Final Paper: Digitalisation of businesses in Private sector in Italy

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Introduction

" When digital transformation is done right, it's like a caterpillar turning into a butterfly, but when done wrong, all you have is a really fast caterpillar. - *George Westerman | Principal Research Scientist, MIT Sloan Initiative on Digital Economy"*

" In Today's era of volatility, there is no other way but to re-invent. the only sustainable advantage you can have over others is agility, that's it. Because nothing else is sustainable, everything else you create somebody else will replicate. - *Jeff Bezos | Amazon Founder"*

" At least 40% of all businesses will die in the next 10 years… if they don't figure out how to change their entire company to accommodate new technologies. - *John Chambers | Cisco"*

The above quotes from some of the top leaders in the world shed a light on the impending doom that awaits businesses that do not adopt digitalisation of their business and undergo digital transformation. It is not only important to embrace digitalisation but also to do it in the right way, otherwise, one will end being just another caterpillar which is a little fast. It shouldn't be confused with business transformation because as soon as a new behavior is achieved by the organization business transformation stops, whereas , digital transformation, owing to the continuous improvements and changes in technology, is continuous in nature and is a long-term effort.

Background

Italy has been plagued with a slow economic growth. The country in 2019, before even conceiving the National Strategy for Digital Skills on July 21, 2020, has suffered from deep rooted social and economic problems. The real GDP is same as that of the year 2000 post crisis, there is large amount of unemployment

among youth and the already pre-existing economic divide between regions have split wider. Increasing the productivity rate is the key to improving the living standards and to offset the shrinking labor force and the negative effect of demographics. There should also be a promise of a steady income, formal employment, and increased inclusiveness. **[1]**

As per the details published in the overview of National Strategy for Digital Skills published on July 21, 2020, when the age group between 16 to 74 is considered, 58% of the Italians lack basic digital skills, 17% have never been online and among the graduates, 1% have only Information and Communications Technology (ICT) qualification. In the latter two stats, Italy ranks the last in entire EU. There is also a shortage of 5,100 ICT graduates with the demand far exceeding the demand. This lack of digital skill is often translated into the slow progress in the adoption of digitalisation by businesses and as such is inhibiting the growth and development of the country. It severely affects the country:

- In use of digital services by the public and private sectors and inhibits citizens' access and use of technology.
- By exposing majority of population to the risk of social and labor market exclusion and in turn shortage of workforce for businesses.
- By hindering access to consultation and public services (prevents the growth of that sector).
- With the exposure to large scale misinformation and exposes the individual to privacy risks due to lack of awareness about the digital footprint. **[2]**

Thesis:

All the above scenarios make it imperative for us to understand the Digitalisation of businesses in Italy, paying particular attention to businesses in private sector and reviewing the underlying causes that are impeding the digital transformation in Italy. *To achieve sustainable and inclusive growth in line with the European Union's digital decade plan of 2030, both large enterprises and SMEs in private sector in Italy, should understand that the root causes that impede the adoption of digital technologies, focus on operating online, investing for long-term, adopting big data, artificial intelligence and e-commerce and coming up with targeted strategies.*

II. Literature review/Causes of the main thesis of your paper

There are a multitude of factors that contribute to the delayed growth of digitalisation of both large enterprises and SMEs in private sector in Italy. The technology adoption at the organization level can be analyzed from the point of view of the Technology-Organization-Environment (TOE) Framework coined by Louis G. Tornatzky and Mitchell Fleischer in 1990.

Technology context:

This analysis can be achieved by looking at the status of adoption of technologies that matter the most in digitalization. Even though the SMEs that account for 41% of the total revenue generated from the Italian Enterprise system and are between 10 to 249 in number, can embrace new technological solutions, they often lack the capacity to invest for this transformation. The large enterprises on the other hand have huge investment capabilities but are constrained by the organizational processes involved. They often find themselves constrained by high number of headquarters and business units. **[3]**

The SMEs that have at least a basic level of digital intensity (70%) is on par with that of EU, which is at 69%. Similarly, for the entire ecosystems, Italy has performed well, especially in the *adoption of cloud services* (52% compared to EU's 34%), in *e-Invoices* (95% compared to EU's 32%), and in *e-Commerce turnover* (14% compared to EU's 11%). However, Italy has lacked in *electronic information sharing* (32% compared to EU's 38%), usage of *social media* (27% compared to EU's 29%), use of *big data in businesses* (9% compared to EU's 14%), *adoption of AI* (6% compared to EU's 8%), *SMEs selling online* (13% compared to EU's 19%) and *selling online cross-border* (7% compared to EU's 9%). **[4]** On top of this is the added shortage of 5,100 ICT graduates as explained previously, clearly indicating a digital skills gap. The slow adoption of AI and big data in Italian businesses negatively impacts the favorable ecosystem for start-ups.

Organizational context:

There has been significant improvement in the terms of digital skills development among the people of Italy especially after the government' s of National Strategy for Digital Skills by *the Minister for Technological*

Innovation and Digitalization of Italy. This points to the fact that the problem is more with the mindset and culture than its because of the availability of resources. If one looks at the advancement in digital infrastructure in terms of *At least 100 Mbps broadband take-up*, *At least 1 Gbps broadband take-up, Fixed Very High Capacity Network (VHCN) coverage, Fibre to the Premises (FTTP) coverage, Mobile broadband take-up, Overall 5G coverage*, and *5G spectrum*, Italy has outpaced the standards set by the EU digital decade plan and is on par or surpassed the EU average. **[3] [4]**

With the available resources, one expects Italian businesses to perform, but this is not the case. Italian firms have failed to meet the standards of EU in terms of *Enterprises providing ICT training (2022)* (19% compared to EU's 22%) and *employment of ICT specialist (2022)* (3.9% compared to EU's 4.6%). The entire company needs to understand the priorities, actions and strategy required to adopt digital technologies. This is a top-down approach and leadership plays a key role. However, the company also needs ICT specialist for the bottom-up integration and execution, which Italy lacks severely. There are only 18% ICT specialist compared to the France (+77%) and Germany (+50%). **[3]**

Environment context:

The environment is very favorable, and the government has rolled out a lot of initiatives and plans to help the businesses and citizens equally for the adoption of digital technologies. The issue is with finance. With globalization and the world being highly interconnected, the firms must play at a global scale and companies should fight in the global arena. This calls for finance and investors and Italian households are squirreling cash away into their private savings and have amassed 340,564 million euros into their personal disposable income compared to a 293,000 million euros at the end of 2020. **[5]** These are assets that could be utilized for the growth of the economy. **[3]**

The sanctions imposed on Russia by Italy following the sanctions by EU, after Russia invaded Ukraine on 24 February 2022, came in the form of ban Russia Today and Sputnik which were controlled by Russian state-controlled media outlets. This meant that the Italian government and AGCOM (Autorità per le Garanzie nelle Comunicazioni), which is the National Regulatory Authority for the communication

industries in Italy, had to work together to control the technical aspects and AGCOM helped all initiatives taken by Italian operators to support the Ukrainian population. This did put a strain on the resources which, otherwise, could have been utilized for improving country digital resilience.

The European Central Bank is curbing its bond-buying program that was till now giving cover to heavily indebted eurozone countries such as Italy. Italy' s increased debt and is second to only Greece. The forecast of GDP growth that says Italy will dwindle down to "zero virgola" (zero point) growth doesn't provide assurance. If the EU recovery fund of 16.5 billion euros is not disbursed to Italy by the end of 2023 for not meeting the growth expectations, then that could also turnout to be catastrophic for the digital plan of Italy. **[6]**

III. Define Outcomes

Present and future direct outcomes

It is fascinating to see the outcomes of all the digital strategies and the issues plaguing them. There are only 5 unicorn companies in Italy (one billion USD capitalization). Furthermore, the possibility for start-ups to scale-up remains limited in Italy in comparison to other EU Member States with a similar economic size and industrial sectors. This is despite a favorable dynamism for the ICT startups, which make for almost half of the registered ones in Italy. There is a growth of 22.55 from the year 2022 to 2023, which is mostly driven by AI, blockchain and cybersecurity. Even when the startups are growing, it is not to their advantage that the existing businesses in the Italian startups are not willing to adopt advanced digital transformation and become a caterpillar as mentioned by George Westerman of MIT Sloan Initiative on Digital Economy. Most of them choose to be technology followers. This weakness of Italian ecosystem for innovative start-ups could undermine the chances for Italy to contribute to the EU digital leadership. Hopefully, the plan of Italy to promote the integrated technology transfer system focused on excellence of technology and production specialization proves useful, especially for SMEs. **[4]**

Further to the stats mentioned above and as a part of the Technology-Organization-Environment Framework, the Digitalisation in Europe - 2023 edition by Eurostat **[8]** provides some certain interesting

insights. The percentage of ICT graduates who are women is only 0.5% and the Italian women have been consistently below the EU average in all sectors namely, Use of internet, Internet user skills and Specialist skills and employment. **[9]** This is a serious concern that need to be addressed since women of Italy make up more than 51.2% of the population. **[10]** Only 19.3% of the Italian businesses provide ICT training to their staff in 2022. **[8][fig 1].** In 2022, Digital intensity levels (0-3: very low, 4-6: low, 7-9: high, 10-12: very high), Italy ranks in the bottom half with very low – 29.6%, low – 42.6%, high – 25.0%, and very high – 2.8%. **[8][fig 2].** Italy ranks one of the highest in Businesses buying cloud computing services (60.5%) in 2021**[8][fig 3].** In 2022, There are 67.2% aged 16-24, 58.8% aged 25-64, and 34.0% aged 65-74, who buy goods and services online **[8][fig 4].** from among 62.9% of total population who find information about good and services online.**[8][fig 5].** Also in 2022, businesses making e-sales have only been 18.3% of the total business ecosystem and this suggests that there is a lot of potential for firms to sell their products and services online since 62.9% of the overall population and a above average (67.2%) of youth show online. .**[8][fig 6].**

Other impacts

Even though, the issues are at large, and the outcomes are not all favorable, there has been significant gains for the Italian economy from participating in the digitalization of its economy and industries. The value of the ICT market has grown to a staggering 70 to 100 billion dollars and is expected to continue growing. The market has attracted a lot of US companies that are among the leading providers of hardware, software, and services is the ICT industry. The big players, not only sell their products and services to the Italian companies, but also invest in the R&D heavily. They also provide educational and training programs, which ultimately benefit the citizens of Italy. Apart from the external collaborations, Italian government is also promoting public-private partnerships to enhance collaboration and leverage private-sector expertise and resources. **[7]**

Winners, losers, & stakeholders

Upon understanding the scale and scope of the above market, we can come to the conclusion that the winners of the digitalisation would be the tech-savvy firms and the upcoming startups that use technological prowess to disrupt the traditional businesses. The losers of this transformation would be the businesses that are not willing to take advantage of the technological advantages that are available to them because as said by Jeff Bezos "*In Today's era of volatility, there is no other way but to re-invent. the only sustainable advantage you can have over others is agility, that's it. Because nothing else is sustainable, everything else you create somebody else will replicate"* and soon the traditional firm, which doesn't adapt losses its competitive advantage and differentiation. The willingness to transform will affect all the main stakeholders; the government, the businesses, the employees learning and leading the transformation, and regulatory bodies that ensure equitable access to technology.

Regulations & Government Programs

Italian government has come with numerous appreciable plans as a part of its commitment to create digital resilience in its economy. Italia is one of the 12 member countries, which is a part of "*IPCEI -CIS*" (Important Project of Common European Interest – Cloud infrastructure and services). **[11] [Fig 1]**. To create a cyber resilient digital transition of industries and management of cyber crisis, the "*Strategy for cybersecurity"* adopted in 2022 to come up with 82 measures to be implemented by 2026. Another initiative is the *"Houses of emerging technologies"*, which funds R&D, tech transfer and experimentation primarily focused on the use of 5G and 6G networks and the technologies such as Blockchain, AI, augmented, virtual and immersive reality, IoTs and quantum technologies. Business association and Digital Enterprise Points (PID) promoted by Italian Chambers of Commerce promote *"Digital Innovation Hubs"* (DIH), which provides training and services to implement innovation, conduct industry research and execute experimental projects. The European commission and the Italian government co-founded *"European Digital Innovation Hub (EDIH) network"* with 13 EDIHs to execute digital projects. There are Competence Centers established by the government to enable public-private partnership and to form innovation clusters headed

by at least one research organization. Italy along with 23 other member states is also a part of the *"EU Startup Nations Standard of Excellence"* to encourage entrepreneurship. **[4]**

Training people is also an integral part of digitalisation of businesses, simply given the fact that they form the workforce that learn and execute these technological advancements in the different companies. To support and make people capable, the Italian government has launched several plans, including *"The National Recovery and Resilience Plan", "Repubblica Digitale (Digital Republic)"* – digital skills development, *"Fondo per la Repubblica Digitale"* – support public-private partnership (initiatives: *'Futura'* and *'Onlife'* – reskilling and upskilling particularly women), *"The Digital Civil Service"* – to help 1 million citizens by 2025, *"Digital Facilitation Centres"* – physical access points for in person and online training, *"School 4.0 plan"* – To transform 100,000 classrooms into innovative, connected and digital environments, *"ITS Academy reform" – guide towards* National Industry 4.0 plan for technical and professional institutes to adapt laboratories, and "*Dipartimenti di Eccellenza"* – for providing 1.5 million euros in funding to selected departments over five years from 2023 – 2027. **[4]**

IV. Discussion of Findings

Analysis of data & discussion of findings

Analyzing the data gives us significant insight into the success, advancement, and accomplishment of Italy in terms of its digitalisation. More than half of the Italians lack basic or above basic digital skills. As business operations evolve and adapt technology, Italy will face a sever lack of specialists since there are only 18% of the total number of graduates who are trained in a STEM designated course and can work in the field of ICT , the strength of ICT specialist in 2022 was 3.9% and because only 1 in 5 businesses provide training for their employees in ICT skills. The technology uptake discussed earlier points to the fact that the almost one third of the SMEs have not reached even a basic level of digital intensity and close to half have the very basic level of digital intensity in the range of 4 – 6. On the other hand, among the large enterprise, only 2.9% have not reached even a basic level of digital intensity. This makes the overall stats where still close to 30% of total businesses in Italy not reached even a basic level of digital intensity. **[8]**

Fascinating, is the adoption of cloud services in businesses in Italy. It has surpassed EU and is among the forerunners. This means that the Italy being a part of the "*IPCEI -CIS*" (Important Project of Common European Interest – Cloud infrastructure and services) is bearing fruits. However, AI has been treated with caution because the businesses using AI constitute close to 6% in Italy compared to countries such as Portugal and Denmark with AI adoption rates of 17% and 24%, where digital public services is very high. [12]. Only half of Italians shop online and out of that close to 2/3rd of the Italians bought Clothes, shoes or accessories online, 1/5th ordered online the food from restaurants, 1/4th ordered cosmetics, 1/4th streamed online, 1/5th bought tickets to cultural or other events, 1/4th booked travel tickets online and 1/5th rented accommodations online. The figures mentioned here are surprising since the percentage of Italians who faced issues while buying online was 23.6%. Italians prefer to not wear tech on them however more than 60% are okay using internet-connected home entertainment solutions. The large firms leverage the social media for their business and hold meetings online, where as half of the SMEs only leverage these resources. Share of large businesses with e-sales was double that of SMEs. The large businesses having twice the e-sales of SMEs points to the lack of numerous aggregators like Amazon and points to a weak logistics for the transport good and services. **[8]**

The lack of digital intensity among the SMEs does reaffirm the earlier statement of SMEs not having enough resources at their disposal to initiate digital transformations and interestingly, "Micro" companies with less than 10 employees constitute 95% of the approximately 4.4 million active companies in Italy. These SMEs, about 211,000 in number, are only 4.78% of the Italian economy but are accountable for 41% of the sales and employ 1/3rd the workforce and constitute 38% to national GDP. **[13]** This points to the fact that the SMEs of Italy are operating with very low profit margins, have relatively less value added because of lack of scale economies, and lack productivity because of lack of adoption of technologies and efficient production process, which might in turn be because of the less funds available at their disposal and the lack of skilled workforce.

Recommendations

The implementation of policies in the area of digitalisation of businesses should continue, particularly, in development and deployment of advanced technologies such as AI and big data. The high implementation rate of cloud services should aid this. Italy should encourage more SMEs and large enterprises in the ICT sector so that the businesses within Italy can be catered by innovation companies within Italy itself.

Italian government should help the SMEs, which constitute a large chunk of Italian economy, secure investment opportunities. Providing government approved investors through an online portal, educating and training the SMEs on how to procure funding and how to fulfil the necessary conditions for investors, providing subsidies, and helping SMEs go to IPOs (remember there is a lot of disposable income with Italian households) would pave the way for SMEs to adopt better technologies and become more efficient.

Italy should deploy measures to strengthen the cybersecurity through the efforts of its National Cybersecurity Agency to help citizens as well as businesses.

Italy should upskill and reskill its labor force. Introduction of skills forecasting to predict the needs of needs of the labor market and improve the collaboration between public-private sectors and between industry and civil society.

To better help the future generations, Italy should:

- Introduce more digitalisation in schools and in its vocational education
- Promote more research through transfer centers to cover fields such as advanced simulation and big data, quantum, Industry 4.0, or AI.
- Introduce more ICT skills training and incentivize the students to choose STEM courses.
- Limit the brain drain by increasing the attractiveness of Italy's universities and research ecosystem and provide better remuneration and incentives for research fellows.

Italy should further its efforts to digitalize and modernize its public services, because in countries such as Portugal and Denmark where public services performed well, the adoption of technology transformation has been higher.

Italy should be wary of disinformation in terms of digitalisation especially from information campaigns, in particular during election periods.

Overall, Italy, with a policy mix supporting investments, efficient policy implementation, capacity building and the enhancement of human capital, should guide the Italian enterprises towards digitalization. Italy should continue its efforts to develop the advanced digital technologies, upskill and reskill its workforce and adopt rapid digitalisation in its public services, to bring about a cultural transformation, which will motivate even more enterprises and people to adopt digital transformation.

V. Conclusion

Summary of key findings

The study of digitalization in Italy's private sector, with a particular emphasis on SMEs and large enterprises, reveals to us a complex landscape filled with both opportunities and challenges. Despite Italy's substantial ICT market growth and the attraction of major US companies investing in R&D, the digital skills gap persists as a significant impediment to fully leveraging digital transformation's benefits. Unfortunately for the Italian government, the promised 16.5 billion euros depends on its delivery of the digital transformation goals.

The analysis further shows us that there is:

- **Digital skills gap:** A considerable portion of the Italian population lacks basic digital competencies, with a notable scarcity of ICT specialists. This shortfall hampers the capacity of businesses, especially SMEs, to undertake or accelerate digital transformation.

- **Technological adoption gap:** While certain sectors and large enterprises have embraced cloud services and e-commerce, there's a notable lag in adopting advanced technologies like AI and big data analytics, particularly among SMEs. This reluctance stifles innovation and competitiveness.
- **Economic and sector wise impact:** The SMEs, vital to Italy's economy, contributing significantly to sales and employment, face challenges in digital intensity and productivity, partly due to limited access to investment and the necessary technological infrastructure.
- **Government initiatives and policies:** Various government initiatives and the strategic emphasis cloud services, AI, big data, innovation, and cybersecurity present a supportive foundation for digital transformation in Italy, however, the execution and alignment with the needs of the SMEs and the wider economy would be challenging.
- **Societal and Economic Inclusivity:** The lack of digital inclusivity, especially among SMEs, not only intensifies the risk of social and labor market exclusion but also misses out on harnessing the full potential of the digital transformation to address economic disparities across different regions and demographics. It is very much required for the cultural change needed for adoption of digital technologies.

Key findings help explain the main thesis statement

The thesis statement: *To achieve sustainable and inclusive growth in line with the European Union's digital decade plan of 2030, both large enterprises and SMEs in private sector in Italy, should understand that the root causes that impede the adoption of digital technologies, focus on operating online, investing for long-term, adopting big data, artificial intelligence and e-commerce and coming up with targeted strategies.*

Based on the above summary and the various sections such as analysis of data, identifying the issues and outcomes, solidifies the thesis statement' s assumption that there is a need to analyze the root cause that are impeding the adoption of digital transformation by enterprises in Italy and that to grow in scale the

enterprises, both SMEs and large enterprises, need to focus on operating online to increase their market addressability, and invest for long term in advanced technologies for increasing their competitive advantage and their efficient.

- **Understanding the root causes:** The identified digital skills gap, uneven technological adoption, and financing challenges are pivotal barriers that align with the thesis statement. These factors directly influence the ability of businesses to adapt and thrive in the digital era.
- **Operating online:** The findings emphasize the necessity for Italian businesses to not only adopt digital technologies but also to integrate them into their core strategies. This approach is crucial for enhancing digital intensity and competitiveness on a global scale.
- **Long-term Investment and Innovation:** Highlighting the importance of investing in digital infrastructure, R&D, human capital and seeking external capital by the enterprises as well as the government for fostering an ecosystem conducive to digital innovation and economic growth.
- **Targeted Strategies for Growth:** The government's role in facilitating access to finance, enhancing digital skills, developing public infrastructure, training the future generations and providing a regulatory environment safe and supportive of digital innovation is stressed. These strategies are crucial for overcoming the identified barriers and achieving the desired transformation.

In conclusion, the research findings substantiate the thesis by highlighting the many-sided challenges to digitalization in Italy’s private sector and suggesting that a intensive effort involving targeted strategies, government support, and stakeholder collaboration is essential for realizing the potential of digital transformation for sustainable and inclusive growth.

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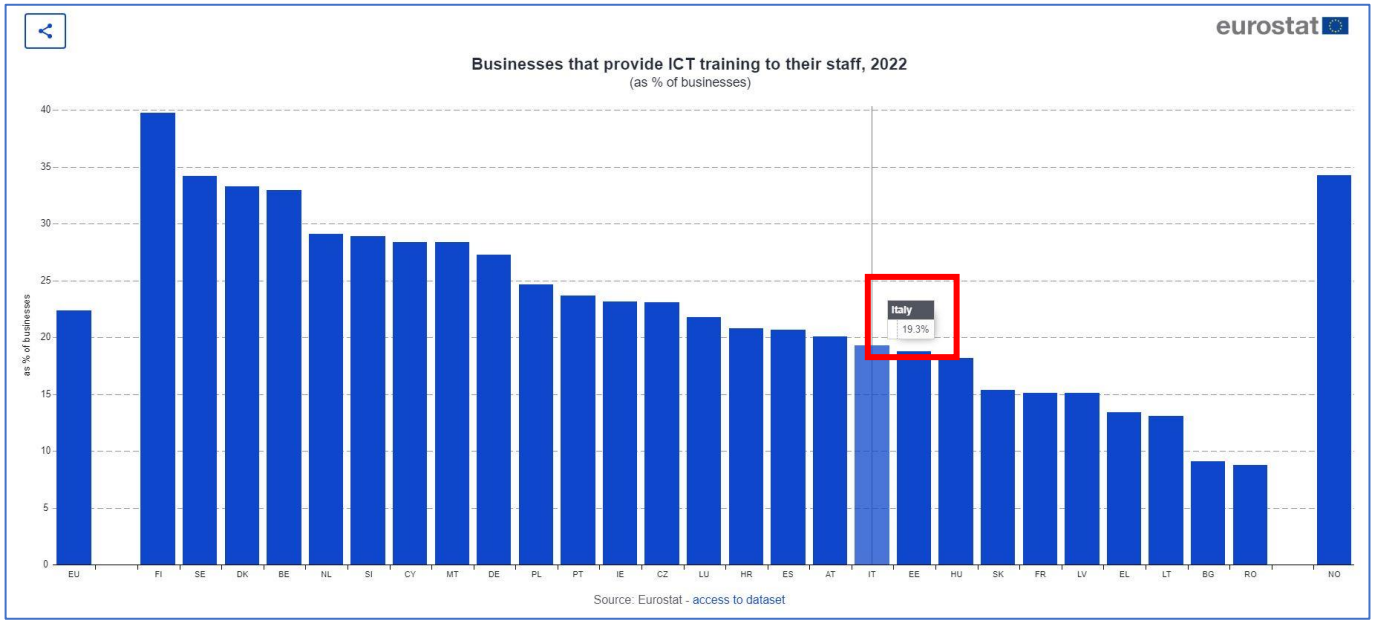
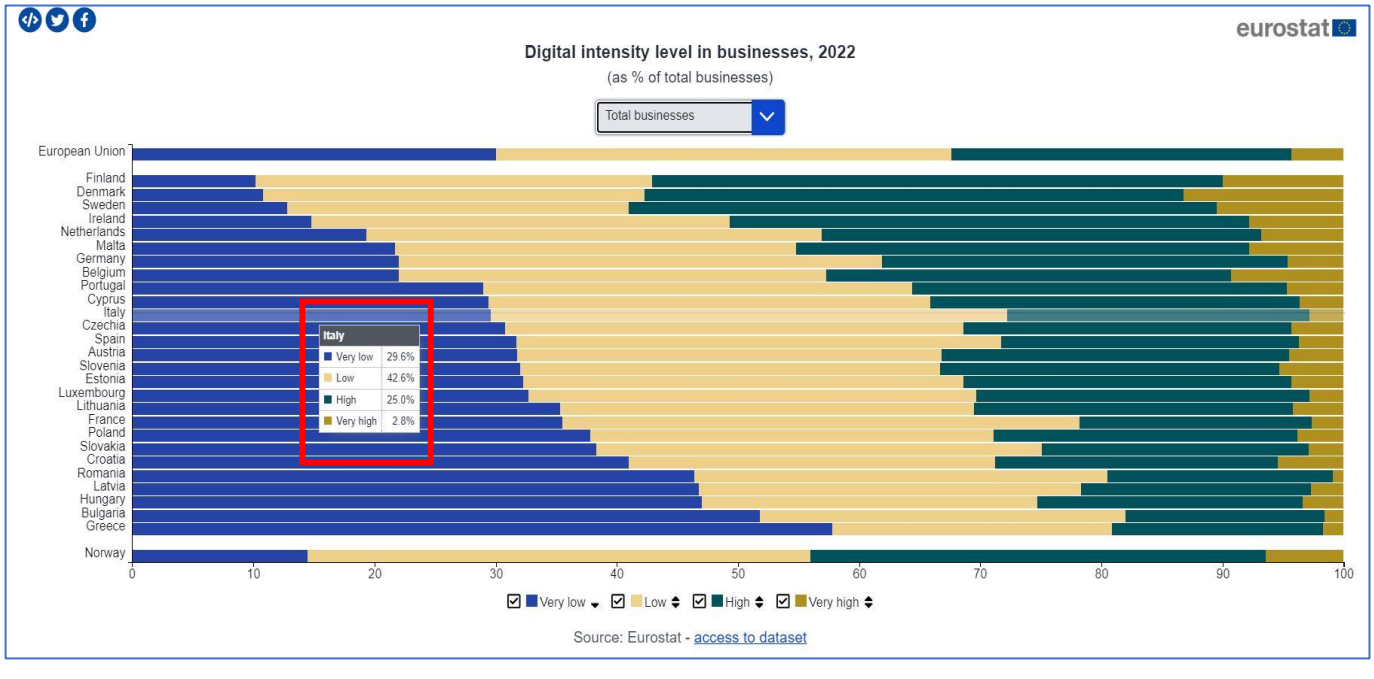
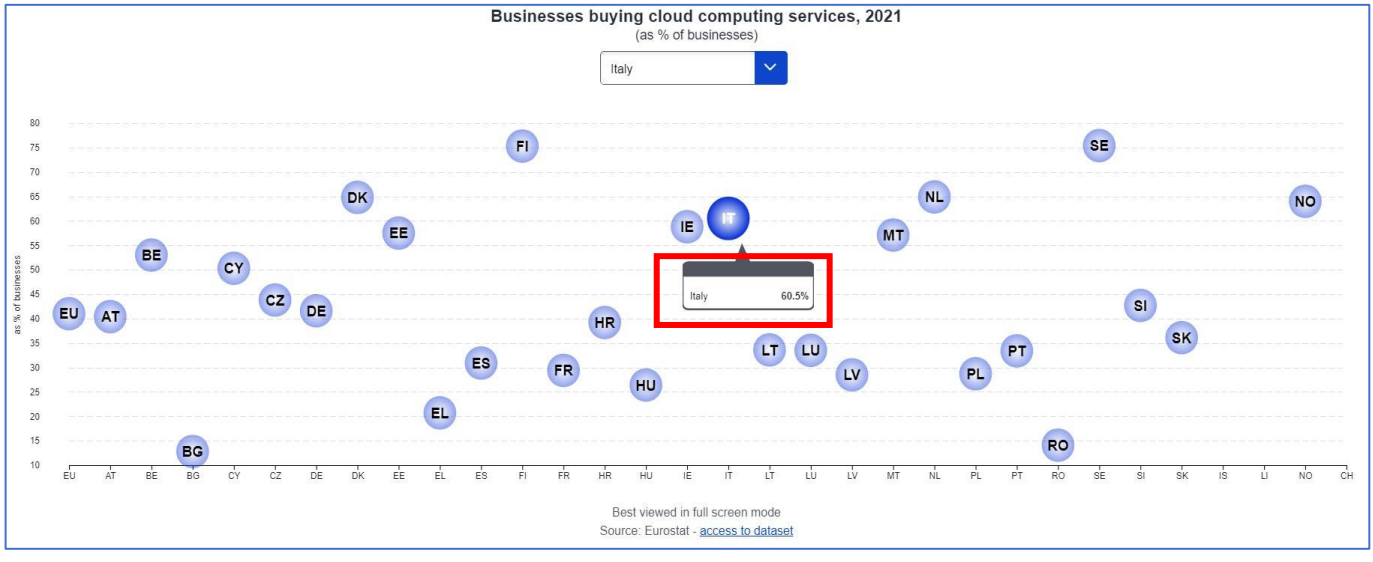
[8] Fig 1:


eurostat
Businesses that provide ICT training to their staff, 2022
(as % of businesses)
as % of businesses
Italy
19.3%
EU FI SE DK BE NL SI CY MT DE PL PT IE CZ LU HR ES AT IT EE HU SK FR LV EL LT BG RO NO
Source: Eurostat - access to dataset

[8] Fig 2:


eurostat
Digital intensity level in businesses, 2022
(as % of total businesses)
Total businesses
European Union
Finland
Denmark
Sweden
Ireland
Netherlands
Malta
Germany
Belgium
Portugal
Cyprus
Italy
Czechia
Spain
Austria
Slovenia
Estonia
Luxembourg
Lithuania
France
Poland
Slovakia
Croatia
Romania
Latvia
Hungary
Bulgaria
Greece
Norway
Italy
Very low 29.6%
Low 42.6%
High 25.0%
Very high 2.8%
0 10 20 30 40 50 60 70 80 90 100
Very low
Low
High
Very high
Source: Eurostat - access to dataset

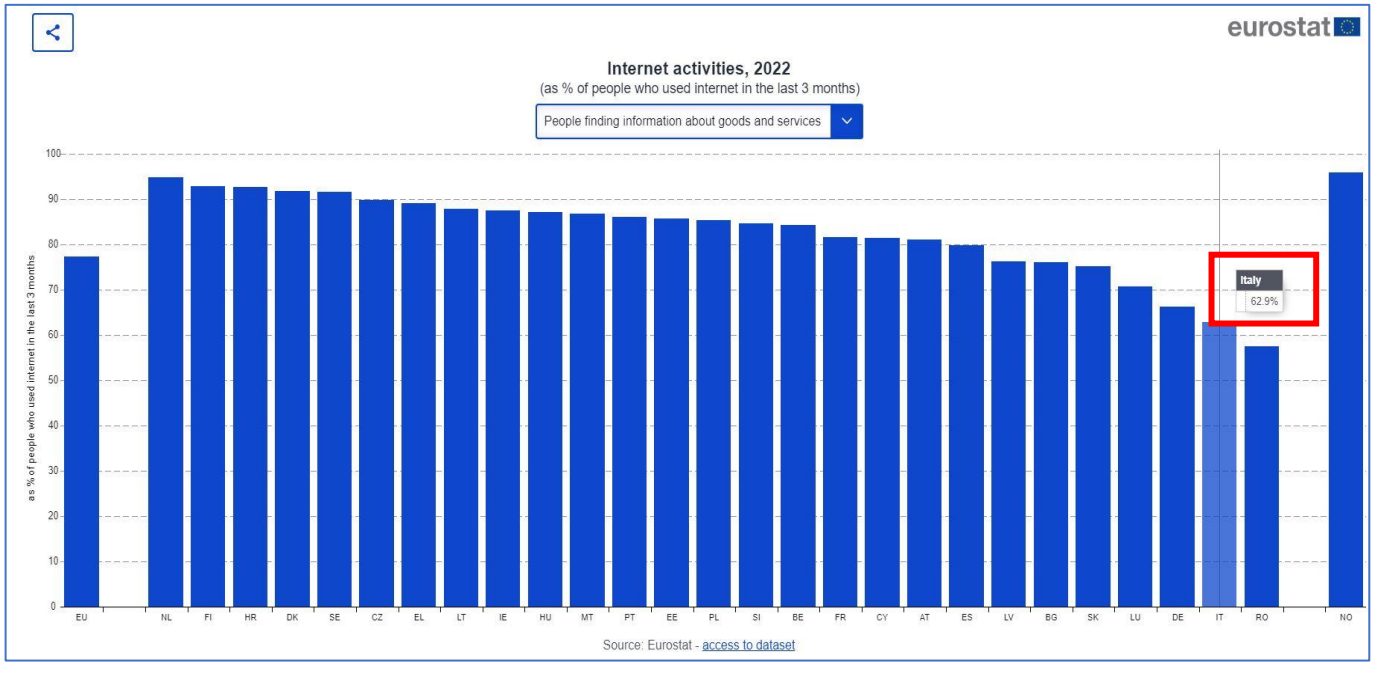
[8] Fig 3:


Businesses buying cloud computing services, 2021
(as % of businesses)
Italy
as % of businesses
Italy 60.5%
Best viewed in full screen mode
Source: Eurostat - access to dataset

[8] Fig 4:


People buying goods or services online, 2022
(as % of people who used internet in the last year)
Italy
16 - 24 years
25 - 64 years
65 - 74 years
as % of people who used internet in the last year
Italy
16 - 24 years: 67.2%
25 - 64 years: 58.8%
65 - 74 years: 34.0%
Source: Eurostat - access to dataset

[8] Fig 5:



[8] Fig 6:

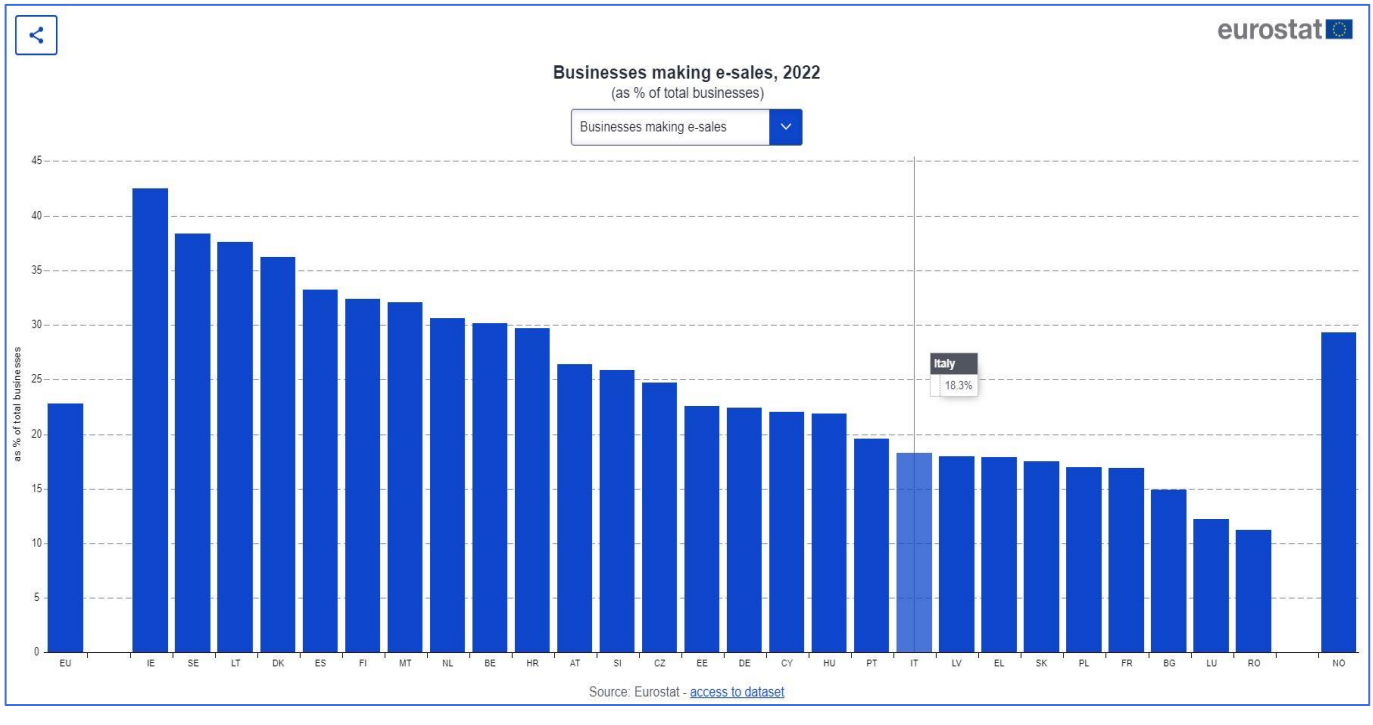


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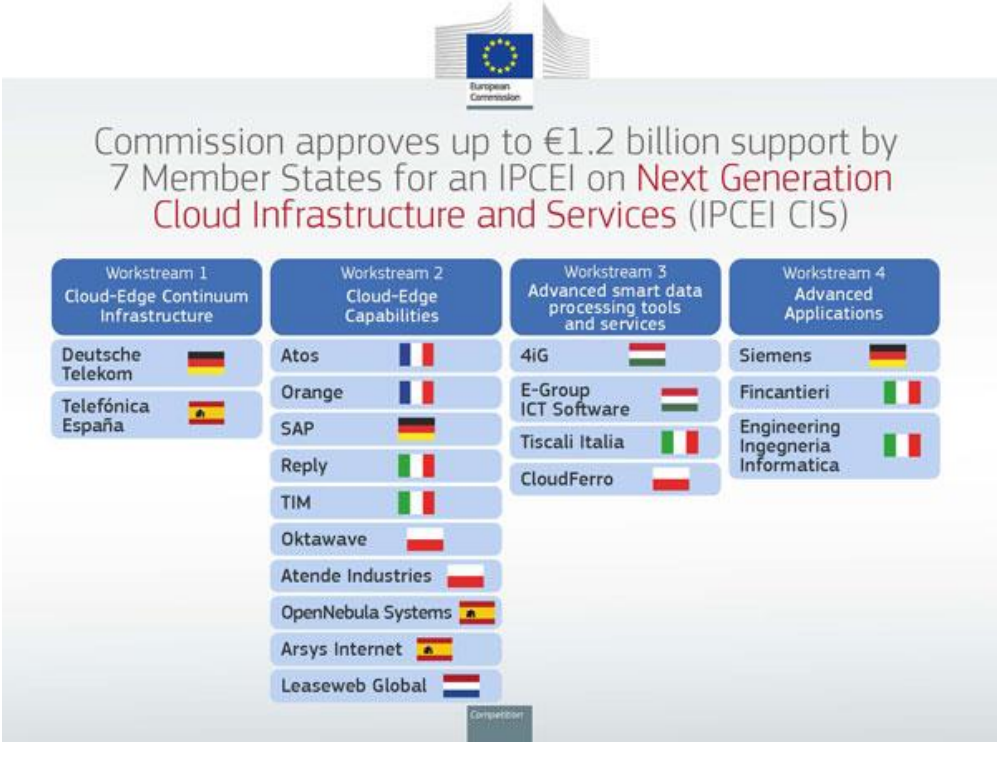
Fig 1:



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