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D 2.2  
Strategic Education Agenda



Erasmus + KA2 Cooperation for innovation and the exchange of good practices **Capacity Building in the field of Higher Education**

Proposals 2019 - EAC/A03/2018

Project Grant Agreement N. **586221**

Project acronym: **NePRev**

Full title: **Setting up a multidisciplinary joint master degree dedicated to the Next Production Revolution**

## STRATEGIC EDUCATION AGENDA

<p>WP/Task/Deliverable: WP2/D2.2</p> <p>Planned Date: <b>15/02/2020</b></p> <p>Due Date: <b>22/06/2020</b></p> <p>Nr. pages: <b>13</b></p> <p>Dissemination Level: <b>International</b></p>	<p>Partner responsible: <b>ISGIS</b></p> <p>Person Responsible: <b>Hamdi Kessentini</b></p> <p>Author: <b>Hamdi Kessentini</b></p> <p>Document version: <b>1</b></p> <p>Reviewed/supervised by: <b>POLITO, POLIMI, CS, OBREAL, ENIT, ISGIS, FSJEGJ, ENIGA</b></p>
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### History of revisions

Rev N	Description	Author	Review	Date
0	Draft	ISGIS	Draft creation	15/06/2020
1	Draft	PoliTO	Review	19/06/2020
2	Draft	ISGIS	Review	22/06/2020

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## Executive summary

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This report deals with the Strategic Education Agenda. The agenda sets the background, perspectives and an action plan for capacity building in NPR for Tunisia and for the Master in NPR.

In the deliverable D2.2 we present the key points that were raised during the meeting from stakeholders at the strategic forum that can help to design the multidisciplinary joint master degree dedicated to the Next Production Revolution. All the feedback collected in this report were useful to design the Master in NPR as foreseen by the NePRev project. Moreover, stakeholders gathered during the event will be contacted to contribute and comment once the Master will be designed and will be involved for students' traineeship and final thesis.

## Introduction

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The spread of new technologies has brought about organizational changes that are behind the digital industrial revolution. This revolution is manifested by: the appearance of “network” companies, the empowerment of work, the improvement of processes, changes in consumer behavior, the appearance of new services and products, the driving role of financial markets and the appearance of new modes of funding (innovation capital, crowdfunding, etc.), the transformation of knowledge management and the development of the collaborative economy and the knowledge economy.



This transformation is not only technological, it concerns equipment, uses, organization and culture, and requires companies to adapt and anticipate.

The most mature companies in terms of digital transformation are the most efficient, knowing their customers (thanks to their strategies geared towards the end consumer) allows them to offer more suitable goods and services and thus develop their turnover. Likewise, the improvement in their production process and organization has led to a gain in productivity which translates into lower or controlled costs. They record a growth of their turnover 6 times higher than those with less maturity.

In the era of the Fourth Industrial Revolution, Tunisia is faced with the imperative of:

- Reduce the differences in the competitiveness of its industrial sector in the face of increased international competition,
- Project itself as a technological destination with its own productive knowledge,

Public authorities and economic actors have focused their concerns on:

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- The support of investment towards the modernization of the productive system and innovation;
- The structuring of collaborative and decompartmentalized ecosystems, the anticipation of future technologies and the skills transfer.

## Key points of the Workshop meeting

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The International Forum for Next Production Revolution in its first edition has been organized at Institut Supérieur de Gestion Industrielle de Sfax ISGIS on 19th of February 2020. Industrials and academics from all Tunisia have participated to this forum. The forum was organized in two sessions: the first session is a plenary session and the second is a round table. The forum agenda is presented in the figure below:



# International Forum For Next Production Revolution

## FORUM PROGRAM

9h00	Registration	
9h30	<b>SESSION 1 : PLENARY SESSIONS</b> <ul style="list-style-type: none"> <li>● <b>Opening</b> Ahmed FRIKHA: ISGIS Director Abdelwaheb MOKNI: Sfax University President</li> <li>● <b>Presentation of ISGIS - 4C - PAQ</b> Hamdi KESSENTINI: 4C ISGIS Director</li> <li>● <b>Advanced Equipments For Industry 4.0</b> Firas ATALLAH: Festo Tunisia</li> <li>● <b>Integration of Industry 4.0</b> Mahdi KAMMOUN: SAMM Test and Automation</li> <li>● <b>Project Presentation ERASMUS + NePRev</b> Pierluigi LEONE: Politecnico di Torino</li> </ul>	11h45
		<b>SESSION 2 : ROUND TABLE</b> <p><b>The role of universities and industrials to promote the transition toward the next Production Revolution in Tunisia</b></p> <ul style="list-style-type: none"> <li>● <b>Chiheb BOUDEN</b> Professor at ENIT and ex Minister of Higher Education</li> <li>● <b>Ahmed BEN MESSAOUD</b> Union of small and medium industries organization</li> <li>● <b>Mohamed BELHAJ</b> Director of Student center for innovation, transfer and entrepreneurship, sfax University</li> <li>● <b>Gwenaëlle GUILLERME</b> Secretary, T.I.M.E. Association</li> <li>● <b>Mahdi BEN HAMMOUDA</b> Technical Manager and Co-founder GPC</li> <li>● <b>Mohamed MEDHAFFAR</b> Tunisia Africa Business Council Sfax</li> </ul>
11h00	● Coffe Break + Guided visit to ISGIS	14h00
		14h30
		● Closure ● Lunch



Ahmed Frikha (director of ISGIS) and Sami Hammemi (Vice director of Sfax university) started the forum by welcoming all the participants including industrials, academics and students from all Tunisia and the partners of the NePRev Project. They also gave a brief presentation of ISGIS and Sfax university.



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Firas Atallah (Engineer at Festo Tunisia) made a presentation on the most advanced equipments for Industry 4.0. He said that Festo is playing a major role in shaping the Industry 4.0 trend. **Industry 4.0** and the **Internet of Things (IoT)** impresses original equipment manufacturers and end users alike. Production and the digital world are coming together, making factory automation more flexible, increasing **energy efficiency**, linking **logistics** processes more closely, optimising the **value chain** – and all this is happening in process automation too. The Internet of Things (IoT), smart factories, **cyber-physical systems** and **big data** are driving the project of the future - solutions must be ever faster, more diverse, more flexible and more intelligent. Calls for greater availability, energy efficiency and just-in-time production are on the increase.



Mehdi Kammoun (Site Director of SAMM Test & Automation) explained how to integrate the solutions of industry 4.0 to industrial companies. He said that system integration in the connected industry 4.0 comes with its challenges. Companies need to keep up to speed and get creative with technology. **Keeping existing systems up to date and working properly is one of the main challenges of Tunisian industry.** Another challenge is getting access to **latent data**, either by using existing technologies or





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upgrading systems. Finally, ensuring the **system security** from cyber threats and attacks is a new challenge fit for Industry 4.0.



Hamdi Kessentini (Professor and director of the career center at ISGIS) presented the ISGIS and the activities of the career center of the institute including its project PAQ (Projet d'Appui à la Qualité). He said that Industry 4.0 is a challenge and a real opportunity for the Tunisian industry. The university can be a vector of the development of Industry 4.0, by participating in the development of **new skills** and adaptation to the changing needs of the Tunisian labor market. He added that the university needs a capacity building in the area of the new industrial revolution. It needs to develop new programs and introduce courses adapted to the local environment and new industrial trends, to implement modern and **innovative pedagogy**, to build **Industry 4.0-oriented laboratory equipment** available for students



Pierluigi Leone (professor at Politecnico di Torino) presented the Erasmus+ NePRev project whose aim is to create a new master in the field of engineering with an innovative program that is encompassing three different focal areas, namely "Industry 4.0", "Renewable Energy" and "Management of Innovation & Entrepreneurship". This





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new master's program will help train new skills in the field of engineering, which is a national priority for Tunisia. He also explained that the NePRev projects also aims to develop a closer connection between universities and industries and enforce the role of Tunisian universities to promote the transition toward the Next Production Revolution and adapting to the evolving needs of the labour market in Tunisia.



Chiheb Bouden (Professor ENIT & ex Minister of Higher Education) said that the developments of the job market call for accelerating the modernization of the Tunisian university system. The courses and diplomas issued by universities will take on real value if they manage to develop a professional placement of international standard. In this regard, the challenge is that higher education in Tunisia must follow the current industrial revolution from the point of view of **industry 4.0**, **renewable energy**, **innovation** and **entrepreneurship**. From another hand, higher education must be more efficient in transmitting the fundamental, theoretical or technical, and allow Tunisian companies to be able to quickly adapt a graduate to their new job.





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Ahmed Ben Messaoud (President of the Union of Small and Medium Industries, UPMI) said that Tunisia is one of the African countries that understood that **digital transformation** and the next industrial revolution offer the country tremendous opportunities to take a leap into the future. In this regard, the major obstacles for Tunisian industrials to successfully transition to Industry 4.0 is the economic crisis that most of industrials suffer from. The most promising sectors of the Tunisian economy that can benefit from the NPR are: **automotive industry** and **pharmaceutical industry**.



Mohamed Belhaj (director of student center for innovation, transfer and entrepreneurship at Sfax university) said that the **Management of innovation and entrepreneurship** section provides students with the skills necessary to create innovative solutions in terms of processes or products to facilitate the transition to the industrial revolution. It will also help solve the unemployment problem. According to the Global Entrepreneurship Index 2018, which measures the health of entrepreneurship ecosystems in each of the 137 countries studied, Tunisia was ranked 1st in Africa. This positive attitude of the country towards entrepreneurship could enhance the country to the 4th industrial revolution.



Mahdi Ben Hmouda (Director of Green Power Company) said that the Tunisian Action Plan for Renewable Energies 2030 aims to produce 30% of Tunisian electricity from



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renewable energy sources in 2030. **Renewable energies** play a key role for the future of Tunisia and they may contribute to make the industrial system more competitive (**affordable cost, reliability**, etc.). The integration of a significant part of renewable energies requires a significant commitment from Tunisian industrials with the preparation of the necessary skills.



Mohamed Medhaffar (Tunisia Africa Business Council, TABC Sfax) said that according to a report published in Brookings magazine in September 2018, Africa is expected to be "the next big industrial center in the world", potentially hosting almost 100 million labor-intensive jobs that will leave China by 2030. There is many opportunities, issues and challenges of Industry 4.0 for Africa. According to Mr Bassem Loukil, president of the Tunisia-Africa Business Council, Tunisia has managed to position itself among the most attractive countries for African students and interns, the number of which should reach 20,000 students in 2020 (Tunis Webdo 24 February 2018 ). Taking into account the real development needs of African countries, a master's degree such as the one we intend to create through NePRev project can succeed in **attracting African students**.





## Issues

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The Issues of Tunisia facing the next production revolution may be summarized as:

- Transformation of the practices of society as a whole, and in particular those of the manufacturing sector associated with management methods, labor and business models.
- Meeting the requirements of the era of product customization, while maintaining equivalent costs, regardless of the volume requested (often low for personalized products).
- The consumer wants a unique product, which does not resemble that of the neighbor or his competitor.
- Optimization of resources and production "on demand".
- Successfully connecting the customer's need to the production unit. This connection cannot be made without the recent contribution of new technologies.

## Opportunities

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The opportunities:

- Companies launching Industry 4.0 choose to join forces to grow faster, find new sources of value creation, pool skills and means of innovation, multiply opportunities and conquer new markets.
- The intensification of the integration and automation of production processes (vertical) with those of the value creation chain (horizontal), the intelligent interconnection of objects and systems can only lead to a substantial increase the efficiency of a business.

## Challenge for Tunisia



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For Tunisia, the challenge is twofold, it is firstly a question of catching up with the delay in industrialization and secondly of making these technologies a source of innovation and competitiveness in the future.

## Other recommendations

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In this section, some recommendations from some important actors of the Tunisian industry are presented

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- Importance of **raising awareness** in the public and private sectors to better prepare for the new technological revolution in order to remain competitive. Kais Mejri, General Director of Innovation at the Ministry of Industry
- The need to develop a strategy with a view of **networking all administrations and structures**, mastering computer security and encouraging businesses to acquire digital applications, emphasizing the need to create a network of industry 4.0 . General Director of the Agency for the Promotion of Industry and Innovation (APII), Amor Bouzouada
- The Tunisian industry has reached an honorable level, on the African scale, ahead of Morocco and South Africa, which has earned the position as the 2nd country exporting industrial products to Europe. Hichem Elloumi, Vice-Président UTICA
- Poulina Group Holding (PGH), SKF Tunisia & Leoni Tunisia are 3 Tunisian success stories that have stood out for their contribution to industrial development, especially Industry 4.0 in Tunisia. These companies see that industrial transformation 4.0 brings difficulties and challenges in the training of more qualified employees who are able to meet the requirements of new technological applications. A **renewal in the training of the workforce** in general and **vocational education** in the **mechanical industry** is necessary.