Digital Literacy as a Factor in the Digitalization of the European Union's Business Sector

A Research Proposal Presented to

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406

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Table of contents

Abstract

Digitalization of entrepreneurship has become heavily reliant on the unevenly distributed employees' ICT competences, which are rarely given sufficient attention in academic literature. This research aims to corroborate a positive statistical correlation that exists between the digital literacy of people working in the European business sector and the overall digitalization level of entrepreneurship in the Member States. The data sample used in the paper covers country-specific digital economy variables that describe the European Union's digital economy. This study will employ the principal component analysis with a subsequent correlational analysis and clustering to identify if there is a connection between digital competences and skills of people and the implementation of technological advances in the EU's business sector. The study is expected to provide the research community and policymakers with more details concerning the intercountry differences in the process of digitalization.

Keywords: digitalization, European Union, entrepreneurship, ICT skills, digital economy, digital literacy

Introduction

Over the past decades, the diffusion of digital technologies has transformed into a widespread phenomenon altering the traditional ways of doing business all over the world. The digital transformation of business has become highly dependent on the overall digital inclusion of people, which is not evenly distributed across the globe (OECD, 2020).

The scholarly discussion on the role of digital literacy in the technological transformation of companies is more relevant today than ever. Digital literacy has been described as an umbrella term covering information, media, and ICT skills of individuals (Warschauer & Matuchniak, 2010). Although the original understanding of digital literacy was quite broad and insufficiently connected to digital advances (Bowden, 2008), the contemporary research community increasingly links human competences with the progress in business digitalization.

Some recent studies produce evidence of a correlation between the performance of businesses that use advanced technological tools and the digital skills demonstrated by the employees (OECD, 2020). Many scholars have pointed out that insufficient digital literacy among staff is one of the limitations to the technological improvement of small enterprises (Dubrova & Esenin, 2020). Also, governmental bodies and their analysis divisions have contributed greatly to the understanding of the topic. For example, digital skills indicators have been largely employed by the European Commission to prepare an index of overall digital transformation of Europe (European Commission, 2020), which is just one of the many indexes that describe the current state of affairs in the field (Dmitrieva, Zhulin, Artamonov, & Titov, 2021). However, it remains largely unclear if digital literacy is the main decisive factor in the technological transformation of businesses or it is of lesser importance compared to other drivers of digitalization of enterprises. Therefore, it seems worthwhile to extend previous research on

evaluating the significance of this factor by comparing it to other determinants of the digital transformation of business using the example of the EU.

The purpose of the current study is twofold: (a) to explore to what extent digital literacy in business contributes to the technological transformation of European firms, and (b) to categorize countries of the European Union based on the proficiency of digital skills employed in entrepreneurial activities. We put forward the following hypothesis: high digital literacy skills and the digitalization level of the private sector of economy have a strong correlation. To realize the objectives and to test the hypothesis, the current study will use multiple sources, including quantitative data. The principal component analysis with subsequent clustering will be used to explore the impact of digital literacy on the enterprises of different European states.

The study may provide a more nuanced picture of how the digital literacy of populations participating in business alters the pace of digitalization across Europe. Our findings could also be of use to organizations involved in the implementation of projects promoting digital transformation in individual European countries.

Literature Review

As digital technologies spread around the globe and become integrated into the operational processes of multiple companies, research on ICT usage in enterprises starts to grow at a rapid rate. Innovative business infrastructure and cutting-edge technologies represent a primary emphasis in the scholarly discussion of the role of digitalization on the economy. Despite this, entrepreneurial activity relies heavily on employees' skills and knowledge in the field of information and communications technology. Thus, it is essential to concentrate on both the means of digital transformation in the business sphere and digital literacy itself.

The unfolding process of the world economy's digitalization has significantly expanded the use of the term "literacy". This has made it possible to apply it in the context of the digital capabilities of economic agents. The shift in understanding this concept provoked by the recent technological developments has made it imperative to define and explain what digital literacy is. A lot of studies have delved into the question of how digital literacy can be defined. For example, a study by Bowden (2008) gives the detailed overview of various approaches to understanding digital literacy that were common in the early days of digitalization. Most of those defined digital literacy as the human capacity to gather and process information, which made the concept rather broad and poorly linked to technology itself. Similarly, Lankshear and Knobel (2008) discuss the plurality of definitions of digital literacy placing a particular emphasis on its ability to quickly switch from one technological procedure to another and to deliver the results of processing the information in the most comprehensible way.

However, more recent studies have offered a different perspective on digital literacy stating that within an organization it goes beyond just human skills and knowledge. In their work, Ranatunga, Priyanath, and Megama (2020) extend the notion of digital literacy in entrepreneurship to include four elements: digital infrastructure, application of digital technologies, regulation, and digital skills. Such a definition provides a clear picture of the dimensions of digital literacy, which can be identified in the current business practice. Therefore, it would be more applicable to base all the future research on the contemporary understanding of digital literacy.

Moreover, the interconnectedness of ICT skills and business performance has not escaped the attention of the modern scientific community as well. Specifically, Schuchmann and Seufert (2016) state that innovative competencies, which can be defined as an essential part of the digital

literacy, are the precondition for the existence of an organization in times of major digital transformation. In the same way, Wang, Kung, and Byrd (2016) point out that digital learning of employees, in particular big data learning, is crucial for the competitiveness of the whole organization. The main conclusion that can be drawn from these studies is that the concept of digital literacy has undergone a major change within a few decades from being predominantly viewed as some particular competences to being regarded as an integral and multidimensional concept underlying the process of conducting business.

Another strand of literature focuses on measuring digital literacy and the effectiveness of its promotion among the general population and individuals who participate in innovative enterpreneural activities. To start with, according to Rassadnev, Osipenko, and Lubyankov (2021), digital literacy can be measured in terms of several key characteristics, which include the volume of digital consumption, the skills of efficient usage of the ICT-technologies, and the basics of digital security. These aspects overlap with the dimensions of digital literacy suggested by Ranatunga, Priyanath, and Megama (2020) and discussed earlier. Such a convergence of views put in the context of measurement gives researchers a basis for the quantitative assessment of digital literacy with the use of its selected elements. This way, it seems feasible to compound an integral indicator of digital literacy for any economy. To illustrate this, digital literacy measurement can be carried out on the national level via the calculation of high-profile international indexes of digitalization, such as ICT Development Index, e-Government Development Index, Digital Economy and Society Index, etc. (Artamonov, Dmitrieva, Titov, & Zhulin, 2021). Each of these indexes has as the key component employees' digital competences, incorporating relevant indicators in the estimates.

The research conducted by Sukhomlin, Zubareva, and Yakushin (2017) offers a different approach and suggests a model of digital skills allowing scholars and managers of companies to effectively evaluate an employee's capabilities within a certain digital specialization. Using this framework, it is possible to conduct an analysis on the microeconomic level.

Although measuring digital literacy seems to be a promising avenue for ~~the~~ further research, there have been few studies to date whose main focus would be the role of ICT skills in the process of digital transformation of business on the macroeconomic level. The current study aims to address this gap by proposing a framework for evaluating a country's entrepreneurial digital literacy potential for the states of the European Union.

Methods

The goal of the study is to evaluate the role of digital literacy in the digitalization of the European Union's business sector and to identify the groups of leading and lagging EU Member States in achieving digital literacy potential. For this purpose, the current study will follow an evaluative research design building on quantitative methods featuring factor analysis.

As the paper primarily focuses on a particular geographical region – the European Union, the rationale of the study will be supported by collecting the data through the Eurostat database, which is developed by the statistical office of the European Union. The database offers open access to ample categories of statistical knowledge which gives quite a detailed description of digital economy and technological transformation within the EU's business sector. The Eurostat database affords the advantage of country-specific statistical coverage of temporal changes in the digital transformation of enterprises. This, in turn, will allow us to add a comparative dimension to the work. To ensure accurate results, all data omissions will be detected and replaced by relevant figures that correspond to the closest points in time.

We will test the hypothesis that we have put forward using the method of principal component analysis (PCA). This dimensionality-reduction technique will be employed on the basis of a database which will be composed of a large pool of digital entrepreneurship indicators. The benefit of applying the PCA on our sample is that the dataset will be condensed to include three distinct dimensions of digital literacy, namely digital safety, digital consumption, and digital skills. Thus, this will enable a multi-dimensional classification of countries. Subsequent cluster analysis will lead to the discovery of the categories of countries with different digital literacy potential. Next, we will introduce a generalized rating of the EU's Member States ordering countries on the basis of their business digitalization performance assessed with the principal components.

We will evaluate the role of digital skills in the digital transformation process in comparison with other dimensions of digital literacy and classify the European countries by their digital literacy potential defining the most and the least successful Member States. The study does not pursue the goal of modelling the future dynamics of digital literacy potential of the European states as the number of observations, which is the number of countries in the EU, does not exceed 30.

Expected Outcomes

The current study is quite timely for a number of reasons. An important implication of this work is that its focus will shift from the digital transformation of the European business in general to the role of human ICT skills in this process, which rarely take center stage in the academic field. The quantitative approach which constitutes the basis for the study appears to advance knowledge about the existing discrepancies in the process of EU's business digital

transformation and is expected to corroborate the applicability of factor analysis to such kind of research.

It is highly probable that this research will provide a better understanding of the differences that exist between the digital literacy potentials of the European Member States. Such information may be of use to the policymakers who are authorized to plan, develop, and implement new European initiatives, because the findings might enable them to better tune their official proposals to the local specificities and needs of particular countries. Moreover, a study such as this one will aid us in determining whether or not the initiatives that already have been implemented are consistent with the current state of affairs in each Member State.

Results from the current study will be presented at the oral defense of the World Economy students' theses at the National Research University Higher School of Economics. During the defense, the findings from the work will be assessed by professionals in the field of digital business transformation. Some of the results will be disseminated in the form of a presentation given at the XIII Conference on Statistical Methods Application for Analysis of Economics and Society.

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