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Digitalization as a lever to promote entrepreneurship and business development in Tunisia









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1.1 Purpose of the report

The purpose of this report is to examine how digitalization and the spread of digital technologies have enabled the creation of new businesses and the development of existing businesses in Tunisia over the past decade. The study builds on lessons learned from the Mashrou3i project implemented by the United Nations Industrial Development Organization (UNIDO) in Tunisia in 2013. It should be noted that the main objective of the Mashrou3i project was not digitalization. However, digitization and the use of digital technologies were ubiquitous in the beneficiaries' activities and the implementation of the project. This has led us to focus on the details of the opportunities offered, the difficulties encountered and the possible ways of accelerating job and business creation through digital technology, starting from the case studies and recommendations of the Mashrou3i project's stakeholders.

This report is based on a mixed methodology combining a qualitative study through interviews with 25 actors involved in the project (project beneficiaries, coaches, coaches and expert members of the project team). It is also based on a desk review of all recent scientific, political and journalistic materials produced on the subject of digitalization and business creation in Tunisia. We conducted a total of 25 interviews with Mashrou3i project beneficiaries, experts, trainers and team members, as well as heads of local administrations.

1.2 Digital technologies and their potential for economic development

For more than three decades, our societies have been greatly affected by the rapid spread of digital technologies. The dominant term in the 2000s was Information and Communication Technologies (ICT), then New Information and Communication Technologies (NICT). ICT refers to information and communication technologies, including the Internet, wireless networks, mobile phones, computers, software, software packages, video conferencing, social networks and other multimedia applications and services. They enable users to access, retrieve, store, transmit and manipulate information in digital form.¹

It was not until the mid-2010s that the terms 'digitalization' and 'digital transformation' prevailed in public debates. For the Organisation for Economic Co-operation and Development (OECD), digitalization consists of the use of digital technologies and data as well as interconnection that leads to new activities or changes in existing activities.² Digital transformation is "a process that aims to improve an entity by causing significant changes in its properties through combinations of information, computing, communication and connectivity technologies".³

Several waves of digital technologies have followed one another since the 1990s.⁴ Each of these new technological waves successively induces a higher transformation potential than its previous one. Currently, new digital technologies and their applications in the enterprise and industrial development sector are known as Industry 4.0. They seem to augur well for a new industrial revolution that has already begun. The concept of Industry 4.0 refers to a new phase of the industrial revolution linked to the development of interconnectivity, automation, machine learning and real-time data processing.⁵

In our analysis, we will designate by digitalization the process of change of an organization or a system by significant improvements in its properties thanks to the use of ICT. These modifications can be continuous or discontinuous (breaks), short or long-term.

In theory, developing countries have an important lever to achieve a technological and development leap through digital transformation.⁶ But in practice, digital dividends depend on many prerequisites. These countries are likely to experience a fourth industrial revolution different from that of developed countries because of their different economic prospects and different access to technology. The main differences are related to industrial sector maturity, technology adoption, skills, human resource availability and political governance.

Digital transformation is provoking fierce debate among policymakers, economists and industry leaders on its economic and societal impact. From an economic perspective, digital transformation profoundly affects the functioning of our economies by opening up unprecedented opportunities for value creation, flexibility and innovation. At the same time, it raises growing concerns about how it affects jobs, wages, inequalities, and natural resources.

There is nowadays a common belief that digital transformation will have a positive impact on economic development. In the case of African countries, the World Bank forecasts an acceleration potential of 2% of additional growth.⁷



1.3 UNIDO's approach to digitalization

UNIDO aims to promote gender-sensitive and sustainable digital transformation and to strengthen digital skills in developing countries. Standards play an important role in digital transformation, complementing and supporting the regulation of digital technologies. UNIDO has actively developed and disseminated relevant standards and related guidelines and knowledge products, such as those on innovation management systems developed in cooperation with the International Organization for Standardization (ISO), and on intelligent quality infrastructure, in cooperation with the International Network on Quality Infrastructure.

With the support of its member States, UNIDO is developing a strategic framework for the Fourth Industrial Revolution that will enable the Organization, inter alia, to (a) Work more strategically with member States and development partners; (b) Develop global programs and tailored interventions to advance the 4RI; (c) Provide more comprehensive support to member States; (d) Enable an expansion

of funding to develop solutions; (e) Strengthen UNIDO's analytical, policy and normative activities; (f) Ensure that post-COVID-19 recovery activities promote inclusive and sustainable digital transformation, improving labor markets and supporting social policies; and (g) Increase the impact of UNIDO's partnerships and programs, including country partnership programs (CPPs) and country programs (CPs).

1.4 The context of Tunisia

Tunisia has suffered from low growth and low employment since the early 2010s. The unemployment rate is now very high (18.4%). The youth unemployment rate is higher than the average unemployment rate and stands at 42.8% in 2021 [8]. There are also significant differences in unemployment rates between the different regions. The highest rates are recorded in the western and southern regions of Tunisia: north-west (33.0%), south-west (26.3%), central-west (23.0%) and south-east (22.5%). The deviations from the national rate (18.4%) vary between four and fourteen points.⁸ Unfortunately, a decade after the revolution, regional inequalities have remained the same and youth unemployment is at record highs.

At the same time, it must be acknowledged that digitalization has progressed strongly in Tunisia over the last decade. Mobile phones, internet and computer equipment have grown exponentially. The estimated proportion of households with a home computer increased from 21% in 2011 to 52.1% in 2019. The estimated proportion of households with home Internet access increased from 16% in 2011 to 51.5% in 2019. Internet penetration in Tunisia was 66.7% in 2021 with 7.92 million Internet users. The number of mobile connections in Tunisia in 2021 was equivalent to 150.2% of the total population. The number of social network users stood at 72.75% of the total population in January 2022.

This increase in digitalization offers a new context and in particular new opportunities for the creation and development of businesses and employment, particularly in interior regions. In theory, digitalization makes it possible to overcome spatial constraints, expand markets by taking into account geographically remote consumers, involve remote workers in the production process and improve production and sales techniques. During the COVID-19 crisis, these technologies served as instruments of resilience for small businesses and helped loosen many constraints.¹⁰

Promoting entrepreneurship and supporting enterprises in interior (disadvantaged) regions then appears as a national priority to revive economic growth and fix local populations. It is in this perspective that the Mashrou3i project is part of.

1.5 The plan of the document

The rest of this document is structured around five parts. In the first part, we present the Mashrou3i project, its context and its objectives. In the second part, we review the achievements of the Mashrou3i project. In the third part, we discuss the legal context of business creation and digitalization in Tunisia. In the fourth part, we will detail the best practices observed in the project that could serve as lessons for the rest of the entrepreneurship programs and projects. In the fifth part, we will return to the major problems encountered and propose possible recommendations to solve them to promote the creation of jobs and businesses in interior regions through digital technology.

Despite these positive developments, there are significant differences on the issue of access to the Internet between gender, the poor and the haves, as well as between regions. The inhabitants of large cities (Tunis, Sousse, Sfax) have better bandwidth quality and better 4G coverage than in interior regions. Specific public measures are still needed to address social inequalities in access to digital equipment and infrastructure. The gender digital divide persists. In 2019, 72.5% of men have regular access to the Internet compared to 61.1% of women in Tunisia.¹¹





Mashrou3i is a public-private partnership project implemented by the United Nations Industrial Development Organization (UNIDO). The project is supported by the Tunisian government and is funded by the United States Agency for International Development (USAID), the Italian Agency for Development Cooperation (AICS) and the HP Foundation.

Mashrou3i aims to promote entrepreneurship among young people and support the creation and development of businesses in 14 interior regions of Tunisia. This requires the promotion of entrepreneurial skills and attitudes. The project aims to enable young entrepreneurs to create and develop their businesses to generate new employment opportunities for young people in their region and also to increase the competitiveness of small businesses.

The project thus contributes to regional economic and social development and the fight against youth unemployment. This involves entrepreneurial training, in-depth business coaching and individualized technical assistance. The project offers young entrepreneurs a favorable framework of support and means to enable them to launch their businesses. The Mashrou3i project also provides technical assistance to help existing companies improve their performance, competitiveness and access to new markets.

Training in entrepreneurial skills. Mashrou3i's activities focus on creating an enabling environment for entrepreneurs, especially young people and women, to start and create successful businesses. By building the capacity of public and academic institutions, the project aims to promote entrepreneurial activity, improve services to entrepreneurs and address potential skills mismatches, particularly in priority governorates.

In this context and to encourage the entrepreneurial culture among students and improve their employability, Mashrou3i enriches the curricula of higher education institutions in Tunisia. In collaboration with the Network of Advanced Institutes of Technology Studies (ISET), Mashrou3i supports teachers in integrating the innovative tools and concepts of the HP LIFE for Entrepreneurs learning initiative into their university curricula. The e-learning program offers more than 32 courses in business and IT skills and is available in eight languages.

2.1 The main achievements of the Mashrou3i project over the period October 2016 - September 2022



More than 6,025 jobs were created, 68% of which are held by women. Since the launch of the project in 2016, Mashrou3i has promoted the creation of 6,025 full-time equivalent jobs in the 14 interior regions of the country (100% of the job creation target achieved). This result was achieved despite weak economic growth in Tunisia, political instability and the COVID-19 crisis that started in March 2020.



More than 30,000 Tunisians have benefited from entrepreneurship training. 34,250 Tunisians have taken online courses to improve their business and IT skills, among them 8,800 young people have completed entrepreneurial training workshops. This training, has enabled a large group of young people to enhance their entrepreneurial skills and apply them to their projects or their future jobs.

In addition, the program has **strengthened the skills of 48 regional business support institutions** in the area of entrepreneurship services. This large-scale action has made it possible to contribute to the dissemination of entrepreneurial culture in the interior regions.



819 start-ups^{*} **have been launched, 45% of which are led by women.** These entrepreneurs benefited from extensive business coaching to help them overcome start-up difficulties and successfully launch their start-ups. Adapted to the needs of each entrepreneur, coaching included help with the finalization of a business plan, the management and development of activities as well as support in various areas such as marketing, communication, administrative procedures, access to finance, digital transformation and quality standards.



Performance of 130 enterprises in the interior regions has been enhanced. These existing enterprises have been supported by the project with personalized technical assistance such as, improving production techniques, quality, and productivity, short specialized training and obtaining quality certifications. Technical assistance was also provided in marketing and access to finance. The Mashrou3i project provided support in adapting the business models of existing companies to meet the challenges of Covid-19. To enable entrepreneurs to access public markets and to take advantage of new business opportunities, the Mashrou3i project also provided technical training on the submission of public tenders via the TUNEPS platform (an online public tendering system in Tunisia).

^{*} The term start-up is used here to designate companies in a nascent stage (start-up) in all sectors. These companies are not necessarily labelled by Start-up Tunisia.



The skills of entrepreneurship educators and students were strengthened through the HP LIFE e-Learning platform. E-learning has benefited 223 educators from higher education institutions. They have been trained to integrate HP LIFE e-Learning into their curricula. In addition, Mashrou3i helped 46 higher education educators enrich their entrepreneurship courses through the HP LIFE program. This capacity building is fundamental for the implementation of entrepreneurship training sessions, now integrated into the curriculum, which will take place beyond the project (an indirect effect of the project). In total, through 128 10-day workshops, nearly 2,000 students were trained in 20 higher education institutions. Students were supported in developing their business model and strengthening their entrepreneurial skills through the Mashrou3i Business Challenge.



Many aspiring entrepreneurs from the regions and students have taken HP LIFE online courses. During the HP LIFE workshops initially in face-to-face mode and then online from March 2020 due to the COVID-19 health crisis, young entrepreneurs learned how to apply HP LIFE's entrepreneurship and IT concepts to their businesses. Since 2016 (the beginning of the project), there have been a total of 34,250 new users of the HP LIFE platform in Tunisia (Annual Report Mashrou3i 2022). An awareness campaign promoting economic opportunities among young people in the interior regions through media actions was also carried out.



Tunisian digital trajectory with little orientation towards business services

3.1 Slow progress in the legal framework and governance of digitalization in Tunisia

Since the 2000s, Tunisia has considered digital technologies to be an important lever for economic and social development. The country is seeking to take advantage of digitalization to speed up business creation and the fight against unemployment. Plans, policies and strategies have been developed to this end. The National Strategic Plan (PNS) "Tunisie Digitale 2020" was put in place to unleash Tunisia's potential through digital technologies. It is structured around the following four axes: Infrastructure, e-Gov, e-business, and Smart Tunisia. The national plan "Tunisie Digitale 2020" had a budget of 5.5 billion dinars for the period 2014-2020. The objective of this strategy was to make Tunisia an international digital hub and to promote ICT as an essential lever for socio-economic development. Unfortunately, the project's achievements fell short of expectations due to political instability and weak governance.

This strategy has not been able to achieve all the objectives, and out of more than 72 major projects programmed under the Digital Tunisia 2020 strategy, only 5% have been achieved. The plan has suffered from complex governance, including a lack of clarity on the roles and responsibilities of different stakeholders and a lack of unifying leadership. This has resulted in a low rate of implementation of the projects included in the program.



A new plan "Tunisia Digital 2025" has been developed given the weak achievements of the previous one. This plan aims to bridge the digital divide, foster the digitalization of education, the transition to e-administration, support entrepreneurship and innovation and implement the national cybersecurity strategy and strengthen digital sovereignty. This plan complements a set of strategic documents for the period 2022-2025.

The digitalization of public services and public administration seems to be accelerating since 2018. Tunisia's new e-government strategy includes adapting infrastructure, promoting cross-cutting projects and promoting new applications for public services. Online registration for primary and secondary education has become mandatory since 2018, to initiate and engage citizens in the digital process. Subsequently, in 2018, the Tunisian Post Office collaborated with the Ministry of Higher Education for the launch of the smart electronic card, acting as a bank card. This card was designed to make life easier for young students, allowing online payments and withdrawals from bank distributors. Also, there was the launch, in the last quarter of 2019, of the "Labes" vital card. The purpose of this vital card is to facilitate the various procedures with the National Health Insurance Fund (CNAM). Other initiatives emerged and multiplied during the COVID-19 crisis.

Overall, Tunisia is making progress in e-government according to international indices. Tunisia is at a fairly high level that reached 0.6526 in 2020 and is well above the global average of around 0.5987. The country has an e-Participation Index of 0.6905 in 2020 - which is higher than the global average of 0.5677 in 2020.¹² In 2016, Tunisia ranked 66th with an overall data openness rate of around 22%. The e-Gov strategic direction proposes performance indicators relating to the online activity of the Tunisian administration.

3.2 The Start-up Act: an innovative legal framework

Tunisia's Start-up Act is remarkable not only for the important steps the country is taking to build a thriving entrepreneurship ecosystem but also because it is the first time in the Arab region that start-ups have succeeded in lobbying policymakers to change the laws that affect them. Let us hope that we will see similar success in other countries of the Maghreb." - K. KTEILY, World Economic Forum (2018).

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Since the adoption of the new Start-up Act regulation by the Tunisian Parliament in October 20182, 709 start-ups have received the start-up label, the number of February 2022.**13 On average, each labelled start-up employs more than 11 people. One of the most relevant indicators, which highlights the development capacity of start-ups, is the number of jobs created. Indeed, new jobs were created during the first year of the Start-up Act, with an average of 3 new jobs per start-up.

The new law addresses issues such as administrative dematerialization, export, international money transfers, recruitment of international staff, etc. New start-ups are accelerating the emergence of new services and industries (clusters) such as e-health services, games, creative industries, 3D modelling and artificial intelligence (several examples of innovative start-ups are mentioned in Annex 1). The Start-up Act changed the situation and triggered a new dynamic in Tunisia. This is not limited to the coastal regions of Tunisia but also affects the entire territory. However, it should be noted that most of these services and enterprises remain located in Greater Tunis.

Nowadays, new programs to boost productivity and exploit technological opportunities are being rolled out around Industry 4.0. Tunisia has already taken steps towards the adoption of Industry 4.0. In December 2020, the HUB I4.0 initiative was launched as part of the digital transformation program in Tunisia. The initiative aims to accelerate the country's transition to Industry 4.0 and increase awareness of Industry 4.0 across the country. HUB I4.0 has established competence centers in Sousse, Sfax, Bizerte, Monastir and Sidi Thabet to support the strengthening of skills needed for future professions. The potential of Industry 4.0 as a new industrial policy is very important and can induce huge changes in the productivity and competitiveness of key industrial sectors in Tunisia.

The government's current progress in the area of digitalization is supported by several cooperation initiatives, including with the European Union, USAID, France, Germany and UNIDO.

After outling the context of digitalization in Tunisia, we now propose to examine the main lessons learned through the Mashrou3i project in terms of business creation in priority regions and the role that digitalization has played.



Innovative practices in digitalization in the framework of the Mashrou3i project

Our study clearly shows that innovative practices and digital transformation have gradually been implemented as part of the Mashrou3i project in Tunisia, and have been observed among entrepreneurs. This has helped beneficiaries take advantage of digital dividends and has accelerated their business development. Essentially, seven lessons are worth highlighting. We propose to return to them in summary form.

4.1 An accelerating effect of digitalization felt by project beneficiaries

All testimonials are consistent on the existence of an accelerating effect of COVID-19 on the use of digital in Tunisia (especially in the interior regions).

The COVID-19 crisis has allowed for an unprecedented acceleration of digitalization." - Mashrou3i project HP LIFE Expert.

This effect was strongly felt by almost all Mashrou3i beneficiaries who have been able to discover tools, opportunities for market expansion and sales outside their (distant) home regions, online resources and interactions with competitors and online partners. The COVID-19 crisis has focused attention on digital and related opportunities. The shift to e-learning has changed the perception of the digital world, generated a lot of interest and opened up new opportunities.

The COVID-19 crisis has helped to focus attention on digital and, above all, provided time to project beneficiaries. This time was spent interacting through the use of the internet and digital platforms, among others, and exploring its possibilities. COVID-19 has also shown that digital-based resilience strategies are possible and vital for Tunisia and new businesses. This allowed the continuity of business operations and the discovery of the digital economy as an alternative to the real economy in times of crisis and mobility restrictions. After the equipment boom, we witnessed a boom in usage of digital technology and learning during the years 2020-2022, which bodes well for a potential acceleration in results (economic growth, productivity and profit).

Over the years, Mashrou3i has designed and shared more than 350 success stories from entrepreneurs. Mashrou3i's Facebook page has more than 37,250 followers. Through articles, posts and information published very regularly via social networks, entrepreneurial experiences, successes and economic opportunities were promoted and shared.¹⁴



4.2 Digitalization is a powerful tool for spreading entrepreneurial culture

The entrepreneurial culture has been boosted by positive communication on entrepreneurship, the promotion of good examples and their exposure on the Internet. This has influenced young people in their choices. Social networks are a powerful vehicle for influencing the behavior of young Tunisians.

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The choice of the Mashrou3i project to rely on online platforms to spread a new entrepreneurial culture in the regions has had a significant positive impact." - Mashrou3i project Regional Expert.

Indeed, the COVID-19 crisis has significantly increased unemployment, which was already high before, among young people and especially among qualified young people. There is growing awareness among young people that entrepreneurship is a viable career path compared to wage employment. This option has become more attractive for many people in the new context of crisis.

Entrepreneurial action seems to be progressing through contagion and imitation behavior. The winning strategies of some young people are quickly imitated and duplicated by others (and not so young people). The demonstration effects played a major role in this. Success stories have sometimes broken the dynamics of the prevailing pessimism in some regions. The entrepreneurial culture has been strengthened by positive communication on entrepreneurship, in particular through the sharing of experiences and success stories. This has influenced young people in their choices. Generally, it has been reported that:

If it was possible for the other young people, then it could be possible for me too." - Entrepreneur and Mashrou3i project beneficiary who launched a start-up specializing in digital applications for agriculture.

This communication was both structured by the Mashrou3i project (articles, periodic newsletters, events, magazines, radio, website, etc.), and informal through the sharing of posts on social networks.

The entrepreneurial culture has progressed thanks to social networks, which has made it possible to draw attention to entrepreneurs and disseminate their good practices. The more positive the communication was about entrepreneurship, the more it fostered exchange between young people and beneficiaries to dispel the fears associated with the launch phase. But not all the potential is yet fully explored as many new successes and sectors deserve to be exploited. The choice of the Mashrou3i project to rely on remote online platforms and communication to spread a new entrepreneurial culture in the regions has had a significant positive impact.

4.3 Digitalization accelerates entrepreneurship learning

Around the world, online learning increased sharply during the COVID-19 period. The Mashrou3i project was no exception. The project adapted during the lockdown periods to the new situation by offering online learning. This has been a challenge for many coaches, trainers, managers and learners. But overall the adaptation to the new situation was considered positive and rapid. The level of digital skills required to use the platforms and functionalities of HP LIFE/Zoom/Google Meet is relatively low and were quickly mastered.

C The HP LIFE platform and the workshops provided (online and face-to-face) have made it possible to create a professional network, reinforcing the multi-stakeholder approach and digital skills." - Mashrou3i project HP LIFE Expert.

While a large majority of beneficiaries found online platforms to be suitable and have rich content and interesting features, a minority reported that e-learning was difficult. E-learning requires a high level of concentration and can sometimes put individuals in a situation of isolation and lack of social interactions that are not controllable by all people. Essentially, assessments were uneven depending on the level of education. While for the most educated (higher education graduates), mastering digital learning platforms was easy and their initial skills allow them to adapt to this type of knowledge transmission. For those who did not have a high level of education, everything was new and a discovery. Initiation sessions were programmed by the project to help novices master the tools and develop their instrumental skills. Apprenticeships were accelerated and instrumental skills were quickly built.

Another feature of this period is that:



Self-training has also been strengthened." - Mashrou3i project beneficiary who launched a start-up in engineering consulting.

Individuals have sought to develop their skills and knowledge on their own on the Internet. This form of learning has been generalized and has become part of the daily practices of many beneficiaries. The content provided by the Mashrou3i project was a starting point for discovering additional resources and knowledge through online self-study. Videos that can be viewed free of charge online (on YouTube or other platforms) are now considered very interesting and easy to access.

Box 1

Online training during COVID-19: During this period, on several occasions, it was impossible to continue face-to-face and on-site Mashrou3i training and other related activities. As a result, the project quickly adapted and immediately offered online training in order not to fall behind in achieving its objectives and to allow beneficiaries to continue to receive different types of assistance. For example, over the 2020-2021 period, 72 student-entrepreneurs were accompanied through intensive online training and 15-day workshops to use HP LIFE to transform their business idea into a viable business model.¹⁵

Remote business coaching during COVID-19: During the height of the crisis, Mashrou3i provided in-depth remote business coaching to 100 entrepreneurs in business planning, digital marketing, communications and access to finance. This included training on the financial and tax incentives of the Tunisian Investment Law as well as explaining the measures taken by the government regarding COVID-19 investment bonuses and the support available to ensure the sustainability of small businesses during the pandemic.¹⁶

Entrepreneurship workshops in virtual training rooms: Virtual training rooms were set up during the COVID-19 crisis. These virtual rooms were created as part of the HP LIFE training approach. Moodle, Zoom and Google Classroom are used. Approximately 400 aspiring entrepreneurs from 14 target regions participated in the 5-day workshops over 3 months. During the workshops, youth learned how to use HP LIFE online tools and received business coaching to turn their idea into a viable business plan.¹⁷

Weekly live streaming sessions: Frequent live streaming has also proven to be a way for the project to remain engaged with youth across the country. Every week, opinion leaders, entrepreneurs, Mashrou3i project experts and entrepreneurial ecosystem actors were invited to discuss different topics related to social distancing, work, entrepreneurship, students, etc. These sessions gained ground and aroused interest and participants were interested in following them.

4.4 Individual online coaching is possible and increasingly accepted

For online coaching activities, there are two types of assessments. For some beneficiaries, online coaching is a perfect substitute for face-to-face coaching (F2F) and gives beneficiaries more flexibility. For others, nothing can replace coaching sessions in F2F mode.

Some coaches have indicated their preference for human contact which is in no way replaceable. To review the progress of projects of beneficiaries and their competencies, some coaches believe that:

It is essential to see certain specificities in the field, on-site at the company. - Mashrou3i project trainer who launched a start-up that offers digital services to companies.

Nothing can replace real observation in their eyes. The specificity of certain projects is also mentioned as a reason to carry out field visits and sessions in F2F mode. This applies in particular to processing projects in the agri-food sector or projects with a significant logistical component.

The gender aspect is also clearly mentioned. Many women beneficiaries have reported that e-coaching has helped them a lot in reconciling family and professional life. This has encouraged them to take more training. Learners, in general, liked distance learning because for some travel is long between the physical place of training and their home.

The profile of coaches also appears to be decisive in the acceptance of online coaching. Some coaches have given confidence to entrepreneurs, providing useful, concrete advice adapted to their needs, making themselves frequently available, and thus allowing adaptation for coaching. But they recommend a mixed solution because direct contact (coaching) is necessary at certain stages from their point of view.



For some coaches, it was a discovery, there was a great effort to adapt to remote coaching." - Mashrou3i project UNIDO Expert.

Learning was quick and necessary in the absence of an alternative.

4.5 The digital world: a new source of inspiration and innovation

The digital world is a space that fosters interaction and the exchange of ideas. In this respect, it makes it possible to increase the level of innovation in enterprises and to improve services, products and production processes. Indeed, beneficiaries of the Mashrou3i project have confirmed the idea that the Internet has allowed them to find new ideas for their business and is an inexhaustible source of inspiration.



The spirit of innovation has progressed well with the use of digital technology." - Mashrou3i project Regional Expert.

Digital space provides access to a variety of useful information, ideas, models, prototypes and tools. All these elements allow entrepreneurs to develop innovative ideas, or at least better adapt and build on original ideas. This innovation activity is not yet clearly integrated and formalized in the process. It could be more structured. For the moment, only the most experienced beneficiaries are practicing this.

Business intelligence practices on competitors in terms of innovation were also observed. Some beneficiaries reported that they regularly review the sites of competitors, or even companies with an international dimension, to review new offers, get an idea of the prices charged and read customer comments and recommendations on their sites.

4.6 Digitalization as a means of market expansion and business model transformation

The development of digital platforms, as well as the use of social networks have expanded access to markets for Tunisian entrepreneurs and companies. Launched in regions with small market sizes,

businesses have been offered new opportunities thanks to the digital world. Indeed, the digital world transcends physical boundaries and makes it possible to serve distant consumers. This possibility has opened up new opportunities for newly launched companies that have been able to experiment with online sales.



The period of lockdowns related to the COVID-19 crisis has greatly accelerated this trend. Faced with this new reality, companies that were able to do so, quickly evolved or changed their business model and began to make intensive use of online sales services. This was the case, for example, of an entrepreneur in Gabes who created a digital agency called Barsha Technology, and who testifies to it:

66 My career has taken a whole new direction by taking HP LIFE training. Barsha Technology is a technology service and audio-visual production company, founded in Gabes in September 2017, our core services offered are mobile application development, website creation, graphic design and office applications, our goal is to have our footprint in the world of technology. Today, Barsha Technology employs a team of seven experts, including web developers, designers and a photographer. It serves the domestic market, but also the international market." - Zeineb Hadj Ali, founder of Barsha Technology.

For the moment, Tunisian companies have two possibilities for online sales: via a digital platform (Jumia, tayara.tn, dabchy, etc.) or social networks in direct mode. Digital platforms have developed strongly in Tunisia over the past decade. They have been able to accumulate a critical mass of users so that economies of scale and networks have sometimes become possible and important. But most Mashrou3i beneficiaries believe that the costs and margins taken by these platforms are too high. This discourages them from using them. They mostly turn to social networks.

The specificity of the use of social networks and especially the Facebook platform stems from the fact that payment solutions are, for the moment, limited or non-existent for this type of transaction in Tunisia. These are acclaimed: "Selling on Facebook, according to many entrepreneurs, is better than having a shop (Head of a local institution in the region). Thus, payment on delivery is the norm. PayPal solutions are currently banned and other solutions are under consideration. Most companies then offer the products/services online on social media pages, and then mandate delivery or transport companies for payment on delivery. This mode of sale does not allow the security of transactions. Some beneficiaries reported significant difficulties in their relations with delivery companies. The costs are higher because they are located in sometimes isolated regions (this is particularly true for companies in southern Tunisia). And in this market, there are too many unscrupulous transport companies. The area is still considered immature.

4.7 Emerging business intelligence practices and improved knowledge of consumer preferences

Several beneficiaries, Mashrou3i experts and project stakeholders reported an increasingly assertive use of internet-based competitor business intelligence. Indeed, "entrepreneurs regularly learn about competitors through the Internet" (Head of a local institution in the region). This concerns the prices charged, business models and offers as well as commercial strategies. This practice depends in part on the skills of the entrepreneur. The higher the entrepreneur's level of education , the more this observation is reported.

Business intelligence activities are often considered secondary for small projects, but as digitization progresses in Tunisia, these new reflexes could significantly improve the quality of submitted projects and the quality of business models and plans. Indeed, this mass of information was already available in the pre-digitalization period but required significant efforts for its collection and processing. Today, we are witnessing the opposite: an abundance of information, easily accessible and easy to structure. This leads to the emergence of new issues related to the choice of information to be considered and the problems of sorting and selecting relevant information according to the Tunisian context and business sector.

4.8 Rapid learning and accumulation of digital skills by entrepreneurs

All project stakeholders interviewed reported that the COVID-19 pandemic was a period of profound change in their learning practices.

E-learning has created great momentum. In addition, through business center facilities, some entrepreneurs have benefited from Internet access on these premises. Online learning and training also improve the results of the Mashrou3i project and its partners, it has increased the number of beneficiaries and training provided. This form of learning and assistance is appreciated by learners and trainers." - Mashrou3i project Regional Expert.

The shift to e-learning via platforms has changed old practices and allowed entrepreneurs to consolidate their digital skills. Learning has been accelerated. Self-training has also been strengthened. However, entrepreneur profiles are an important element. While for some, this training allowed them to jump on board the digital train and acquire the basics of instrumental skills. For others, this has opened them to digital possibilities for accelerating and consolidating their projects.

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Many challenges remain in boosting business start-ups and taking full advantage of digital dividends

The presence of many good practices and entrepreneurial successes cannot hide the significant difficulties and challenges faced by entrepreneurs and start-ups in Tunisia. Many barriers still limit digital dividends in Tunisia and the full exploitation of digitalization as a means of facilitating entrepreneurship. Seven trends are worth highlighting here.

5.1 Network coverage remains low in the interior regions of Tunisia

One of the major handicaps concerns network coverage in the interior regions. Networks are not yet sufficiently developed. The target regions of the Mashrou3i project are not the densest in terms of population and operators have invested less in these areas compared to coastal regions. As a result, the quality of the Internet connection is still low. However, beneficiaries report a gradual improvement in services and coverage (outside sparsely populated rural areas).

These problems of connection and bandwidth have negative effects on the quality of the training set up as part of the Mashrou3i project. This has impacted, in some regions, the presence of e-learning courses. In other regions, poor network coverage and an unstable internet connection have impacted the progression and pace of learning. At the same time, some entrepreneurs reported the negative impact on the e-services offered. Indeed, the e-services offer depends on a high-speed and stable Internet network. Business owners also reported that they were able to attract investors to their regions but that the quality of the Internet was a major constraint.

5.2 Digital equipment and solutions follow a cost-benefit logic

The adoption of digital solutions requires equipment beforehand: purchase of computers, smartphones, software, and entry points. This equipment follows a cost/benefit logic. However, it must be noted that this equipment, when acquired, is not optimal, in part because of the costs that are still perceived as high.

For many project beneficiaries, financial constraints require them to invest more in other spending areas that are considered to be higher priority compared to digital technologies. The idea of buying, for example, a computer, printer or software does not come to mind spontaneously at the beginning of the project. Beneficiaries seek to prioritize and purchase first other necessary goods and essential equipment (machinery, raw materials, etc.) for the operation of their projects. Specific funding requests have been made for the Mashrou3i project managers in this sense during and after the COVID-19 lockdowns.

Although equipment prices have fallen significantly, the financial constraint remains severe. Indeed, it is necessary to take into account all the hidden costs related to digital technology. Quite often, the costs of subscribing to an Internet service provider, acquiring software, maintaining hardware, subscribing to cloud computing, maintaining servers, protecting data, etc.) are not well taken into account in the financial estimates of business plans. These associated expenses are very often largely undervalued in business projects in Tunisia.

Finally, equipment is very quickly outdated due to rapid technological developments. This rapid obsolescence of equipment can sometimes suggest that investments will be quickly lost. These factors lead to findings that in some areas the equipment is not optimal. In the far south, it is now estimated that the rate of beneficiaries' computer equipment does not exceed 20%.



5.3 Lack of end-to-end digitalization in administrations

The Tunisian administration is at a preliminary stage in its transition to web 2.0 (an interactive web). The most important part concerning the development of e-services is at its premise. Most Tunisian administrations have a static website (for information only).



The majority of administrative institutions have maintained a strong paper culture focus." - Mashrou3i project Regional Expert.

The first phase of digitalization, that is to say, the transition from paper to digital for certain services and the disappearance of paper forms are not yet assimilated, even though a workflow approach (series of steps, tasks and procedures) would make it possible to boost these institutions.

There is little or no e-government in practice.



The number of new digital services announced was more than those provided in reality." - Mashrou3i project beneficiary.

While a large number of online services have been announced, many have failed or operated with difficulty. Procedures such as the online domain name, online click-to-pay services, and the online NER (although it has progressed very well), are not always functional from start to finish. There is always a part of the chain that is not digitialized and that calls into question all other efforts made. As a result, there is a great deal of time lost and uncertainty about a very short-term, efficient transition to e-government in Tunisia.

Attempts during COVID-19 to digitize some services in haste were a failure. After COVID-19, there is a strong and backward return of the dominant culture: that of paper. The customer experience has not been taken into account correctly. The failure of the first experiment in this field is a source of mistrust among users. For example, there were many difficulties in the digitalization of **services for tax revenue offices and formalities**. During the COVID-19 period an online declaration, online payment and online claim application were implemented. This app did not work properly.

Some entrepreneurs have been forced to pay penalties." - Mashrou3i project Regional Expert.

Unable to find a solution with the tax administration for penalties, problems and complaints, entrepreneurs no longer want to pay electronically and have returned to the culture of cash and office payments. Early adopters have withdrawn and it will be difficult to reverse this trend in the short term.

5.4 Difficulties in e-government are greater in interior regions than in coastal regions

Many entrepreneurs report difficulties in making progress in their administrative procedures, and in receiving administrative support that would save them time and productivity. For example, it has been reported to us that in some regions the administration is not clearly aware of the benefits of the Start-up Act. They often have a basic knowledge of digital and have a paper-oriented culture. In theory, digitalization should make it possible to homogenize approaches between the regions and Greater Tunis (central region). Unfortunately, in practice, in the interior regions, the necessary information and skills are still very often lacking. The repercussions are very important, especially in regions such as the far south. Here we have been told that some administrative staff do not accept digitalization; they do not think it is valid. Some refuse to process requests by email and still require faxing.

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Sometimes it requires travel of up to 130 km one way and 130 km back instead of receiving a document with a single click. This should no longer take place today." - Mashrou3i project Regional Expert.

It should be noted that in some regions there are no administrations such as the employment **office.** This leads to many trips between the place of residence and the relevant administrations.

In addition, payment in cash for government services remains an obligation that is perceived by many entrepreneurs as a waste of time. Similarly, the servers are low-capacity and the services are not at the same level.

Many applications are quickly overloaded and most servers are out of use and too often undersized. This constrains entrepreneurs. The very choice of applications and hardware is problematic in some cases. This shows a problem in managing the digitalization of certain public administrations and a lack of skills in public procurement.



5.5 The lack of an e-payment system is a major handicap for businesses

While private initiatives are progressing - due to advances in equipment and the use of digital technologies - there are structural barriers to the e-economy such as the absence of an effective online payment system.

The lack of an e-payment system is a real handicap, even if online payment exists in theory." - Mashrou3i project Expert.

Recently, efforts have been made by the state and start-ups to improve the current environment of the e-economy. Several start-ups in Tunisia have been created in this field to help the development of e-commerce and e-payment. A Start-up in Gabes is now looking to digitalize banking services. Others are tackling the problem of money transfer.

The potential of Fintech innovations and online payments is very important in Tunisia. CHowever, the lack of electronic and mobile payments (although initiatives are underway) hampers the use of technology and measures must be taken to enable their development and inclusion.

Due to a change in payment behavior as a result of the Covid-19 crisis, in 2020 the number of online payments increased by a record 67% (UNCTAD, 2022).¹⁸ The number of electronic payments increased from 1.5 million in 2015 to 6.4 million in 2020. The volume of electronic payments increases from 111.6 million TND in 2015 to 342.4 million TND in 2020 (99.3% domestic transactions; 0.7% international transactions) (UNCTAD, 2022). In 2020 the volume of electronic payments for goods was TND 12.9 million compared to TND 0.6 million in 2015, it was multiplied by 21. However, the volume of electronic payments for goods remains relatively low compared to other categories of electronic payments (tourism and transport, telecommunications, e-Gov)

5.6 A structural problem of digital mistrust

Tunisia faces a structural problem of digital mistrust. This mistrust is rooted in socio-cultural beliefs. For some, digital technology is an intrusion into family space, ideology and value systems. This leads them to limit its use or to question its relevance as a possible choice for the business world and entrepreneurship.

In addition, digital transactions are traceable and a small part of the activity is generally undeclared (entering the informal economy). This leads to a certain mistrust of the digital world that could reveal this hidden part.



There is always a lack of confidence in online payments." - Mashrou3i project beneficiary who launched a start-up in engineering consulting.

Most people prefer the traditional cash payment method. There is still a culture of mistrust towards online payments and credit card payments. Most transactions are informal and payments are made through informal channels.

In addition, there are many scams and the risk of loss of income is real. Entrepreneurs are therefore suspicious and prefer not to engage spontaneously in the digital economy. Restoring digital trust is essential for the digital transformation of businesses and entrepreneurship in Tunisia.

5.7 Brain drain and the limitation of local skills

In general, the issue of digital skills is still fully relevant for newly launched businesses in interior regions. The attractiveness of foreign labor markets remains strong and in some cases, entrepreneurs have ended up abandoning their projects and accepting job offers in Europe, the Gulf countries or North America. Despite the launch of projects and entrepreneurial dynamics, large wage differentials and the possibility of valuing one's skills in markets with digital skills shortages have led some beneficiaries to prefer the immigration option.

Two explanatory factors are associated with these initial decisions outside national borders. On the one hand, the digital world increases the possibilities of remote self-employment, which allows many young Tunisians to enter these markets in a remote mode, to validate their skills before entering the real markets and leaving the borders. On the other hand, there are nowadays difficulties in receiving remuneration for this type of distance work linked to the status of the self-employed and which lead young people to the decision to settle elsewhere. The development of specialized head-hunters in Tunisia is accelerating this type of recruitment.

On the other hand, structural wage differentials (measured in nominal rather than real terms) weigh on these decisions. Mobility is not perceived as irreversible and is perceived more in terms of circularity. For some entrepreneurs, experience abroad can only strengthen their business and will also allow them to develop networks and integrate into the global economy. This is especially true for e-services companies and for entrepreneurs with high qualifications.

Some local entrepreneurs are worried about the massive leakage of IT engineers who need to be kept to make the digital transition in Tunisia a success.

In 3 years we can completely transform the country! But there is no willingness to keep the people competent. All the engineers are gone, all my classmates are gone!" - Entrepreneur and Mashrou3i project beneficiary who launched a start-up specializing in digital applications for agriculture.

While the Mashrou3i project contributes, at its level, to the development and emergence of a local economy in the regions, digital technology can consolidate new local businesses, and even promote their expansion, by giving them access to new markets and opportunities for collaboration with the outside world. At the same time, this could also lead to an acceleration of skilled immigration if the opportunities offered by the digital world prove to be greater elsewhere and current constraints are not overcome. This aspect should be taken into account in future projects of the cooperation agencies.

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Conclusions and recommendations



The purpose of this report is to examine how digitalization of the economy in Tunisia has fostered the creation of new businesses and the development of existing enterprises in 14 priority governorates in Tunisia. For this, we have relied on the results of the Mashrou3i project set up by UNIDO in Tunisia in 2016 as a support for analysis. Even though the primary objective of the Mashrou3i project was not digitalization, it is clear that digital technologies were a determining factor for the success of the project. The use of digital technologies was ubiquitous in the activities of the project beneficiaries and in its implementation. Based on a mixed methodology: a qualitative study through interviews with 25 stakeholders involved in the project and a desk review of relevant publications, we were able to identify structural trends that need to be taken into account for new projects.

Six major lessons are highlighted in this conclusion.



First, our study clearly shows that digitalization can be a vehicle for accelerating the creation of businesses and the growth of existing enterprises in all sectors, offering them many opportunities. At the same time, start-ups in the digital sector are multiplying in Tunisia and this shows an important link between entrepreneurship and digitalization. This start-up movement is now affecting all Tunisian regions.



Secondly, e-coaching and e-learning have been accelerated and will be important trends in the near future. Online learning and coaching platforms were well received (especially during COVID-19). This trend will most certainly continue even in a post-COVID-19 mode. The option of organizing hybrid coaching and learning sessions seems to be the one that has the greatest preference for both beneficiaries and trainers.

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Thirdly, progress in e-government (and offline e-government) to provide reliable, accessible and diverse e-services will be key to fostering entrepreneurship and business in Tunisia. The results of the interviews show that the digitalization of administration is a high expectation and is of great importance to entrepreneurs and start-ups. It facilitates and increases the efficiency of business start-ups and operations. However, Tunisian companies and start-ups still face many challenges and limitations in operating online administrative tasks and dealing remotely with administrations via the Internet.



Fourth, electronic payment solutions are a key element in the development of e-commerce and the efficiency of future Tunisian businesses. The current situation shows that businesses in Tunisia are facing several challenges when it comes to online payments. As a result, e-commerce is still limited to online payments and payment on delivery is still the one that has the preference of consumers. Difficulties are then encountered with the delivery companies.



Fifth, innovation activities are new and important enough to guide new entrepreneurs on promising, viable and innovative business models. New companies and start-ups have the potential for innovative approaches and the creation of new business models. These innovations make it possible to optimize, in particular, the management of operations, and supply chains and improve products and services. Capitalization on these innovative approaches is a major element for future projects.



Sixth, positive communication about entrepreneurship amplified by social media is a powerful vehicle for spreading entrepreneurial culture. Young people are sensitive to sharing best practices of e-entrepreneurship. Social media is becoming a powerful tool in this regard and has an impact on entrepreneurs and future entrepreneurs. This breaks the isolation of people who embark on entrepreneurship and shows them the way forward.

Our study highlights the need to take into account eight recommendations, proposed below, to create a more favorable environment as well as improved assistance for Tunisian start-ups and companies.

The improvement of the digital infrastructure is a necessary condition for accelerating digitalization as a lever for the development of companies and start-ups. While Tunisia is making progress in digitalization, infrastructure still needs investments and improvements. Digital start-ups need a high-quality digital infrastructure to function normally and efficiently in the regions.

Accelerating the digitalization of public administration is vital in order to provide flexibility and save businesses time and resources. Currently, businesses in Tunisia face problems in accessing public administration. Strategies are needed to accelerate the digitalization of public services and to help businesses access online services. This will save money and time, as well as make them more productive and efficient.



The implementation of new forms of hybrid teaching combining face-to-face and online courses is strongly recommended by project beneficiaries. Hybrid forms of teaching are recommended with at least 20% to 35% in face-to-face mode. However, hybrid forms of teaching face challenges. This requires the mobilization of resources and equipment to deliver courses in both modes. It also requires a better understanding of the needs of beneficiaries and their profiles. A user-centric approach optimizes tools for people and helps manage expectations.

Electronic payment and m-payment systems should be strengthened as soon as possible to facilitate the payment process for entrepreneurs. Flexible electronic payment options and closer cooperation between businesses and authorities to address this structural problem would help to remove barriers to business and trade growth. Providing secure online payment options would be beneficial for both businesses and consumers. Particular attention to international online services is fundamental for the competitiveness of the regions. Mobile payments have proven to be effective in many African countries and should be considered and implemented in the Tunisian context.

The implementation of skills upgrading programs for entrepreneurship and digitalization is necessary for the spread of entrepreneurship via digital. New technologies require new skills and training to improve existing skills. The trades and skills needed to work are evolving. The lack of digital skills could hinder future economic development and limit the growth of start-ups. Therefore, the digitalization of entrepreneurship requires the build-up of new skills and programs to prepare entrepreneurs to embrace digital transformation.

Capitalize on the positive dynamics of entrepreneurship in the regions through media coverage and good examples. Entrepreneurship in some parts of Tunisia seems to be more developed than in others. Therefore, the sharing of best practices between regions should be done to foster entrepreneurial ideas and innovative activities. This can go through social networks or specific applications, as the Mashrou3i project has been initiated through regional groups on Facebook (Mashrou3i fi Jendouba, Mashrou3i fi Siliana etc.). The dynamics of contagion and imitation work perfectly in Tunisia. Demonstrating successes and good practices to young people and the unemployed enhances the attractiveness of initiatives and entrepreneurship in the choice of career options.

Make greater use of social media to promote the dissemination of entrepreneurial culture. To this end, Mashrou3i has designed and shared over the years more than 350 success stories (sharing experiences of beneficiaries' entrepreneurial successes). The Mashrou3i project Facebook page has more than 37,250 followers where these stories and economic opportunities are promoted and shared [14]. Entrepreneurs need to use social media and share their ideas and achievements, so this can be a motivation for others. At the same time, the use of social media for entrepreneurial purposes could lead to more innovative ideas due to online interaction. This interaction and the idea of setting up online entrepreneurship clubs, which are dynamic and assisted within the framework of the Mashrou3i/HP LIFE project, were strongly recommended by the project beneficiaries. Especially more clubs organized in a structured way beyond the simple exchange of information via social networks.

The results of this work need to be consolidated. This work was based on a limited panel for interviews, although supplemented by numerous references, additional data related to the Mashrou3i project and the latest available reports on this topic, and will require further development to reach a critical mass of responses. This will improve the significance of the results and refine the diagnosis obtained in this work.

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Appendix 1

Some leading deep tech start-ups in Tunisia

- Enova robotics: is a start-up specializing in the development of mobile robots and R&D projects in robotics. Enova Robotics combines unique expertise in mobile robotics, artificial intelligence and security. It gives Enova Robotics the advantage of offering sharp and very specific products that represent the future of this sector. <u>https://www.enovarobotics.eu/</u>
- Epilert: is a waterproof portable device that detects and monitors epileptic seizures using biometrics and machine learning (epilepsy monitoring unit). This is a bracelet connected to a mobile app via Bluetooth. Epilert contains a monitoring system that allows epileptic patients, their caregivers and doctors to monitor vital signs, daily lifestyle, medication intake and patient seizures through dedicated mobile apps. <u>https://epilert.io/</u>
- Fabskill: is a Tunisian start-up specializing in the digitization of the recruitment process that offers a complete online solution to facilitate and accelerate the processes of selection, monitoring, evaluation and hiring of talent. It is an online platform exploiting artificial intelligence for recruitment. <u>https://fabskill.com/login</u>
- InstaDeep: provides AI-based decision making systems for businesses. With expertise in both artificial intelligence research and real-world commercial deployments, it offers a competitive advantage to customers in a world where AI is first. <u>https://www.instadeep.com/</u>
- RoamSmart: is one of the leading providers of innovative roaming and big data solutions for mobile operators. It is a cloud-based software that allows mobile operators to manage their roaming services. It supports the digital transformation of their roaming and wholesale activities. <u>https://roam-smart.com/</u>
- Wattnow: is an IoT-based service that monitors the energy consumption of households and businesses through a small energy sensor box placed in the power grid of a home or business. It helps to identify anomalies and trends in terms of energy waste. The collected data is sent to users via the Wi-Fi network on the mobile application and the Wattnow platform. <u>https://www.wattnow.io/</u>

Appendix 2

Public policies, strategies and projects related to digitalization in Tunisia

- National Strategic Plan (PNS, in French) "Tunisie Digitale 2020": National Strategic Plan (PNS) "Tunisie Digitale 2020" has suffered from complex governance, due in particular to the lack of clarification of the roles and responsibilities of the various stakeholders and the absence of unifying leadership, which has led to a low rate of implementation of the projects that have been included.
- The national strategy "Smart Gov 2020": The national strategy "Smart Gov 2020" was adopted in 2016 with the support of the Ocde. Three digital government platforms for citizen participation are now implemented to facilitate citizens' access to administration and involve their users more in the process of developing digital and open government (e-people, e-participation, legislation.tn).
- The strategic plan of "Digital Tunisia 2025": Tunisia presented the plan of "Digital Tunisia 2025". It aims to bridge the digital divide, foster the digitalization of education, the transition to e-government, support entrepreneurship and innovation and the implementation of the national cybersecurity strategy and the strengthening of digital sovereignty.
- National Cybersecurity Strategy (2020-2025): Tunisia has begun the development of a national cybersecurity strategy (2020-2025), aimed at creating a defence system to protect its sensitive facilities, develop its digital economy and encourage investments in this direction. However, the country lacks a law dedicated to cybercrime despite the implementation of the National Cyber Security Strategy 2020-2025.
- 2018: Law on start-ups: "The Tunisian law on start-ups is remarkable not only for the important steps that the country is taking to build a thriving entrepreneurial ecosystem, but also because it is the first time in the Arab region that start-ups succeed in lobbying policymakers to amend laws that affect them. Let us hope that we will see similar success in other countries of the region." (K. KTEILY - World Economic Forum, 2018).
- July 2020: Adoption of the law on crowdfunding: The law on crowdfunding was adopted by the House of People's Representatives in July 2020. The new law paves the way for new forms of financing that were previously unavailable. Entrepreneurs, civil society actors and individuals will be able to raise funds from the public through online platforms. The law on crowdfunding complements a series of new laws aimed at improving the business environment in Tunisia: the law on social and solidarity-based entrepreneurship, the decree-law on self-employment and the Start-up Act.

- In 2022 a new digital transformation strategy: In 2022 a new digital transformation strategy is developed and proposed. It is structured around six strategic axes. Develop digital and financial inclusion to facilitate access to broadband and financial services through digital and develop online services.
- November 2020: Adoption of the electronic signature: On 18 November 2020, Tunisia adopted the electronic signature of the acts. Tunisia Internet has just launched a new application allowing the electronic signature of administrative documents, which will be officially adopted by the administration. The electronic signature operation is all the more free, easy and achievable in just a few minutes, adds the same source.
- The National Cloud Project Roadmap: The National Cloud Project Roadmap was adopted in 2019. This project aimed to ensure the digitalization of the Tunisian administration. In this context, a study by the Ministry of Communication Technologies and Digital Transformation was carried out over two years to demonstrate that the idea does not consist in building a Data Centre; it is to open up to the private sector that already has it. Among the difficulties encountered is the energy consumption of data centres, which contributes significantly to the rise in cloud services costs.
- The project of the unique identifier of the citizen: The project of the unique identifier of the citizen was mentioned for the first time in 2014 but was not formalized until 2020 by decree-law. It consists of eleven digits: a reserve digit, two check digits and eight random digits. This combination is attributed to each Tunisian citizen at birth on Tunisian soil or outside the national territory as soon as they are registered in the civil registry and to any person who obtains Tunisian nationality. Decree No. 2020-312 of 15 May 2020 established the content and technical specifications of the citizen's unique identifier and the rules governing the maintenance and management of its Registry. Thus, in its article 11, it listed the data to be kept in the register. This identifier should not collect any data (the collected data will be recorded in its register).

Appendix 3

Examples of major international cooperation projects in the field of digitalization in Tunisia

"TOWARDS AN INDUSTRY 4.0 IN TUNISIA"

(GIZ / Ministry of Industry, Energy and Mines)

The Ministry of Energy and Mines Industry in Tunisia and GIZ, mandated by the Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ), have been working since November 2018 on a roadmap to implement an initiative to transition Tunisian industry to Industry 4.0. Entitled "Towards an Industry 4.0 in Tunisia".

"INDUSTRY 4.0"

(UNIDO)

The project currently being launched "Industry 4.0" promotes youth employment in Tunisia and Côte d 'Ivoire. It is funded by the Federal Ministry of Economic Cooperation and Development (BMZ), and implemented by UNIDO since April 2022 in Tunisia.

"INNOV'I"

(European Union / Expertise France)

The Innov'i project, a program launched in 2019, supports the digital transformation, supporting the implementation of the Start-up Act. This project, funded by the European Union to the tune of €14.5 million and implemented by Expertise France, aims to support the strengthening, structuring and sustainability of the innovation and entrepreneurship ecosystem in Tunisia

"INVEST FOR JOBS"

(GIZ)

Since 2019, GIZ has been designing a Digital Transformation Centre in Tunisia on behalf of the Special Initiative for Training and Employment - "Invest for Jobs" of the Federal Ministry of Economic Cooperation and Development (BMZ). The Center has two main pillars: The "Digital4Jobs" project focuses on supporting start-ups, industry 4.0 and the digitization of key sectors, in particular digital finance, e-commerce and healthcare. The second pillar of the program, the "Digital4Reforms" project, is working on the themes of GovTech, digital infrastructure and cybersecurity.





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