

THE SMART MANAGEMENT AND INDUSTRY 4.0, PROVIDERS OF POTENTIAL SOLUTIONS FOR IMPROVING THE IMPLEMENTATION OF THE OPERATIONAL PROGRAMME HUMAN CAPITAL

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Abstract

Regional Intermediate Body for Sectoral Operational Programme Human Resources Development Bucharest-Ilfov Region implements the 40Ready Interreg Europe project, “Strengthening SME capacity to engage in Industry 4.0”. Within this project, a research tool, a survey (“Industrial revolution 4.0 coming to our lives”), was developed and applied, designed to provide relevant information in the field of Industry 4.0 and also to provide thematic solutions (a new criterion to support SME digital competences through the Operational Programme Human Capital 2014-2020; a new evaluation criterion for the call “Digital competencies for SMEs’ employees”, designed to support the Managing Authority for OPHC in evaluation and, at the same time, to help SMEs acknowledge the main I4.0 domains to focus on their digitalisation path in general and specifically for developing employees’ digital competencies).

This paper, the result of an exploratory research, aims to present the relevant characteristics, trends and potential solutions for improving the

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implementation of the Operational Programme Human Capital 2014-2020, a topic that generated the need to start and, implicitly, to operationalize such a study.

Therefore, in the configuration of the research process, there were no strict rules.

Keywords: *industry 4.0; smart management; European projects; digital competences; human factor; Operational Programme Human Capital 2014-2020.*

JEL Classification: I25; I28; D22; D24; D25; D61; E24; G18; M15; O14; O15; O3

Introduction

The concepts of digitalization and Industry 4.0 are becoming a reality. Automation, artificial intelligence, the Internet of Things (IoT), other advanced technologies quickly capture and analyse a multitude of data that provide many types of information.

The current challenge is to change the way of thinking, training, working of economic agents, managing to create added value by digital technologies.

Romania has the necessary advantages (internet speed, IT sector development, state-of-the-art technology already present in large production facilities, specialized workforce) to make a leap towards *digitalization* and *Industry 4.0*.

The Fourth Industrial Revolution, known as *Industry 4.0 (I4.0)*, is fast becoming our new reality, the new *modus vivendi*, meant to revolutionize and transform the economies, jobs, mentalities, strategies and ways of action of the human capital. To materialize this goal, technologies, especially digital ones, combine elements and processes specific to data analysis, artificial intelligence, cognitive technologies and the Internet of Things (IoT). The main objective, assumed by *Industry 4.0*, is to create digital enterprises, which are interconnected and perfectly able to make informed decisions, to perform in a competitive environment, where the place and central role belongs to human resources. This new revolution interconnects and harmonizes smart technologies that go beyond organizations and end up interfering with our daily lives.

In essence, this is also the purpose of the *40Ready partnership* - to achieve, through collaboration, at interregional level, its main objective, namely, the

preparation of SMEs, at all levels - entrepreneurs, managers and staff - to adapt and make facing the challenges of the *Industrial Revolution 4.0*, in close connection with activities dedicated to public policy instruments, that support SMEs in their technological, organisational and cultural transformation.

The project is a collaboration bridge, a platform for experience exchange and joint learning between 8 partners from 7 countries. These countries are: Italy, Belgium, Finland, Poland, Spain, Lithuania and, last but not least, Romania. Our country is represented in the project by the Regional Intermediate Body for Sectoral Operational Programme for Human Resources Development Bucharest-Ilfov Region.

Also, Project 4.0 partners and stakeholders work together to understand the needs of SMEs in the digital skills development process, on the one hand, and how decision-makers can act, with public policy instruments, to address these needs, on the other hand.

Furthermore, according to Romanian Digital Authority latest analysis "*Romanian Digital barriers for public and private sectors*", the private sector's digital barriers (SMEs included) are mainly those related to human capital: work force' low digital competencies; absent management digital competences for SMEs owners; limited number of IT specialists for SMEs needs; lack of finances for adopting advanced digital technologies accompanied by support and consultancy.

Romania is at the bottom line of European ranking related to the number of SMEs planning/having a strategy for digitalising activity (for both basic/advanced technologies); Romanian SMEs are willing to engage in digitalisation, but making very few steps towards it; a significant part of Romanian SMEs don't have a solid analysis regarding their needs for digitalisation; SME's Romanian sector is positioned in a preliminary stage of the digital transformation; digitalisation and its key role in transforming SME's activity and management is very low understood by SMEs; the great majority of SMEs have a very low desire for digital transformation, or they are not informed/inconclusive informed.

The OPHC 3.12 call (*Digital competencies for SMEs' employees*) was launched giving total freedom to applicants to prepare a development plan for improving SMEs employees' digital competencies, on the following 3 categories: basic digital abilities, work related digital abilities and TIC specialisation digital competencies; also, the European e-Competence framework (e-CF) is mentioned.

The missing element here are: a homogenous approach, at national level, on how to assess employees' digital competencies and to create an objective development plan.

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The survey “*Industrial revolution 4.0 coming to our lives*” was developed and applied to provide relevant information in the field of Industry 4.0 and also to provide thematic solutions: a new criterion to support SME digital competences through the Operational Programme Human Capital 2014-2020; a new evaluation criterion for the call “*Digital competencies for SMEs’ employees*”, designed to support the Managing Authority for OPHC in evaluation and, at the same time, to help SMEs acknowledge the main I4.0 domains to focus on their digitalisation path in general and specifically for developing employees’ digital competencies.

To this end, the partners have developed an action plan in the project, with proposals on how public policies and, implicitly, European funds can better support SMEs in preparing I4.0.

Regarding the possibilities for improving public policies, identified in the thematic research, operationalized within the project, it should be remembered that they vary, from project funding for I4.0 skills development and digital maturation, to management approaches that create synergy between policy instruments, strategies that integrate both I4.0 and skills development for SMEs.

Added value, brought by this project, consists in the fact that its partners are managing authorities or implementing bodies of the selected policies, actors who have the power and want to make real changes.

In this way, the regions involved in this project will become, first of all, better prepared to implement successful, sustainable and profitable projects in I4.0. They, in turn, will support regional SMEs to become more competitive, maintaining and creating better jobs. Secondly, depending on the intervention needs of SMEs, potential sources of funding will be identified and presented. For example, substantial financial support to strengthen the professional capacity of human capital in SMEs can be provided by the European Social Fund (ESF). European Funding for Regional Development (ERDF) can be of real use in supporting technological and organisational development. Moreover, the improvement of these policies could guarantee the development of SMEs, both for the people working in them and for the technological support of digitalisation and industrial automation.

1. Potential solutions for improving the implementation of the Operational Programme Human Capital 2014-2020

According to the *Small Business Act Factsheet 2019 for Romania*, a report by the European Commission, SMEs represent 99.7% of companies in the economy

and employ 66% of employees. That is why it is essential that the digitalisation of these companies be guided, supported, coordinated.

Also, the analysis of the labour market in Romania, from the perspective of changes in the occupational structure, has revealed 3 major categories of occupations: the dominant ones, those that have significantly changed their content and the emerging ones. Regardless of their typology, most occupations have changed in the content of work, the main generating factors being the adaptation to customer needs, increased competition, and technological refurbishment.

Moreover, the development and expansion of the private sector and the requirement to stabilize certain market segments have led to the development of beneficiary/customer-oriented policies at the level of companies and, therefore, increasing the role of factors such as adapting to customer needs and increasing competition in the field.

Besides, according to *the DESI 2020 report*, Romania continues to have the lowest level of use of internet services among EU Member States, which corresponds to the lowest level of basic digital skills in the whole country (see previous chapter). 18% of people aged 16 to 74 years old have never used the internet (EU average: 9%). Only 3% of Romanian internet users sell products online and only 4% attend online courses.

Technological progress in the digital field has a special influence on existing occupations on the labour market. In this context, the need for permanent qualification among employees has become a constant variable in the business environment, companies being forced to ensure a continuous training process, especially regarding the digital skills.

The same report shows that, although there has been a slight increase in the percentage of ITC specialists in the previous year, they represent a much lower proportion of the workforce than in the EU (2.2% compared to an average of 3.9% EU).

The ITC specialists represent 1.2% of all employed women. On the other hand, Romania has good results in terms of ITC graduates, ranking 5th among the Member States, with 5.6% of all graduates.

The action identified and proposed, as a result of conducting the survey, refers to the Operational Programme Human Capital 2014 – 2020, Main Axis 3 - *Jobs for all*. Within Axis 3, the focus is *Specific Objective 3.12: Increasing employees' level of knowledge/competencies/abilities related to economic sectors/domains listed by National Strategy for Competitiveness and National Strategy for Research, Development, and Innovation*.

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The action improves the way in which thematic calls are organised and the way that projects are selected. It is based around inclusion of a new evaluation criterion for the call “*Digital competencies for SMEs’ employees*”. The new criterion is designed to support the OPHC Managing Authority in evaluation and, at the same time, to help SMEs acknowledge the main I4.0 domains to focus on their digitalisation path in general and specifically for developing employees’ digital competencies.

The *Applicant’s Guide for this specific call* includes *Annex 3 - Evaluation Criteria and Technical and Financial Selection*. Within this Applicants Guide, a new evaluation criterion is inserted under category 2 – *Effectiveness*, related to digital competences for SMEs. More, precisely the following text is included: “*The project has added value in the sub-category: Training/assessment and certification of digital skills is provided in the following technological areas specific to Industry 4.0: social media; mobile services; Cloud technologies; the internet of things; cyber security solutions; automated robots and machines; large data and data analysis; 3D printing; artificial intelligence; Bitcoin; Blockchain etc.*”

Also in the guide, *Chapter 1. Information on the call for projects, subchapter A1. General context*, the following text was approved by OPHC Management Authority and included: “*According to the study carried out within the "40Ready" project funded by the Interreg Europe program, a major interest of the respondents for the I40 field and for the development of digital skills was confirmed. Following this analysis, it turned out that most of the responding SMEs have little-moderate knowledge in the digital field (71%), are prepared to a small-moderate extent for the changes brought by the Industrial Revolution 4.0 (55%) and have initiated actions change, to a moderate extent. (60%). The overwhelming majority of respondents appreciated the Industrial Revolution 4.0 as an opportunity. The most important conclusion of the study is that, soon, SMEs need access to European funds as the main source of confidence on which to base their efforts to adapt to the Industrial Revolution 4.0.*”

Conclusion

The survey “*Industrial revolution 4.0 coming to our lives*”, carried out at the start of the *40Ready* Project, confirmed a major interest of respondents for I40 domain and for digital competencies development.

According to this analysis, most of the SME respondents have little-moderate digital knowledge (71%), are little-moderate prepared for 4.0 Revolution’s challenges (71%) and have started changing actions at a moderate level (60%).

The great majority of respondents evaluate *Industrial revolution 4.0 as an opportunity*.

The most important conclusion of the study is: *in near future, SMEs need EU funds attraction as main countable source in their adapting effort to Industry 4.0.*

Moreover, the report showed:

- that digitalization brings opportunities for all types of companies, including SMEs, but ensuring SMEs access to digitalization must be supported, coordinated and monitored;
- the current challenge is to change the way SMEs think, train and work to create added value by digital technologies.
- Romania has many advantages such as high internet speed, development of the ITC sector, state-of-the-art technology already present in large production facilities, as well as specialized labour force to benefit from *digitalisation* and *Industry 4.0*.
- the main areas for improving public policies regarding the digitalisation of SMEs are awareness of the need for SMEs digitalisation; appropriate technical solutions for SMEs digitalisation; increasing digital skills at all levels relevant for SMEs digitalisation; adequacy of digital solutions chosen by SMEs to market requirements.

The action identified and proposed, as a result of conducting the survey, improves the way in which thematic calls are organised and the way that projects are selected. It is based around inclusion of a new evaluation criterion for the call “*Digital competencies for SMEs’ employees*”. The new criterion is designed to support the OPHC Managing Authority in evaluation and, at the same time, to help SMEs acknowledge the main I4.0 domains to focus on their digitalisation path in general and specifically for developing employees’ digital competencies.

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