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Digitalization

Trends and Insights for
Argentina 2017

Digitalization Survey Argentina 2017 | Result Report

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Foreword



Javier Pastorino

CEO, Siemens Limited Argentina

Dear readers,

Up to the year 2000, humanity as a whole had accumulated about two billion giga bytes of data. We currently generate this volume of information in a single day. Growth in this area is unlimited – not least because the real world is now being mapped more and more in the virtual one. A brief look at the digital transformation now underway reveals just how much our world has changed in the last few years and just how great today's paradigm shift really is.

In these ways and more, Siemens is working together with its customers to re-define the meaning of productivity, the meaning of service, and create new business models. From design and engineering to production and operations, to maintenance and service, Siemens hardware, machines and software are designed to talk to each other, creating new synergies between hardware, software and data, enabling resource optimization, injecting new levels of flexibility into operations, ensuring operational reliability, uptime, availability and resilience, while enabling faster time to market.

Argentina is naturally part of this global process of change, and as many other countries faces both considerable challenges and opportunities in terms of digitalization. And there are reasons to be optimistic: the potential is clearly there, as demonstrated by the fact that our country is home to four of Latin America's six start-up unicorns, or tech companies that are valued at over 1 billion USD.

We're working together – across all our business fields – to drive the digitalization in the local marketplace, to help our customers

remain successful over the long term, jointly developing trendsetting technologies and business models. We are – and will remain – active participants in today's digital transformation. On that note, I'd like to encourage you to take a close look at our survey results. I hope you'll find them interesting and stimulating reading.

With best regards,

A handwritten signature in black ink, appearing to read 'J. Pastorino', written over a horizontal line.

Javier Pastorino

Introduction

Digitalization 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.

Against this backdrop, Siemens has been conducting surveys among companies in several countries, including Brazil, Mexico, Germany, Portugal, Ireland – and now also in Argentina, where the company conducted interviews with over 300 Argentinian business leaders and specialists. The questions were not only about what digitalization means to them, but also how far the companies have already become digitalized, where do the respondents see potential, where barriers, and what are their current plans for digitalization.

On an international comparison, the surveys show commonalities as well as individual differences. Additionally, the respondents in Argentina reveal not just general digitalization trends within the country, but varying assessments depending on industry sector or on where the respondents are positioned within the companies' structure.

In general, Argentina faces considerable challenges in terms of digitalization. The 2016 Global Information Technology Report published by WEF ranks Argentina only 89th out of 139 in terms of digitalization. This puts Argentina 11th among the 22 other ranked Latin American economies and second from last when compared with other high-income nations, only scoring higher than Venezuela in this bracket. One main reason, according to the WEF report, appears to be unsupportive political and regulatory environments during the last years, as well as business and innovation environment.

There are however reasons to be optimistic for the development of digitalization in Argentina. The country boasts strong figures for its secondary and tertiary enrollment rates even comparing with other Latin American countries, a digitally very active population in terms of quantity of mobile users and internet connections, and companies, as this survey demonstrates, with a strong interest in digitalization. The corporate interest still needs to translate into more holistic digitalization strategies and their implementation, though. This – along support from political and regulatory bodies – can lead to an improvement of local productivity, global competitiveness and disruptive innovation.

The potential is clearly there, as demonstrated by the fact that Argentina is home to four of Latin America's six start-up unicorns, or tech companies that are valued at over 1 billion USD¹. And this potential also meets an imminent need that cannot be ignored: The 2016 World Development Report by the World Bank found that this kind of technology will impact deeply in current status-quo of local job market. The majority of jobs, as known today, will be transformed and replaced by digitalization. Therefore it must be seen as a significant challenge but, at the same time, an important opportunity².

Siemens is, of course, perfectly positioned to help customers grow their businesses digitally. Today, 17,500 Siemens employees are software developers (out of 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.

¹ Financial Times, Argentina: home to the majority of Latin America's tech unicorns, 2016

² World Bank, World Development Report, 2016

Executive summary and key results

01 **A comprehensive survey on digitalization in Argentina.**

Survey participants comprised a sample of 313 decision-makers and specialists from companies representing 22 industrial sectors in Argentina – primarily drawn from electrical and electronics, food and beverage, metals, automotive and chemicals industries. Participants were asked how they implement digitalization at their company, who is responsible for digital strategy at their company, what challenges the company faces in the area of digitalization and what requirements they anticipate for the future.

02 **Expectations versus reality: Implementation of digitalization strategy in Argentina lags behind presumed importance.**

Most (55%) of the companies surveyed have defined digital strategies for portions of their business, but less than one fifth has such a strategy for the company as a whole. A further 27% have no strategy at all. More than half (53%) has not conducted an economic feasibility study or an analysis of workflows with a digital focus. Moreover, more than a third of respondents could not identify any specific digitalization project on their immediate time horizon. More than half claims to be unaware of any specific digitalization plans over the next three years.

03 **Importance and relevance of digitalization: Respondents have broad understanding and generally see it as crucial.**

Respondents have a broad understanding of digitalization: They associate it first and foremost with the process of converting something analog into something digital – but a quarter also mentions data management, and one out of ten names establishing a network between devices, systems and humans. More than a half says they are familiar with the concept of digitalization. They cite nearly all aspects of digitalization as relevant to their company, especially digitalization of manufacturing, such as reading data out of machines and sensors, automating production processes, and creating interfaces for more efficient interaction with machines, suppliers. As the most important trends in digitalization they name the Internet of Things (IoT), new software developments, cloud computing, cyber-physical systems such as automation technologies for factories or smart grids. Still, overall implementation status of these technologies is low.

Executive summary and key results

04 **High costs and lack of knowledge are main obstacles to the further implementation of digitalization.**

The primary barriers for implementation of digitalization according to respondents are costs: Most of all internally, as in operating costs, financing of technologies and costs for further education and training of employees. Additionally, costs are relevant from the external perspective: The most inhibiting factor is lack of tax advantages for investments in digitalization. The other main barrier relates to knowledge and know-how: Respondents perceive a lack of know-how for conceptual planning and implementation as well as a lack of experience in big data analysis as major obstacles. Only around four in ten estimate their organization's skills in terms of data analytics as rather high and for all other digital skills like evaluating emerging technologies, technology architecture and design or prototyping scores are even lower. Costs and lack of expertise are also seen as the main obstacles in other countries as evidenced by the results of the surveys in Ireland (2017), Mexico (2015), Brazil (2015), Portugal (2015) and Germany (2014).

05 **Responsibility for digitalization is usually centrally anchored.**

For around six in ten customers surveyed, the responsibility for decisions relating to digital strategy is centralized. Responsibility does not necessarily lie with the CIO or CTO. Digitalization is mostly a "tone-from-the-top" topic, with senior management or the board being responsible for digitalization issues. Special teams and committees are also leading digitalization among some respondents.

Survey results

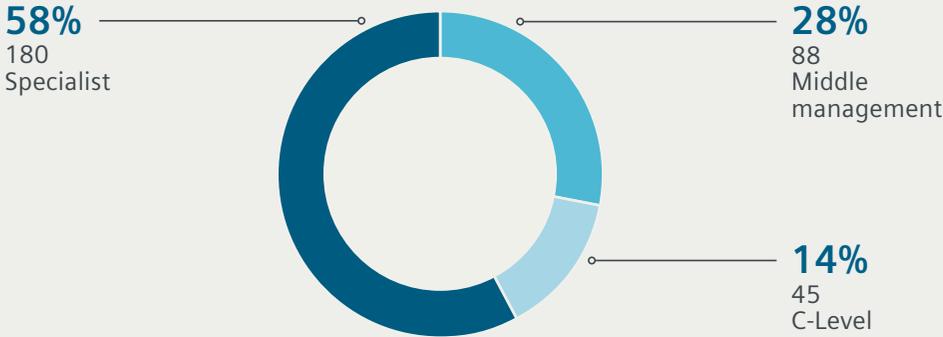
The survey questions covered a wide range of issues relating to digitalization and its outstanding importance for the future of the economy. In conducting the customer survey, Siemens focused, among other things, on two key aims:

Siemens' first aim was to find out which aspects of digitalization 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 digitalization.

The second aim was to find out if the companies surveyed have already developed an overarching digital strategy and where the responsibility for digitalization lies within their company organization.

Surveyed: A cross section of Argentinian industry

Position (N=313 persons surveyed)



Siemens conducted the survey with 313 respondents, with four out of five being Siemens customers and the rest prospects in August and September 2017 using a predefined questionnaire. Small and medium-sized enterprises represent two thirds of respondents, with large enterprises of more than 500 employees accounting for the remaining 32%. 58% of respondents are involved in operational implementation of the company strategy, especially in engineering; 14% work in top management and 28% in middle management.

Company size (N=313 persons surveyed)



no comment=2%

22 industry sectors represented

Industry that the company is in (N=313 persons surveyed)



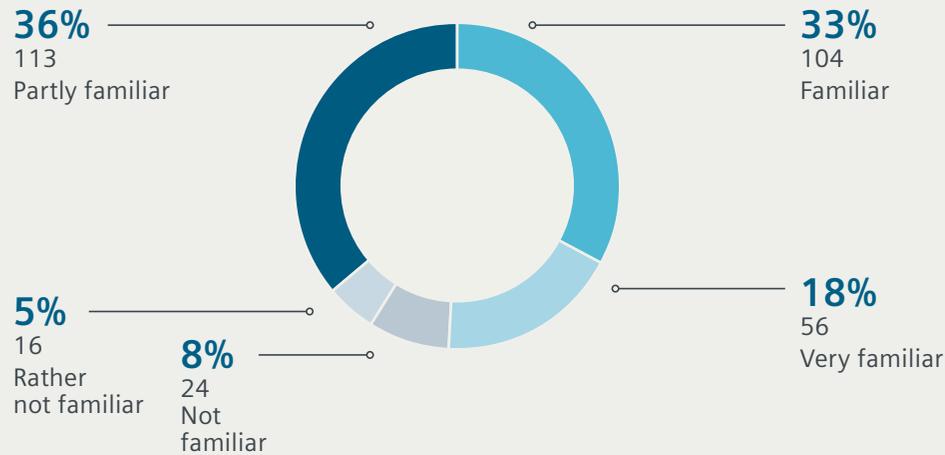
The respondents can be categorized in a total of 22 industries: The largest representations are found in electrical and electronics (23%) and food and beverage (10%). Other industries represented include metals (7%), automotive (7%), chemicals (7%) and infrastructure / construction (6%)¹.

¹ On the following pages, there are sometimes results of the industries included. For machine building, power transmission and oil and gas, these results have to be treated with caution due to the low number of cases.

The main aspects of digitalization

How familiar are you with the concept of digitalization in general?

(N=313 persons surveyed)

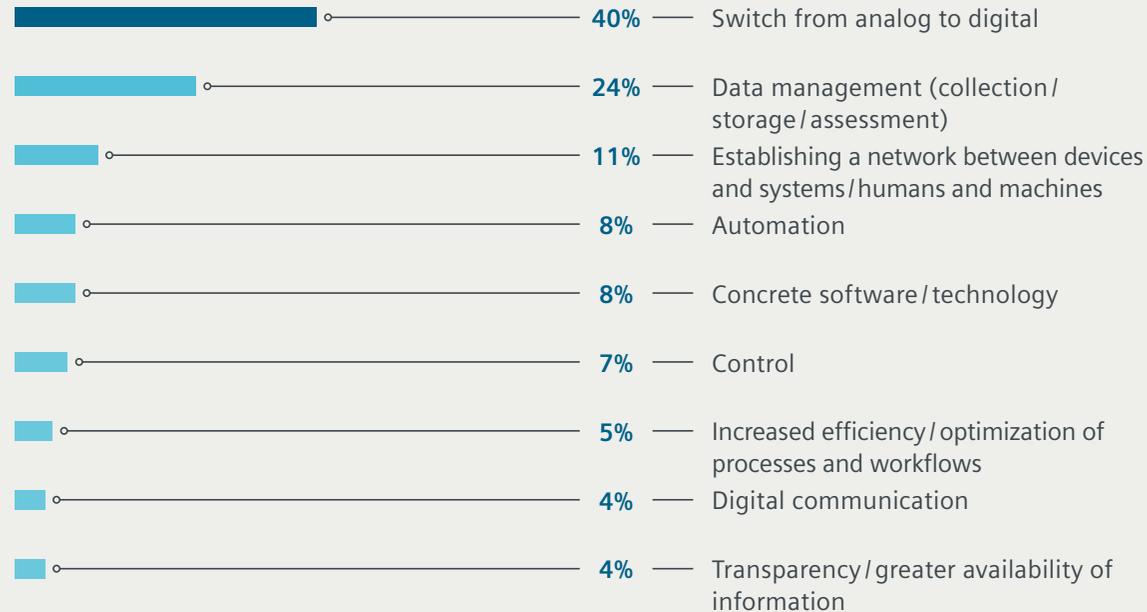


More than half of respondents (51%) describe themselves as either familiar or very familiar with digitalization, and about one out of ten (13%) know very little about it. About two thirds of respondents from the food and beverage and metal sectors describe themselves as familiar with the concept of digitalization. The lowest familiarity scores were found among respondents from oil and gas (25%) and machine building (21%).

The main aspects of digitalization

What does the term “digitalization” mean to you?

(N=313 persons surveyed, multiple answers possible)



no concrete idea=2%, no comment=5%, other=5%, values under 2% not displayed

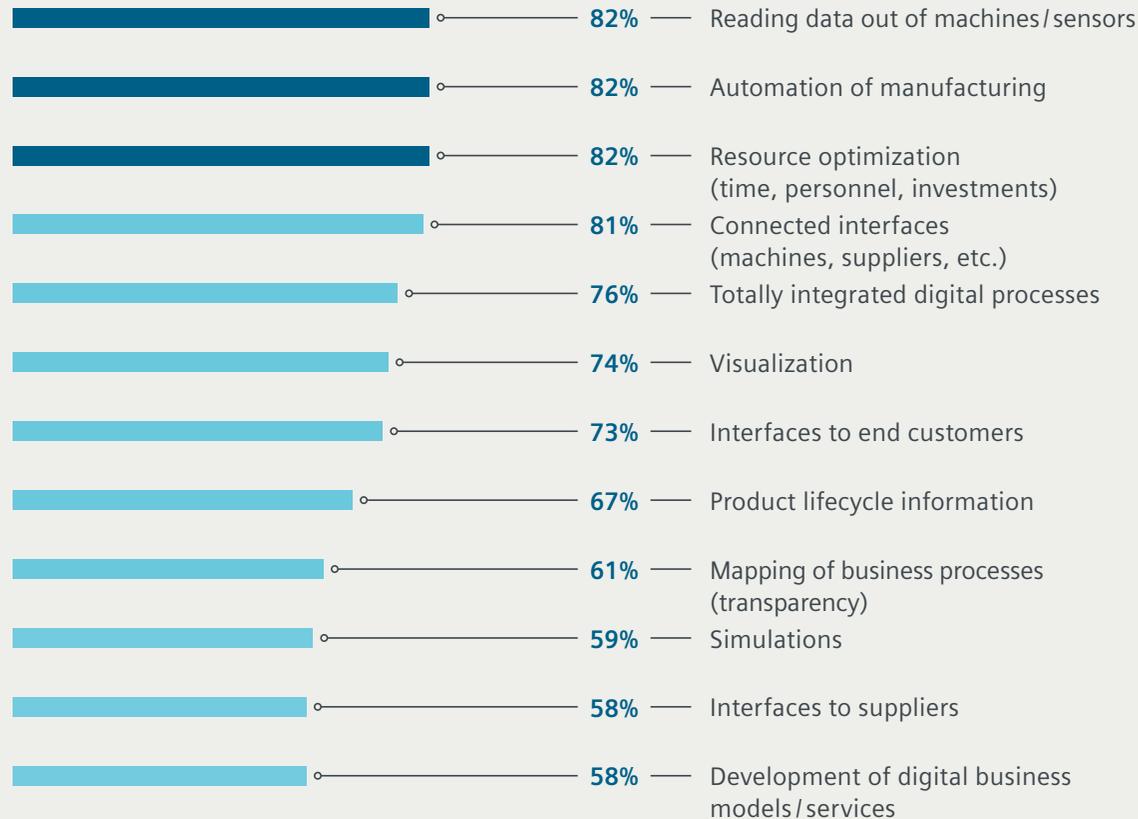
In their own words, the largest number of respondents – 40% – demonstrates a basic understanding of digitalization as the conversion of analog information into digital formats. Data management is a core part of digitalization according to 24% of all respondents. Some 11% of respondents also cite establishing network among devices and systems, humans and machines, while 8% point to software and technology or automation. In surveys in Brazil (2015) and Mexico (2015) digitalization is understood by an even larger share as the switch from analog to digital (48% each), whereas other aspects are only mentioned by 16% and less. The survey in Ireland (2017) showed a broader understanding of digitalization than surveys in Argentina, Brazil or Mexico.

Key aspects of digitalization identified

Which of the following terms provide the best summary of what you understand digitalization to mean?

How important are these areas to you?

(N=313 persons surveyed)



other factors=2%

A large majority of surveyed companies focus mainly on digitalization in manufacturing. Some 82% assigned equal importance to the reading of data from machines and sensors, the automation of manufacturing and resource optimization, such as in machines, suppliers, etc. An impressive 81% emphasize connected interfaces between machines and with suppliers. 76% also mention the establishment of totally integrated digital processes, 74% the visualization of complex processes, 73% interfaces for end customers and 59% simulations of products and production processes.

Answers varied depending on the position of the respondents: 73% of C-Level respondents appear to have a more holistic view by attributing a higher importance to interfaces to suppliers than middle management – 49% –, whereas middle management appears to be more process focused with 64% emphasizing simulations as opposed to 49% among C-Level respondents.

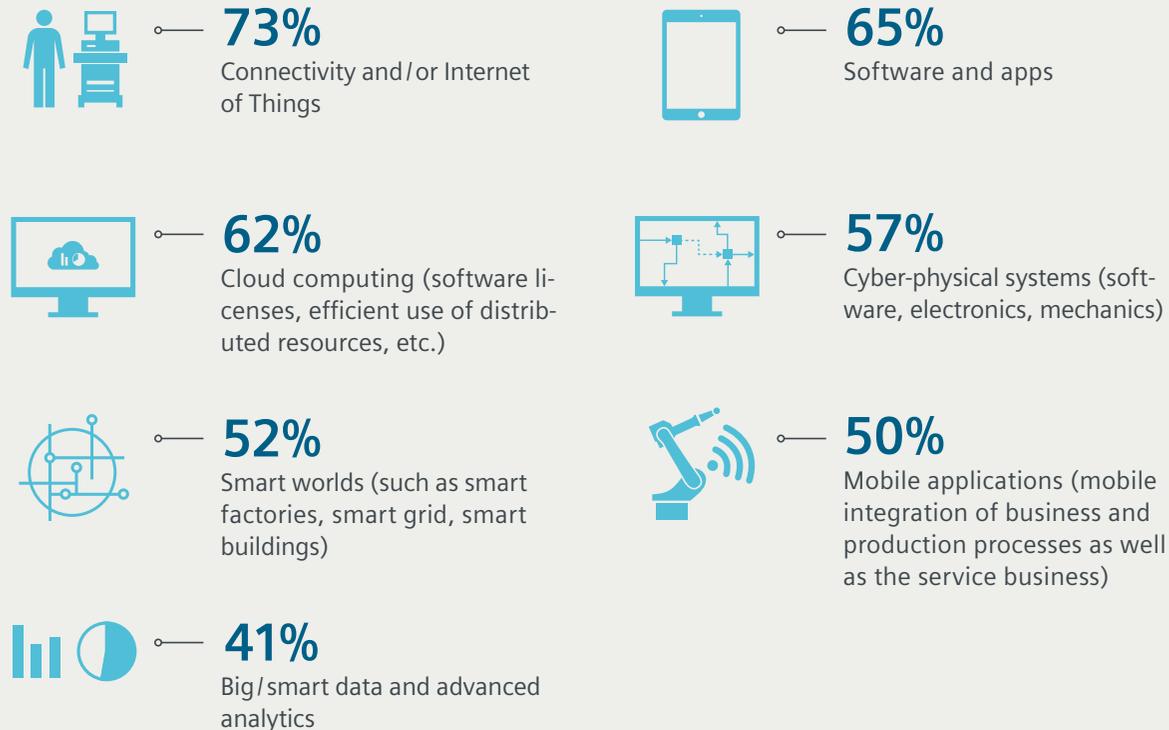
The most important technology trends

Digitalization trends: Identified but only partially implemented.

How important do you consider the following trends to be?

Which trends are currently important in your business environment?

(N=313 persons surveyed)



Nearly three fourths of surveyed companies see the IoT – the integration of people, products, and devices – as the digital technology of tomorrow. Around two thirds point to the development and use of new software and apps as an important trend. Nearly as many – 62% – point to cloud computing and 57% to the development of cyber-physical systems. But only a third to a fourth of the companies is very advanced at implementing these trends or has completed this process. Other trends, cited by around half of the respondents, are smart worlds and mobile applications. Obviously, within each industry, assessments diverge from the average e.g., among respondents from machine building, cyber-physical systems and IoT are considered by 79% each as the most important trends, followed by smart worlds with 71% compared to a 52% average.

The most important technology trends

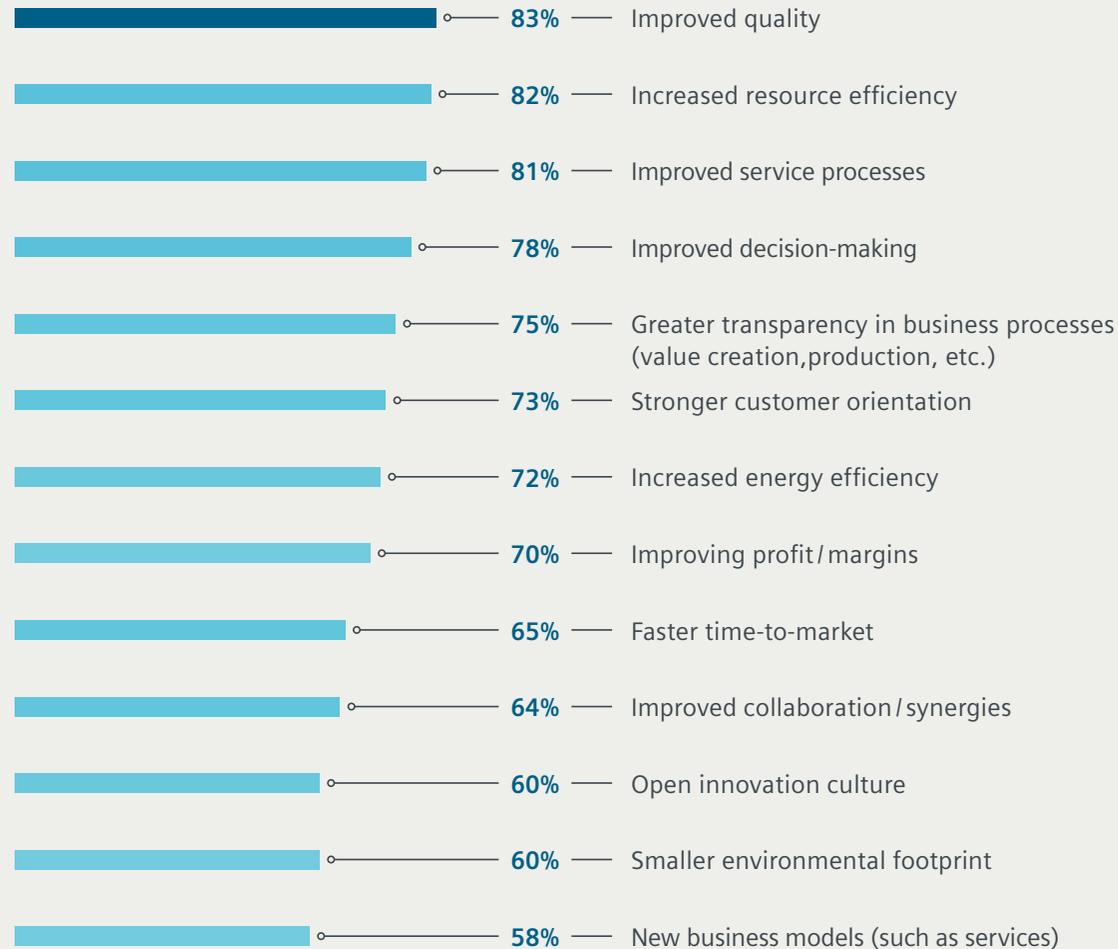
What importance do you assign to digitalization trends and what applications do you see in your business environments?

-  “Smart worlds is one of the most important trends to me: We apply it in the part of production and energy saving in general.”
 - Engineer
Infrastructure/construction
-  “We are applying connectivity and/or Internet of Things in the area of engineering, services and processes.”
 - Head of the engineering sector
Food and beverage
-  “Our company applies cyber-physical systems throughout the company: Most of all in production and command offices.”
 - Maintenance engineer
Pulp and paper
-  “We are already using cloud computing for all our customer and some technical data.”
 - Owner
Electrical and electronics
-  “We have customers spread all over America and therefore use mobile applications. It is very important to have access by mobile to certain information.”
 - System manager
Metals
-  “We use software and apps in my area for drawing, design and calculation. It is important to automate these areas, in addition to all management ones, to eliminate routines and make work more focused on creativity.”
 - Engineering manager
Machine building

The potential of digitalization

Expectation: Digitalization will have a positive impact on all areas of business. What do you expect from digitalization?

(N=313 persons surveyed)

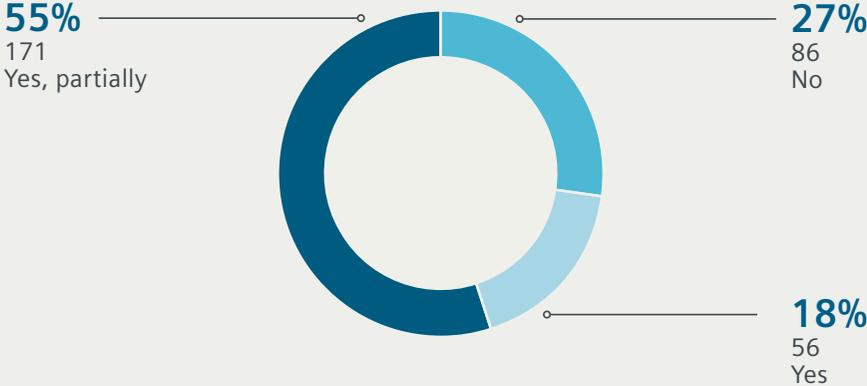


Around 80% of surveyed companies expect digitalization to improve everyday operations by enhancing quality, service and decision-making processes and by allowing a more efficient use of resources. Around three fourths place a premium on greater transparency for their business processes, stronger customer orientation and increased energy efficiency, while seven out of ten assume it will help to improve profit margins. Unsurprisingly, profit is the most important impact among C-Level respondents. In Brazil and Mexico these expectations are even higher than in Argentina, but they all share a general expectation to improve business operations.

Digitalization and business strategies

Planning: The majority has digital strategies. Have you already developed an overarching digital strategy?

(N=313 persons surveyed)

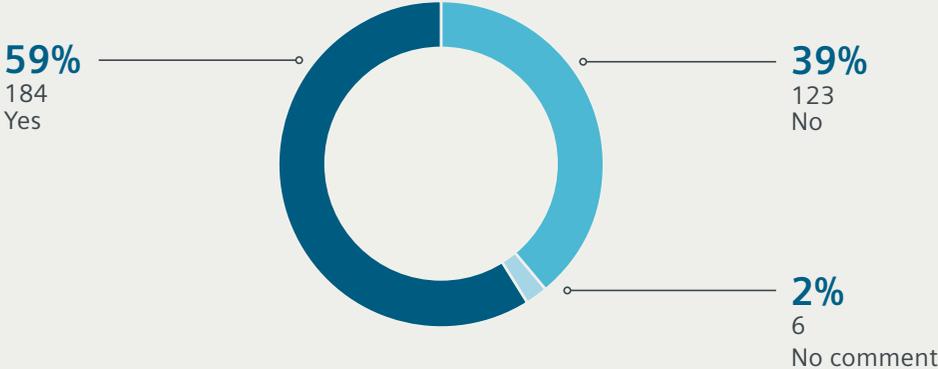


The majority of surveyed companies have fully (18%) or partially (55%) developed an overarching digital strategy. In the context of other surveys and various industries, the picture becomes more differentiated: 73% in Argentina represents the highest share of digital strategies among respondents in comparison to the surveys in Brazil (71%) and in Mexico (59%) albeit at the same time the lowest number in overarching strategies. Also, results vary significantly by industry, with around nine of ten companies in power transmission and oil and gas in possession of a digital strategy, compared to only three of ten in machine building.

Responsibility for digitalization

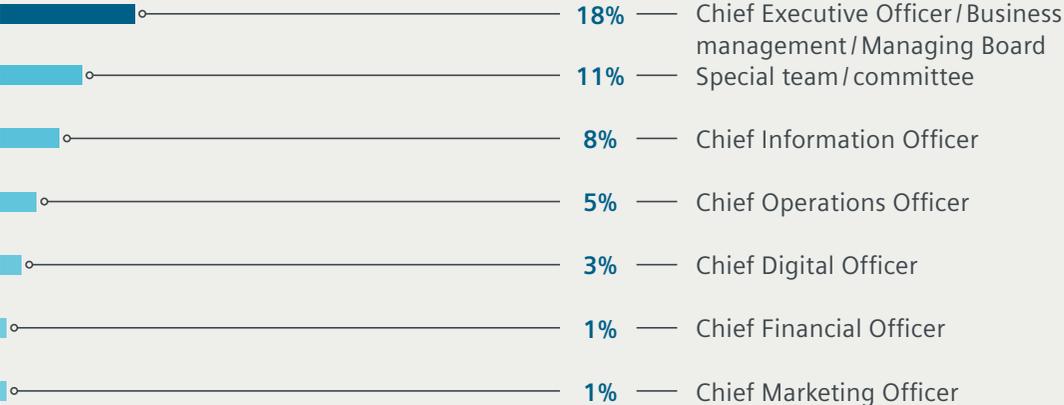
Does your company have a position / governing body that bears central responsibility for these topics and makes decisions regarding a digital strategy?

(N=313 persons surveyed)



Yes, that's determined by:

(N=184 persons surveyed)



other (20%); I don't know (11%)

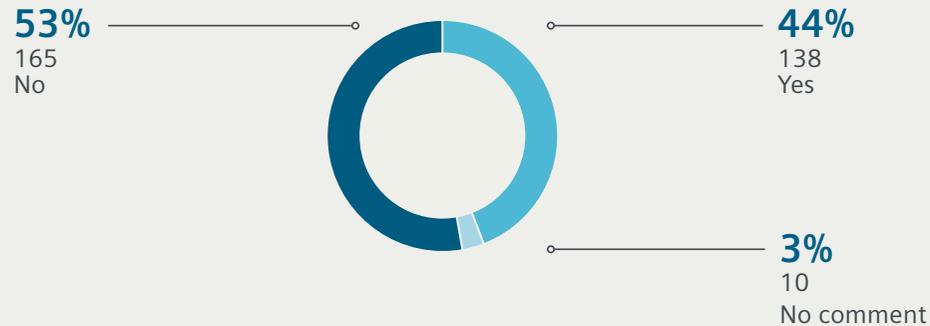
More than half of the companies (59%) have assigned responsibility for digitalization projects to one central person or entity, most likely the CEO or Managing Board, a special team or committee or the Chief Information Officer. This is especially true in large enterprises, where 67% have already set up a central role. In terms of industry, digitalization is institutionalized the most among oil and gas (81%) and automotive (77%).

For companies in which digitalization has not been centralized (39%) a variety of specialized departments frequently plays a significant role alongside top management. A third of the respondents without positions with central responsibility did not know who is in charge of digitalization.

Implementation not yet very far along

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

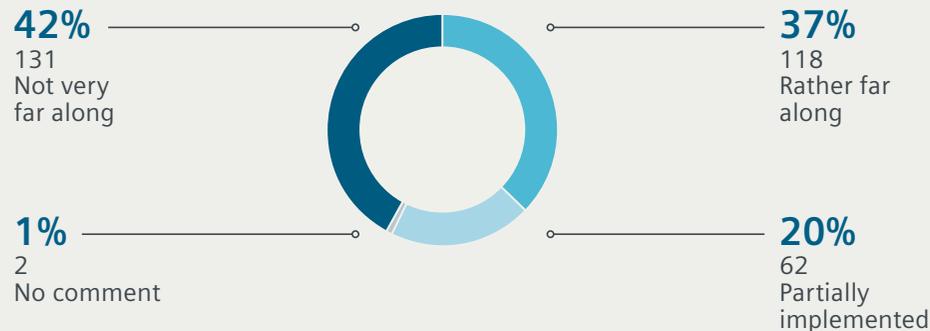
(N=313 persons surveyed)



44% of respondents have conducted an economic feasibility study – a cornerstone of digital strategies –, among those from automotive even 73%. Most of the respondents are not very far along concerning the implementation of digitalization (42%), whereas 20% have partially done so and 38% even assess they are rather far along. Brazilian respondents stated more often to be rather far along with their implementation – 72% – compared with only 27% in Ireland.

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

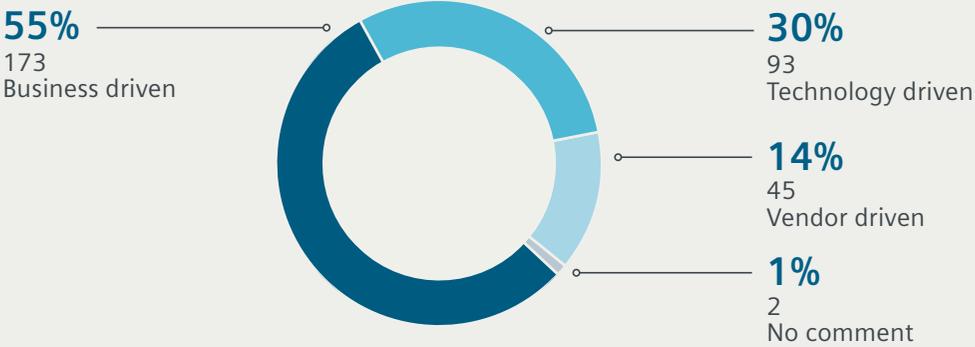
(N=313 persons surveyed)



Decision criteria for digitalization projects

How do you characterize your approach to adopting new and emerging technologies?

(N=313 persons surveyed)



55% of respondents cite business concerns as driving the implementation of new technologies. Three out of ten have a technology driven approach to adopting new and emerging technologies, among machine building, chemicals and infrastructure this is even the case for around four out of ten. Another 14% are waiting for new technologies first to get established on the market and then be introduced to them through strategic vendors of the company; among power transmission that is the case for half of the respondents.

Majority with immediate digitalization projects

What digitalization projects are you planning for the next year?

-  “We want to set up a **smart network** by Siemens to end user level in small populations.”
— Head of area operations
Municipalities and DSOs
-  “We have several projects related to **the automation of almost all the sectors** of elaboration on raw material until mixture.”
— Technical head
Food and beverage
-  “We are planning to **digitize all production control.**”
— System manager
Metals
-  “We are going to implement several projects on the **lifecycle of equipment.**”
— Maintenance supervisor
Electrical and electronics
-  “We are going to increase **production with renewable energy** and thus also cut costs.”
— Maintenance coordinator
Metals
-  “We are planning a pilot project to collect **plant data.**”
— Project engineer
Food and beverage

Respondents mention numerous precise plans for digitalization projects for the next year, but more than a third of the respondents do not have any plans or do not know of any projects.

Room to grow: More than half without digitalization projects over the next three years.

What digitalization projects are you planning for the next three years?

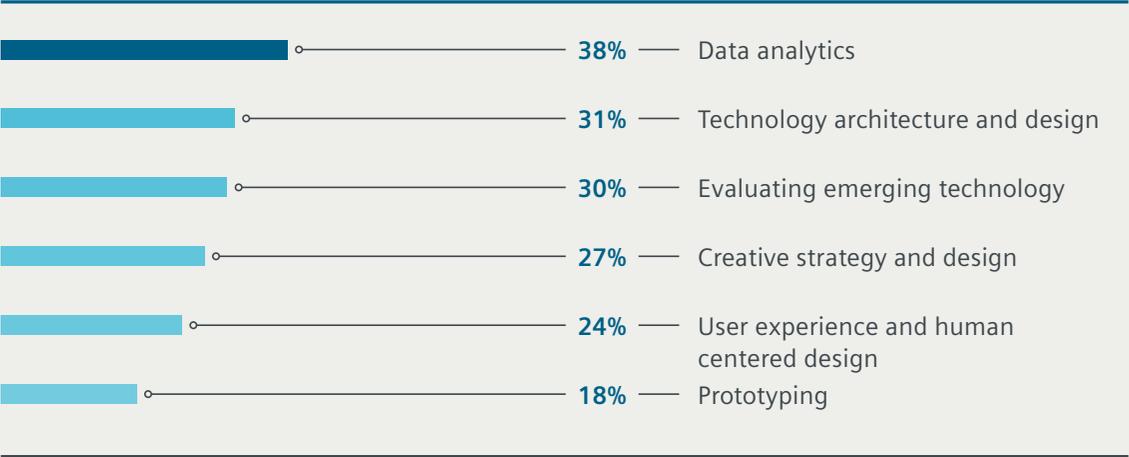
-  “We plan to develop tools that help automate the design area.” — Engineering manager
Machine building
-  “We will develop predictive maintenance in the areas of administration and finance and also scan the whole process.” — Head of department of transforming stations
Power transmission
-  “We are aiming at energy saving.” — Manager
Machine building
-  “We are planning some pilot projects with smart meters and real-time capture of meters.” — Planning manager
Power transmission
-  “We would like to implement process control, as well as financial and remote control of equipment.” — Maintenance supervisor
Minerals and mining
-  “We are going to incorporate new areas of informatics and updates.” — Production unit manager
Chemicals
-  “We will focus on the integration of high voltage equipment for monitoring our systems.” — Head of department equipment and high voltage
Municipalities and DSOs

Asked about their company’s digitalization planning over the next three years, respondents named a wide variety of projects. But more than half claims to be unaware of any specific digitalization plans.

Expertise: Digital skills need to be improved

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

(N=313 persons surveyed)

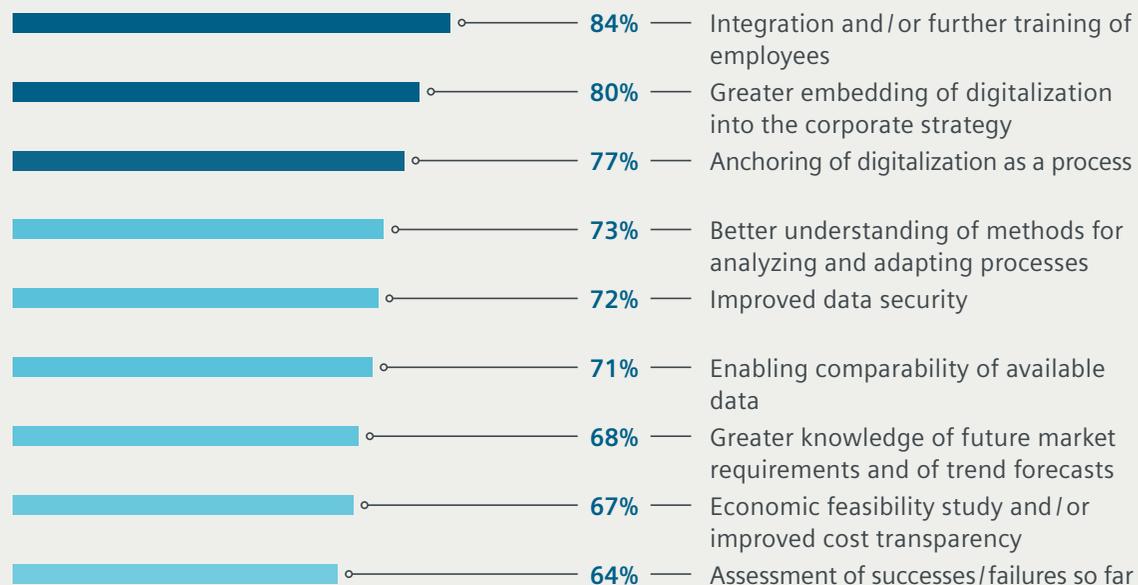


The trust of the respondents in their company's digital skills points at room for improvement. Not more than some four out of ten estimate that their company has high to very high skills in data analytics. Roughly one third says the same for technology architecture and design and evaluating emerging technologies. Only about a fourth feels positive about competencies concerning creative strategy and design and user experience and human centered design. And a mere 18% trust their company's prototyping skills. Scores from the automotive and electrical and electronics industries are overall higher, for chemicals and food and beverage are overall below average.

How to improve digitalization

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

(N=313 persons surveyed, multiple answers possible)



others=6%

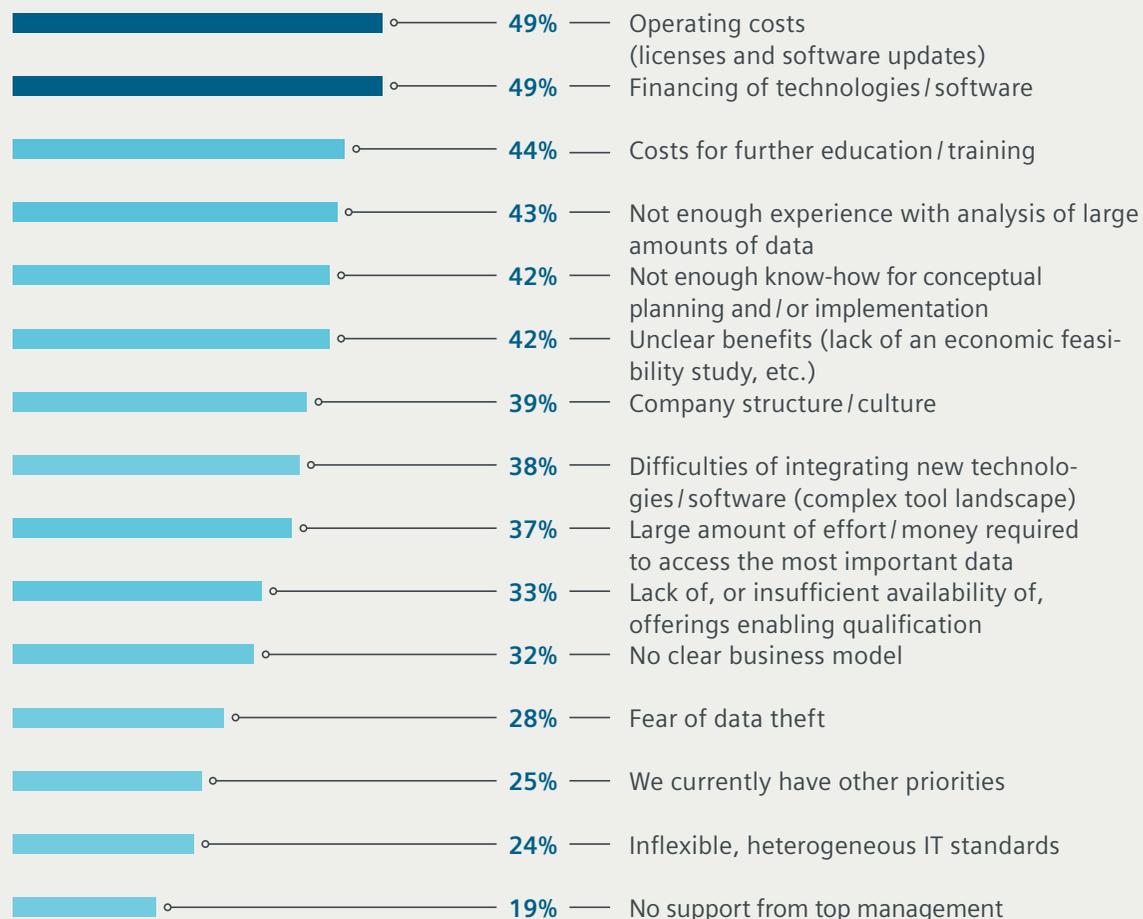
To drive digitalization forward, most respondents – 73% to 84% – perceive the need to integrate and further train employees in digital workflows, a need for greater embedding of digitalization into the corporate strategy, for anchoring of digitalization as process and a need for a better understanding of the methods for analyzing and adapting processes. Also, improved data security is mentioned as an important concern. Other perceived needs include enabling the comparability of available data, greater knowledge of future markets, economic feasibility and case studies, and improved cost transparency. While these drivers are considered relevant in all industries, their ranking slightly differs, pointing to industry specific needs.

Greatest barriers and challenges

Challenges: Cost and expertise. What holds you back from making even greater use of digital technologies and processes at your company?

Internal factors

(N=313 persons surveyed, multiple answers possible)



For advancing digitalization respondents internally cost concerns are seen as the biggest hurdles. Around half of the respondents name paying for software licenses and updates as well as the financing new technologies and software as major obstacles. The cost for providing employees with additional training is mentioned by 44%, and the cost and effort to access the most important data by 37%. However, a lack of experience and know-how is also a concern, though to a slightly lesser extent: 43% mention not enough experience with analysis of large amounts of data, and 42% a lack of know-how for conceptual planning and implementation.

Other mentioned barriers include the company structure and culture (39%) and difficulties of integrating new technologies and software (38%). Some respondents also cite unclear business models (32%) and fear of data theft (28%). Cyber security concerns are certainly not unfounded, as Argentina is ranked only as a “maturing” country in the 2017 “Global Cybersecurity Index” by the UN’s “International Telecommunication Union”¹.

¹ https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-GCI.01-2017-PDF-E.pdf

Main obstacle: No tax advantages

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

External factors

(N=313 persons surveyed, multiple answers possible)



Nearly half of respondents lament the lack of tax advantages for investments in digitalization. They also point to the lack of technical standardization (42%) and concerns about market readiness (39%). Around one third also mentions the lack of legal and regulatory frameworks, which is important on the national and international level, and a lack of demand from customers and suppliers. Overall, external factors are scored higher in Brazil. With the exception of Mexico, not having found a suitable partner is a major concern in Brazil, Ireland and other surveyed countries.

Outlook: Digitalization at Siemens

Business enterprises, no matter what their size or area of focus – whether manufacturing, energy, transportation, infrastructure or beyond – are confronted by digitalization whether they like it or not. Markets are becoming increasingly complex and new technologies and new competitors are disrupting familiar business models all the time. Any organization which wants to survive and indeed thrive needs to seize the possibilities of digitalization.

While there is a general recognition of the importance of digitalization among our survey respondents the rate of implementation lags behind. Over half of the companies surveyed have defined digital strategies for portions of their business, but few have defined strategies for their company as a whole. Meanwhile implementation rate of top digital technologies cited like Internet of Things (IoT), cloud computing, cyber-physical systems for factories or smart grids is also low.

Many enterprises frequently do not know where to start their journey of digital transformation. It is hard for them to define tangible activities they can implement and they are uncertain how digital transformation will impact legacy systems. Some of the barriers that our survey respondents face include a lack of experience of big data analysis, lack of know-how for conceptual planning and implementation and unclear benefits. However, customers can rely on Siemens to guide them through their digital transformation.

We work with customers to identify how digital technologies can best enhance performance, productivity and competitiveness and offer tangible ways to move forward. For example for the automotive and food beverage industries, we offer product

and process design and simulation software and automation technology to help reduce time to market, increase flexibility and realize individual customer demands. For customers in the oil and gas and power generation industries and independent power producers, we offer remote monitoring and diagnostics to ensure higher availability of critical systems. Using predictive analytics, our tailored service program Flex LTP increases generation, reliability, uptime and reduces lifecycle costs. We can help cities to modernize and upgrade their aging infrastructure and optimize their operation using digital technologies.

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 optimize use of assets by analyzing and deriving value from data. As an open platform, customers and third parties can use MindSphere to develop their own applications, digital services and even new business models.

With proven success stories across all major industries, Siemens works with its customers to boost their performance by guiding them through their digital transformation with a comprehensive portfolio, expertise and domain know-how. As a result, our customers in Argentina 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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