

THE ERA OF DIGITALIZATION AND FUTURE CHANGES IN THE ACCOUNTING PROFESSION

PhD Gabriel RAITA*

*Babeş-Bolyai University of Cluj Napoca, Romania
gabriel.raita@econ.ubbcluj.ro*

PhD student Teodora Odett BREAZ

*Lucian Blaga University of Sibiu, Romania
breazteodora@yahoo.com*

Abstract

The future of massive investment in the world of work is shaped by technical progress, globalization, demographic change, and institutional change. As a result of recent research and development, we can see considerable differences in investment in work by sector and occupation, with a predominant focus on creative, interactive, and complex activities. At the same time, companies' demands for innovative capacity and flexibility are increasing, which means that compatibility with workforce preferences becomes a central challenge for a sustainable work organization. Digitization is changing activities and requirements in all companies - but especially small and medium-sized enterprises face major challenges in this era of digitization. Because the world of digital work is as varied as the corporate landscape, we want to bring a more precise contribution to the specialized literature in the field of the accounting profession. We want to emphasize the importance of digitization and more than that we want to gain experience and strengthen skills to reduce the fear of entities to step into this field.

Key words: *digitization; management; financial institution*

JEL Classification: *F66, J24, M54*

I. INTRODUCTION

Investment in labor already has a long history, but the perspective on the subject has changed again in recent years. In addition to technological progress, continued global economic integration and globalization also have an impact on and interaction with the future of work. The possibility of relocating work to countries with a particularly favorable ratio between productivity and labor costs, also through low transport costs, an increasing supply of skilled workers in other regions of the world and increasing digitalization of the work streams in both the industrial and service sectors have a direct impact on the activities and business units that will remain in Europe. In particular, the competitive pressure of globalization increases the need for technical innovation and increased productivity to cope with a successful structural shift towards high-quality products and services. It may also include the use of state-of-the-art, capital-intensive production technologies, such as 3D printing, which can help relocate production in smaller batches or, according to customer requirements, to countries with higher production costs.

So, everyone is talking about digitization. Above all, its effects on the labor market. All you have to do is turn on the TV or open a newspaper, and sooner or later you will encounter the striking theses of an imminent wave of "technological mass unemployment." This is impressively described, for example, by the American author Martin Ford in his acclaimed work "Rise of the Robots". Production processes are then increasingly automated with the help of new digital technologies. This applies especially to industries, where fewer and fewer people work, but more and more robots. And digitization is just at its beginning. Once it has fully developed its effects, for example through artificial intelligence, its potential is almost limitless. Publicist Drum (2017) predicts that trucks with drivers will be used until 2025, at the latest. Shortly thereafter, machines will be able to compose works, perform cardiac surgery, and finally take over all activities. Human labor will then become "superfluous."

Assessments of the effects of digitalization on the workforce range from optimistic presentations based on new job profiles to concerns about the destruction of jobs by modern technologies, as in the past, every stage of the industrial revolution has had an impact on the labor market. For now, digitization and automation will not lead to mass unemployment. The problem is not unemployment, but greater inequality and stagnation of real wages in the middle of the wage spectrum. To date, the use of robots has had a low impact on wages. However, things could get worse with the advancement of artificial intelligence and other digital technologies. How can economic policy react? The redistribution of income through transfer and tax systems or even an unconditional basic income cannot be reduced. A preventive policy begins with the primary distribution of market revenues. A priority is the productivity-oriented wage policy, massive investments in knowledge infrastructure and the intensification of training and professional development.

II. LITERATURE REVIEW

Currently, there are few empirical studies on the overall effects of employment due to technological change. Studies in the UK and the OECD in the 1990s show that macroeconomic adjustment processes have been sufficient to offset the effects of these changes (Layard & Nickell 1985; Layard, Nickell & Jackman 1994; Pini 1995). However, the results refer to the earlier stages of technological change and do not relate to digitization. In addition, there are now new econometric methods for identifying causal effects, as well as more detailed micro and regional data for measuring the effects of technological change. In a more recent study, Feldmann (2013) found that for 21 industrialized countries, technological progress in the form of innovations only increases unemployment only in the medium term, but not in the long term. However, the author does not only consider the national unemployment rate, the effects on employment and wages, a subdivision of effects according to labor market groups or the analysis of adjustment channels.

Previous research has shown that digital technologies primarily replace repetitive routine activities because they are easier to program. However, newer technologies of the Fourth Industrial Revolution are increasingly penetrating areas of activity that were previously reserved for humans (Brynjolfsson & McAfee, 2014). Frey and Osborne (2013) estimate that 47% of jobs in the United States are threatened by machinery. Comparable studies for Germany even find that 59% or 18 million jobs are in danger (Brzeski & Burk, 2015). Other studies conducted in OECD countries show that although the potential for automation is significant, not all professions can be replaced with automated systems because professional reasoning is needed, so digitization or automation does not automatically involve the dismissal of employees (Arntz, Gregory & Zierahn, 2016; Bonin, Gregory & Zierahn, 2015; Dengler & Matthes, 2015, Căpușneanu, Topor, Constantin & Marin-Pantelescu, 2020).

The study by Osborne and Frey (2013) was the inspiration for a number of other comparable studies (Bowles 2014; Frey & Osborne 2014; Pajarinen & Rouvinen 2014; Brandes & Zobrist 2015; Bonin, Gregory & Zierahn 2015; Brzeski & Burk 2015; World Bank, 2015, Cordoș & Fülöp, 2015; Cosmulese & Socoliuc, 2019; Fülöp, 2019; Constantin, Topor, Căpușneanu & Manole, 2020). The aim of all these subsequent studies was to examine the potential for occupational substitution through digitization, networking and automation for specific countries.

Digitization also creates new jobs (Gregory, Salomons & Zierahn, 2016) with an IT profile. However, most studies agree that the activities of low-skilled people can be highly automated. The qualification and continuous training of employees is becoming more and more important and inevitable, hence the growing offers for such employee programs highlighted in the non-financial reports of the entities.

A problem with the existing surveys is that the digitization and networking of business processes in the area of important services are not given the required attention because they are included in the production process. In addition, there are no representative studies showing changes in the degree of digitization and automation of work equipment in companies, as well as simultaneous changes in work at the workplace and qualification and competence requirements for employees in these companies. Hirsch-Kreinsen (2016 a, b) formulates development scenarios for industrial works, for example the polarization thesis.

As a result, certain areas of activity could go hand in hand with increasing skills and qualification requirements during digital change. On the other hand, there may be areas of activity that require fewer applications from employees. This includes simple tasks with little or no room at all for maneuver, here we are talking about standardized control and monitoring functions (Hirsch-Kreinsen, 2014).

Acemoglu and Restrepo (2017) examine the effects of robot use on wages and employment in local labor markets in the US, with the results highlighting several negative effects on labor and wages in the United States. In a very similar study for Germany, Dauth, Findeisen, Südekum & Woessner (2017) conclude that an increasing use of industrial robots has net neutral effects, as a negative effect for employees in industry is offset by the corresponding positive effects on employment in the service sector. However, both studies can only examine the basic mechanisms to a limited extent, due to the narrow approach. In fact, not all activities in a profession can be automated equally. Rather, machines can take on certain tasks in a profession, while others they cannot. Whether a profession can actually be automated depends on the importance of the field of activity that can be replaced by machines. Therefore, the potential for automation can vary from one job to another even in occupations. An analysis of the automation potential based on the effective activity structures of individual jobs therefore leads to significantly changed results (Bonin, Gregory & Zierahn 2015).

III. RESEARCH METHODOLOGY

In the research methodology, we will discuss the research philosophy, the approach, the choice of method, the strategy and the time horizon, as well as the reasons behind our choices. What we aim for is a realistic critical philosophy (Bryman & Bell, 2013), with a deductive approach. We believe that there is a reality, independent of our perception, but when it comes to our research, we also believe that the results can be misinterpreted, depending

on how we, as people, see them. To support the reader, our approach is based on the deduction that begins by reviewing the literature and then based on it we will make a questionnaire to test the information found in the literature and in practice (Bryman&Bell, 2013)

Thus, our method was based on the deductible approach starting from the current state of knowledge in the literature. In order to support the theoretical part, we also made a practical part that is based on a research based on focus group, through which we aimed to identify the future of the accounting profession through the prism of digitalization and what would be its implications. Following the analysis, we presented the results and conclusions related to our research.

IV. STUDY RESULTS

Starting from an abstract notion for some and for others, especially known by the abbreviation of VUCA, we want to present you some practical aspects regarding the implications that digitalization has on the accounting profession. To shed light on what VUCA means, we will start by defining notions to eliminate any ambiguity. The term VUCA is not a concept known to everyone, but everyone is affected in one way or another: VUCA is an acronym that is composed of the initial letters of the words volatility, uncertainty, complexity and ambiguity (Figure 1). The terms describe the current state of the world of work: it is complicated, fast, uncertain and unpredictable with a continuous upward trend. What exactly does this mean and what does a VUCA world mean for long-term employees and companies?



Figure 1 – VUCA components
Source: Author’s projection

A study by Genner, Probst, Huber, Werkmann-Karcher, Gundrum, & Majkovic (2017) presents the forms of digitalization that society is facing. The specialists and directors surveyed by the authors consider in a percentage of 73% that the company is more and more preoccupied with digitalization and automation in the work process, 72% prefer mobile or even flexible work, as well as the use of (digital) media in communication with customers or other stakeholders. While the digital transformation of the world of work is a topical issue in the literature, many researchers focus on the actual implications of digitalization on the organizational culture of companies.

Therefore, in the digital era it is very important to focus our work on technological perspectives and internal and external implications (see Figure 2).

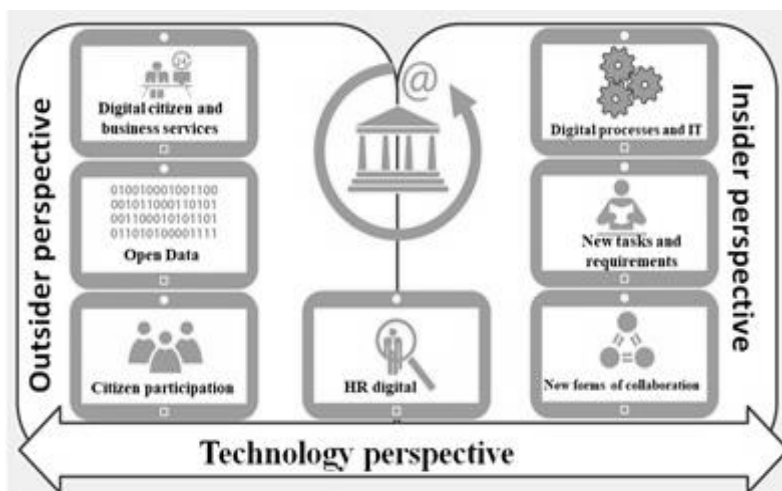


Figure 2 - Technological perspective and internal and external implications in digital human resources
Source: Buchmann & Brixner, 2018

The figure above shows an overview of the seven fields of action from an external and internal perspective that appear for the administration. Basic thesis: only if there is a balanced interaction of the internal, external and technological perspective, taking into account the potential of new technologies, can a sustainable target image for digital administration be developed in the next decade.

The fundamental goal of many organizations is to become more resilient in the context of dynamic environments. But how can companies proactively shape their organizational culture in times of digital transformation to achieve global resilience? To find answers to this question, we applied a qualitative method for the present exploratory study. Specifically, two focus groups were set up with a number of seven people in the accounting field, given that we are interested in the implications of digitalization on the accounting profession.

The set of questions launched for discussion to the participants aimed at:

- a.) Knowledge of these new digital techniques;
- b.) Their influence and impact on investment in labor;
- c.) Measures to resist and cope in the digital era;
- d.) Opportunities and challenges of digitization for companies.

The focus group interviews were transcribed and analyzed according to content.

In order to support the focus groups in the first stage we have made a conceptual delimitation of what digitization means, Big Data (BD) and to better understand we have presented an example of digitization for the accounting field, more precisely through the abstract model of a 360 degree perspective of an invoice. In this sense, we present the situation of electronic invoices that are increasingly accepted in the digital era. Many company administrators have this as an imposition, and are afraid of the effect that electronic invoicing can have compared to traditional invoicing. The reluctance of the administrators and the people involved is understandable due to the fact that this is the reaction of the human being when he is taken out of its comfort zone, without thinking about the potential advantages it can have. Implementation is always carried out only when it becomes mandatory, therefore support from regulators would be helpful, so the minimum legal obligation to accept electronic invoices would be implemented, so as not to miss important opportunities which are offered by a new technology, namely the digital era.

Using an example of electronic invoice, so through it you can display the full range of topics in the organization, staff, processes and IT technology, which is approached with a digital perspective, why not, 360 degrees. In accordance with legal requirements, it would be sufficient for the administration to create an e-mail box and convert invoices into PDF format, print them and process them manually on a regular basis to avoid other technological processes or other more complex IT processes. It is obvious that this alternative is not an innovative one, but it is a first step towards digitization and the use of Big Data processes. However, it may be important to highlight the economic benefits of such an electronic invoice. In order to emphasize the importance and economic benefits of an electronic invoice, we need to expand our field of vision and analyze the context in which electronic invoicing is involved.

Thus, an invoice and the payment process associated with it that appears at the end of a long chain of processes represent the process that a user has previously registered. An illustrative model would be the delivery of goods that is done on the basis of a pre-order. A receipt of goods and acceptance of the service are determined upon delivery. Finally, the invoice is issued by the supplier. The listing of these day-to-day processes contains an important aspect of the so-called end-to-end viewing of business processes: at all stages of the sub-process, information is generated that forms the preconditions for paying the invoice. Consequently, the process of verifying an invoice is carried out in a practically reverse order, in extreme cases, all actors previously involved in the procurement process are asked to verify and release, tick, in a way, the appropriate resources to reach to pay the invoice without physically moving the documents from one compartment to another. Thus, we believe that digitizing invoices could have several benefits, from accessing to archiving.

After the presentation of this study we resorted to debates and completion of questions based on the launched topic. In the following we present the results and opinions of the people involved in this qualitative study.

Knowledge of these new digital techniques

A first step in our analysis focused on a set of general questions regarding the focus group's IT knowledge and skills. The questions were structured based on predefined Yes or No answers. The results of these elements are shown in Figure 3 below.

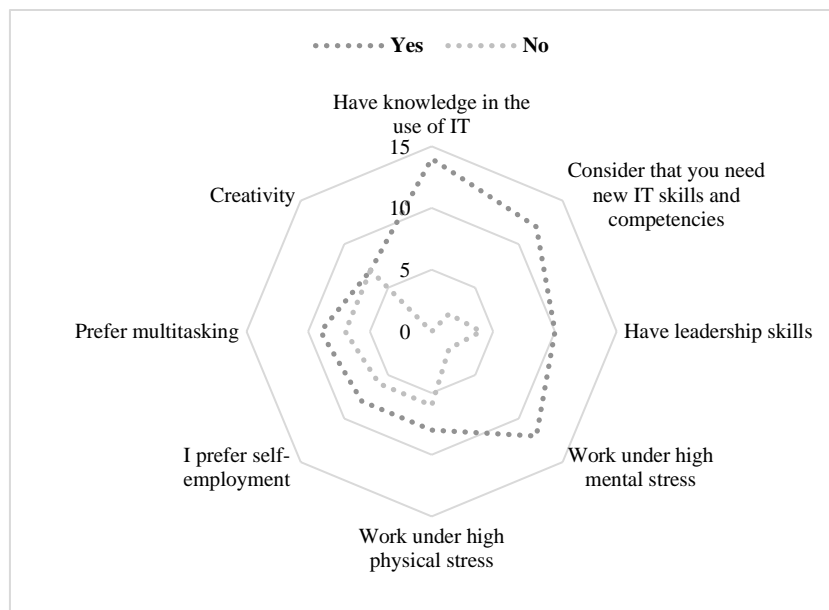


Figure 3 – Results of the analysis "Knowledge of new digital techniques"
Source: Author's projection

What we can see is that all participants use and have general IT knowledge. Most of them also acknowledge that they would need to develop their skills in this area.

The influence and impact on investment in labor

All participants stressed that digitalization brings changes to both the organization and the work environment. It was found that the need for digitization derives from customer requirements (internal or external) and is based less on optimizing the work process. The customer wants a quick solution in a short time for the problems they face. Thus, in terms of the customer, in particular, it is increasingly expected that organizations will act as network solution providers and workflow partners that also solve customer problems in the short term. The changing demands of customers in the digital era inevitably lead to changes in the area of responsibility of employees and therefore to their skills. In this way, we must align ourselves with the requirements of the market in order to maintain and practice our profession. Moreover, respondents pointed out that current generations are much easier to adapt to change than people over 50, their adaptation being much slower and time consuming.

The replacement or why not even the elimination of the accounting profession from the labor market feared the availability of affordable personal computers for small businesses as early as the 1980s. But these things have not materialized so far and, more than that, in the future it will be very difficult due to the complexity of the accounting profession. Here the group stressed that due to the countless tax regulations it is necessary to continue using specialized employees to provide advice and solutions, which cannot be replaced by digitalization. By expanding the range of consulting services towards digital content, such as digitizing certain customer processes, both tax and business consulting can provide great opportunities and open up new business areas, but personal contact is still preferred by both clients and service providers.

Measures to resist and cope in the digital era

A company must also ask itself how it can automate communication and further ensure personal contact between employees, suppliers and customers. Interpersonal contact is necessary to maintain relationships on an emotional level. In times of increasing work environment and self-employment, it is also necessary to clarify how and to what extent employee accessibility should be ensured. Excessive accessibility, as the research literature shows, can lead to mental exhaustion.

The basic tenor of the participants shows that the simplest and supposedly best way to work together is still the physical one. With the necessary delegation of decision-making authority to employees, it is important that everyone takes responsibility. This requires trust, which, however, is becoming increasingly difficult to build, especially in situations where personal contact is minimized so it is necessary to maintain personal interactions.

Digitization opportunities and challenges for companies

However, these challenges bring more opportunities than disadvantages (see Table 1). During demographic change, many jobs will have to be filled in the next decade. This can only be successful if modern and well-paid job profiles are created that are competitive in the private sector. Staff working in the administration in the future will take on more diverse tasks, which is why staff development is extremely important in times of digitalization.

In addition to professional training, general communication and self-management skills are required. Last but not least, the role of your own IT organization is changing. Until now, it has often been limited to the role of an internal service provider, in the future IT will play a key role in the design of the process and tasks. Digital transformation is not a single IT project, but it contains a multitude of individual topics.

Table1. Opportunities and challenges of digitization for companies

Opportunities	Challenges
Big Data (BD) storage availability	Knowledge of Big Data Technology (BD)
Relatively inexpensive storage media that saves physical space in offices and on computers for increasingly cluttered documents	Allocate a considerable budget for the digitization of the activity and for the initiation / training in the field of digitization
Possibility of using intelligent systems (Artificial intelligence)	Convincing employees of the opportunities these technologies offer
Creating complex networks	The lack of generalized strategies regarding digitization, these being specific for each activity
Combining existing technologies and systems	Lack of support and communication with the client
Increase labor productivity	New knowledge of digital media management
	Increased spending on data protection and cybersecurity
It allows better satisfaction of customer requests	Increases dependence on external services

Source: Author’s projection

The evolution of work from a statistical perspective

Learner and Storper (2014) consider that activities with medium competencies usually go hand in hand with many routine activities (accounting, repeated insurance services, etc.). These are codable activities that are easier to trade than activities that require implicit knowledge ("tacit knowledge"). Thus, routine manual and cognitive activities can be increasingly automated by digitization and removed from the professional life. This "biased technological change" (Goos, Manning & Salomons, 2014) has been empirically proven based on census data for the US (Autor, Levy & Murnane, 2003) and also for the EU (Goos, Manning & Salomons, 2009).

		Ease of complementarity (technology is labor-augmenting)	
		High (tasks intensive in cognitive analytical and socioemotional skills)	Low (tasks intensive in manual skills)
Ease of automation (technology is labor-saving)	High (routine tasks)	1 Bookkeepers Proofreaders Clerks	2 Machine operators Cashiers Typists
	Low (nonroutine tasks)	4 Researchers Teachers Managers	3 Cleaners Hairdressers Street vendors

Figure 4 – Activity matrix of professions

Source: World Bank (2016), p. 122

As can be seen in the matrix above (Figure 4), employees in quadrant 4 become more productive through digital technologies, so there is a high complementarity between these types of activities and the involvement of the use of ICT technologies. Technological changes and, in particular, the digitization and creation of networks increases the demand for non-routine, interactive and analytical activities. The activities in quadrants 1 and 2 perform many tasks that are therefore easy to automate. Productivity in quadrant 3 is largely independent of digital technologies. ICT is neither complementary nor a substitute for this activity (World Bank, 2016).

During digitization, there is empirical evidence of a growing demand for highly qualified employees (OECD, 2013). The growing demand for a more skilled workforce is mentioned in the literature as a skills-based technical change. Qualification-oriented technological change can be observed in many countries (see Figure 5).

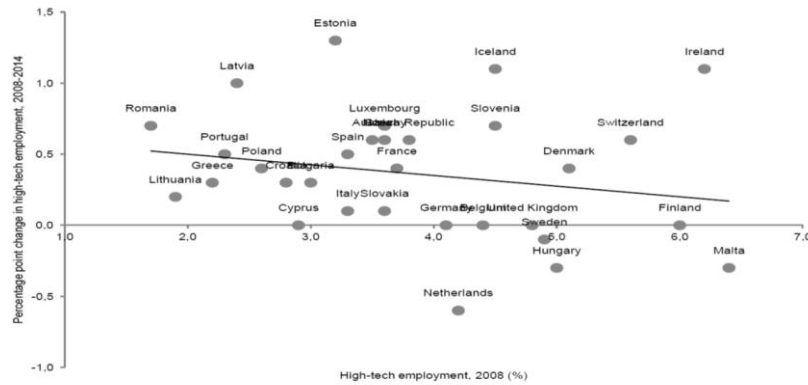


Figure 5 – Qualification-oriented technological change
Source: Berger & Frey, 2016

In the case of skill-oriented technological change, a change in production technology (e.g. digitization) is assumed, which favors higher-skilled work because it increases its relative productivity and therefore relative demand. The use of computers and broadband internet at work is associated with a positive causal effect on the salaries of highly qualified employees (Spitz-Oener 2008; Grimes, Ren & Sevens 2012; Akerman, Gaarder & Mogstad, 2015).

Below we would like to present some statistics on estimates of future employment growth by country as presented by the European Center for the Development of Vocational Training (CEDEFOP), which are displayed both in terms of percentage increase and change in absolute numbers.

If we focus strictly on the audit activity (Oncioiu, Petrescu, Bîlcan, Petrescu, Fülöp & Topor, 2020) we see a significant increase in employment in the period 2018-2030. At EU level we are talking about an increase of 2.2% and in the case of Romania of 8.8%, therefore we cannot say that digitalization brings with it the dismissal of employees in the accounting field (see Figure 6).

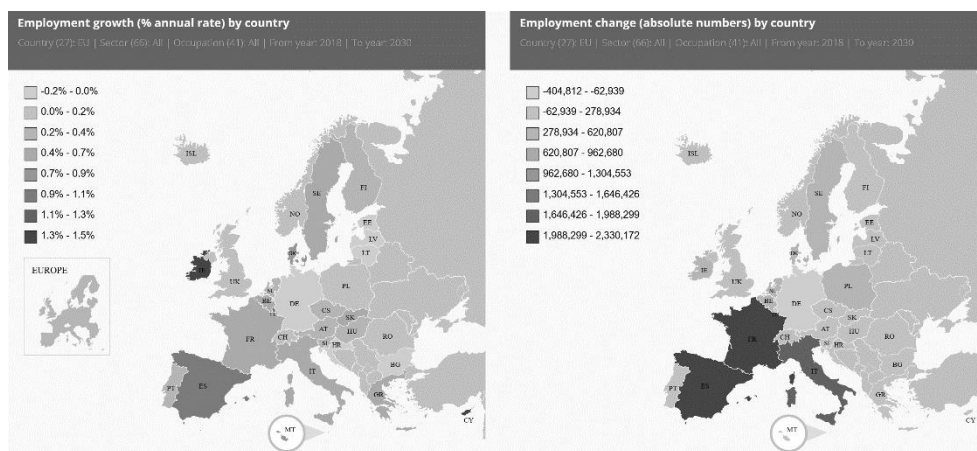


Figure 6 – Digitization of audit activity
Source: CEDEFOP www.cedefop.europa.eu

Figure 7 shows estimates for future employment for the legal and accounting profession as they are taken together.

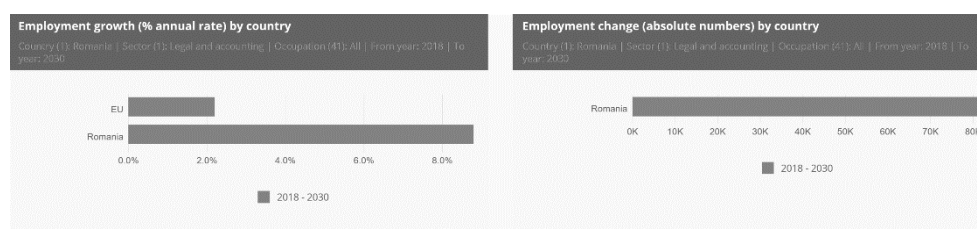


Figure 7 – Estimates for future employment for the legal and accounting profession
Source: CEDEFOP www.cedefop.europa.eu

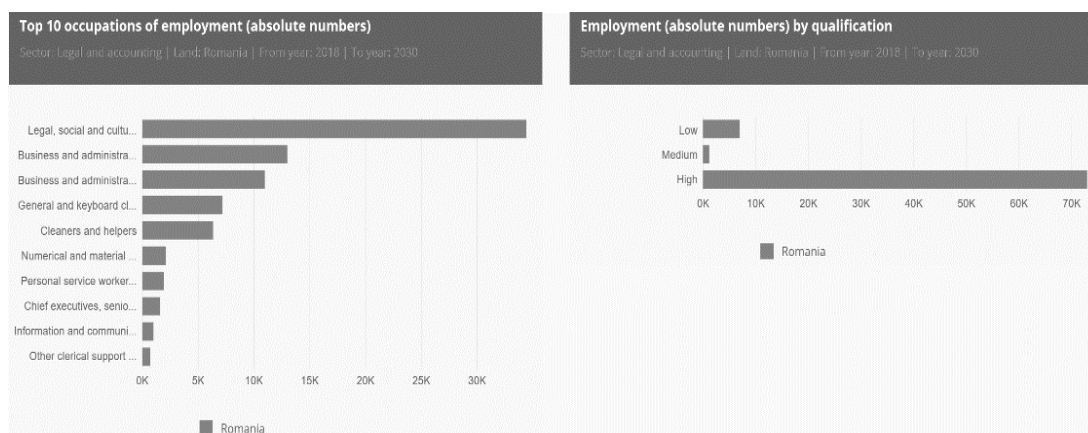


Figure 8 – Estimates for future employment for the legal and accounting profession (percentage increase and change in absolute number)

Source: CEDEFOP www.cedefop.europa.eu

In Figure 8 are presented both as increase in percentage and as change in absolute terms, Moreover, we also focused on the distribution of labor by qualification in absolute terms for the selected sector. What we can see is the fact that more and more highly qualified people are demanded (90%), employees with a medium qualification (1.4%) and a low level (8.6%).

V. CONCLUSIONS

The effects of digitalization on companies are currently being discussed from several perspectives and at the same time they are specific to each activity and industry, thus referring to the entire value chain that requires communication and organization. In this study, we presented the state of the literature to identify its current state and to clarify certain specific concepts, this part was complemented by a presentation of the possible effects of digitalization on accounting in general and from the perspective of consulting provided by these, which are often providers of accounting services.

Creative innovation management is as necessary as program management that evaluates individual project ideas, recognizes, and coordinates general relationships, and integrates them into ongoing budget planning. Here the emphasis is on intense cooperation with specialized departments, organizational units, and staff development to ensure the continuous development of the organization, processes and qualifications in harmony with technological possibilities.

In conclusion, it can be said that digitalization equally affects all aspects, material objectives, people, organization and technology. Innovative solutions can only be implemented with an end-to-end understanding of the process. In addition, the potential of new technologies remains untapped without proper organizational transformation and sustainable qualification. In the process of strategy formulation, the target image must be developed in cooperation between the business side and IT. If there is a conclusive picture that considers the external, internal and technological perspective, we can say that the cornerstone has been laid for a successful implementation.

The technical possibilities of digitization offer a multitude of opportunities for the accounting profession as it results from our study. Many processes can be automated, such as issuing and paying invoices, or even making monthly reports and why not financial forecasts due to the large volume of information that is stored through these technologies. An important role in this process is the availability of employee involvement, which can be enhanced by artificial intelligence that leads to the acceleration of digitization and automation.

It is very important for providers in the digital era to receive information and solutions as quickly as possible, this can mean, on the one hand, an improvement in the quality of information available as a basis for decision-making and, on the other hand, regarding self-control, an independent location and time, in terms of flexible access to information.

For the responsible accountant, regardless of if he is employed or working individually, this inevitably leads to a change in the areas of responsibility, as well as to new ways of thinking and points of view of the professional activity. Thus, the technical and human skills go into the background, these being replaced by the IT skills that are gaining more and more importance in this digital era. Therefore, the profile of the responsible accountant in the digital era is changing from the ordinary accountant with accounting knowledge to a specialist in the field of accounting and IT. It is important that this profile of the accountant from the digital era is already formed from the academic environment, we want a reaction of educational institutions on the development of the new accountant to combine technical knowledge with analytical and IT.

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