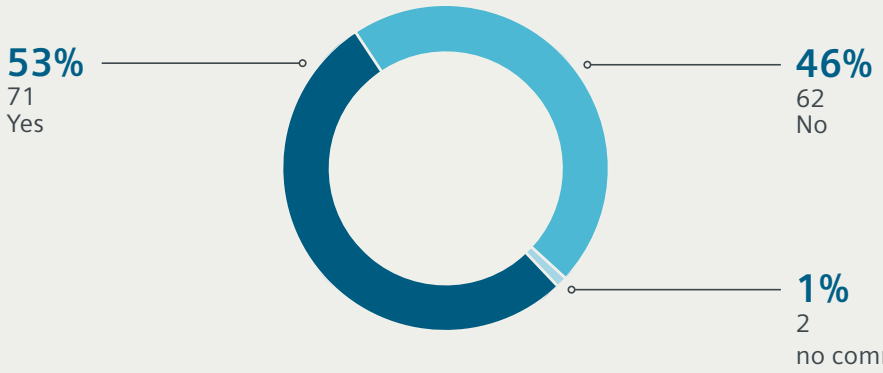
One in three also laments the lack of tax advantages for investments in Digitalisation – which respondents in Portugal cite as the number-one barrier in 2015. Last but not least, one fifth of Irish respondents describe an inadequate legal and regulatory framework for Digitalisation – which is important on the national and EU level, of course, if Ireland hopes to remain internationally competitive going forward.

Political support, regulatory framework and security issues seen as crucial.

Responsibility for Digitalisation

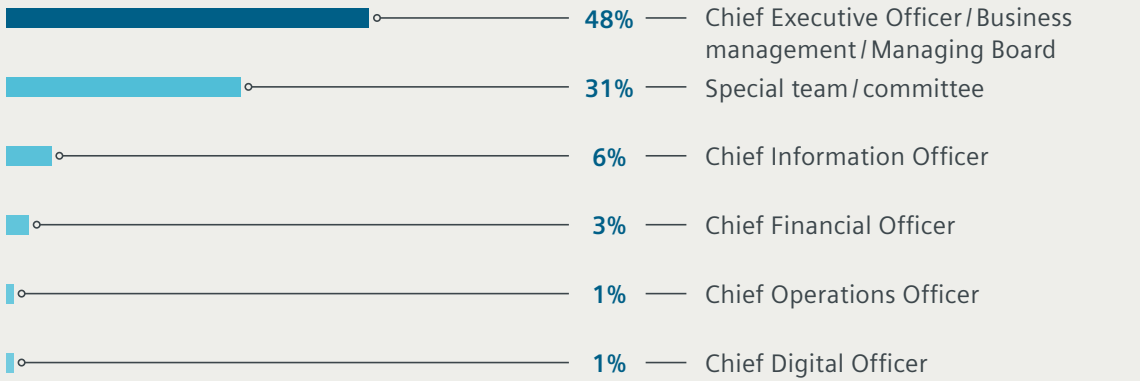
Question: Does your company have a position / governing body that bears central responsibility for these topics and makes decisions regarding a digital strategy?

(N=135 persons surveyed)



Yes, that's decided / determined by:

(N=71 persons surveyed)



other (7%); I don´t know (3%)

More than half of the companies (53%) have assigned responsibility for Digitalisation projects to one central person or entity, most likely the CEO or Managing Board or a special team or committee (31%). This is especially true in large enterprises, where 61% have already set up a role for this. These positions are at the company management level in about half of all respondents.

For companies in which Digitalisation has not been centralised (46%), a variety of specialised departments frequently play a significant role alongside the top management.

Digitalisation seen as a topic for the managing board.

International comparisons

Siemens has conducted Digitalisation surveys among companies in several countries, including Brazil, Mexico, Germany and Portugal, the latter a close European neighbour and a country also pushing its Digital credentials.

Participants in Portugal reported to be further ahead in terms of the implementation of various digital technologies compared with those in Ireland.

Additionally while Ireland benchmarks well against a similar but older (2014) survey in Germany, Irish companies seem to compare less favourably in having already developed an overarching digital strategy: 35% in Portugal compared with 27% in the Irish survey.

Whereas in Portugal four in ten respondents already conducted a process or an economic feasibility study, only 23% did so in Ireland. Unsurprisingly, the implementation of Digitalisation strategies mirrors this situation: four in ten respondents in Portugal see implementation rather far along compared with 27% of Irish respondents.

One reason for this could be that over half of companies surveyed assess that they lack sufficient data, know-how and experience for implementation, whereas among Portuguese respondents these knowledge and experience based factors are less of a concern, but cost is. And since Portuguese companies see themselves further along with implementation, lack of knowledge and experience appears to be a bigger stumbling block than cost.

External barriers, such as not having adequate partners or not enough demand from customers or suppliers, are considered less important among Irish companies than internal ones. They get cited by at most four in ten respondents. For Portuguese companies external barriers weigh more heavily on their ability for implementation, the main one again being financial related – a lack of tax advantages for investments in digital technology.

Outlook: Digitalisation at Siemens

Every day, billions of connected devices and machines bridge the real and virtual worlds, changing the way we live, travel, work and make things. By 2020 Gartner estimates that there will be over 20 billion connected devices. Today most of the data collected is unused or not used to its fullest potential. With innovative technologies, Siemens is helping industries from manufacturing to power utilities to transportation to embrace the power of data.

We merge the physical and virtual worlds through the simulation of products, machines and plants using digital twins. Digital twins can reduce time to market by up to 50 percent by virtually testing products and production processes before actual production begins. Digital twins of plants and machines offer numerous benefits throughout the entire lifecycle from product design, production planning, and engineering to commissioning, operation, servicing and the modernisation of systems and plants.

Every machine and system holds a wealth of data. MindSphere, the cloud-based operating system for the Internet of Things, can connect machines and physical infrastructure to the digital world. Offering industrial apps and digital services, MindSphere can reduce downtime, increase output and optimise use of assets. As an open platform, customers and third parties can use MindSphere to develop their own applications, digital services and even new business models.

At Siemens we are also seizing the potential of Digitalisation to transform our own company. We're applying digital technologies like digital twins, simulation software, additive manufacturing and intelligent automation in our own facilities. We're fostering a culture change to become faster, more agile, more innovative. And because speed is of the essence in the digital era, we collaborate with an ecosystem of partners, as well as co-create solutions with our customers.

Together with our customers, Siemens is helping to shape Digitalisation worldwide. We're using digital technologies to improve the stability of power grids, to increase the electricity output of wind farms, to reduce energy consumption in buildings and to enhance other critical systems that keep our world running smoothly. With our industry specific know-how, we can identify how Digitalisation can improve productivity, performance and competitiveness. As a result, our customers in Ireland can count on a partner who will support them in successfully meeting their requirements for the future.

Information resources

Further information on the content is available from:

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