



Digital Transformation in Micro and Small **Companies: Trends** and Needs













TRASFERIMENTO TECNOLOGICO INNOVAZIONE SISTEMA CAMERALE VENETO





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Our study: Focus Groups and Interviews











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Introduction

More than an era of change, we live a change of age: digital technologies power the transformations of what is being called the fourth industrial revolution. We experience this new world daily through the various forms of connectivity and interaction with people, entertainment, acquisition of products and services and management of personal lives. Specifically to the business world, industries and companies are being challenged to evolve with society, by capturing business opportunities and facing competition from those born in a digital age.

Therefore, the digital transformation in companies is no longer a question "if it will happen", but a question of "when it will happen", and the answer is clear: those who do not adapt will hardly be able to survive in the market. In fact, nowadays it is already clear that digital technologies bring enormous benefits to businesses, whether to improve process performance, increase business reach or ensure more rigorous decision-making based on factual data.

But what is "digital transformation"? One says that it is about creating new websites, buying and selling online, using social media to communicate or the overall adoption of technology in our lifes and businesses operations. These examples are what digital transformation is not. "Digital transformation" is a multilevel, often complicated process combined with a variety of initiatives with the main aim to make a company mature in a field of digitalisation and to bring the company to the state of true digital capability.

Consequently, it involves different actors, variables and factors, and it could only be successful when correctly understood, planned and monitored.

This e-book focuses on the desmification of a successful "Digital transformation" process, particullary when applied to micro and small companies (MSEs).

<u>The first chapter</u> of this e-book explores the most important concepts related to a digital transformation process, from its main theoretical concepts to a legal framework. Also, it approaches the risks and challenges of a digital transformation, the opportunities that may arise from the implementation of a digital transformation and provides some insights about the management of changes that consequently occurs.

<u>The second chapter</u> of this e-book adopts a more pragmatic poin-of-view, as it tries to explore the current trends and best practices of a digital transformation process in Europe, with a specific scope to Portugal, Italy and Poland.

<u>The third chapter</u> investigates the perception of the phenomenon of "digital transformation" among different players in MSEs (workers, managers, CEOs) and experts in the digital transformation field. To achieve this aim, it was conducted a focus groups and interviews with the intuit to gather opinions about the process of a digital transformation in MSEs, as far as it concerns its main concepts, its advantages and disadvantages, as well as the perception of opportunities and barriers in the implementation of digital solutions in a company's strategy.





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The Small.Com project aims to develop a program that begins by diagnosing the needs of micro and small companies in the face of the latest developments that the digital economy can provide them ("Small.com" digital transformation maturity assessment tool), and at the same time it aims to empower its human resources through an individualized training program (free online intensive courses), so that the implementation of digital tools in micro and small companies can be done in a sustainable way.

To know more about the project, go to https://www.smallcom.eu/





Digital Transformation: Main Concepts and State of the Art

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1. Digital Transformation, digitalisation & Digitization

In this e-book, the terms "digital transformation", "digitization" and "digitalisation" will be used almost equally, although they are not interchangeable.

"Digitization", "digitalisation", and "Digital Transformation" are three terms that seem the same or similar but the truth is that they differ and to understand the subject of this document it is advisable to provide some definitions.

1.1 What is Digitization?

According to the Oxford Learners Dictionary, "**Digitization**" is "the conversion of text, pictures, or sound into a digital form that can be processed by a computer". One of the most common associations with the term digitization is the transformation from analog to digital.

One easy example of digitization would be taking a photograph and turning it into a digital photograph. For the purposes of this book, we define digitization as digitally enabling analog or physical artefacts for the purpose of implementing into said artefacts into business processes with the ultimate aim of acquiring newly formed knowledge and creating new value for the stakeholders.

1.2 What is digitalisation?

"digitalisation" is the process in which a company uses digital tools, like online sales, online meeting tools, and online storage tools. This technology provides greater value for customers and clients and it is very often connected with a new business model. "digitalisation" is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.

As organisations implement "digital technologies" – which in this context really means computers and other information technology – people's jobs change. Imagine factory workers putting down their hammers and lathes and instead using computer-controlled equipment, for example – such change is at the heart of digitalisation!



1.3 What is Digital Transformation?

"Digital transformation" is a multilevel, often complicated process combined with a variety of initiatives with the main aim to make a company mature in a field of digitalisation and to bring the company to the state of true digital capability. Digital transformation requires the organisation to deal better with change overall, essentially making change a core competency as the enterprise becomes customer-driven end-to-end. This process seeks to take advantage of the possibilities and opportunities afforded by new technologies in a faster, better, and more innovative way. For this reason, effective strategies recognize that the end goal will continue to move as true digital transformation is an ongoing journey, as is change and digital innovation.

In the final analysis, we digitize information, we digitalize processes and roles that make up the operations of a business, and we digitally transform the business and its strategy.

2. digitalisation of Operations

Companies must constantly innovate and adapt to stay competitive and flourish in a VUCA environment (Volatile, Uncertainty, Complexity, and Ambiguity). In order to reach their digital and business objectives, firms must assess their present procedures and make the necessary modifications. The current debate is whether organisations should continue to digitize business operations or embark on a full-fledged digital transformation.

Specifically, to Operations, it is important to explain the differences between "Digitization of Processes" and "digitalisation of Processes". Although they are similar terms, but they have distinct meanings that we should consider.

PROCESS DIGITISATION

Transform a process into a digital format that can either duplicate it exactly as it is (AS-IS) or improve it to incorporate some process optimization.

Frequently, companies claim to have been digitized, justifying that they have reduced or eliminated almost 100 percent of paper (digitally storing the information) and that, instead of manual processes, they have created digital models of processes represented by BPMN notation - Business Process Model & Notation - that have even been able to automate paper-based manual processes to be executed with vertical applications that so far have not been digitized.



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PROCESS DIGITALISATION

When processes are digitalized, it means that some digital technologies are used in the processes, as well as digitally managing data (digitized data and digitally native data), in order to convert processes (not just digitization) into processes that are more efficient, productive, profitable, and provide greater customer satisfaction in their digital and physical interactions with the company. As a result, digitalisation enables the use of digital data to improve business performance and generate new revenue, reduce costs, and create a new customer experience, among other benefits.

DIGITAL BUSINESS TRANSFORMATION

It's not just about automating or incorporating technology into an existing process (digitalisation) to improve the current value chain; it's also about changing the business model, changing the value chain, and, without a doubt, creating a new supply of products and services (caused by the application or incorporation of digital technologies in the products or services prior to the transformation), all of which lead to a new and better way to provide customer value.

A wide range of stakeholders have produced a lot of interest in Industry 4.0 characteristics such as automation, robotics deployment, IIoT, blockchain, cloud computing, and IT/OT integrations over the last five to ten years. Leading businesses have implemented automated business processes that include sophisticated data management systems, preventive and predictive analytics, digital twins, and other technologies.



Figure 1 -Digital transformation framework. Source: Westerman, et al (2)

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In times when the acceleration of technology adoption and change leads to entirely new markets, customers, and businesses (people, capabilities, processes, models...) realities, opportunities, and challenges, ultimately leading to a new economy, digital transformation encompasses all aspects of

business, regardless of whether it concerns a digital business or not. Digitization alone will not be sufficient for a comprehensive digital transformation of the business, since new business models will need to be backed by new automated business processes that allow the company to offer new products and services to its clients.

2.1 Operational opportunities of digitization

Automated processes will gradually perform the great majority of corporate operations, with practically everyday business executions accounting for an increasing share of all actions. Humans and automated processes will help to develop the business, collaborate to develop an all-encompassing business strategy, and boost key individual procedures.



Figure 2: Areas in which there are operational opportunities of digitization. Adapted from Bhattarai (3)

3. Digitalisation of Products & Services



3.1 Digitalisation of products

Enriching physical products with digital technologies such as Internet of Things (IoT) technologies or Augmented Reality (AR) are increasingly relevant in research and practice.

Digitised products or smart-connected products are products that contain both physical (e.g., a car, tennis racket, mechanic machine, or t-shirt) and digital components (e.g. software, sensors, processors) (5). The digitalisation of products is achieved via "the incorporation of digital materiality into objects that previously had a purely physical materiality".

IoT and related technologies (sensors, components, and processors) have brought to light a new product type, called **intelligent product**, which presents new functionalities, useful for monitoring the status of the user or product, its tracking, and data analysis, which may in turn become new products or services to be offered to customers or to new customers interested in them. Smart products generate data that can be managed remotely and are able to monitor themselves and the surrounding environment, reporting real-time data and information to the company about its operation: the product itself then becomes the enabling factor of the process of remotisation and virtualization[1].

3.1.1.Product archetypes

A study identified four different product archetypes and each archetype as defined by a particular orchestration of criteria: 1. Digital, 2. Connected, 3. Responsive, and 4. Intelligent as shown in Figure 3. These archetypes are organised in a hierarchical logic where a product will need to fulfil all the essential criteria of one archetype before it can move to the next one (6). That is, as archetypes increase, so does the versatility of the tangible components (i.e., the hardware), the complexity of the intangible components (i.e., the hardware), and the potential capabilities (i.e., the hardware and software working together). In this regard, capabilities can be considered as the bridge or threshold between the product and all outbound services and functions (6).

[1] Taken from Project VIR2EM: Deliverable 11 of the WP3 "Security Analysis, Usability and Impact of Virtualisation and Remotisation Solutions".



Figure 3 - Framework of smart product archetypes. Adapted from Raff, Stefan, Wentzel, Daniel e Obwegeser, Nikolaus (6)

3.2 Digitalisation of services

By entering in service digitalisation area, instead, it's possible to talk about digital servitisation that refers to the transition from products to services and integrated solutions. Servitisation is often described as a transition, where the company moves from providing pure stand-alone products and add-on services to maintenance contracts, operational services and, finally, to outcome performance-based offerings. Servitisation is a fully fledged transformation from product to service orientation, which often manifests in integrated solutions, including customised products, and advanced services (7).

The concept of servitisation is considered to capture the digital technologies related to IoT and remote monitoring, and studies have also begun using the concept of digital servitisation to underline the role of digital service technologies (7). Studies highlight the interplay between digitalisation and servitisation. Servitisation studies tend to operationalise the level of servitisation through offerings. The scope of service offerings provides a good reflection of the company's servitisation, the industrial services bundled with customised products. It is particularly relevant for companies and researchers, as it captures and communicates the company's solutions strategy, business model and the tactic used to create and appropriate value from the company's innovations or capabilities such as digitalisation (7).

3.3 Focus on IoT for products and services

Internet of Things (IoT) represents a scenario in which each object or "thing" is embedded in a sensor and is able to automatically communicate its status with other automated objects and systems embedded in the same environment. These are intelligent objects defined as such because they are characterised by having one or more of the following features: identification, localisation, status diagnosis, interaction with the surrounding environment, data processing and connection.

IoT seems poised to cross over into mainstream business use: the number of businesses adopting IoT technologies is on the rise, with the worldwide number of IoT-connected devices projected to reach 43 billion by 2023.

IoT features tools for studying consumer behaviour, attitudes, consumption, and choices, which have relevant implications for marketing studies (9). Likewise, the proliferation of such high-tech products and services has implications for innovation and digital management studies. Indeed, IoT might be a key enabler of business digitalisation, thereby improving existing processes and daily routines. Secondarily, IoT allows different physical devices to connect to the Internet and engage in continuous data exchange.

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3.4 Advantages of digitalisation of products and services

The digitalisation of products and services brings important characteristics and benefits, such as:



Figure 4: Benefits and characteristics of digitalisation of products and services.

Moreover, the application of Industry 4.0 technology trends such as IIoT, additive manufacturing, cloud service, and data analytics, and the development of design principles of Industry 4.0 such as smart manufacturing and product customisation has been associated with numerous economic sustainability opportunities such as:

(I) material flow optimisation, (ii) better time to market of products, (iii) manufacturing space and facility optimisation, (iv) resources efficiency, (v) reduction of waste, (vi) superior product innovation and quality, (vii) improved production capacity and reliability, (viii), strategic adaptability, and (ix) lower inventory costs.

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4. Organizational digitalisation

Organizations benefit most from digitalisation because information is more accessible and transparent. digitalisation has made it much easier to make information available to all employees, who previously had limited knowledge of the overall corporate picture (11).

Increasing access to technology and the long-term deployment of a global digital structure are generating an appealing market for products and services, requiring businesses and organisations to reposition themselves in a new customer-centric environment.

Specific digital capabilities will be required to sustain these activities from the standpoint of education and vocational training. However, the anticipated systemic changes would necessitate essential transversal skills including teamwork, communication, problem solving, creativity, and critical analysis. These are the digital economy competencies that must be distinguished from digital skills (13).

93% of executives believe that digital is crucial to accomplishing their strategic goals, as per McKinsey Digital Quotient poll from April 2019. Not only is the rate of technological advancement frequently underestimated, but it is also increasing. Automation, artificial intelligence, advanced analytics, the Internet of Things, and augmented and virtual reality are just a few of the key digital technologies that are continually growing.

Because employees see greater flexibility in integrating work and personal life, flexible working environments contribute significantly to enhancing company attractiveness (15). Companies are adopting more flexible and adaptive work styles to maintain high productivity, owing to the ability to work from anywhere at any time thanks to digital information and communication technology (17).

As previously stated, technology advancement has always played a significant role in the design of the workplace and working life. Companies' business models and business processes are influenced by Industry 4.0, which compels them to digital transformation and transforms their organisational structures into a flexible and distributed form (15).



ORGANIZATION

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Companies should seek to re-integrate humans into their digital process in order to fully profit from these technological developments. In fact, failing to do so might have a negative impact on a company's profitability, since consumers and employees are increasingly becoming self-sufficient as a result of the rise of digital platforms (19).

According to what was mentioned, there are a few barriers to digitalizing organisational culture. Those are:

Lack of commitment with the strategy The inactivity, inconsistencies and lack of attitude with the leaders' digitalisation plan will spread to the rest of the organisation. Lack of digital skills Individuals who are part of the company must master basic technologies to empathize with the values of digital culture. Absence of collaboration environments Without spaces where teams can come together and collaborate with each other, it will be more difficult to foster creativity.

Lack of vision and leadership

Attempts to digitize culture will fail without evangelizers to induce a change of mentality and values in the company.

Poor Communication

Lack of dialogue or opacity in sharing information will prevent important messages from reaching the teams.

Fear of change

A team's resistance to change and refusal to leave the comfort zone can jeopardize the digitization of the culture.

Figure 6 - Barriers to digitalizing organisational culture. Source: Digital transformation in corporate culture. Iberdrola (20)

4.1 Advantages of Organizational digitalisation

The following list was adapted from Herman (21):

- Increased Flexibility
- Reduced Operational Costs
- Improved Productivity and Efficiency
- Enhanced Communication and Innovation
- Heightened Employee Experience
- Strengthened Talent Recruitment and Retention
- Improved Employee Satisfaction

5. Digital Transformation Maturity: Towards Excellence

Now that we have analysed each dimension of digitalisation within an organisation – operational, products and services and organisational – it is possible to conclude that the digital maturity of a company depends not only in the investment of digital technologies or ecommerce. In order to become truly digital, a company most not only to build digital innovations, but also to drive enterprise-wide transformation.

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The outcome of the change depends substantially by two factors or how emerging technologies are managed and how the value generated by digital innovations is used. As it can be seen in the figure below, there are two key concepts: **Digital-driven innovations** and **Human-driven innovations**.



Figure 7: Interactions of human and digital driven innovations. Adapted from De Felice and Petrillo (22).

- **Digital-driven innovations** arises from being able to fully grasp the potential of the ongoing digital revolution, in terms of cost reduction and increase in performance related to the applied technology.
- Human-driven innovations are instead the result of proposals and resulting actions from creativity and human resourcefulness, which generate value by imagining new uses (innovations of use), proposing engaging experiences or realising significant sense-making processes. In this dimension, it is also possible to find the leadership and management capabilities for a successful digital transformation. This consists of the vision to shape a new future, governance and engagement to steer the course, and IT/business relationships to implement technology-based change.

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Applying all these dimensions in a digital transformation process, linking all the domains, an organisation can achieve excellence. In the graphic bellow, it is possible to observe some of most common linkages between the 3 domains of digitalisations in order to make an organisation truly digital (adapted from Westerman, Tannou, Bonnet, Ferraris, McAfee (23)



Figure 8: Most Common Linkages Between Domains of Excellence. Source:Westerman, Tannou, Bonnet, Ferraris, McAfee (23)

6. Enabling a Digital Transformation Process

Digitalisation poses enormous opportunities and threats to the corporate world. Whereas digitisation is seen to provide opportunities for new and alternative business models and agile, fast-moving companies (start-ups), for established business models and large, slow-moving companies (traditional players) digitisation can be seen as a threat. This is because start-ups and young companies can design many of their IT solutions in a straightforward Greenfield setting using agile processes and flexible and minimal management structures. The IT organisation of traditional players often face a complex application landscape that combines multiple legacy-applications, inflexible processes, and rigid managerial decision-making structures that make digitisation more difficult to introduce. Regardless of these perceptions of opportunity and threat, IT organisations within companies face intense pressure to ensure smooth day-to-day operations (Run IT) and increase their portfolio of innovative digital solutions (Change IT).





Consequently, IT organisations, and those of traditional players, in particular, are taking a closer look at Lean IT – a concept that evolves from Lean Manufacturing – as it aims to provide more efficient service delivery and increased reliability by taking the perspective of customer value in all business activities. Digital transformation is a learning process that requires integrating technology, business and learning strategies in an entrepreneurial-oriented organisation (25). Indeed, it is important to understand that digitalisation is not only an issue of technology adoption but requires a change of mindset and leadership practices (25).

6.1 Enabling digitalisation Index – Economic research 2019

The Euler Hermes Enabling digitalisation index (EDI) (26) measures the ability and agility of countries to help digital companies thrive and traditional businesses harness the digital dividend, the score is from 0 - the worst and 100 - the best. It focuses on the conditions for the companies to thrive digitally or to transform. It does not measure the digital adoption that is the outcome of digitalisation. The components of EDI are regulation, knowledge, size, connectivity, and infrastructure. Each component is explained in more detail in **Table 1**:

REGULATION

A conclusive business environment is a strong driver for financing, investment, and entrepreneurship. We use the Distance To Frontier indicator from the World Bank Business survey. The indicator is a proxy of regulation aspects, which matter for digitagility (ease of getting credit, minority investor's protection).

KNOWLEDGE

Developing, sharing, and using knowledge is pivotal in the digital era. Clear knowledge drivers are human capital building and innovation potential. We use the Skills score developed by the World Economic Forum (secondary and tertiary enrollment rates, quality of the education system, the extent of employees' training, digital competences), and the Innovation Score (R&D by corporates, collaboration between universities and the private sector, intellectual property laws).

CONNECTIVITY

This relates to secure and accessible networks for digital transformation. It is accessed using four indicators: the internet user ratio (the number of people using the internet as a percentage of the population), mobile phone and fixed phone lines subscriptions per 100 people, and the number of secure servers per 100 people.

INFRASTRUCTURE

Good logistics is an enabler for digital attractiveness. We use the Logistic Performance Index (Doing Business) as a proxy of soft and hard logistic infrastructure.

SIZE

A large and digital savvy customer base is essential for businesses. We measure it using the number of internet users and their incomes (captured by nominal GDP).

Table 1: Components of Euler Hermes Enabling digitalisation Index. Source: Euler Hermes (26)

According to the research made for EDI, the most important component is **knowledge**. Companies should invest in knowledge, lifelong learning – education and training, and research R&D. According to the research and EDI from 2019, companies should take into account the following issues:

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- Companies should prepare for digital war;
- New risks will appear- the more company is in the digital area the more is exposed to cybercrime, ransomware, and hacking of critical infrastructure. The more digital is the company or the country the more is exposed to these risks;
- Creative destruction might take place in the future.

7. Managing digitalisation changes

The transition of the traditional economy to a digital one caused by the rapid pace of ongoing changes in the socio-economic sphere, the emergence of both new challenges and dangers but also new opportunities for doing business requires the development of new conceptual approaches to making management decisions. In reality, change management is a strategy that any transformation needs. Companies manage their clients, customers, staff, new technologies, trends and shifts in market trends, new needs and unexpected situations. The ability to adapt to change is one of the crucial characteristics of a modern digital company that wants to transform.

According to Smirnova, Zaychenko, and Bagaeva (27), the prerequisites for the speedy transition to digital business management are:

-The need to explore the distinctive features of Industry 4.0 in the context of the current evolution that industrial society is experiencing;

-Identification of new drivers that allow the requirements for human resource management in the enterprise, in the conditions of society digital transformation.

7.1 Change management strategies for a digital transformation

Companies are experiencing a period of great change, which also because of the digital revolution in progress, affects more and more deeply on organisational forms, on business models, on fairs and on functions and on skills required of management. Successful companies should start from a vision of the possible future.

As reported by Deloitte, the digital revolution, still underway, is making available an increasing number of tools that facilitate birth relationships between people and even between objects (Microsoft Skype, Google Hangout, Google Team Drives etc.). We have witnessed the birth of the Internet of people in the past, now we are experiencing the birth of the Internet of things. In other words, digital driven, interacts with human capabilities, human driven, leading to the fusion of 'minds' and 'tools' and the creation of Interconnections (22).



7.2 Human Capital as a vector of digital transformation

One of the main directions of the successful implementation of the Digital Economy program is "personnel for the digital economy". Human resource management is one of the main parameters for ensuring the competitiveness of enterprises in modern conditions. The formation of "personnel for the digital economy" begins with implying the improvement of the education system, which should provide the digital economy with personnel with the necessary skills in Industry 4.0. The next important aspect is the transformation of the labour market, which consists of the speedy restructuring of traditional personnel requirements that ensure the availability of modern digital competences (27).

The post-information society, the so-called Industry 4.0, is characterised by the following processes: the person and information do not identify, artificial intelligence becomes the center of the economic system, capable of creating new knowledge by processing big data through self-learning machine learning systems, not just productivity, but adaptability to changing conditions that guarantee long-term competitiveness. In a post-industrial society, intellectual capital includes (27): human capital, organisational capital and information capital.

As reiterated by Bygren (29) "employees are the primary key resource" which should be used like other key resources to support "an effective decision-making structure in the company in order to provide a flexible company structure, strategies, and actions to be able to keep up with changes." Indeed, although digital skills are important, they alone are not sufficient to compete in a complex and differentiated environment. The ability to use technological innovations allows corporate staff to spend less time analysing data and increase resources for decision-making strategy: corporate employees can enrich their skills and expertise to research of a higher value for their organisation (30).

The digital transformation of enterprises has enormous growth potential for Europe. However, 47% of the EU population does not have adequate digital skills, despite predicting that in the coming years 90% of jobs will require a high level of digital skills (30).

Skills are a decisive factor in the relationship between technological change and employment. The availability of a workforce with adequate skills enables organisations to adopt new technologies and exploit their productive potential.

In its policy brief (31), OECD outlines the skills required for digitalisation to be economically beneficial and, at the same time, socially sustainable.



Figure 9: Needed Skills for a socially sustainable and economically beneficial digitalisation.

8. Risks and challenges of Digital Transformation

8.1 Digital Transformation and its risks

Digital Transformation is transforming organisations, operations, and the workforce by increasing information flow, creating new insights, and revolutionising business models. Although digital transformation has its roots in Industry 4.0, as explained before, it extends to many other sectors of the value chain. The power and value of digitalisation lies in flows of information, and the ability to integrate digital information from many different sources and locations to drive the physical act of doing business (32). In this way, digital initiatives that create new opportunities can also lead to risks such as security breaches, regulatory compliance failures, and other setbacks. The result is an ongoing conflict between the need to innovate and the need to mitigate risk (33).

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With that in mind, in 2018, the consulting firm Deloitte published the document "Managing Risk in Digital Transformation", in which it outlines a framework of digital risk. In it, they have considered 10 risk areas as the risk landscape in any digital economy: Technology, Third Party, Cyber, Privacy, Strategic, Forensics, Operations, Regulatory, Data Leakage and Resilience.

8.2 Digital Transformation and its challenges

Trends in labour markets indicate that younger generations will perform more different occupations than generations in the 20th century as digitalisation provides enormous access to knowledge, reduced costs, and greater interdisciplinarity that contributes to fast-changing professions (34). Another approach to the labour market impacted by digitalisation is the proliferation of forms of work indicated by some researchers (35). It implicates the mix of ordinary and unusual work, informal and formal sectors very often with illegal status (36).

According to Davidsson, et al (37), the challenges in digitalisation can be grouped in the following categories, that can be applied to every organisation: business models, privacy and integrity issues, security, interoperability, scalability, usability, data collection and deployment.

Alongside, virtuous companies that have invested and have financial resources to tackle the challenge of Industry 4.0, there are small and medium-sized enterprises using obsolete systems, not up to the new technological paradigms. In this context, it is necessary first of all to increase the awareness of businesses of the point of evolution in which they are located and therefore with regard to their maturity. Before making the necessary quantum leap, companies must understand where they are and define a path, a strategy (38).

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9. Opportunities with Digital Transformation

9.1 Organizational opportunities

There are many benefits for an organisation and its staff in introducing digitization, digitalisation and digital transformation, namely:



Table 2: Opportunities of Digital Transformation.



9.2 Market Opportunities

To understand the relationships between digital maturity and financial performance, Capgemini Consulting in partnership with MIT Center for Digital Business, conducted a study (23) that involved a sample of 184 publicly traded firms. Comparing digitally mature companies to their less-mature competitors, they found striking differences: Companies that are mature in both Digital-driven innovations (Digital intensity) and Human-driven innovations (Transformation Management intensity) outstrip industry competitors along different dimensions of financial performance. Digirati – those companies that are mature in both dimensions – have the highest performance, far outperforming less-mature firms on multiple financial measures.

According to the mentioned report, companies that are mature on the digital intensity dimension are better at driving revenue through their existing assets, as digital intensity helps companies to gain and manage more volume with existing physical capacity. On a basket of measures including revenue per employee and fixed asset turnover, these companies outperform average industry performance by 6-9%.

Moreover, the authors explained that companies that are mature in the human dimension of digital transformation are more profitable. On average, the companies are 9-26% more profitable than their average industry competitors on a basket of measures including EBIT margin and net profit margin. For these firms, strong vision and governance help to align investments along a common direction. They weed out activities that run counter to the future vision of the transformed firm. Then they engage their employees in identifying new opportunities (23).



Table 3: Financial Performance of digital companies.

This financial performance enabled by digitalisation and digital transformations creates new market opportunities that was never seen before. In fact, according to Fortune Business Insights (39), the global digital transformation market size was \in 689,5 billions in 2020 and is projected to reach \notin 3.314,3 billions by 2028, exhibiting a compound annual growth rate (CAGR) of 22.1% during the forecast period.

The global market growth is mainly due to the increased adoption of advanced technologies such as IoT, AI, robotics, and others among different industry verticals. Enterprises shifting from traditional business models to technologically advanced business models facilitate the growth of the digital platforms that would increase performance efficiency. Key players operating in the market are taking major initiatives to help customers adopt digital solutions, thus, contributing to the growth of the market.





10. Digital Transformation: European Legal Framework

Digital transformation is crucial for governments to provide better and more efficient services to the citizens. A legal framework is a necessary component of each e-government ecosystem to ensure proper delivery of e-services.

Governments and regulators play a key role in encouraging enterprises in pursuit of digital transformation as part of the company's technological development promotion for the benefit of society. These entities have the power to foster innovation by providing legal rules that reflect society values like people and consumer's rights, ensuring the safeguard of personal data and information.

Digital regulations should satisfy customers and companies' needs by giving the right directive to build a secure legal framework, inspiring trust in technology adoption. As digital transformation is an ongoing process, digital regulations need to be updated to the latest form of technology, innovation and public requirement.

Every company that works actively in a European digital landscape by providing digital solutions, services, or platforms on which sensitive data is stored and managed, always needs to adopt a secure and legally compliant solution that meets European legal standards. Digital regulations can satisfy different topics and protect different forms of data.

It is possible to categorise these regulations under the following macro-categories that cover various issues:

- (I) Data protection;
- (II) IT Security;
- (III) Copyright;
- (IV) Digital Identity;
- (V) Digital Payment or Digital Transaction;
- (VI) Liability

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Digital Transformation Trends and Best Practices

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FRAMEWORK

Now that all the main concepts of Digital Transformation were explained, in this chapter we will provide some examples of the current trends of Digital Transformation.

Moreover, we will analise in more detail the performance of digital transformation of Portugal, Italy and Poland.

Finally, we will explore some of the best practices of good practices in digital transformation in Portugal, Italy and Poland.







1. Europe

1.1 Enabling digitalisation Index - Economic Research 2019

As explained in the previous chapter, the Euler Hermes Enabling digitalisation index (EDI) (26) measures the ability and agility of countries to help digital companies thrive and traditional businesses harness the digital dividend, the score is from 0 – the worst and 100 – the best. It focuses on the conditions for the companies to thrive digitally or to transform. It does not measure the digital adoption that is the outcome of digitalisation. The components of EDI are regulation, knowledge, size, connectivity, and infrastructure.

The Table 4 presents a comparison between EDI and digital adoption and it shows the gap between the digitalisation potential and realised digitalisation.

Digital adoption indicator	Countries with untapped potential
Tech companies' market cap as a share of GDP	Countries with very high untapped potential: Portugal, Poland, Slovenia, Iceland, Italy, and the UAE. Then come Austria, Belgium, Denmark, Spain, France, the UK, Luxembourg, Malaysia, Norway, New Zealand, and Singapore.
Cloud computing adoption	France, South Korea, Austria, Switzerland, and Germany have untapped potential. Spain and Luxembourg are borderline.
Big data use	Spain, Sweden, South Korea, and Austria have untapped potential. Estonia, the Czech Republic and Italy are borderline.
E-orders	France, Spain, Luxembourg, Austria, South Korea have untapped potential
ICT specialists	France, Germany, Norway, Sweden and Austria have untapped potential. Australia, Spain and New Zealand are borderline.
Robots per 10,000 employees	Switzerland, Austria, Finland, and the Netherlands have untapped potential. France and Canada are borderline.
User penetration in the mobile point-of-sale segment	France, the UK, Spain, and the U.S. have unttaped potential as measured by mobile payments penetration.

Table 4: Digital adoption and countries with untapped potencial. Source: Euler Hermes (26)



Top 10 best performers

Western European countries continue to rank highly on the EDI, accounting for 6 of the top 10 digital enablers. The Scandinavian countries, particularly Denmark (ranked 3rd), Sweden (10th), Finland (13th), and Norway (20th), are the best represented; they balance their small size with the best knowledge, legislation, and infrastructure scores (Graph 1).

Overall, total R&D investment in the Eurozone (as measured by the knowledge score) is 2.0% of GDP, compared to 2.8% in the United States, 2.1% in China, and 2.4% on average in the OECD. In Europe and China, R&D is concentrated in the industrial sector, whereas in the United States, financial services receive a larger share of total R&D spending. However, there is still a disparity within Eurozone nations, with R&D spending in Sweden (3.3%), Austria (3.1%), Denmark (3.1%), Germany (3.0%), and Finland (3.3%) all above the US average (which is the 9th highest worldwide) (2.8%).



Graph 1: Enabling digitalisation sub-components score, top 10 index (100=best).



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Top 10 best European performers

Several core European markets improved their digitagility in 2019, owing primarily to advances in knowledge: France rose two spots to 17th position, Spain rose three spots to 24th place, and Italy rose one spot to 28th place (Graph 2). Nonetheless, R&D investment in France (2.2%), Italy (1.3%), and Spain continues to lag behind (1.2%). Switzerland drops three places to 7th position in the trade and financial centres, while Luxembourg drops 11 places to 25th place: they were unable to keep up with global connectivity advancements, and their infrastructure quality deteriorated. Portugal, a potential trading hub, climbed two spots to 30th place, thanks to continuous infrastructure improvements and connectivity efforts. This was also true for Ireland, whose efforts to improve connectivity compensated for a drop in its infrastructure, ranking (21st place).



Graph 2: Enabling digitalisation sub-components score, top 10 european countries index (100=best).

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1.2 The Digital Economy and Society Index

As stated before, The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators on Europe's digital performance and tracks the evolution of EU Member States in digital competitiveness.

The DESI Index addresses five main areas, Connectivity, Human Capital, Use of Internet, Integration of Digital Technology, and Digital Public Services.



(40)

Graph 3 shows the ranking of Member States on the Digital Economy and Society Index in 2020 based on 2019 data (40). Finland, Sweden, Denmark and the Netherlands have the most advanced digital economies in the EU followed by Malta, Ireland and Estonia. Bulgaria, Greece, Romania and Italy have the lowest scores on the index. It is important to underline that the largest EU economies in terms of GDP are not among the digital frontrunners and this impacts on the overall performance of the single market.





This being said, there are several initiatives that have recently been introduced in these Member States to improve the digitisation of the economy and society. Germany, which ranks 1st amongst EU countries regarding 5G readiness, has launched several measures with the aim of advancing digitisation and is driving initiatives in the area of IT security, supercomputing, artificial intelligence and blockchain. France has started a comprehensive effort to facilitate the digitisation of public services and businesses and to set up a dynamic ecosystem for tech start-ups. In December 2019, Italy adopted 'Italia 2025', a 5-year plan that puts digitisation and innovation at the centre of a "process for the structural and radical transformation of the country". These initiatives, which require robust implementation over time as well as investments, may result in a progression of these Member States on the DESI in the coming years.

One important area addressed by DESI index is the "Integrational of digital technology", as this dimension measures the digitisation of businesses and e-commerce.

The top performers are Ireland, Finland, Belgium, the Netherlands, Denmark and Sweden with scores greater than 55 points (out of 100) (Graph 4). At the other end of the scale, Bulgaria, Romania, Hungary Poland, Greece and Latvia lag behind with scores less than 35 points, significantly below the EU average of 43 points.



Graph 4: Digital Economy and Society Index (DESI) 2020, integration of digital technologies. Source: European Commission (40)

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Inside the dimension "Integrational of digital technology", The Digital Intensity Index (DII) measures the use of different digital technologies at enterprise level. The DII score (0-12) of an enterprise is determined by how many of the selected digital technologies it uses. Denmark and Sweden are the only countries in the EU where the percentage of enterprises with a very high DII (i.e. possessing at least 10 out of the 12 monitored digital technologies) is above 10%, followed by Finland and Belgium with 9%. By contrast, in countries such as Romania, Greece, Bulgaria, Poland and Hungary the majority of businesses (over 55%) have made only a small investment in digital technologies (i.e. have a very low DII).

Therefore, there is a lot of room to improvement in regards of digital transformation in the European Union.

1.3 I-DESI 2020

The International Digital Economy and Society Index (I-DESI) (41) compares the digital economy performance of EU27 Member States and the EU as a whole to that of 18 other nations. Those are Australia, Brazil, Canada, Chile, China, Iceland, Israel, Japan, Mexico, New Zealand, Norway, Russia, Serbia, South Korea, Switzerland, Turkey, United Kingdom, and the United States.

There are five dimensions taken into account in I-DESI:

DIMENSIONS	DEFINITION
Connectivity	Broadband infrastructure rollout and quality;
Human Capital	The capabilities required to take advantage of the opportunities that a digital society provides;
Citizen use of Internet	The wide range of activities carried out by persons who are already online;
Digital Technology Integration	Business digitisation and the growth of the online sales channel;
Digital public services	The digitization of government services, with an emphasis on eGovernment.

Table 5: 5 Dimensions of I-DESI. Source: Foley, et al (41)

The report, presenting data from 2015 to 2018, shows that the EU-27 Member States perform well in comparison to the 18 non-EU countries, with the best EU-27 countries matching or exceeding the best worldwide countries. Denmark was, in fact, the I-DESI index's top-ranking country. Iceland was the most successful non-EU country. Five of the top 10 spots in the main I-DESI index were occupied by EU27 countries.

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In the following graphs, it is possible to see the similarities between the normalised scores of the EU27 countries and non-EU countries.



Graph 5: Normalized scores for the main I-DESI index (EU27). Source: Foley, et al (41)



Graph 6: Normalized scores for the main I-DESI index (Non-EU). Source: Foley, et al (41)

According to the report from the European Comission (42) in terms of conditions supporting digital transformation, the Netherlands, Finland, Sweden, Belgium, and Luxembourg are at the forefront (Digital TransformationEl). Furthermore, great strides have been made throughout the EU in terms of entrepreneurial culture, talent supply and demand, investment, and financial access. Finally, a comparison of the Digital Technology Integration Index (Digital TransformationII) scores among Member States reveals that Denmark, Ireland, and Finland have the highest ratings.

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1.4 Adoption Of Digital Technologies By European Enterprises

According to Eurostat, large enterprises are more likely to adopt new technologies. Electronic information sharing via enterprise resource planning (ERP) software, for example, is significantly more frequent in large businesses (80%) than in SMEs (35%).

Only 17% of SMEs sell online (compared to 39% of large businesses) and only 8% sell cross-border online (24% for large enterprises).

Cloud services and big data are only two examples of technical opportunities that SMEs have yet to take use of.

• Cloud Computing

In 2020, large businesses (48%) used cloud computing more than SMEs (25%).

Cloud use is strongest in the computer programming and consulting sectors (65%), with roughly 20% in construction, retail commerce, transportation and storage, as well as in housing and food services.

Transport and storage, construction, manufacturing (food, beverages, tobacco, textile, leather, wood, paper; publishing and printing), retail trade (except motor vehicles and motorcycles), accommodation, and food service activities are the sectors with the least cloud usage, accounting for 19-20% of businesses.

• Big Data

14% of businesses deployed big data analytics in 2020. This enabled them to produce near-real-time or real-time findings from data in a variety of formats. Large organisations dominate big data processing (with 34% employing it), but SMEs still have need to develop in order to reap the full benefits of big data (14% use big data).

Almost a third of Malta's businesses analyze big data. With 27% each, the Netherlands and Denmark are close behind. Only 5-6% of businesses in Romania, Slovakia, Cyprus, and Bulgaria, on the other hand, analyze big data.

When broken down by industry, **the travel agency and publishing activities sectors (both at 28 percent) are the most likely to analyze big data**, followed by computer programming and the information and communication sector (both at 27%). Only 14% of businesses in the retail trade sector, 13% in construction, 12% in lodging and food and beverage service activities, and 10% in manufacturing use big data analysis.



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2. Portugal2.1 DESI 2021 – Portugal Performance

Going through the most recent evolution and international comparisons, Portugal has a DESI score that is lower than the average for the EU-27 countries (43).



Graph 7: Ranking - Digital Economy and Society Index (2021). Source: European Commission (43)

Portugal significantly raised the percentage of ICT specialists, putting the number close to the EU average in terms of human capital. Portugal scores worse than the EU average in terms of basic digital skills but has a higher proportion of people who are above basic. ICT specialists are more likely to be women than the EU average. Portugal does well in VHCN (very high capacity network) and fast broadband coverage when it comes to connection. More work would be put into ensuring that mobile broadband adoption and VHCN coverage reach all families, particularly those in remote areas. Portugal outperforms the EU average of 34% by increasing its take-up of at least 100 Mbps fixed broadband from 56% to 63%. On the other hand, it is slow to adopt mobile broadband.

Compared to the EU norm of 60%, 51% of Portuguese businesses have at least basic digital intensity. On the use of ICT for environmental sustainability, SMEs selling online, and AI use, they outperform the EU average. Since last year, more businesses have started embracing cloud services. Portugal is a leader in digital public services across the EU. Users of e-government have increased, but they still lag behind the EU average of 64% (57%). In terms of pre-filled online forms and digital public services for the general public and enterprises, Portugal performs better than the EU average. As seen in its recovery and resilience plan, improving digital skills continues to be a national focus (RRP).



2.2 Digital Transformation In Portugal

In 2018, the study "Digital maturity study about Portuguese companies", from EY and Nova School of Business & Economics, stated that digital transformations has already started in Portugal, but the phenomenon was still in a very embryonic stage. However, COVID-19 pandemic accelerated this behavior. A research analyzing the impact of COVID-19 on SMEs, conducted by the Connected Commerce Council and supported by Google, found that digitalisation was critical to the resilience of small and medium-sized businesses in Portugal and in Europe (44).

Almost all (80%) small European businesses boosted their usage of digital technologies during the epidemic, according to the survey. In Portugal, the figure was even higher; approximately 90% of Portuguese SMEs enhanced their digitalisation process. This is probably because Portuguese SMEs were comparatively more digitally uncertain (e.g., companies that use less digital tools and do not give them priority).

Throughout example, the Connected Commerce Council found that before the epidemic, 58 percent of Portuguese small firms were familiar with digital tools, compared to 61 percent in Europe.

Currently, at a national level, 36% of SMEs consider digital tools to be a priority and use more than ten, indicating that they are digitally advanced (compared to 42% in Europe). Furthermore, 50% of Portuguese SMEs are digitally evolved, indicating they see such tools as a support or even as something essential for their business, but only using an average of six. In the rest of the European continent, this figure is 40%. There are 14% of digitally insecure small firms in Portugal and 18% in Europe, according to Google, which makes "business performance poorer."

In fact, in Portugal, digitally advanced small businesses outscored their indecisive counterparts (-33%) by a factor of 1.4x, and they employed more staff (1.1x).

2.3 Sectorial Analysis

In 2021, 96.6% of Portuguese companies used computers with Internet connection for professional purposes. Proportion that was similar to the one recorded in 2020, with emphasis on the Information and Communication sector (99.8%), Transport and storage (99.7%) and Construction and real estate activities (97.8%). Accommodation and catering was the sector with the lowest percentage (88.5%) (44).



Graph 8: Companies that use computers with internet connection for professional purposes, as % of total companies with 10 or more people employed, by sector of activity and total

In relation to **digital literacy**, the survey reports that, in 2021, 44.5% of people employed used a computer with an Internet connection for professional purposes. By sector of activity, Information and Communication had the highest proportion (94.8%), followed by Trade (60.1%) and Transport and storage (51.5%), similarly to what was seen in 2020. Construction and real estate activities was the sector with the lowest percentage (30.8%).



Graph 9: Employees who use computers with internet connection for professional purposes, as % of total employees in companies with 10 or more employees, by sector of activity and total

2.4 Governmental Incentives For Digital Transformation

Currently, there are several stimuli to support the digital transition of companies. The Recovery and Resilience Plan (RRP) is a national program that will undertake a package of reforms and investments aimed at restoring sustained economic growth following the epidemic and reinforcing the convergence goal with Europe over the next decade.

The European Council established the Next Generation EU as a tool for reducing the economic and social effects of the crisis, promoting long-term growth, and addressing the dual climate and digital transformation issues. This instrument incorporates the Recovery and Resilience Mechanism, which includes the PRR, a three-dimensional investment strategy for all Portuguese people: resilience, climate transition, and digital transition.

The national options in the PRR are based on five components in the following areas: empowerment and digital inclusion of people through education, training in digital skills and promotion of digital literacy, digital transformation of the business sector, and digitization of the state, to ensure that Portugal accelerates its transition to a more digitalized society.

Significant reforms and investments are planned in the areas of digitization of companies, the state, and the development of digital skills in education, health, culture, and forest management under the Digital Transition concept.

In total, it is predicted an investment of €2,4 billion to finance public and business digital projects (46).





3. Poland 3.1 DESI 2021 – Poland Performance

Poland ranks 24th of 27 EU Member States in the 2021 edition of the Digital Economy and Society Index (DESI) (47).

During 2020, Poland made progress in many indicators, but given the equally positive developments in other countries, this has not translated into a change in its overall position. There are still persistent significant gaps as regards to human capital, where Poland ranks 24th, scoring below average on most of the indicators.



Graph 10: Ranking - Digital Economy and Society Index (2021). Source: European Commission (47)

Within one the main indicators, **connectivity**, there was an increase in the percentage of households covered by Fixed Very High Capacity Networks – 64.6%, compared to 60.3% in 2019.

Poland has not assigned any harmonized radio spectrum for 5G deployment, swift assignment will be necessary for the provision of 5G connectivity under transparent, open and non-discriminatory conditions.

Digital technologies are becoming very popular among Polish enterprises.

- 15% of Polish enterprises use cloud solutions;
- 18% of Polish enterprises integrate some kind of AI technology in their operations.

Poland will put efforts in increasing digital technologies by incentives to invest and focusing on female digital enterprises.

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Poland ranks 24th of 27 EU countries in **human capital** and is, thus, below the EU average. There is still lack of digital skills:

- 44% of people between 16 and 74 years have at least basic digital skills (EU 56%);
- Only one in five (21%) have above-basic digital skills;
- Only 46% have at least basic software skills (EU average of 58%);
- ICT specialists and female ICT specialists account for a lower percentage of the workforce in Poland than the EU average;
- ICT graduates account for 3.8% of all graduates;
- 18% of Polish enterprises offered specialized ICT training to their employees.

Poland ranks 24th among EU countries on the **Integration of digital technology in businesses' activities**.

- 52% of Polish SMEs have at least a basic level of digital intensity;
- 60% of enterprises with medium/high intensity of green action through ICT;
- 13% of SMEs selling online and 5% selling across borders to other EU countries;
- 15% of them using cloud solutions;
- 18% integrating AI technology into their operations;
- 14% of Polish enterprises actively use social media;
- 29% engage in electronic information sharing;
- e-Invoices and Big Data are not yet widely popular.

3.2 Digital Transformation in Poland

Siemens measured the level of digitization of the Polish industry in 2020. The research was conducted and the report presented "Digi Index 2020, the level of digitization of production in Poland". The main indicator is Digital Enterprise Index (Digi Index). Digi Index is calculated for the entire industry and for the machine industry: food, chemical and pharmaceutical, automotive and machine industry.

The Digi Index for Polish industry was 1.9 points in 2020. According to the scale adopted by Siemens, this is an alarming result. It indicates an urgent need to introduce changes in the area of digitization of enterprises in Poland.

Polish producer companies reach the best results in:

- Production and operational activities (2.6 points);
- Data management (2.9 points).

The worst results are reached in:

- Systems integration (1.1 points);
- Strategic planning (1.4 points).

Polish companies often focus on the standardization of production and operational activities as well as the digitization of production data. Companies miss digitalisation strategy and systems integration.

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The main barrier to digitalisation is the lack of financial support – 43% of the surveyed companies according to the Siemens study. Another crucial problem is the lack of knowledge on how to develop plan and strategies.

The level of digitization in Poland is far behind the European leaders.



Graph 11: Share of people with general digital skills in Poland in 2020, by skill level and gender. Source: Statista (46)

According to the data of the Statistics Poland, access to the Internet is not an obstacle to the implementation of Industry 4.0 solutions of Polish enterprises. Computers are the main tool in Polish enterprises.



Graph 12: Enterprises with Internet and broadband Internet access (2015-2018). Source: Królikowski, Bałasz and Ubowska (47).





3.3 Sectorial Analysis

Pandemic changed everything in Poland and digital transformation was larger than expected. Remote working, schooling, e-commerce, virtual visits to banks, public services became standard. digitalisation became a must everywhere and all companies were somehow forced to swich to digital mode and undergo transition.

According to McKinsey & Company experts, Poland and other countries in the CEE region are considered as "digital challengers". They are countries with special competitive advantages such as new technologies as driving forces for economy.

According to PwC experts, the pandemic and subsequent lockdowns made many companies accelerate the process of digital transformation, focusing on the development of online channels. In the last year, the group of consumers using the online form of shopping has significantly increased, almost 85%. Poles declare that even after the end of the pandemic, they do not intend to reduce the frequency of e shopping.

According to the Digi Index (Digital Enterprise Index) the average level of digitization of production in the machinery, automotive, chemical-pharmaceutical and food industries is 1.8 points on a 4-point scale.

The following areas were assessed:

- Strategic planning,
- Organization and administration,
- Systems integration,
- Production and operations,
- Data management,
- The application of digital processes.

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The best perfoming sectors in Poland are the chemical and pharmaceutical.

Companies reported that they devote from 6.48% to 9.12% the average percentage of profits on digitization; 60% of companies plan to maintain the current level of expenditure within 12 months; 13.3% of companies declare that they will increase digitalisation processes. The chemical and pharmaceutical industries are the best in this respect, where 30% of enterprises plan to increase their expenses.

A complete lack of investments in digitization is declared by almost 6% of organisations.

Reported problems:

- lack of adequate financial support (34%);
- lack of knowledge about creating strategies;
- inability to use the collected data and problems with integrating systems from different suppliers (16% each).

3.4 Governmental Incentives For Digital Transformation

Poland will benefit from the Recovery and Resilience Plan. It will enable Poland to emerge stronger from the COVID-19 pandemic and progress with the green and digital transitions. The Polish plan forms part of an unprecedented and coordinated EU response to the COVID-19 crisis, to address common European challenges by embracing the green and digital transitions, to strengthen economic and social resilience and the cohesion of the Single Market.

The Commission's assessment finds that Poland's plan devotes 42.7% of its total allocation to measures that support climate objectives. The implementation of Poland's plan is expected to contribute significantly to the decarbonisation of the Polish economy by increasing the share of renewable energy in the energy mix, the energy efficiency of the economy and the independence of Poland's energy supply. This includes substantial funding for offshore wind energy plants, as well as key changes to the regulatory framework facilitating the construction of offshore and onshore wind farms. Moreover, the implementation of the plan is expected to support an energy efficient renovation of buildings, the modernization of railways and bus transport, road safety and the development of green hydrogen technologies.

The Commission finds that Poland's plan devotes 21.3% of the total allocation to measures that support the digital transition. This includes investments to provide universal access to high-speed internet, digitalisation of public services, IT equipment for schools, digital skills and cyber-security.





4. Italy4.1 DESI 2021 – Italy Performance

The 2021 edition of DESI (50) sees Italy in 20th place among the 27 member states, rising from the 25th place of the previous edition. As we can notice, Italy went up five places from the previous results and probably this is due to the general technological progress boost for technological promoted by the EU for a greater competitiveness.

In regards of the **human capital** dimension of the DESI, Italy's DESI 2021 score is 35.1, much lower than the EU average score of 47.1. Italy is significantly lagging behind other EU countries, recording very low levels of basic and advanced digital skills. In more detail, Italy scores the lowest in the sub-dimension "enterprises providing dedicated ICT training".



Graph 14: Ranking - Digital Economy and Society Index (2021). Source: : European Commission (48)

The positive news is that in 2020 Italy launched its first National Strategy for Digital Skills, which defines a global approach to the development of digital skills to bridge the gaps with other EU countries. The strategy includes four axes of intervention and covers a wide range of sectors and target groups:

- Students enrolled in education and training courses, to integrate computer skills in primary and secondary schools and university curricula;
- Active workforce, including e-leadership skills (digital leadership), basic digital skills and advanced and specialized skills;
- ICT specialists, to improve the country's ability to develop skills for new markets and new professions;
- Public in general, to develop the digital skills necessary to exercise citizenship rights.

In conclusion, the report says that Italy has to face significant gaps in basic and advanced digital skills in order to avoid the digital exclusion of a significant part of the population and to not limit the innovation capacity of companies. The National Strategy for Digital Skills represents an important achievement and an opportunity to bridge this gap (50).

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In respect to the **connectivity** dimension, Italy has done some progresses towards both internet coverage and dissemination of connectivity networks, with a great increase of connectivity services. However, the pace of fiber deployment slowed between 2019 and 2020 and further efforts are needed to increase coverage of ultra-high-capacity networks and 5G and to encourage their deployment (50). An aspect that positively influenced connectivity and the internet coverage was covid-19, because during 2020, the Italian authorities have paid particular attention to the demand side, establishing phase I of the "Voucher Plan", the "Connected Schools Plan" and revisiting the national ultra-broadband plan (BUL), aiming to reach and exceed the objectives set by the European Commission for 2030. With the Italian Resilience and Recovery Plan are added the "Connected Health" Plan, the "Connecting minor islands" Plan, the "Italia 5G" Plan and measures for the constellations and satellite services. For mobile connectivity, the report highlights that "The" Cura Italia "and" Simplifications 2021 "decrees law provide for measures aimed at increasing 5G coverage by imposing, in particular, limitations on the power of veto the installation of antennas by local authorities.

Moving over to another dimension, Italy ranks 10th as regards to the **integration of digital technologies**. Italian enterprises have great results in the use of electronic invoicing. In fact, 95% of them use it, a figure almost three times higher than the EU average. Moreover, the percentage of SMEs that use cloud services has remarkably increased, reaching 38% compared to 18% in 2018. However, Italy is still weak in the use of big data and artificial intelligence, recording a percentage below the European average.

In terms of the evolution of policies, the government has reviewed and further extended the tax breaks in the framework of Transition 4.0, moving from the hyper-amortization tool to the tax credit.

Furthermore, Italy ranks 18th in terms of **digital public services**, immediately after Belgium. Therefore, despite the improvements recorded, the use of digital public services remains relatively low.

The percentage of Italian online users who use e-government services increased in 2020, reaching 36%, but it is still below the European average, which corresponds to 64%. However, the report writes that in 2020 and 2021 there has been a strong acceleration in the adoption of important enabling platforms for digital public services by public administrations, foreseeing that the new reforms envisaged by the PNRR will give a further boost to the digitization of services and the modernization of public administration across the country.

Finally, Italy achieves better results than the EU in terms of offering digital public services for businesses and Open Data. However, it ranks below the EU average in terms of delivering digital public services to citizen.

4.2 Digital Transformation in Italy

Attitude to change, openness to new technologies, ability to compete on the markets, clear strategy on transformation objectives are the fundamental characteristics for a company that looks to the future, according to Vodafone Business (51). The study carried out by Vodafone Business identify and analyses the characteristics necessary for a company to be prepared to face the challenges of the future.

In Italy, only a little more than one in five companies (21%) is considered "Fit for the future". Of these, 82% have developed at least one digital transformation plan and 59% are accelerating their digital transformation plans after the pandemic, against percentages for businesses in general which instead amounted to 54% and 38% respectively. Nine out of ten Italian FFTF companies say they are prepared to face risks and unforeseen events.

The role of technology also makes the difference between a company considered ready for market challenges and one that is not yet: 92% of FFTF companies are optimistic about the role of technology in society. With objective advantages also for the internal company: 79% of companies believe that technology will benefit occupational safety in the next five years. As for hybrid work - now very widespread in companies following the pandemic and which appears to be organized more effectively within FFTF companies - 90% of companies say they are satisfied with the speed with which they have adapted to new technologies and 77% of FFTF companies are satisfied with the flexibility that has been created within the workplace.

Digital transformation collects a lot of investments, but not in Italy, despite the pandemic having suddenly increased the adoption of digital technologies by companies to adapt existing business models to the new global economic context.

With regard to **investments** in digital transformation, Italy only ranks 19th out of 28 nations in the study, with a 62.6% rate of digitization of companies. Italy is in fact below the European average but slightly ahead of France (62.5%) and above the United Kingdom (61.3%). Although Italy is above the European average on several parameters of this study on digital transformation, two factors severely penalize it. For almost 2 out of 3 companies (63%) digital infrastructure remains a concrete problem and the digitization rate of SMEs remains below the European average by as much as 15 percentage points.

The digital transition is not just a matter of investment in products and services. Resistance to change is one of the main obstacles. Digital culture, starting from school, is the basis for a good transformation of companies and the country, to overcome the discomfort that people experience in having to review their way of working.

There are certain categories of people who believe that digital transformation does not actually lead to significant changes in results, compared to the old ways of working. For this reason, training is a fundamental investment, to overcome those cultural resistances that always lead to finding objections, to endorse their ideas. In addition, the age does not help. For example, Italy, in 2019, had almost 14 million older people over 65, half of whom were over 75, classifying it as the country with the oldest population in Europe with 22.8% of the total over 65 years old compared to 20.3% of the EU average. Compared to 2010, over 65 have grown by about 1.8 million people, compared to a drop in under 15 by almost 400,000 and a population increased by 1.2 million.

Among the European areas where the percentage of elderly population is highest is Liguria with 28.5 % of over 65. This is a relevant information because the most adult staff, who have spent much of their work history with a very different approach from that required, can now find objective difficulties to change.

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From a cornerstone on demand study conducted on a sample of over 1400 HR professionals and business managers from 14 European countries, including Italy, it was noted that the first obstacle in digital transformation is people's resistance to change. In particular, 46% of Italian respondents identified cultural resistance to change as the main obstacle to the digital transformation of companies; 29% lack of vision on the part of leadership, equal to insufficient financial resources; 27% the difficulty in maintaining the best talents and 27% the lack of internal innovation.

4.3 Sectorial Analysis

The latest research conducted by Datrix in collaboration with ByTek, the University of Tuscia and the "Paolo Savi" Economic Technical Institute of Viterbo, reveals that finance and insurance are the sectors in which the digital maturity of Italian companies emerges most. Furthermore, there are sectors that include arts and education, while the construction and real estate sectors are the worst performers (52).



As regards to the geographical distribution, the three provinces that achieve the best results in terms of digital scores are Trento, Bolzano and Milan.

The research also shows that digital maturity does not depend only on the sector, but also on geolocation, although not always in a proportional way. However, it must be considered that while Milan has obtained a high score thanks to the fact that it hosts a large concentration companies of belonging to well-digitized sectors, such as finance and insurance, companies based in Trentino Alto-Adige have good performances in terms of digital maturity regardless of the sector in which they operate.

Graph 15: Digital Maturity Index by sectors. Source: Simonetta (50)



4.4 Governmental Incentives for Digital Transformation

In the last year, Italian companies have experienced a very marked acceleration in the process of digitizing processes. The reasons are to be sought both in the use of smart working and, subsequently, hybrid work, and in the approval of the NRPR (National Recovery and Resilience Plan) in April 2021 in the Senate. The drive towards agile work has been determined to a large extent by the pandemic emergency and the subsequent evolution of this type of activity consists of hybrid work, which presupposes corporate software and hardware structures able to support digital and human resources that interact with each other from and in business locations, as well as remotely, anywhere in the world.

In this context, the funds allocated by the NRP to Italian companies investing in their digital innovation aim precisely to encourage a technological restructuring of national companies. One of the main objectives set out in the document adopted in Parliament last spring is to make productive realities more competitive, through digital innovation, which necessarily requires significant investment.

NRPR is a very important opportunity to increase the investments that SMEs can devote to digital innovation, with the aim of increasing their flexibility and competitiveness in the market, especially given that according to the DESI index Italy was, until recently, at 25th place out of 28 European countries.

The measures provided in the Transition Plan 4.0 consist of the recognition of three types of tax credits to companies that invest in the following areas:

• Tax credit for investment in capital good

To support and encourage companies' investments in new, tangible and intangible capital goods, functional to the technological and digital transformation of production processes.

• Tax credit for research, development, innovation and design

To stimulate private spending on research, development and technological innovation by supporting the competitiveness of businesses and facilitating digital transition processes, within the circular economy and environmental sustainability.

• Tax credit for training 4.0

To support businesses in the process of digital and technological innovation, focusing on training and skills consolidation.

Training and upskilling are part of the third and final area in which companies can benefit from tax credits, focusing on the importance of continuing training and the development and consolidation of skills. To support the growth of so-called digital competences, the Plan provides for a model for the redevelopment of the managerial figure, based mainly on know-how and soft skills, indispensable in a modernly structured context. Specific training courses are provided, through the cut of the tax wedge that, although temporary, will make available to employees, collaborators and managers funds that can be used for training.

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FRAMEWORK

With the intuit to gather opinions about the process of a digital transformation in MSEs, as far as it concerns its main concepts, its advantages and disadvantages, as well as the perception of opportunities and barriers in the implementation of digital solutions in the company's strategy, focus groups and interviews were carried out, in the context of the Small.Com project study.







1. Focus Group

The activity "focus group" is the second task of Result 1 of Small.Com project, "Digital Transformation: trends and needs of micro and small businesses".

The main objective of this focus group was to obtain information on current and future digital transformation needs in Micro and Small Enterprises (MSEs). Thus, the participants in this group were partners/managers/workers of micro and small companies. With this task, we intended to understand how the participants interpret the phenomenon of digital transformation, pointing out its advantages/disadvantages, as well as the perception of opportunities and barriers in the implementation of digital solutions in the company's strategy.

The Focus Groups sought to reveal differences between participants, to allow the facilitators to identify areas of agreement or common understanding, in addition to areas of disagreement or opinions that are unique to the individual. This ultimately improved the quality and accuracy of the recommendations and conclusions put forward, and helped identify important aspects for a successful digital transformation process.

The discussion was designed to gather information from the participants in regard to the following questions:

·What is Digital Transformation?

·What are the dimensions of Digital Transformation?

•Should businesses, especially MSEs, adapt their strategy according to the evolution of digitalisation? •What are the factors that may contribute to the adoption of a Digital Transformation process in MSEs?



1.1 Participant Demographics

The focus groups were carried out in three different countries, Portugal, Italy and Poland. In Portugal, two focus groups were carried out.

In what concerns the number of participants, there were in total twenty-eight participants. Italy gathered eight participants, Poland gathered six, and Portugal, with the two sessions, gathered fourteen participants.



Figure 10: Demographics of the focus groups.

Due to the current and ongoing circumstances, AEP and T2i carried out the activity online, using the ZOOM platform. Nevertheless, EDIT VALUE and Globalnet carried out the focus group activity in person. In the case of EDIT VALUE and Globalnet, the focus groups happened at the companies' headquarters. All focus groups were supervised from at least one facilitator.

Overall, all partners showed satisfaction with the outcome of this activity, since the experience was very fruitful in terms of gathering valuable opinions and considerations.



Table 6: Inclusion criteria.

From the four focus groups, the majority of the partcipants worked in administrative functions. Furthermore, the age group that was more represented was between 25-30 years and there were more women than man, generally.



Figure 11: Demographics of the groups.

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1.2 What is "Digital Transformation"?

For almost every participant, digital transformation is something that has drastically changed the way we approach and work. This transformation can be found both in the field of teaching, training and human resources, both in the service sector, the design of urban structures, for example, and in a lot of other areas. Digital transformation and digital tools have allowed storage and sharing of documents online and data in an easier way. Another aspect is the ability to always remain connected, wherever you are, it only needs Wi-Fi or Internet network. Looking an at Digital Transformation from a business point of view, it creates the opportunity to have a showcase not only at national, but also international level, as it amplifies the possible horizons. A few participants made the point that Digital Transformation is, first and foremost, a process and not just one concrete, tangible object. It's something that influences how we work. In a manner, you no longer do what you formerly did.

It's merely a transformation "from one point to another." Last but not least, digitization forces businesses—both those that manufacture goods and those that provide consultancy and other services to modify their working practices. There has been a genuine revolution in knowledge as well as in people's abilities, attitudes, and behaviors.

The participants were aware of the need for change and for bringing the company into the digital space. They both concurred that if they do nothing, their company will not advance. In fact, a few participants stated that they simply had no choice but to participate in the Digital Transformation process in their organisations, and they are happy about it because it makes a lot of their work easier. All participants acknowledged that **digital transformation increases the satisfaction of clients, customers, and other stakeholders.**

1.3 Dimensions of Digital Transformation



Figure 12: Dimensions of Digital Transformation.

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Regarding the applied exercises, we can infer that digital transformation is that а process incorporates every department within a firm, but this can occur in various ways and to varying dearees for anv organisation. Participants particularly agree that while technology and the adoption of appropriate digital tools can undoubtedly aid in the digital transformation, they are not the sole factors. In fact, all concurred that for digital transformation to occur, technology serves more as an enabler. This is so that businesses may integrate the benefits that disruptive technology brings only if they already have a solid foundation, organisational mentality, processes, and strategy in place. In reality, you must take into account that you must adjust the technology and tools you choose to use within your business to the needs of your customers, partners, and core business.

They consider this to be one of the key components because businesses respond to client wants; when their target markets change, businesses must adapt as well; digital transformation enables this. First, the need must be understood and articulated; later, it is true that technology also influences thought and enables "making the leap". Moreover, it is acknowledge that technology is very helpful for a better analysis and integration of data within the organisation and, in a simpler matter, for online meetings and remote working (among other reasons).

Furthermore, **strategy** is crucial since a strong corporate strategy can result in a remarkable digital transformation process for a corporation.





In the graph above, we provide a descriptive analysis of the importance each of the 28 participants gave to each dimension, according to their evaluation on the first activity of the focus group. As mentioned, the participants considered that processes, strategy, people and culture were the three biggest factors in the success of a company going through a digital transformation process.





Participants stated that when individuals are more active in digital transformation than they were in previous change initiatives, including senior organisational leaders and those in roles particularly connected to the transformation process, the process is more likely to succeed. Additionally, good communication inside the organisation is very helpful since digitalisation brings about a shift that might occasionally result in moments of ignorance, stagnation, or obstruction, but if there is good communication, the process is facilitated. The process comes to a halt if someone working for the company becomes stuck, has no idea who to ask, feels embarrassed or fearful of being judged for not being able to use a particular technology. But this is true regardless of digitization. If there isn't open communication and no understanding that learning comes from mistakes, the system crashes whenever there is an incident that causes the organisation to undergo a transition. To support these features, a culture of learning and an acceptance of failure must exist.

The digital transformation requires cultural and behavioral changes that include controlled risk-taking, greater teamwork, and customer centricity. Another problem with the "people and culture" theme, though, is that the shift in perspective signifies a significant stride for characters from a different generation. The younger generations do not experience this "transition," nor do those who were born in this already "digitized environment," nor do they experience exhaustion. In order to enable the use of technologies and support staff regarding digital tools and digital culture, it is crucial for SMEs to invest in training.



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1.4 Round-Table Debate

From the debates, we conclude that, in general, participants' believe that **businesses cannot afford to ignore the process of digital transformation**. Technology adoption creates opportunities for corporate stability and growth. Customers would rather resort to a corporation with cutting-edge technology than one that is limited by antiquated ones.

The largest drawback of the process, though, is an increase in cybersecurity risk. Social barriers are also either created by technology or destroyed because of it. For the purpose of business stability and growth, businesses should not concentrate on the drawbacks but rather on what they can do to ensure a seamless transformation process.

In addition, those who have worked for the company for a long time show opposition to computerization and the digital transformation because they fear losing their position of authority. However, in this instance, there can also be a professional requalification. The limitation that the value of people in organisations is declining is noted, although it is not universally accepted. If we look at the past and even our current situation, the digital made remote transformation work possible throughout pandemics. Of course, if a hybrid work paradigm is not implemented, this reality could result in less human interaction. On the other hand, though, this circumstance highlights how important social interaction and individuals are. Even in this new virtualization paradigm, we cannot draw a clear connection between the decline in human contact and relevance of individuals.With the help of new technologies, we may communicate online while still retaining many of the benefits of face-to-face communication and using our time more effectively, not to mention how many businesses were able to continue operating during the pandemic because of the "internet".

Additionally, the mentioned disadvantage of finding it difficult to keep up with the quick advancement of technology can be viewed as a benefit. We keep learning, and we constantly value what we have learned more than before

Showing successful, commercially viable examples of businesses that have already begun this process and invested in digital transformation may be a good way to allay reluctance and establish imitation mechanisms.



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1.5 Factors that may contribute to the adoption of a Digital Transformation process in MSEs

From this exercise, it became clear that having a manager or leader who can provide the digitization process with input and stimulation is crucial. The manager provides the motivation, but a worker or someone from outside the organisation can also assist and bring a vision. However, it's crucial that the entire business and its personnel be encouraged to develop their digital knowledge and skills. Additionally, it is not an issue for an enterprise to operate in a B2B (business to business) or B2C (business to consumer) manner, but the sort of customers thev have mav influence the implementation challenges. Business management can use whatever digital tools they desire, whether they are B2B or B2C. Technically speaking, if the other organisation has a digital bent, communication might even be simpler.

In what concerns e-commerce adoption, it does not contribute to the organisation being viewed as digital; rather, it is merely a tool and a little step along the way. In this matter, it should be noted, that not all businesses require e-commerce for their operations, but they can still be considered a "digital enterprise".

The government's financial assistance and incentives are crucial for promoting the digital transformation and encouraging SMEs to make investments in this field. A business that obtains funding to digitize itself will be more content and open to this shift. However, businesses have the notion-whether consciously or unconsciously-that there is insufficient financial support for the implementation of digital practices. This is so for reasons: first, the systems and their two implementation are too expensive for the funds that are currently available; second, even when low-cost digital solutions are available, it is challenging to finance their implementation and training.

Therefore, it is concluded that a **true digital transformation process can only be successful if the entire organisation and its employees want and get involved.**



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1.6 Main Takeaways of the focus group

We draw the conclusion that there are various approaches to support digital transformation in a company from this experiment. The size of the business and the number of employees will determine this. To know where to start moving forward, it might be quite helpful to analyze the company's level of digital maturity. Smart working and the opportunity for improved time management raise employee interest and satisfaction levels, which in turn raises company levels because happy and satisfied employees benefit both the firm and themselves.

After they have begun the journey toward digitization, demonstrating the benefits of digital transformation and the development of practical cases can encourage and assist the process. Additionally, it is essential to provide training and education programs that address several facets of a company's digitization, from internal operations to market perspectives and financial topics. All participants agree that there should be a variety of topics covered in the online courses, such as sustainability, gamification, better management of financial resources, as well as other resources like data and information, and the significance of soft skills as opposed to only technical ones.

Most people agree that properly designed and strategically implemented education and training programs can effectively help the process, but institutions must also provide incentives and financial support.

Another intriguing strategy is the potential to do some pilot actions in a certain firm region with a small group of participants in order to monitor and ultimately "fix the shot".

The focus group's key finding was that almost all of the participants were quite comfortable with all online communication platforms, including Zoom and teams. They are adept at using a variety of project management and design technologies, including Canva. Participants attempt to reduce the amount of paper produced in their offices by converting everything to digital format and are also familiar with the public services available online.





2. In-depth Interviews

The activity in-depth interviews with experts is the third task of Result 1 of Small.Com project, "Digital Transformation: trends and needs of micro and small businesses".

The main objective of the interviews was to collect opinions and recommendations from experts in the area of digital transformation in Micro and Small Enterprises (MSE).

With this task, we intended to understand how the interviewees interpreted the phenomenon of digital transformation, pointing out its advantages/disadvantages, as well as the perception of opportunities and barriers in the implementation of digital solutions in the company's strategy.

The interviews explored the phenomenon of digital transformation in the point of view of experts in the field. Our aim was to gather know-how about the process of a digital transformation in MSEs, as far as it concerns its main concepts, its advantages and disadvantages, as well as the opportunities and barriers in the implementation of digital solutions in the company's strategy.

The interviews gave the project expert insights about the digital transformation process in micro and small companies, and pairing with the results of the focus groups, improved the quality and accuracy of the recommendations and conclusions put forward, and helped identify important aspects for a successful digital transformation process.

2.1 Participant Demographics

The in-depth interviews were conducted primarily online for convenience's reasons. Once more, the partners chose the participants by contacting them through their network, by phone calls and e-mails. In light of this, the partners conducted the interviews over the phone, through online video services such as Google Meet, and via email.

A quick summary of the participants that were interviewed for this project activity is included in the following figure.



Figure 13: Participant Demographics (Interviews).

From the eighteen interviews, the majority of the partcipants were CEOs and Project Managers. The majority of respondents were Portuguese, interviewees of EDIT VALUE and AEP.



Figure 14: Structure of the in depth interviews

2.3 What is "Digital Transformation"? Why is it important?

According to the questions posed, all respondents appear to agree that **digital transformation has always** been crucial and is an unquestionable means for businesses to expand, become more efficient, and maintain their competitiveness.

When questioned "what is "digital transformation" in a company?", in addition to the definition of digital transformation as the improvement of business processes, which allows the substitution of the manual, traditional and legacy ways of doing business to a digital and a simplest business environment, some participants go further and also understand that digital transformation is an internal cultural transformation that starts at the head of the structure and goes all the way to the consumer, towards flexibility, dynamism and adaptation. In fact, it is not only the insertion of new technologies, but a deep evaluation and a redesign of processes, accompanied by path of management change. Thus, in their opinion, transformation is a journey and not a destination.

Notwithstanding the above, one participant mentioned that "this process consumes a lot of resources and money and that it is not available for all companies that want to go through it". Indeed, according to the polish participants, the basic need for the digital transformation is funding. Companies very often do not know how to get funding and, in addition, are afraid that the funding process would be so complicated and dangerous (controlling and reporting from/to funding institutions) that they resign from trying.





On the other hand, some interviewees consider that one of the most important elements of digital transformation is the People involved, including customers, employees and management elements. In particular, one Italian participant made the following analogy: "digital is like an instrument, if you can't use it, there's something wrong". Without making people's entire lives depend on digital, they should understand it and use it properly.

In fact, the participants agreed that the opportunity and advantage of digital transformation are more apparent than ever, especially in light of the current technological evolution society is going through. "Technologies in the area of IoT, Smart Cities, Big Data and others are relatively recent and, as such, they are able to open doors to greater benefits, if well deployed in our society" said one respondent.

Furthermore, participants suggested that the fact of the matter is, if one looks at the average consumption time of users, one can understand that everything now is on mobile and on the digital. Business has always moved where the attention is and the examples exist: it's hard to imagine a company created by a 22 year old kid earning 900 million a year in just 6 years, competing directly with Nike without leaving a computer, as is the case of Gymshark. Just by looking at history, one can see how complicated it is to find an example with this sort of exponential curve.

Furthermore, the respondents believe that any type of business or sector of activity can benefit from being digitally evolved and processes can always be optimized through digital transformation, regardless of their type of activity. The respondents agree that there are sectors of activity in which digital transformation has already occurred due to the nature of the activity and that there are other sectors of activity in which it has not yet taken place (and therefore there is an opportunity). Additionally, one participant mentioned that all companies deal with people and that digital transformation did not only bring about changes in business, but especially in people's behavior. The participant goes further to explain that "businesses have to follow this change in behavior or end up on a dead end street".

Regarding the way digital transformation should be approached in various businesses, the participants mentioned that depending on the processes that are being affected, **companies have to approach digital transformation in a way that comprehends their business model, their resources (time and costs) and their overall context.** All companies should identify the opportunities and benefits of digital transformation, however **the company context is critical to a successful execution of a digital strategy.** The variables are always different, audience, offer, and average ticket, among others. The final goal could be the same but the way through which these aims are achieved depends from case to case.

2.4 How to start: Dimensions, factors, opportunities, and barriers to digital transformation in MSEs

The dimensions and factors that contribute most to a digital transformation in SMEs are many and of different nature. Digital transformation must be seen as a journey, not as a point of arrival. It is a process that is made up of various steps and takes into account more than just technology

In actuality, "digital transformation" refers to more than just implementing new technologies; it also refers to thoroughly analyzing and redesigning business processes, as well as changing management practices and mindsets. It is a real transformation of skills, behaviors, attitudes, with the birth of new knowledge.

The most important elements of digital transformations are the three main pillars of this process: **people**, **organisation and technology**.

Some participants have the same perspective regarding the way to start the process to become more digital: look at the history of the business numbers and processes that happen most often, fix objectives and seek specialists in the technological and organisational areas, who will help to make a diagnosis and analysis that will allow companies to make an informed decision. **Even in companies in the same area, the transformation can occur differently and with different objectives.** One participant also suggested pilot actions, perhaps on a small group, but then open them to everyone, so that each of the human resource would be involved in the process.

Most important elements identified in digital transformation are: Investment in personnel trainings and courses, have a positive and elastic mentality towards change and be curious, have a good leadership because it has an high impact both on company and workers mood, involve all the human resources, nobody excluded, everyone must be aware about the transformation process and with the same level on interest, invest in purchase and use of digital tools, not only waiting for incentives and external funding

On a general point of view, participants from Portugal and Italy understand that micro and small companies are resistant to a digital change. As said by one participant: "in general, the human being is led to resist innovation, it tends to remain in its comfort zone".

The major barriers identified in the interviews were: Lack of digital literacy, Lack of financial support or resources, resistance to change (mindset), fear of digital tools and the achievement of digital competences, difficulties with analyzing data – lack of data analysis competences.

However, the answers from the polish participants are interesting as all of them have the same remarks that there is definitely no specific resistance to a digital change from micro and small companies as they all represent the SME sector.

Finally, it is important to consider that obviously the use of digital technologies has an impact on the environment, but they also act as an enabler of a very important and increasingly required aspect: the development of the circular economy, based on rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle and recover.

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2.5 What are the critical success factors? How can we encourage organisations to start their path on digital transformation process?

To a sustainable digital transformation, the participants mentioned that the **critical success factors are the detailed knowledge of the business process for every specific company and to have a careful progressive adoption.** They mentioned that it is important to acknowledge and understand that this transformation will be expensive, time-consuming and difficult. That's why the opportunity exists. It is an investment and anyone who does not address the issue by not being willing to adjust the business model is placing a limitation on the success of the business.

Furthermore, all participants believe that the focus should be on showing leadership that this isn't about "digital" it's about business. That it's not about making a website and selling online, but about **diversifying the business model and creating a predictable sales system.** It is necessary to speak the language of MSE's. In fact, they mentioned that it is only possible to assess the effective benefit and scope of a digitization project with input from various levels and skills of an organisation. Therefore, providing that practical examples where the cost-benefit is demonstrated, the focus should be on showing how it can help the company to be more productive.

Additionally, the Italian participants generally agree that some actions to encourage SMEs to become more digital might be: Enhance existing incentives, work on digital skills, further encourage investments in digital innovation and R&D, have a certain stability of the initiatives over time, promptly define the terms of application of the regulations and simplify the bureaucracy.

The use of success stories and case studies to inspire digital transformation is a key tip for fostering virtuous cycles. An important point came up by a participant, who said that surely being curious and trying to make jumps in the "almost empty" is good. Then, sometimes it can be good, others bad, but on average the luck increases, namely through the networking. Others participants gave another advices, that is to be cohesive, structured, close and open to new ideas and to change because in this way it is possible to see scenarios that were not considered before.





Conclusion

"Digital transformation" is a multilevel, often complicated process combined with a variety of initiatives with the main aim to make a company mature in a field of digitalisation and to bring the company to the state of true digital capability. During the process of digital transformation, the client is at the centre of all company activities and choices. It is a human-centred process and human-centred decision-making. Moreover, these companies that put the client at the core of all their activities are more likely to succeed.

Digital transformation requires the organisation to deal better with change overall, essentially making change a core competency as the enterprise becomes customer-driven end-to-end. Such agility will facilitate ongoing digitalisation initiatives but should not be confused with them. In reality, a full digital transformation must embrace digitalisation solutions among all chain of value: **digitalisation of operations, digitalisation of products and services, and organisational digitalisation**.

In reality, this process seeks to take advantage of the possibilities and opportunities afforded by new technologies in a faster, better, and more innovative way. For this reason, effective strategies recognize that the end goal will continue to move as true digital transformation is an ongoing journey, as is change and digital innovation. The outcome of the change depends substantially by two factors or how emerging technologies are managed and how the value generated by digital innovations is used, more specifically, **Digital-driven innovations** and **Human-driven innovations**.

According to the Euler Hermes Enabling digitalisation index of 2019, companies should invest in knowledge, lifelong learning – education and training, and research R&D. Ever evolving, the digital workplace combines leadership, culture, technology and practices to yield critical outcomes that impact the bottom line. Specific digital capabilities will be required to sustain these activities from the standpoint of education and vocational training. However, the anticipated systemic changes would necessitate essential transversal skills including teamwork, communication, problem solving, creativity, and critical analysis.

The relationship between men and machines is no longer the one inherited from the century of Fordism, but also the sources of value, the supply chains used, the decision-making processes are under way rapid redefinition (22). Successful companies should start from a vision of the possible future, as experiencing the ongoing digital revolution means being invested by an increasingly rapid and pervasive flow of induced changes from the adoption of new tools and digital media.

The main challenges in digitalisation are highlighting digital competencies and cybersecurity, being that the last constitutes its biggest risks. Moreover, digitalisation of the companies and processes leads to the convergence of different sectors which will contribute to and influence the reduction of needs for certain professions and new professions will appear. It will be a significant challenge for the digitalisation process and it will require a need for retraining and lifelong learning. Another challenge will be that not everyone will be able to go through the transition due to various factors such as age, gender, the region of residence, and quality of life.



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Inspite these fears, challenges and risks, companies should start a digital transformation process having in mind that there are many benefits for an organisation and its staff in introducing these solutions. It is known that companies that are mature in both Digital-driven innovations and Human-driven innovations outstrip industry competitors along different dimensions of financial performance: companies that are mature firms on multiple financial measures.

On the basis of 4 focus group conducted in Portugal, Spain and Poland, that gathered more than 25 different actors in micro and small companies (managers, workers, CEOs, etc), we can conclude that it is already known that **businesses cannot afford to ignore the process of digital transformation**. Participants' agreed that technology adoption creates opportunities for corporate stability and growth and share the opinion that customers would rather resort to a corporation with cutting-edge technology than one that is limited by antiquated ones.

These idea is also shared by experts in the field of digital transformation: **companies have to approach digital transformation in a way that comprehends their business model, their resources (time and costs) and their overall context**, or they will end up on a dead end street.

Finally, this ebook allow us to identify the most critical factors to a success digital transformation process, being to have a detailed knowledge of the business process for every specific company, to have a careful strategy and progressive adoption, and to properly design and strategically implement education and training programs.

However, it is important to note that this e-book highlights a major barrier in the adoption of a digital transformation process that the literature underestimates. Companies associate digital transformation with an extremely costly process and find it difficult to equate this process as strategic investment with an attractive return on investment in a long turn. Therefore, governmental incentives plays a major rule in the implementation of a digital transformation strategy.





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