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CONTENTS

Dear reader,

The Journal "Economic Development" published by the Institute of Economics – Skopje, is an academic journal in the field of economic development more than 20 years. The main goal of the Journal is to provide intellectual platform to the wider academic and professional publics, and to promote the development of economic thought in the country and globally. It covers theoretical and empirical researches in the field of economic and social development, demography, education, corporate governance, international economics, international management, administrative management, corporate and public finance, economics and tourism management, agricultural policy and agricultural management, marketing and marketing management, entrepreneurial management and other areas in the field of social sciences.

The journal "Economic development" has an open approach in accepting and publishing the papers reviewed by an international editorial board consisting of domestic and foreign experts from different countries. The journal is available in online form, through the database of academic papers published by the Institute.

This issue of the journal "Economic development" is a special Issue with selected papers from International Conference "Emerging Trends in Business Economics: Towards Competitiveness, Digitalization and Financial Innovation". It was organized by the Institute of Economic Sciences from Belgrade, Serbia and the Institute of Economics from Skopje, North Macedonia. The Conference event was held on 28th and 29th October 2020 in virtual form due to the Coronavirus outbreak.

The main topic of the Conference was focused on innovations, digitalization and competitiveness, with aim to share knowledge and expertise in the wide areas of economy in the digital era. Over 100 participants from 9 countries at tended the Conference, discussing on topics: Competitiveness and global growth; Trends in the digital economy; Financial innovation and Fintech etc. Selected conference proceedings were invited to submit full papers for peer-reviewed publication in this Conference Issue of "Economic development".

Skopje, April, 2021

Zoran Janevski, PhD
Editor-in-chief

SNEZANA KOSTADINOSKA MILOSESKA[*]
VASIL POPOVSKI[**]
ELIZABETA DJAMBASKA[***]

DIGITAL PERSPECTIVES OF SOCIAL ENTREPRENEURSHIP IN WESTERN BALKAN COUNTRIES

Abstract

Digital technologies play an increasingly important role in our society. The ability to connect and interact quickly and efficiently becomes essential and digital skills are even more relevant for companies and individuals. The main objectives in paper are to show the growth potential possibilities of both the market and the social impact of the social enterprises, considering the digitalization of the same. Hence, the digitalization in Social Services in general sense, is define as the massive adoption of digital technologies to generate, process and share information and implement specific tasks via digital devices. Pandemic most explicitly shown us and taught us that there is great room for the digitization of many old and new businesses, especially in the social entrepreneurship in WBC as huge potential.

The main focus of this paper is to increase the awareness of the concept of the Digital Social Entrepreneurship (DSE), as a combination of the social and digital aspects of entrepreneurship. Therefore, the possibilities and obstacles of these process in the Western Balkans countries (WBC) is considered.

The results from the analysis in WBC, in the field of social enterprises gives overview of the current situation, which is underdeveloped. SEs in the WBC need to bridge the challenges they are facing in the everyday functioning and the digitalisation process. Theory and modern practices show that

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[*] PhD, Ss. Cyril and Methodius University in Skopje, Institute of Economics – Skopje, Republic of North Macedonia, E-mail: snezana@ek-inst.ukim.edu.mk
[**] PhD, Ss. Cyril and Methodius University in Skopje, Institute of Economics – Skopje, Republic of North Macedonia, E-mail: vasil@ek-inst.ukim.edu.mk
[***] PhD, Ss. Cyril and Methodius University in Skopje, Institute of Economics – Skopje, Republic of North Macedonia, E-mail: beti@ek-inst.ukim.edu.mk

digitalisation in these services offer many possibilities and positive effects, including new opportunities for entrepreneurs, new companies/business, new and more productive jobs which leads to sustainable growth.

This research recognized common issues when it comes to the challenges that countries are facing, and creates recommendations that might benefit social enterprise in their digitalisation.

The issue of digitalisation is crucial for social economy enterprises, because the changes offer both challenges and opportunities. Indeed, new digital technologies enable quicker exchanges of best practices and offer tools to support the values of the social economy through new collaborative, short-circuit and circular economic models, on which social economy actors could have a defining influence if they rise up to the task.

Key words: Digitalisation, social enterprises, social economy, social impact, Western Balkan Countries

JEL Classifications: O350, O33, O500

Introduction

The opportunities and challenges emerging around potential synergies between digitalization, new technologies and social economy actors are manifold and should be thoroughly examined and addressed. Social economy and social enterprises must use digitalization and digital technologies as a lever for economic and social transformation and increased social impact across Europe.

The main objectives is to unlock and fine-tune the growth potential of both the digital single market and the social economy, so the attention should not only be directed on the ways social economy actors could use the digital economy, but also on ensuring that social economy actors can participate in the Digital Single Market and help shape the way in which it functions.

The issue of digitalization is crucial for social economy enterprises, because the changes it implies offer both challenges and opportunities. Indeed, new digital technologies enable quicker exchanges of best practices and offer tools to support the values of the social economy through new collaborative, short-circuit and circular economic models, on which social economy actors could have a defining influence if they rise up to the task. However, it should be noted that the budgetary constraints faced by most social economy enterprises is a clear barrier as they tend to struggle more than other enterprises in their uptake of new technologies.

The term "social economy" first appeared in France during the first third of the XIX century. For a long time, its meaning was much broader and amorphous than it is today. Anyone can develop their own a priori conception of the social economy, simply by placing more or less emphasis on either its economic or its social dimensions, both of which are wide-ranging.

Only few decades ago the discussion about social entrepreneurship was very rare. Nowadays, the presence and discussion of the social entrepreneurship is inevitable.

The notion of social enterprise first appeared in Italy in the late 1980s, but it really began to be used at the European level in the mid-1990s, especially through the works of the EMES European Research Network. Even so, the concept itself has not gained the same recognition in all European countries (and is even still poorly understood in several of them), still the recognition of its importance and the roll in developing process of the economy is evident. Researches highlight the aims and increasing research effort to analyses this in field. Therefore, international literature on this theme is thus now developing significantly.

It is essential, first of all to defined the concept of social entrepreneur, social entrepreneurship and social enterprises. "Social entrepreneurship" can be considered as a process through which "social entrepreneurs "create" social enterprises"[1].

- The term "social entrepreneur" has been particularly emphasized by American foundations and organizations like Ashoka since the mid-1990s. Those entities identify and support in various ways individuals launching new activities dedicated to a social mission while behaving as true entrepreneurs in terms of dynamism, personal involvement and innovative practices. Such a social entrepreneur brings about new ways of responding to social problems. In Europe, on the contrary, the emphasis has been much more often put on the collective nature of the social enterprise, as well as on its associative or cooperative form, although the US approach is gaining some influence.

- The notion of "social entrepreneurship" has been conceptualized in rather precise ways in the late 1990s. These conceptualizations stress the social innovation processes undertaken by social entrepreneurs. However, the concept is increasingly being used in a very broad sense as, for various authors, it now refers to a wide spectrum of initiatives, ranging from voluntary

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[1] Defourny J. and M. Nyssens, "Social enterprise in Europe: recent trends and developments", Social Enterprise Journal, Vol. 4 No. 3, pp. 202-228, 2008

activism to corporate social responsibility.[2] Between these two extremes, a lot of categories can be identified: individual initiatives, non-profit organizations launching new activities, public-private partnerships with a social aim etc. While Americans now tend to stress the "blurred boundaries" among institutional and legal forms as well as the "blended value creation" (profits alongside social value) that characterizes social entrepreneurship, Europeans rather stress the fact that social entrepreneurship most often takes place within the "third sector" (i.e. the private, not-for-profit sector). In any case, it seems clear that, of the three notions briefly defined here, that of "social entrepreneurship" is the most encompassing one.

- As to the concept of "social enterprise", it first appeared in Europe (a few years before it emerged in the United States), and more precisely in Italy, where it was promoted by a journal launched in 1990 and entitled Impresa sociale. The concept was introduced at the time to designate the pioneering initiatives for which the Italian Parliament created the legal form of "social cooperative" one year later. European countries have since passed new laws to promote social enterprises. Along with such approaches, the EMES Network stresses the positioning of European social enterprises "at the crossroads of market, public policies and civil society", especially to underline the "hybridization" of their resources: social enterprises indeed combine income from sales or fees from users with public subsidies linked to their social mission and private donations and/or volunteering. This clearly contrasts with a strong US tendency to define social enterprises only as non-profit organizations more oriented towards the market and developing "earned income strategies" as a response to decreasing public subsidies and to the limits of private grants from foundations.[3]

While being aware of the conceptual diversity that we have just underlined, we mainly focus here on the notion of social enterprise that are digitally organized. Digital technology has tremendous potential to value creation in every industry by reshaping their internal capabilities, business functions and services around customer experience. It addresses the need to drive organizational change in an effort to shift employee behavior, enhance

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[2] Alter, S. K. (2006), "Social Enterprise Models and Their Mission and Money Relationships", in A. Nicholls (Ed.), Social Entrepreneurship. New Models of Sustainable Social Change, Oxford University Press, Oxford, 205-232.

[3] J. Gregory Dees and Beth Battle Anderson, "Framing a Theory of Social Entrepreneurship: Building on Two Schools of Practice and Thought", Research on Social Entrepreneurship: Understanding and Contributing to an Emerging Field, Association for Research on Nonprofit Organizations and Voluntary Action (ARNOVA), (2006)

interaction, discover and exchange information and draw inferences on the collective intelligence and cognitive analytics to take timely decisions. Today, mobility is evolving to a broader set of digital devices that can be embedded in the customer products. To stay competitive and relevant to the customer, most technology companies are rapidly moving towards the digital engagement architecture supported by digital and social strategies and real-time collaboration among all stakeholders. It necessitates a pervasive social and cloud orchestration layer that spans many different system of records and departments with-in an organization.

The main focus of this paper is first to increase the awareness of the concept of Digital Social Entrepreneurship (DSE), which tends to combine the social and digital parts of the entrepreneurship. This paper aims to explain why the current world situation after the pandemic could open a way into creating more digital social enterprises. Digitally-enabled solutions to the rising amount of social problem in the world could definitely contribute to tackling social and economic problems of the now.

Furthermore, this paper focus on the current social economy in Western Balkan countries. The analysis is essential in proposing policies and measures for the improvement. Especially important is to demystifying the obstacles and opportunities for developing digital social enterprises.

Methodology consists of the comprehensive analysis of strategic national documents in the field of economics and gathering information to assess opportunities in development of social enterprises. Also, publications by academic institutions and private sector, as well as international organizations are considered.

Overview of the current social economy in the Western Balkan Countries

The social economy is relatively small in the WBC, but have potential to build social-economic capability. Establishing and fostering the social economy in Western Balkan countries is very important for their economic development and as a better way for the convergence of the EU standard.

The transition towards a market economy involving the closure of many state-owned enterprises has resulted in high unemployment, decline in the government provision of services, increased social disparities and marginalization of certain social groups. Social entrepreneurship in the

Western Balkan countries are still seen as an inclusion model mostly for people with disabilities, with few countries having defined other vulnerable groups as beneficiaries of the employment model created by social enterprises.

Albanian society is built on traditional foundations, traditional practices can entrench discriminatory practices and create social barriers to civic- and solidarity-based forms of organization. Even that Law on SE from 2016 exist, there is no implementation registered yet. The primary purpose of the SE is social inclusion. Hence, SE's are mainly founded on the provision of basic social services, including children with disabilities, health and community services, kindergarten and other social services targeted at vulnerable groups. Other service includes hostel services, catering, tourism and production. Cooperatives in agricultural production and trade are dominant. The financing problem is evident: Grant/donor funding, which is predominantly international, corporate and individual donors. They use membership fees and their economic activity as a source of finance. A very small percent of SE's funding comes from public sources. Only loans from EBRD/EIB are available for commercial lending for SE's.

Accelerators are specifically design to meet the needs of the SE's sector. A number of new incubators that may have a positive impact on the SE sector, although none of them was set up specifically to support SE. SEs are not the topic in the formal education system, some private Universities show interest but no action.

In Serbia, even with unfavorable legislative, economic and institutional framework, developed an emerging, but notable social economy sectors whose principal actors are the cooperatives. SE's provide variety of products and services, most commonly serving agricultural producers, people with disabilities provision of basic social services, including children with disabilities, health and community services, kindergarten and other social services targeted at vulnerable groups. The predominant economic sectors for associations and foundation are services such as education and training, tourism and catering, culture and arts.

SE's are funded from public-sector grants, foreign donors and foundations, national donors and grants from companies. The SE's for the employment of the people with disabilities benefit from public subsidies on salaries. Association and spin-off companies receive support in free-of-charge use of business premises. An increasing number of SE's in Serbia are ready to absorb loan funding and other commercially available methods of financing.

In Kosovo, the social enterprise sector is in the early stages of development.

SE' s in Bosna and Herzegovina and Montenegro are engaged in multiple activities (graphic design, preservation of traditional crafts, production of souvenirs, garments, home décor, and merchandising items) and mostly they are in the start-up phase.

And in North Macedonia, with direction and support from donor organizations, many CSOs were created to play a key role in the provision of social and health services to vulnerable groups and it is these CSOs that are at the forefront of the creation of the new social economy.

First of all, the region suffers the consequences of the changes in the government or policy that lead to changes in the regulatory framework making business operations subject to frequent changes. Doing business in such an environment is not well supported centrally for traditional business, neither for social enterprises. Unfortunately, the grey economy, corruption and political instability are considerable problem in all WBC.

Therefore, the lack of a regulatory framework for social economy is the main obstacle, for the appropriate recognition of the socially driven initiatives. Also, SE's is not highly ranked on the governmental and institutional agenda as part of their strategy for sustainable and equitable development.

In practice, in Western Balkan countries, social enterprises do not receive needed public recognition, do not enjoy tax benefits, and are struggling with administrative burden and inconsistent implementation of regulations.

The most important challenge relevant for their functioning is the visibility of the social enterprises. With the existing legal structure, the SE's did not have equal status as for example NGOs or LLC. Therefore, they are not having tax exemptions or incentives due to the legal status they operate in. SE's remain unknown to the wider public, though reaching significant impact at the local or regional level.

Financing of the SE's in WBC is one of the huge existing problem. First of all, initial stage funding is coming from donors in the majority of cases or many initiatives have been funded with own resources, or family member's money. It is evident the lack of absorption capacity by SE's to utilise other funding sources than grants and available commercial funding products are not suitable for SE's as they are relatively expensive, with high interest rates and repayment deadlines which cannot be serviced by SE's. Institutional involvement and lack of incentives for private sector in providing funding is evident.

Another evident problem that SE's are dealing the way they measure progress and donor reports formats to record their results and impact. Usually they keep track of the number of the beneficiaries they serve and information related to outcome of their activities and financial indicators. There is a lack of any systematic monitoring and evaluation based on international frameworks about the overall impact of social enterprises in each of the WB countries. Thus, the social impact is mostly documented at the level of case-studies and individual best practice, rather than overall impact of the SEs within the country.

Despites the mentioned challenges, still the business environment in the Western Balkan Countries have same benefits: geographical proximity of the EU market and the assistance of the EU, a relatively stable macroeconomic environment and high economic growth, , a relatively good business environment, a stable and relatively developed financial system, relatively low costs and skilled workforce, ensured protection of the rights of investors and contracts resulting in the Stabilization and Association agreement, EU and other CEFTA bilateral trade agreements.

WB countries already have some support infrastructures in place in the form of intermediary organizations, incubators, accelerators, training centers, mentoring and coaching programs coupled with funding as well as various networks advocating for the interest of social economy actors.

This stated situation with the social enterprises, give us clear overview for the process of the digitalization of the social enterprises. Besides the ongoing obstacles, the process of digitalization of SEs can help in overcoming the existing problems and lead to the optimistic scenario in the social economy.

Digital transformation refers to the economic and social effects of digitalization (i.e. the conversion of analogue data and process into machine-readable format) and digitalization (i.e. the use of digital technologies and data, as well as interconnections that result in new or modified activities).

This transformation is driven by the advance of new digital technologies such as the Internet of Things (IoT), Blockchain, Artificial Intelligence, Big Data, Cloud Computing, Next-generation Wireless Networks and more. Some of the effects of digitalization (Automation of tasks and occupations: Digitalization of processes: Emergence of platforms and use of blockchain: Digital documentation systems: Artificial intelligence and introduction of robotics: Connected help and monitoring systems: The use of big data to foster personalized services) in SEs in WBC will be offers a wide range of results.

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Digital perspectives of the SEs are towards:

- **Increase awareness among policy makers about the digital entrepreneurship and use role models to inspire future digital entrepreneurs from under-represented and disadvantaged groups** - build the inclusive culture towards digital start-up, strengthening the regulatory framework and establishing the support measurements for DSEs in the Western Balkan countries

- **Innovative initiative and creating new opportunities for entrepreneurs** - improved access to scientific publications and information through new tools and platforms, enhanced access to research data and strengthen engagement with a wider range of stakeholders, facilitates the innovative process. Also, it encourages the entrepreneurs to be more creative and to innovate. First, data is becoming a key input for innovation because it provides insights on market trends, allows for the optimisation of production and distribution processes, and facilitates the adjustment of products and services to market demand. Second, data enables services innovation since new services are (and will be) required, e.g. the Internet of Things has enabled predictive maintenance services. Third, digital innovations such as 3D printing increase the speed of innovation cycles since product design, prototypes and testing can all be accelerated. Finally, innovation is increasingly collaborative, which helps share the costs and reduces the risks of digital innovation.

- **Boost their productivity and access more opportunities** – the productivity benefits can be addressed through the opportunities to access new markets (i.e. customers in other regions or countries, new products and services) and boosting productivity by reducing business operating costs. This combination of new opportunities and reduced costs potentially opens-up entrepreneurship to more people. The lower costs of starting and running a business makes it more feasible for those with lower levels of savings and capital to pursue digital entrepreneurship. This includes, for example, the potential to operate a digital business without a physical location and relatively little equipment. However, these lower barriers to entry would be expected to lead to more entrants, more social inclusion and will lead to increased competition. This is very important to inclusive entrepreneurship.

- **Support the development of digital and entrepreneurship skills** – Including learning and obtaining the digital entrepreneurship skills in

formal education, thru training and mentoring programs and using the e-learning platforms;

- **Improved visibility, as a result of interconnection using social media, networks connections and internet cloud platforms**
- **Possibility for establishing the indicators that measures progress and impact of the social services that are provided thru DSEs**
- **Improve access to resources and finance for digital social enterprises**

This will change the business environment and the way of thinking about the importance of social economy. It would strength the market competition, encourage and boosting the public-private cooperation and social dialog, create new opportunities for entrepreneurs, new companies/business.

It is widely accepted and agreed that the benefits from the digitalization of the social economy are still far from being reached. Also, it is important to recognize that the benefits will likely not be shared by all.

It will create new and more productive jobs, business, better access to social services and growing and sustainable economic growth.

The main impact will be the new design and delivery of social services. In addition, positive impact with the public expenditures in all WBC is expected. DSE is the only way for fulfilment the European Pillar of Social Rights obligations.

CONCLUSION

The analysis results in WBC in the field of social enterprises gives overview of the current situation, which is underdeveloped. SEs in the WBC need to bridge the challenges they are facing in the everyday functioning and the digitalisation process. Theory and modern practices show that digitalisation in these services offer many possibilities and positive effects, including new opportunities for entrepreneurs, new companies/business, new and more productive jobs which leads to sustainable growth.

Digitalization of the social enterprises can drive innovations, creating new opportunities for entrepreneurs, can boost the opportunities for SE and access more opportunities

DSE will change the business environment and the way of thinking about the importance of social economy and innovation, by strengthening the

market competition, encouraging the public-private cooperation and social dialog. It will create new jobs, businesses, better access to social services and economic growth. The main impact will be the new design and delivery of social services. In addition, positive impact with the public expenditures in all WBC is expected.

SE in the WB need to bridge the challenges they are facing in the everyday functioning and the process of digitalization. All of the countries do have support mechanisms for SMEs and SE, that might be easily adapted to the DSE requirements and needs. Policy should address the activities that build inclusive culture toward digital start-ups, support development of digital and entrepreneurship skills, policy action aimed at improving connectivity, stimulating innovation and strengthening the regulatory environment and improve access to resources and finance for the creation of digital business and the digitalization for the self-employed.

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KATERINA HADZI NAUMOVA-MIHAJLOVSKA[*]
NEDA PETROSKA-ANGELOVSKA[**]
MARIJA TAKOVSKA[***]

IMPORTANCE OF IDENTIFYING COST MANAGEMENT IN GREEN BUSINESSES

Abstract

Green business can be defined as business committed to the principles of environmental protection within their activities, while striving to use renewable energy sources and trying to minimize the negative impact on the environment. Identifying their costs is very important because it provides a realistic assessment of the economic and environmental impact of business (enterprise) on the environment. Therefore, the main purpose of the paper is based on analysis of the activities of green businesses to identify the main characteristic of their cost management and to clear that managers need cost management tools in order to make right decisions.

Key words: green businesses, cost management, environmental accounting
JEL Classification: Q50, Q56

Introduction

Making businesses more green starts with being aware of the issue at hand and understanding just how important it is to make changes, both for the business and the planet. Green business can be defined as business committed

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[*] PhD, Associate professor, Institute of economics - Skopje, Ss. Cyril and Methodius University in Skopje, Republic of North Macedonia, katerina@ek-inst.ukim.edu.mk
[**] PhD, Full professor, Institute of economics - Skopje, Ss. Cyril and Methodius University in Skopje, Republic of North Macedonia, neda@ek-inst.ukim.edu.mk
[***] PhD, Full professor, Institute of economics - Skopje, Ss. Cyril and Methodius University in Skopje, Republic of North Macedonia, marija@ek-inst.ukim.edu.mk

to the principles of environmental protection, striving to use renewable energy sources and trying to minimize the negative impact on the environment. In this regard, these businesses are part of a long-term strategy for sustainability, i.e. they are an opportunity to achieve business goals without creating economic or social threats to the environment, both for current and future generations. Green business is to adopt principles, policies and practices that improve the quality of life for customers and protect resources. Using renewable energy resources, enhancing material recyclability, reducing toxic dispersion are all eco-efficient practices while doing green business. In order to understand the concept of green businesses, it is necessary to know certain elements and characteristic of that business, from which it is especially important to identify the costs. Identifying their costs is very important because it provides a realistic assessment of the economic and environmental impact of business (enterprise) on the environment. Therefore, the main purpose of the study is based on the analysis of the activities of green businesses to identify the main characteristic of their cost management.

The methodology is based on an analysis of the literature on relevant concepts and theories in the field of green businesses and cost management. The descriptive method will be used to describe the data and key terms; the induction method for looking at a number of investigated cases that draw conclusions about green businesses and cost management; the method of deduction to reach concrete conclusions; method of analysis for analyzing the used literature and the method of synthesis for connecting information, facts and data into a whole that will be logical and obtained through the methods of deduction and analysis.

1. MAIN CHARACTERISTIC AND ACTIVITIES IN GREEN BUSINESSES

According to Majurin, green business means making money so while sustainably harnessing opportunities that nature holds, and without harming the environment.[1] Green business can be defined from two perspectives: one relates to the output in the form of green products or services, while the other relates to the process of an economic activity. Green business is to adopt principles, policies and practices that improve the quality of life for customers

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[1] Majurin E., Green businesses booklet, ILO; International Labour Office. - Geneva: ILO, 2017, p. 7

and protect resources. Using renewable energy resources, enhancing material recyclability, reducing toxic dispersion are all eco-efficient practices while doing green business. The main pillars of green businesses are:
- Reducing the use of materials,
- Reduction of energy consumption,
- Reduction of the release of toxic substances,
- Increasing recycling,
- Maximum use of renewable resources,
- Extension of product durability,
- Increasing the intensity of services.

The "green business" concept has been defined in the specialized literature as:
- Businesses or practices oriented towards the environment, including: the use of organic or natural products, the adoption of some strict measures against emissions and the procurement of materials from renewable sources;[2]
- Businesses that adopted the concept of environmentalism and sustainability in all their functions;[3]
- Brown and Ratledge adopt quite a narrow definition of green business as "an establishment that produces green output";[4]
- Makower and Pyke, in a broad brush way, state that "a green business requires a balanced commitment to profitability, sustainability and humanity";[5]
- The Business Dictionary indicates that green business is "a business functioning in a capacity where no negative impact is made on the local or global environment, the community, or the economy", and further adds that "green business will also engage in forward-thinking policies for environmental concerns and policies affecting human rights";[6]

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[2] Smith,A perceptual study of the impact of green practice implementation on the business functions, Southern African Business Review Vol. 14 N.3, 2010

[3] Szolnai L., Green business or community economy?, International Journal of Social Economics, 2002, p.652

[4] Brown D. T., Ratledge E. C., Energy, the environment and delaware jobs: Defining and describing green business, University of Delaware, 2011, http://128.175.63.72/projects/DOCUMENTS/Green_businesses.pdf, 20.12.2020

[5] Makower J., Pyke C., Strategies for the Green economy: Opportunities and Challenges in New World of Business, McGrow-Hill, New York, 2009, p.290

[6] Business Dictionary, n.d., www.businessesdictionary.com/definition/green-businesses.html 20.12.2020

- Similarly, G. Croston states that "Green Businesses have more sustainable business practices than competitors, benefiting natural systems and helping people live well today and tomorrow while making money and contributing to the economy";[7]
- Slovik proposes an amalgamation of environmental sustainability demand with that of social responsibility: "A "green business" can be defined as an organization that uses renewable resources (environmentally sustainable) and holds itself accountable for the human resource aspect of their activities (socially responsible)";[8]

The usual definition for green business is business committed to the principles of environmental sustainability in its operations striving to use renewable resources and trying to minimize the negative environmental impact of its activities. The suggested definition allows to distinguish, but not to dissociate, "green business" concept from the broader term of "sustainable business". Therefore, the business to be green should be regarded as the outcome of the interaction of three main elements of the process: consumers, governments, and the business itself. The first two are contributing to the formation of "green request" to business and the latter implementing green practices. In fact, the basic activity of green businesses is to combine profits with real wealth in a country, and that is to reinvest in natural capital by creating a system that will provide economic benefits from environmental protection. Therefore, one of the main activities in green businesses is cost management, because it provides a realistic assessment of the economic impact of business on the environment.

2. COST STRUCTURE RELATED TO GREEN BUSINESSES AND ENVIRONMENTAL PROTECTION

Cost management can be defined as a set of procedures used to control or reduce the cost spend both on the internal and external resources in the company. The main division of costs is:[9]

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[7] Croston G., Starting Green: An Ecopreneur's Toolkit fot starting a Green Business from Business paln to Proits, Enrepreneur Press, 2009, p.324

[8] Slovik K., Nine steps to Greening Your Business, 2013, www.startupnation.com/steps/93/ 20.12.2020

[9] Duman H., Yilmaz Icerli M., Yucenursen M., Apak I., "Environmental cost management within the sustainable bisiness", The online Journal of Science and Technology, Vol.3, Issue 2, 2013

- Internal costs that affect the businesses directly and they can interfere with them and
- External costs that businesses are not responsible for and they cannot interfere with them.

The same division applies to environmental costs.[10] Environmental internal cost can be traditional or conventional, hidden, dependent and image and relationship costs. (Figure 1) Traditional or conventional costs are the costs arising from machinery and equipment, raw materials and consumer goods. Hidden costs represent the indirect environmental costs or the dependent costs which may occur in the future. These costs are the costs that arise during the execution of the activities of a process, system or facility. Many businesses assess these costs as an expense in the period, and do not give the necessary importance to these costs in their business decisions and daily activities. Dependent costs represent the costs that may arise in the future depending on the environmental effects. For example, penalties to be paid for the oil spills as caused by various accidents and expenses related to the solution of environmental damage caused are the dependent costs. Image and relationship costs (Public Relations) are costs associated with annual environmental reports, relations with the local population and environmental activities carried out on a voluntary basis.

Figure 1 Types of environmental costs
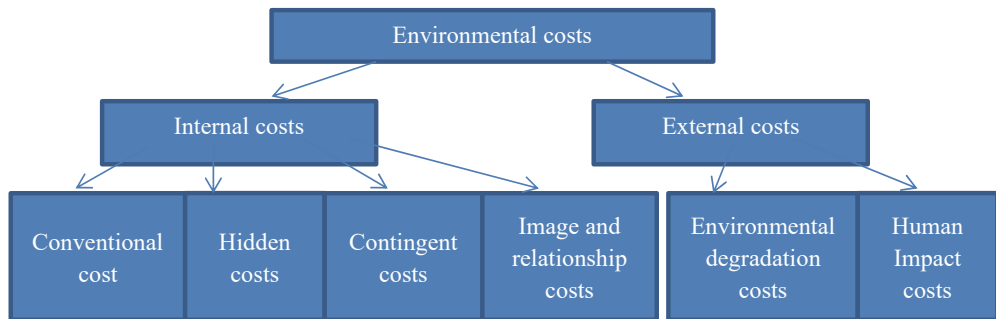
Sorce: Duman H., Yilmaz Icerli M., Yucenursen M., Apak I., "Enviromental Cost Management Within The Sustainable Bisiness", The Online Journal Of Science And Techlology, Vol.3, Issue 2, 2013

Environmental external costs are the costs that businesses are not directly responsible but arise from the activities which have adverse effects on the environment. Activities that give rise to these negative consequences are the

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[10] Ibidem

activities that cannot be prevented by law. In addition, to measure the real values of the external costs is difficult. However, some businesses are trying to take these costs as an item of costs within the environmental accounting systems.

The environmental cost can be examined as a result of the activities carried out for the purpose of environmental protection and providing sustainability, as a result of the use of resources in production activities and as a result of environmental pollution caused by business. In this context, environmental costs can be divided on:[11]

- Prevention costs - costs incurred in the process of design, production, usage and destruction stages of the product in order to protect the environment and minimize the environment damage. They include costs incurred in the life cycle of the product; Environmental planning costs; Environmental harmonization costs in product design; Recycling costs; Eco-friendly packaging costs; Environmental management costs, waste control, elimination or treatment costs are within the scope of prevention costs. These costs are the costs that can be determined in accordance with the decisions of the administration.

- Operating costs can be defined as the price for public natural resources benefited while operating activities. Types of these costs are the use of natural resources such as air, water and soil. Businesses may not be required to pay a fee for the operating costs arise from the use of natural resources if environmental damage that the public suffered as a result of the use of these assets is below the limits permitted by law.

- Affect costs are related to environmental damage caused by the failure of the previous activities. These costs are high and expensive because beside the taken measures after the pollution, the natural and environmental damage are not effective san lead to huge economic losses. Therefore, the environmental problems need to be managed before their occurrence.

According to Jugovic, the environmental costs can be classified into four groups:[12]

- Prevention costs, i.e. the costs of activities carried out to avoid environmental degradation;

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[11] EPA, (United States Envinonmental Protection Agency), An Introduction to environmental Accounting as a Business Management Tool: Key concepts and Terms, http://www.epa.gov/gateway/learn/, 7.9.2019

[12] Jugovic J., Environmenatal cost management used for improving competitiveness of companies, Ekonomske ideje AI praksa, br.33, 2019, p.48

- Detection costs, costs that arise in connection with the activities of controlling the compliance of products and processes with the relevant environmental standards;
- The costs of internal failure are the costs of activities that are carried out due to the fact that pollution and waste were incurred but not taken out into the environment. The aim of these activities is to ensure that the generated waste does not reach the environment or to reduce the level of pollution to that prescribed by regulations;
- The costs of external failure arise in connection with the activities carried out after the pollution and waste have reached the environment, for the purpose of their treatment, i.e. the payment of fines that the company, due to non-compliance with legal provisions regarding environmental protection, bears. One part of the costs of external failure borne by the company itself belongs to the group of private costs, while the other part of the costs, which are borne by parties outside the company, that is, the social community, are the so-called social costs.

Environmental costs need to be identified, systematized in accordance with accounting needs and included in the financial report in order to be able to move quality financial statements adjusted to the needs of environmental decision-making.

3. POSSIBILITIES OF USING ENVIRONMENTAL ACCOUNTING IN COST MANAGEMENT OF GREEN BUSINESSES

For efficiently manage the environmental costs and reduce costs and the impact of environment to a minimum, it is necessary to have quality and timely information. Environmental accounting provides a clear picture of materials costs, energy, external and internal negative impact on the environment, as well as the composition of harmful emissions and waste in the technological process. The goal of environmental accounting is to increase the amount of relevant information in order to set priorities in decision making. Therefore, it uses data about environmental costs and achieved environmental performance.

Accounting in green businesses is an important tool for understanding the natural environment's role in the economy and provides adequate data on contribution of natural resources on the economy. At the same time they also concern towards the effect of pollution on natural resources, degradation

increases cost. Therefore, the accounting in green businesses has two purposes, one is to improve the financial environmental performance in the business and the other is to check how the operations of the organization have an effect on the environmental system.[13]

The accounting in green businesses is related to environmental information and environmental ecosystem i.e. it deals with accounting and management issues relating to environmental and social impacts, regulations and restrictions, safety, environmentally sound, and economically viable energy production and supply. UN defined accounting in green businesses as identification, tracking, analysis, and reporting of the materials and cost information associated with the environmental aspects of an organization.[14]

Therefore, it can be concluded that accounting in green businesses with its timely, relevant and truthful information gives support in making management's business decisions at different levels of decision-making hierarchy. For this reason, it represents the most important part of the entire business enterprise system and it provide improvement of business system reputation on the market, ensure better communication with stakeholders, provide better access to risk management and it facilitate in discovering additional savings opportunities in using the resources and operating costs.

4. BENEFITS AND IMPLEMENTATION OF ENVIRONMENTAL ACCOUNTING IN COST MANAGEMENT OF GREEN BUSINESSES

The concept of environmental accounting involves all areas of accounting, which must adapt to the new requirements in a business system, because of its orientation to the environment protection up to the lowest level.[15] It includes the identification, allocation and analysis of material flows and their related cash flows, in order to provide insight into the impact of the environment on financial performances.

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[13] Agarwal V., L Kalpaj., "a study of importance of green accounting" International Journal of Advance Research, Ideas and Innovations in Technology, Vol. 4, Issue 5, 2018, p.206 https://www.ijariit.com/manuscripts/v4i5/V4I5-1234.pdf

[14] United Nations, "The Handbook of National Accounting, Studies in Methods Series F, No. 78 Integrated Environmental and Economic Accounting: An Operational Manual," United Nations, New York, 2000

[15] Grey, R., Bebbington J., Accounting for the Environment, SAGE Publications, London, 2003

Environmental accounting is a managerial tool used for many purposes, such as: improving performances in relation with the environment, inventory and controlling costs, more efficient technologies with less pollution, nonpolluting products, etc. Environmental accounting takes into consideration all the costs of a product, including the environmental costs of the buiness. Implementing environmental accounting assumes emphasizing distinct environmental costs, provisions for risks and afferent costs, specific information in explanatory notes (financial report's annotation), etc.

The implementation of environmental accounting in cost management of green businesses insure a balance between the cost and the decrease of the impact on the environment. The benefits can be both external and internal. The diagram presents the general scheme of the benefits. Also, it shows that they are intertwined and that they can not be clearly distinguished. (Figure 2)

Figure 2 Environmental accounting in green businesses
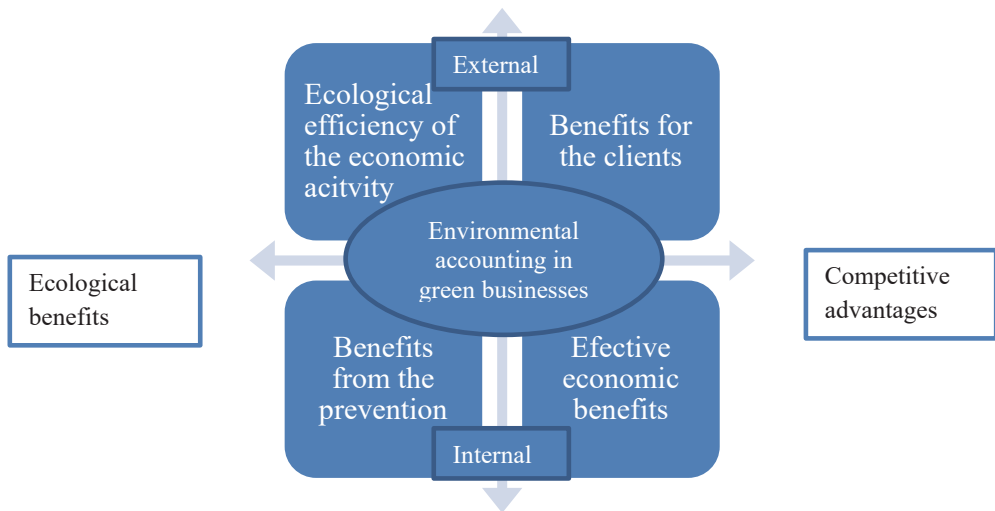
Source: Developed by authors according to the literature review

Environmental accounting helps to make decisions on identifying those responsible for the pollution stemming from commercial activities and the estimated environmental effects and expenditures. In addition, environmental accounting produces information needed in planning to reduce environmental expenditures and different consumption structures. This is associated with physical activities of the green businesses as well as monetary aspect. Moreover, environmental accounting helps in allocation resource for

environmental costs, cost measurement, integration of business decisions and providing information to the external environment.

Conclusion

The purpose of cost management system is to provide information for internal users, especially for mangers and those who are involved in decision making process in green businesses. Cost management identifies, collects, measures, classifies and reports information that is useful for managers for determining the cost of products, customers and suppliers, and other relevant objects and for planning, controlling, making continuous improvements, and decision making. Namely, cost management is not only concerned how much costs the green enterprise is dealing with, but also with factors that drive costs, such as cycle time, quality and process productivity. Thus cost management requires a very deep understanding of an enterprise's cost structure that could be very different and complicated.

In that context, accounting in green businesses is an important tool for understanding the natural environment's role in the economy and provides adequate data on contribution of natural resources on the economy. Environmental accounting is needed in green businesses in order to insure a balance between the cost and the decrease of the impact on the environment.

Acquired results from above theoretical research direct to the recommendation for better awareness of managers in green businesses for benefits of environmental accounting in better cost management and decision making in allocation resources for environmental costs.

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ISIDORA LJUMOVIĆ*
AIDA HANIĆ**

CHARACTERISTIC OF CROWDFUNDING CAMPAIGNS RELATED TO THE CIRCULAR ECONOMY PROJECTS: EVIDENCE FROM EU COUNTRIES

Abstract

Ever since 2010s, EU is the leader in the concept of circularity as a new socio-economic paradigm. Due to the nature of circular projects, they are faced with financing difficulties. Crowdfunding emerged as an alternative source of finance that has the potential to enhance projects with environmental and social aspects. The focus of this paper is to explore the characteristics of the crowdfunding campaigns of the circular economy project in the EU countries and to determine do start-up projects located in a country with better circular rank have a higher probability of launching a crowdfunding campaign. Using the data from "*Kaggle.com*" open-source repository and Politico as a circular economy index, we found that circularly oriented crowdfunding could be a suitable source of finance for circular projects in terms of positive statistically relevant relationship between the probability of launching circular campaign and the success. At the same time, results suggest that the probability of launching the circular campaign is higher in countries with the lower rank of chosen index of circularity.

Keywords: Circular economy, Crowdfunding, EU, Kickstarter campaigns, Politico circular economy index
JEL Classification: G23, O44

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* PhD Senior Research Associate, Institute of Economic Sciences, Belgrade, Serbia, isidora.ljumovic@ien.bg.ac.rs
** Ma Research Assistant, Institute of Economic Sciences, Belgrade, Serbia, aida.hanic@ien.bg.ac.rs

1. INTRODUCTION

The concept of a Circular Economy (CE) gained attention in global business and academic community. The number of published articles regarding CE exceed 4000 records in Scopus and Web of Science database in the period of 2016–2019 (Camon Luis and Celma, 2020). The implementation of a CE requires new business model which can have two directions: from the top down through policies and legislation or from the bottom up through firm competitiveness and profitability (Lieder and Rashid, 2016). In that aspect, circular business model (CBM) can be a solution for creating new socio-economic paradigm based on zero waste, improved environmental impacts and better economic conditions (Oghazi and Mostaghel, 2018).

In order to implement and scale CBM, access to finance can have a big impact on this process. In practice, companies or entrepreneurs that are trying to implement CBM need to consider two factors: lifetime of the product that needs to be longer than in the linear model, which affects the costs and the current revenue model they use. This implies the need to gain access capital for the implementation of CBM or to finance various types of projects. Crowdfunding is considered to be one of the solutions defined by Mollick (2014) as *"the efforts by entrepreneurial individuals and groups – cultural, social, and for-profit – to fund their ventures by drawing on relatively small contributions from a relatively large number of individuals using the internet, without standard financial intermediaries"*. In practice, it is a form of social lending (Devi Bhaskar et al., 2015), used to finance new ideas or existing ventures (Lehner, 2013), that can foster sustainability (Block et al., 2018) and impact public and the media (Mollick, 2014; Stanko and Henard, 2017) or it can be used as a marketing tool (Hörisch, 2018). For this purpose, we are focused on the characteristic of crowdfunding campaigns related to the circular economy projects from the EU countries. We argue that orientation of a country to circular economy influences the decision of an individual to launch crowdfunding campaign with elements of circularity.

2. LITERATURE REVIEW

The concept of the circular economy appeared in the sixties of the last century but is put in the centre of attention recently. First known definitions of the circular economy highlight the idea of closed systems where the outputs of

all parts of the system are linked to the inputs of other parts (Boulding, 1966). The circular movement grew over time, introducing other elements into the explanation of the term. In addition to the first definition, Stahel & Reday-Mulvey (1976) added life extensions of products concerning the ecological aspect of the process based on reuse - repair - reconditioning – recycling (Stahel, 1982). Recent analyses point out that circular economy is many things related to the R's concept: Reuse, Recycling, and Remanufacturing (Blomsma & Brennan, 2017); Regenerate, Reduce, Reuse, Recycle and Recover (Brennan et al., 2015; Kirchherr et al., 2017).

Since the early 2010s, CE gained global attention and became one of the EU's main policy priorities (Taranic et al., 2016). In 2015, the European Commission published the Circular Economy Action Plan where CE is observed as an *"economy where the value of products, materials and resources are maintained in the economy for as long as possible, and the generation of waste is minimized".* This means that the aim of the implementation of CE is "*to give a new boost to jobs, growth and investment and to develop a carbon neutral, resource-efficient and competitive economy".*

Although the concept of CE is widely used in EU documents and legislation (Sverko-Grdic et al., 2020), the level of implementation differs among member states. This situation is expected given rounds of enlargements within the EU, the size and the level of development of the member states' economies. In 2018 the EU brought a set of indicators for CE monitoring framework in the member states. The proposal presents ten indicators, based on existing information from Eurostat, the Raw Materials scoreboard, and the Resource Efficiency scoreboard (EC, 2018). Another, more convenient index was developed by Politico, a circular economy index, ranking the European Union's (EU) progress on reducing waste and boosting recycling, based on data from Eurostat and the European Parliament. This index evaluates seven key metrics: annual municipal waste per person, annual food waste per person, municipal recycling rate, trade of recyclable raw materials, material reuse rate, circular economy patents and investments in circular economy sectors — to rank the EU's 28 countries. According to this index, in 2018 Germany, Great Britain and France were ranked as top three. These three top countries invested 31 million EUR while other member states made less investments in this sector. In this paper we, opted to use this indicator.

Even though they are middled ranked in Politico index, Nordic countries aim is to *"make the circular economy-thinking more mainstream"* (Moving towards a circular economy – successful Nordic business models, 2015). For

instance, in 2016, the Government of Denmark launched a white paper on the circular economy with the aim to create conditions for new innovative business models. In that aspect country set up the Advisory Board for a circular economy which in 2017 gave 27 recommendations aiming to promote a Danish transformation into a circular economy (Moving towards a circular economy – successful Nordic business models, 2015). In 2018, Denmark invested16 million EUR with the aim to strength companies and motivate them to improve circularity (The Danish Strategy for Circular Economy, 2018).

Though the European countries are very supportive regarding CE, access to finance has a big impact regarding the implementation process of CE. Provision of financial services enables new ideas, investments and further growth. Poor access to financial resources is the result of various imperfections in the financial market, on the supply side and the demand side. The development of new technology raised alternative sources of finance, among them social capital networks – crowdfunding as the most relevant as a source of finance for start-ups (Angerer, et al., 2017; Brown, et al., 2019).

In 2016, European Commission viewed crowdfunding as a *"supporting innovative ways of connecting savings to growth and diversifying the funding sources for European businesses is crucial to improving growth and job creation in Europe"* (European Commission, 2016). There is a trend from 2011 regarding rise in crowdfunding in Nordic countries (Ingram and Teigland, 2013) especially in using their own crowdfunding platforms while Kickstarter was available for these countries since 2014 (data from Kickstarter official website). In 2018, European Commission presented a proposal for the regulation on crowdfunding services providers which will enable platforms to easily provide their services across the EU. The proposal was adopted in 2020 in terms of harmonizing the regulation in all member states.

According to Petruzzelli et al., (2019), every crowdfunding project needs to have a project creator, the backers, the crowdfunding platform, the campaign itself, and the crowdfunding outcomes. Regarding crowdfunding platforms, they are a concept of interaction of social networks and small venture capital with the adoption of microfinance aspects, where individuals and companies can raise relatively small amounts of funds for their projects from a larger number of investors.

Main crowdfunding platforms operating today are Kickstarter, Indiegogo, Patreon, GoFundME, Chuffes and similar. Crowdfunding platforms can be in form as a reward-based, donation-based, lending-based and equity-based (Stanko & Henard, 2016). Donation-based platforms aim to raise funds for

non-profit projects, for the implementation of social goals. Reward-based crowdfunding offers products or services to the crowd in exchange for funds. They can be keep-it-all (KIA) and all-or-nothing (AON). Debt-based social capital platforms operate similarly to credit institutions, investors borrow funds and expect principal repayments plus interest rates. Crowdfunding platforms that enable fundraising in exchange for equity are focused on entities that are already registered and have a certain level of business.

3. METHODOLOGY

Kickstarter platform is one of the most cited, analysed, oldest and largest crowdfunding reward-based platform (Kuppuswamy and Bayus, 2014). In that aspect it was also used in this research. Kickstarter was launched in 2009 and hosts project from 15 categories where art, comics and illustration, design and technology, film, food and handicrafts, games, music and publishing are the main categories. Campaigns on the Kickstarter can last up to 60 days. It implies "all-or-nothing" funding model, if the target amount is not collected, the money is returned to the backers.

3.1. Sample

In this research we used data from an open-source repository, "Kaggle. com", for the period 2009-2019. We modified data in several steps. First, we included only the campaigns from the EU countries plus the UK. Then, we excluded projects that were cancelled, suspended or on-going, since they are not relevant for our research. Finally, we followed the Cumming et al. (2017) and Butticè et al. (2019) and left out the campaigns with the goal below USD 5,000 or over USD 500,000. The final dataset included 18,963 EU based project campaigns with detail information on crowdfunding campaigns.

3.2. Variable and Descriptive Statistics

As presented in the literature review part, current literature mainly provides evidence concerning whether sustainable entrepreneurial initiatives increase the odds of success. However, only a few studies analyse the country of the origins of the campaign and how the institutional setting influences the likelihood of launching green campaigns. Cumming et al.

(2017) analysed clean-tech crowdfunding campaigns, hypothesizing that the levels of diffusion of clean-tech campaigns are higher in countries with low levels of individualism. Butticè et al. (2019) studied the relationship of the institutional setting and the environmental sustainability orientation in terms of the emergence of green initiatives on crowdfunding platforms. The probability of a crowdfunding campaign being green is lower in countries where institutions are more oriented towards environmental sustainability, measured by the EPI index.

As inspired by this research, we argue that the emergence of campaigns oriented to circular economy should be higher in countries with higher circular performance, measured by the index related to the circularity. In analysing project related to the circular economy, we followed the work of Butticè et al. (2019) and used econometric estimates where the dependent variable is a dummy, indicating whether a crowdfunding campaign relates to a circular economy initiative or not and classification by Cumming et al. (2017) in testing the hypotheses and identify projects that integrate the principles of the circular economy. For this purpose, we performed a text analysis technique by searching predefined keywords related to the concept of the circular economy: „circular economy", „reuse", „renewable", „recycle", „renewable", „remanufacture", „regenerate", „fuel consumption", „waste", „cleantech", „Greentech", „GHG", „low-carbon", „environmental", "sustainable", „ecology", „eco-", „solar", „biomass", „hydro" and "wind". In our sample of 18,963 EU based project campaigns, we identified 502 campaigns as circularly oriented, that is 2,6% of total campaigns.

As for the crowdfunding campaigns, we used data on whether the campaign belongs to the concept of the circular economy (circular), defined as dummy =1 if the identified activities are related to the concept of the circular economy, 0 elsewise; campaign success *(success)*, defined as dummy = 1 to one if the funding amount is higher than the target amount; 0 elsewise; campaign duration *(duration)*, as the length of the campaign duration, the goal of the campaign (*target_capital*), as the logarithm of the target capital to be raised (for campaigns based on a currency other than USD, the authors of the dataset convert the amount into USD at an annual average exchange rate); launched year (*year*) referring to the year the campaign was launched and Politico, a circular economy index ranking (*politico*) measuring the circular orientation of the focal country.

In Table 1 we report statistic on the number of circular and non-circular campaigns across countries. The largest number of campaigns are

located in the UK, followed by Germany, France, Italy and Netherland. Relatively to this, the number of circularly oriented campaigns are distributed similarly. Nevertheless, if we look at the share of circular campaigns in total, surprisingly, three countries stand out: Hungary (8.11%), Slovenia (7.81%) and

Table. 1 Comparison between circular and non-circular campaigns across countries

Country	Number of non-circularly oriented campaigns	Number of circularly oriented campaigns	Total number of campaigns	% of circular campaigns in total	Politico index
AT	264	7	271	2,58%	9
BE	265	2	267	0,75%	8
BG	30	1	31	3,23%	24
CY	6	0	6	0,00%	28
CZ	58	1	59	1,69%	4
DE	1709	48	1757	2,73%	1
DK	383	33	416	7,93%	13
EE	12	0	12	0,00%	17
ES	997	32	1029	3,11%	10
FI	34	0	34	0,00%	22
FR	1403	31	1434	2,16%	3
UK	9428	213	9641	2,21%	2
GR	85	3	88	3,41%	26
HR	20	0	20	0,00%	19
HU	34	3	37	8,11%	15
IE	295	9	304	2,96%	25
IT	1373	49	1422	3,45%	5
LT	32	0	32	0,00%	20
LU	25	1	26	3,85%	11
LV	17	0	17	0,00%	23
MT	8	0	8	0,00%	27
NL	1073	38	1111	3,42%	12
PL	146	1	147	0,68%	6
PT	22	0	22	0,00%	16
RO	36	1	37	2,70%	18
SE	638	24	662	3,63%	14
SI	59	5	64	7,81%	7
SK	9	0	9	0,00%	21
Total	**18461**	**502**	**18963**	**2,65%**	/

Denmark (7.93%), all three middled ranked according to the Politico index. Statistical correlation between the share of circular campaigns across countries and Politico index is statistically significant with the negative coefficient (Pearson Correlation coefficient = −0.616, p-value < 0.01), suggesting that the probability of launching the campaign in countries with the lower value of Politico index is higher.

As we assumed projects related to the concept of the circular economy are rather grouped around several categories, rather than evenly dispersed. In our chose sample fashion, design, crafts and food stand out (7.4%; 6.6%; 4.9 and 4.5%, respectively) in relative terms. In absolute terms, however, fashion (131) is followed by technology (115), design (76) and food (58). These results are as expected, as the nature of the campaigns related to the concept of circularity is rather unique compared to other projects.

Table. 2 Comparison between circular and non-circular campaigns across categories

Category	Number of non-circularly oriented campaigns	Number of circularly oriented campaigns	Total number of campaigns	% of circular campaigns in total
art	931	11	942	1,2%
comics	301	2	303	0,7%
crafts	233	12	245	4,9%
dance	85	0	85	0,0%
design	1070	76	1146	6,6%
fashion	1648	131	1779	7,4%
film & video	2115	21	2136	1,0%
food	1234	58	1292	4,5%
games	2741	33	2774	1,2%
journalism	349	6	355	1,7%
music	1093	3	1096	0,3%
photography	590	3	593	0,5%
publishing	1658	30	1688	1,8%
technology	4064	115	4179	2,8%
theatre	349	1	350	0,3%
Total	**18461**	**502**	**18963**	**2.65%**

3.3. Results

To evaluate the characteristics of crowdfunding campaigns of circular projects in the EU countries, we performed probit estimation since all variables are discrete and binary. Table 3 reports the results of our estimates. For the analysis, we used variables as described in the prior part of this paper, where the dependent variable is the dummy differentiating projects that are related to the concept of circularity (variable=1) from those who are not (variable=0). This way, we estimated characteristics that have the odds to contribute to the campaign being circular and related the circular index to the probability of launching a campaign. We found statistically significant positive relation for several factors, including success, politico, year and a certain type of categories. Campaigns that succeeded are positively related to its likelihood of being circular (0.411, $p < 0.05$), with the odds to be circular increases as the amount of money requested increases.

Politico is positively correlated to the likelihood of being circular, pointing out to the fact that higher values of rang indicate better odd of launching a circular project. Since higher values of the index suggest lower ranking, these results point out to the fact that the odds of launching a circular campaign are better for countries that are ranked lower. Also, this indicated, despite our initial claims, that that the emergence of campaigns oriented to the circular economy is not higher in countries with higher circular performance, measured by the Politico index of circularity. Variable related to timing suggests a statistically significant positive coefficient. We interpreted this as a fact that recent campaigns have more odds to be circular. Variable related to the duration of the campaign and goal expressed as logarithm value did not have a significant result.

Finally, results related to the variable category, confirm that circular projects are concentrated around several major categories. We interpret results compared to a baseline category art. Positive statistically significant coefficients exist for categories technology, food, fashion, design and crafts. Compared to baseline category art, campaigns in these categories have a higher probability of being circular. On the other hand, category music, has a statistically significant negative coefficient, pointing out that projects in this category have a lower probability of being circular compared to the category art. We did not find a significant result for other categories.

Table 3. Binary logistic results

Parametric rating	
(Intercept)	-188,842** (58,91)
success	0,411** (0,1069)
duration	0,002 (0,0043)
politico	0,021** (0,0081)
log_target_capital	0,177 (0,1123)
year	0,091** (0,0292)
theater	-1,476 (1,0471)
technology	0,817** (0,3199)
publishing	0,427 (0,3553)
photography	-0,886 (0,6538)
music	-1,49** (0,6534)
journalism	0,371 (0,5121)
games	-0,116 (0,3519)
food	1,323** (0,3331)
film & video	-0,215 (0,3753)
fashion	1,846** (0,3172)
design	1,515** (0,3311)
dance	-18,135 (8585,635)
crafts	1,416** (0,4245)
comics	-0,659 (0,7723)
art	0[a]
(Scale)	1[b]

Dependent Variable: Boolean Circular
Set to zero because this parameter is redundant.
b. Fixed at the displayed value
Standard errors are in parentheses and
** Significance level: 0.05.

We must note the limitation of this method since we can only interpret these results as significant correlations between variables and not as causal relationships. Our results show that more recent projects, the ones that are more successful and lower-ranked by Politico circular index, increase a favour to be circularly oriented. The implication of the results from our sample points out that crowdfunding could be a suitable source of finance for circular projects. Campaigns related to circular projects have higher success and as such more odds to be financed. Results related to the fact that recent campaigns have more odds to be circular can be explained by the fact the circular economy is rather new phenomena and fast-growing concept. We borrowed the explanation for the results connecting circular index and probability of launching a related campaign from Butticè et al. (2019). They got similar results for environmental campaigns and concluded that when a country puts environmental issues at the top of its priorities, more financial sources are available. In contrast, if the institutional setting is not in favour of circularity, entrepreneurs are faced with limited sources of finance and are prone to use alternative finance, such as crowdfunding. Another impotent issue is related to the clustering of circular campaigns. Results of the analysis on our sample show that circular campaigns are grouped around a few categories.

4. CONCLUSION

In this paper, we have investigated two issues. One is related to the characteristics of the crowdfunding campaigns of the circular economy project in the EU countries, represented by chosen variables. Next, we assumed that start-up projects that integrate the principles of the circular economy and are located in a country with high ranking by Politico have a higher probability of launching a crowdfunding campaign. Using the data from Kickstarter, we found positive statistically relevant relationship, between the probability of launching circular campaign and success, timing and Politico index of circularity. Also, the odds of launching circular campaign are higher among certain categories such as categories technology, food, fashion, design and crafts.

Nevertheless, the paper has several limitations. As mentioned, the results are associations, not causal relationships. Out sample treats only the data from Kickstarter, reward-oriented platform and they cannot be generalized on other types of platforms. As we did not develop an original dataset, we included only available factor in the analysis, while circular orientation can be dependent on many more.

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SILVANA JOVCHESKA[*]

MODERN ORGANIZATIONAL IDENTITY THROUGH DIGITAL MANAGEMENT

Abstract

The organization, which understood its audience well, showed good results in an emergency caused by the virus pandemic with COVID 19. In fact many organizations immediately failed to reorganize, make significant decisions in creating a new organizational identity, and successfully present its new digital organizational identity in front of the audience.

The research done for the needs of this paper provides an analysis of the situation in terms of creating a new organizational identity, new organizational image and the willingness of organizations to respond qualitatively to the challenge of the new digital way of managing organizations. The positive and negative aspects of the digitalization of organizations are also presented and the extent to which human resources are willing to accept the new way of working is calculated. The question is summarized whether they would apply that way in the future if they were allowed to make a choice between the classic way of working, with a physical presence in organizations or the new online work. Research has shown that there is definitely a need for a new way of managing organizations, in a specific so-called crisis period that no one but epidemiologists could have guessed would create a need of quarantine and social distance. It is this new situation that has required companies to be managed in a very different way than the classic one. In such a situation, it is necessary for the managers to monitor the situation with great concentration and to create an organizational climate that will respond positively to the new reality. Creating a new identity for online reality creates a new online image among the public that proved to be effective in this time period.

Keywords: organizational identity, organizational image, new global reality, online operations
JEL classification: M11, M12, M15, D23

[*] Assistant Professor, Ph.D., AUE-FON University, Skopje, R. Macedonia, sjovceska@yahoo.com

Introduction

"Improving and protecting the public face of the company is the basic corporate responsibility that all good managers will instinctively understand and comprehend."

Marshal (1997)

The identity of the organizations is created through its work, communication, promotion to the public. Identity is created, built and maintained over time. To ensure a positive organizational image, managers must manage the identity of their organization, define and code it, and as such convey it to the audience.

Organizational identity is in fact the policies of organizational communication, inside the organization itself and outside the environment. It is a long-term vision of management in terms of how the organization wants to be perceived by the environment and how the organization sees itself. Living in a period of pandemic caused by the Covid virus 19 we are witnessing the need for an extreme change in the vision for the future of organizations, the way we should present it to the public and the way we will communicate with consumers. Adapting to the new environment means adapting to the new virtual way of working and creating a new organizational identity through digitalization of the work process and public relations.

1. CREATING AN ORGANIZATIONAL IDENTITY

One of the basic strategies of modern management is to convey the desired perception of an organization. There is no accepted definition of corporate identity in the scientific literature, but a clear distinction between identity and image is emphasized. Consumers are faced with the dilemma of whether the created image of the organization corresponds to reality. Identity is a pure representation of the organization and shows its character. Identity is what makes up an organization and what are its qualities that are created over time. In fact, the image is how the organization tries to be seen in the eyes of the public. Unlike image, identity is not perceived differently by one or another audience. Identity remains the same regardless of changes in the environment. It defines the organizational characteristics that describe its basic character, through permanent and specific character features. Identity

represents the image of employees in the organization and how consumers and investors perceive them. Identity inspires trust in the audience. In fact, identity represents the corporate character of the organization. So the basic conclusion is that if we understand the character of the organization, then we can understand its identity.

In a situation when we manage the impressions that the organization leaves on the environment, then we are talking about creating a positive image of the organization. Only organizations with a positive image are considered successful companies. Managers strive to have the image and identity at the highest level and to be the same.

The organization daily transmits its own philosophy in order to realize the set strategic plan. The first step is to define organizational policies, and thus create its core mission. The mission of the organization is its set goals and its principles in the work process. The organization through the created identity presents its uniqueness, history, beliefs, philosophy of work. It is therefore ranked in the environment in which it operates. Identity is the essence of an organization's existence and it is difficult to change. If an organization displays a clear identity, it builds public trust.

Organizational identities need to be constantly monitored and appropriately adapted to emerging conditions and relationships. By creating a new identity, an organization changes its relationship with its audience. The modern organization always presents its policy clearly and precisely to the public. The message has a positive effect on brand loyalty. A successful organizational strategy implies a clear message that will build a positive image in the environment, but the fact is that the audience will always have their own image for that organization.

Organizational style is responsible for building a sense of belonging to a particular organization, which helps employees to have a sense of belonging, greater self-confidence and motivation for quality work.

Creating a corporate identity[1]:
• Set goals.
• Design a program that is coherent throughout the organization.
• Positively position the organization.
• Establish the desired identity as part of the integrated strategy.
• Ask if a name change is necessary.

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[1] Katzenbach J.R., Thomas J., Anderson G., The Critical Few: Energize Your Company's Culture by Choosing What Really Matters, Berrett-Koehler Publishers, Oakland, USA, 2018, pg.182

• Check if the new name will be globally acceptable.
• Develop a new logo.
• Create a test - a new corporate identity in the market.
• Apply the new identity consistently throughout the organization.
• Explore the views of different republics.
• Introduce the program.

The theory recognize three basic types of corporate identity[2]:
• Monolithic - The whole organization uses one visual style, instantly recognizable, with a well-known reputation, with strict guidelines.
• Confirmed identity - The parent company retains its own style, but the subsidiaries, each of them has a recognizable identity with its own style - culture - traditions and brands.
• Branded identity - The affiliates have their own style, and the parent company is not recognizable, the brands have no connection with each other and really compete with each other.

Practice shows that you can not always control your image. If identity answers the question - who / what do we believe we are? ', Then the image answers the question - who / what do we want others to think we are? "The image is in the public eye, not in the organization.

An organization that has created its own positive image has[3]:
• visible representation of a person about the organization;
• reflection of the reality of the organization;
• a set of experiences that someone has with the institution / organization;
• image that the audience has of the organization through the accumulation of all messages it receives and decodes.

The organization creates its own image that is managed and controlled in order for the organization to be productive and project a good perception of itself. The organization can not order a good image, a good image. It sells a good image, a good image, not a passive attitude towards the environment. The only way an organization can reach its potential customers - and introduce them to what it can do for them - is through communication; by creating an image and transmitting that image, that image among the audience. The

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[2] Katzenbach J.R., Thomas J., Anderson G., The Critical Few: Energize Your Company's Culture by Choosing What Really Matters, Berrett-Koehler Publishers, Oakland, USA, 2018, pg. 41
[3] Tuff Ch., The Millennial Whisperer: The Practical, Profit-Focused Playbook for Working With and Motivating the World's Largest Generation, Morgan James Publishing, NY, USA, 2019, pg.79

images projected by the organizations reflect the different ways in which the organization is perceived[4]:

- The sender encodes information in the form of a projected image.
- The recipient receives the message and decodes it in the form of the received image.
- Every audience can see the organization in different ways.
- Based on their impressions, the public knows the organization as it perceives it.

Based on those impressions - made over a period of time and gradually accumulated, one on top of the other - the image of the organization develops. Based on that image, the audience perceives the organization and reacts based on it. "Every organization creates its own image even if it does nothing consciously to create it. Communication is a bridge between what we are and the image that others have of us". The image - whether it is an accurate reflection of reality or not - can be created by advertising. Corporate advertising is designed to create a positive position - an image of the corporation itself. There is a need for strategic solutions on how to present certain messages in order to be acceptable to different audiences. A series of ads over a period of time can contribute to a particular image of an organization. Awareness of the company about what is its quality makes it successful. The image is instantly changing and adjusting the visible image of the company. Corporate communication deals with conveying a favorable reputation to an organization. Takes care of managing public expectations. A good image is the result of organizational success. A large number of acts, influences and messages an organization uses and applies to reach its target audience. In this way the organization develops its character.

The character reflects the reality of the corporation. Based on that reflection, the audience perceives the organization and its employees. They make decisions based on what they think the organization is. A good corporate image / image can greatly help the corporation to enter new markets[5]. The image is created based on the images that the audience creates and they decide whether or not they want to have a relationship with that organization. The image creator can be defined as: public relations expert employed to invest in improving

[4] Chapman, White, The 5 Languages of Appreciation in the Workplace, Northfield Publishing, Chicago, USA, 2010, pg. 203

[5] Tuff Ch., The Millennial Whisperer: The Practical, Profit-Focused Playbook for Working With and Motivating the World's Largest Generation, Morgan James Publishing, NY, USA, 2019, pg. 215

the impression that the organization is doing good for the general public. The perception is based on the impressions from the work of the organization, as well as on what the audience wants to believe at that moment. Image is a form of favorable management of impressions among the target audience.

Every organization that is well perceived in an environment, as a rule has satisfied and motivated employees and customers and is respected by its audience. These are the basic factors that contribute to creating a favorable image. Organizations that have a good image, more easily promote their own products, through the good impression gained for its services or simply because of the created awareness of the company. If the public has a good opinion of an organization, it is more likely to cooperate with it and more likely to encourage others to do the same. The financial audience is one of the most important - a favorable image encourages potential investors. "I never buy products from companies I have never heard of. Dating gives birth to favoritism, not contempt."

Many companies become well known for doing good things for people. By doing so they earn respect. Gaining respect affects[6]:
• successful recruitment and selection of staff;
• good perception of the environment for them;
• ability to attract the media;
• good opinion from acquired and potential customers and associates;
• good opinion by state bodies.

All this confirms the fact that a successful organization is the only one that is socially responsible and constantly monitors consumer behavior and constantly adapts to new working conditions.

2. ORGANIZATIONAL IDENTITY IN TERMS OF COVID 19

An organization that understands its audience well is always well positioned. An organization with a good image has priority and will always be one step ahead of the competition. Promoting a favorable corporate image is one of the basic strategic tasks of the organization. If customers do not have corporate images on which to base their opinion, they have difficulty making purchasing decisions.

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[6] Chapman, White, The 5 Languages of Appreciation in the Workplace, Northfield Publishing, Chicago, USA, 2010, pg.56

Image is the result of all the experiences, impressions, feelings, beliefs and knowledge that people have about a company, but the problem arises when the normal reality changes with a state of emergency, a state of pandemic caused by the Covid 19. virus. At that moment, the companies are facing the challenge and how to continue their operations. The priority of every communications manager is to establish the organizational vision, and then to create a strategy for communicating with the public even though the situation in the environment has changed drastically. Managers are aware that the organizational image is a significant business investment that can potentially be repaid much faster at the expense of other investments, so many companies have changed their recognizable image with a new digital one, based on digitalization and modernization. The companies started working online, and changed all physical contacts to digital, virtual ones.

The research done for the needs of this paper provides an analysis of the situation in terms of creating a new organizational identity, new organizational image and the willingness of organizations to respond qualitatively to the challenge of the new digital way of managing organizations. The positive and negative aspects of the digitalization of organizations are also presented and the extent to which human resources are willing to accept the new way of working is calculated. The question is summarized whether they would apply that way in the future if they were allowed to make a choice between the classic way of working, with a physical presence in organizations or the new online work.

3. RESEARCH METHODOLOGY

The research for the needs of this paper was done by surveying a total of 47 surveyed managers. The research was processed using the statistical program package SPSS. To answer the hypothesis set for the needs of this research which reads "if the organizational identity in a certain period is managed digitally, provided that the company has the conditions for it, then the organization is efficient and in an emergency situation, in this case Covid 19". Using the SPSS, Pearson correlation coefficient was calculated in order to determine whether there is a correlation between the digitalization of the company and its successful management of the positive organizational identity.

4. RESULTS

The findings of the surveyed respondents regarding the correlation between the digitalization of the company and its efficiency in specific conditions (in this case Covid19) show that there is a statistically significant positive correlation between:

- digitalization of operations and positive motivation of employees at level p <0.01 (r = 0.377)
- employee motivation and a positive organizational image significance at level p <0.01 (r = 0.377)
- employee motivation and a new online image significance at level p <0.01 (r = 0.548)
- positive communication image and new online image that significance at the level of p <0.01 (r = 0.510)
- digitization of operations and a new online image of significance at the level p <0.05 (r = 0.360)
- digital communication and positive financial effects significance at level p <0.05 (r = 0.288)

Table 1 shows the correlations between the examined variables.

Table 1: Pearson correlation coefficient between the examined variables (N = 47) 10

Correlations											
	1	2	3	4	5	6	7	8	9	10	11
1. consumer beh.	1	,121	-,176)	,024	-,279)	,080	,037	,192	-,099)	-,085)	-,055)
2. dig. of operations		1	-,125)	-,005)	,175 ,	,377**	,063	,092	-,322)*	-,153)	,360*
3. digital communication			1	,275	039	-,040)	,288*	,071	,009	-,059)	-,024)
4. new online image				1	,244	,188	,090	-,130)	-,130)	-,033)	,269
5. employee motivation					1	,377**	-,009)	,023	-,201)	-,052)	,548**
6. positive organizational image						1	,026	,167	-,207)	-,059)	,510**
7. positive financial effects							1	,198	,005	-,234)	,009
8. knowledge transfer								1	-,471)**	-,002)	,284
9. interest in new brands									1	-,039)	-,338)*
10. increased sales										1	-,088)
11. new online image											1 **.

Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Author's research

In contrast to this correlation, the correlation coefficient between the following variables show that there is a statistically significant negative correlation between:

- digitalization of operations and interest in new brands at level $p < 0.01$ $(r = 0.322)$
- transfer of knowledge and interest in new brands, significance at the level of $p < 0.01$ $(r = 0.471)$
- interest in new brands and a new online image significance at level $p < 0.05$ $(r = 0.338)$

For these reasons, the basic hypothesis is confirmed.

Conclusion

Research has shown that there is definitely a need for a new way of managing organizations, in a specific so-called crisis period that no one but epidemiologists could have guessed would create a need of quarantine and social distance. It is this new situation that has required companies to be managed in a very different way than the classic one. In such a situation, it is necessary for the managers to monitor the situation with great concentration and to create an organizational climate that will respond positively to the new reality.

Creating a new identity for online reality creates a new online image among the public that proved to be effective in this time period. The research confirmed the fact that тhe benefits of raising awareness of the need for modern digitalization of organizations and creating a new organizational reality and thus creating a new organizational identity are directly related to the success of organizations and its image. Motivated employees are also effective employees. Pandemic digitization is a motivation for employees. Motivated employees create a positive organizational image which means maintaining the existing and creating a new modern image for the organization. The research also confirmed the link between professional digital communication and the positive image of the organization. All this leads to significant financial effects on the company's operations. And all this leads to a change in traditional attitudes with the new modern management where the satisfaction of online work of employees on the one hand and online cooperation with consumers, on the other hand, is seen as an investment, not an expense. Therefore, the digitalization of organizations realistically increases the value of the organization itself.

The research showed that there is no correlation between the digitalization of operations, knowledge transfer and the image of the organization with the interest in new brands, which means that the pandemic did not arouse interest in new products and items. Emphasis is placed on already known and proven brands.

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JOVANKA DAMOSKA SEKULOSKA[*]
NINOSLAV MARINA[**]

ARTIFICIAL INTELLIGENCE BASED MODEL IN THE PROVISION OF FINANCIAL SERVICES

Abstract

The application of Artificial Intelligence (AI) technology is changing the way of provision of financial services disrupting the entire financial industry. The main aim of the paper is to create a model that will make the influence of AI technology in the provision of financial services visible. The proposed model suggests AI technology as an engine of getting insight into the available archive, current and real-time data of the micro and macro-economic environment. It will help the financial institutions and investors to enhance the understanding and prediction of making stock investment decisions in the highly dynamic internal and external business environment.

Key words: financial services, AI technology, investment decision, model, data
JEL Classification: G11, G12, C45

Introduction

Technological innovations in Information and communication technology (ICT) have been reshaping and shifting the provision of financial services. They lead in the creation of the term Financial technology (FinTech) meaning technologically enabled financial innovation resulting in a new business model,

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[*] Asst. Prof., PhD, University of Information Science and Technology "St. Paul the Apostle" Ohrid, e-mail: jovanka.damoska@uist.edu.mk
[**] Full-time Professor and Rector at the University of Information Science and Technology "St. Paul the Apostle" Ohrid, e-mail: rektor@uisdt.edu.mk

applications, processes or products with an associated material effect on financial markets and institutions and provision of financial services (IAIS, 2017). As one of the FinTech innovations, the AI technology has been disrupting the financial industry. Application of the AI in the financial industry creates new value revolving around data analytics contributing to more efficient decision making.

The AI provides opportunities for FinTech to innovate financial products and services. According to the Survey of global AI in financial services (World economic forum, 2020), risk management currently represents the leading AI implementation area, followed by the generation of revenue potential through new products and processes. The survey reveals that 61% of investment management is mostly specialized in the use of AI to generate new revenue potential, and 50 to 55% of investment management use AI for risk management, process reengineering and automation and client acquisition.

In the first part of the paper, theoretical aspects of AI will be presented together with AI as a digital analytical and decision-making tool for enhancing the efficiency and accuracy of the activities. Then, some of the AI enabling tools and their application in the financial industry will be described. It will be explained how the AI technology can change and add new value to the creation and provision of financial services, particularly to credit evaluation, portfolio management and financial prediction. The AI technology introduces new value in the investment decision process, transforming it to more efficient and smarter one. Hence, in the third part, we suggest a data-knowledge-decision model considering AI technology as a new value in knowledge creation. Through the creation of an Artificial neural network (ANN) as an AI tool, it will be displayed that AI technology can get insight into the available data set of the micro and macro-economic environment. It will help the financial institutions and investors to enhance the understanding and prediction about the highly dynamic internal and external business environment in the process of making an investment decision. In the conclusion part, the summary of the research will be presented and the proposals for future research will be provided.

1. THEORETICAL BACKGROUND

AI technology has been experiencing rapid progress since it has become an integral part of the activities of any entity which creates information based competitiveness. The AI has changed the way of playing the business, disrupting the traditional models of functioning. AI is becoming a supporter

and enabler of almost every situation and activity in finance, personalized shopping experience, automated customer support (Bahrammirzaee, 2010; Pannu, 2015; Li et al., 2017; Magnimind, 2019). McKinsey Global Institute (MGI) has identified financial services as one of the leading sectors of adoption of AI technology (McKinsey Global Institute, 2017)

The drivers of the implementation and adoption of AI in banking and finance involve competition, massive data sets, a growing number of commercial AI offerings, financial specific AI products, customer experience and customer engagement (Hall, 2018). The main motivations for applying AI in financial services, Fernandez (2017) has identified information processing as a basic function of financial services, large data volumes and the changing environment. AI tools contribute to increasing efficiency, reduce costs, boost analytical capacity, and automate operating activities and processes. Hefty importance and application of the AI tools are significant as an advisory tool in making an investment decision.

AI methods are becoming the most valuable tool in the functioning of financial markets (Bahrammirzaee, 2010). They are aiming to facilitate the credit activities, the supply of the financial products, the prediction of financial trends, the simulation of financial and investor's behavior, the asset portfolio management, the pricing stocks, the determination of optimal capital structure, the prediction of security price movements etc. Culkin and Das (2017) provide a brief overview of the ideas in AI and learning models and explain how they could be mapped to financial issues. Regarding the financial markets (Bahrammirzae, 2010) has chosen the three most important artificial intelligence applicability domains like credit evaluation, portfolio management and financial prediction and planning. The information technology has facilitated the creation and use of big data and applied statistics for financial risk measurement and management and AI and machine learning is now used to leverage the data further (Frame et al. 2018).

The predictive role of the AI systems is identified as one of the main contributions of AI to the financial sector. The AI systems can predict price changes based on the data, market prices and volumes, information provided by social media, macroeconomic records, financial statements and reports. Against the traditional database system, which is inadequate to create knowledge, AI technology as a cognitive system is excelled by the three key capabilities: understanding, reasoning, and learning (Sharda et al., 2015). The cognitive system builds knowledge by learning from previous actions and information and then uses the resulting knowledge base as an engine for discovery and

decision support (IBM Analytics, 2016). The ability of the cognitive systems to understand data not just transactional but also demographic and behavioral, in visual, audio, and natural language form and understand the context of data, is very critical to the financial sector.

2. AI TOOLS IN THE FINANCIAL SECTOR

The main challenges of the FinTech are aimed to facilitate the provision and enhance the financial sector by making financial products more available, predicting financial trends, simulating financial and investor's behavior, asset portfolio management, determining the optimal capital structure, detecting new or changed regularities etc. (Bahrammirzaee, 2010). The AI tools and applications include a range of different purposes, from low-intelligent applications like automation to higher-end intelligence capable of decision making (Basset, 2018). The AI family of intelligent systems is a collection of concepts applicable in different domains. Sharda et al. (2015) have recognized 14 application tools within the AI framework. They identified machine learning, expert systems, artificial neural networks, computer vision, natural language processing, intelligent agents, etc.

Machine learning (ML) is a subset of AI. It has become increasingly applicable in the financial sector as a result of a combination of a vast amount of data, faster computer capabilities and sophisticated algorithms for data analysis. The main task of the ML is the creation of algorithms that make data-driven predictions and decisions using mathematical models (Athey, 2017). The main aim of ML is to learn from the data (Frame et al., 2018). ML methods stress obtaining the best prediction by creating a model based on data identified as the most powerful predictors. Artificial neural networks (ANN) is one of the main techniques of machine learning.

ANN has been using in many business applications for pattern recognition, forecasting, prediction and classification in finance. Biologically inspired, the main processing elements of the ANN are the neurons, the same as the brain's neurons. Sharda et al., (2015) explain that the artificial neurons receive the information from other neurons or external input stimuli, perform a transformation on the inputs and then transmit the transformed information to other neurons and external outputs. Culkin and Das (2017) identify that the applicability of ANN in the financial sector is derived from the availability of large data, the necessity for speed and pattern recognition on the base of data,

where the various inputs are modeled to predict the outputs. ANN is used in stock market prediction based on many variables like streaming data on stock prices, interest rates, volatilities etc. It is also used by banks to determine what kind of e-banking products to offer to the customers.

3. AI APPLICATION IN THE PROVISION OF SOME FINANCIAL SERVICES

The financial sector is turning more to ANN where a wide range of AI applications could be identified in the most essential investment issues like credit evaluation, portfolio management and financial prediction and planning.

Crucial issues concerning the credit application are the decisions on the conditions and the amount of the loan that should be paid to the customer. The evaluation of the creditworthiness of the individuals or the business entities is connected with the process of determining the credit scoring. The AI methods are becoming the prominent tools in assessing and evaluating the credit scoring of the credit applicants. The machine learning tools like ANN deliver very accurate results. ANN is designed by using the financial data of the customers as the input vector and the actual decisions of the credit analyst as the desired output vector (Bahrammirzaee, 2010). This system can deal with the diversity of input information referring to the loan applicant. Jensen (1992) has suggested and proposed a type of ANN as less costly and more accurate than the previous traditional methods. He proposed applicant characteristics like the demographic and credit information as input neurons and on the other hand three categories of payment history as the network output neurons.

Investors rarely put their entire wealth into a single asset or investment. Financial institutions are obliged by law to diversify their investments (Erhardt and Brigham, 2011). The principle "Don't put all your eggs in one basket" is crucial in the process of making an investment decision (Van Horne and Wachowicz, 2009). Determining optimal asset allocation implying to the broad category of assets like stocks, bonds, cash, real estate investment across time horizon and risk exposition is one of the main challenges of portfolio management. Today the investors know properly that wise diversification of their portfolio is a crucial investment decision (Bahrammirzaee, 2010). The diversity and vast amount of information on the micro and macro environment cause the process of making a decision very hard and uncertain. Due to this, portfolio management is one of the suitable areas for ANN application.

Accurately predicting the financial markets is quintessential for investors. Traditional methods of market forecasting used linear and regression model approaches for forecasting time series. Bahrammirzae (2010) suggested the designing of ANN to predict exchange markets, bank's liquidity, inflation and stock markets. A range of researchers have identified ANN as an accurate tool in the forecasting of stock returns, S&P 500 index (Niaki and Hoseinzade, 2013; Sheta et al., 2015), forecasting stock prices (Maia and Carvalho, 2011), forecasting macroeconomic time series like consumption index, interest rate, unemployment (Terasvirta, 2005).

4. AI MODEL IN MAKING AN INVESTMENT DECISION

The capacity of investors to make a profit decision depends on the ability to predict the return and the stock price trend. Thus, the main challenge of this paper is to propose an AI-based model that will improve the predictability of the stock investment decision. The main well known conventional models for stock price trend prediction in financial management are Capital Financial Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT) (Erhardt and Brigham, 2011). These models are linear in determining the stock returns where the historical data are the inputs and the stock return is the output. Their accuracy weakness is connected with the limitation factor, since determining the expected rate of return in the CAPM model is based on the one-factor market portfolio and several macroeconomic factors within the APT model (Haugen, 2010). The investors at the stock markets encounter a very complex and dynamic environment, determining the linear model assumptions not to be applicable in the prediction of stock trends and stock returns (Yuan et al., 2020). To overcome the disadvantages and limitations of conventional models, the AI models have been widely used for stock price trend prediction (Khashei and Bijari, 2010).

The paper suggests an AI model as a tool enabling the investors to make a more accurate investment decision and prevent them from being affected by information asymmetry and market inefficiency. Since the nature of today's financial industry is data-driven, the AI model, as a method of gathering and analyzing archive stock data and all available current data, generates a set of logical and knowledge-based instruction for stock investment. The proposed model is a *data-knowledge-decision model* (Figure 1).

The initial step of the model is an intelligence based data gathering process. The intelligent tools recognize and collect data sourcing from any

available touchpoint, referring to examined stock. The model embraces all sources and forms of data.

In the second step of the model, the intelligent tool of the system processes data and reveals the relationship between the features of the input data. Using the intelligent tool, the system gets insight into the data and creates knowledge about the examined investment issue. Created knowledge as an output represents the recommendation system of deciding to invest or not to invest in the examined stock.

Figure 1: Data-Knowledge-Decision model of making an investment decision
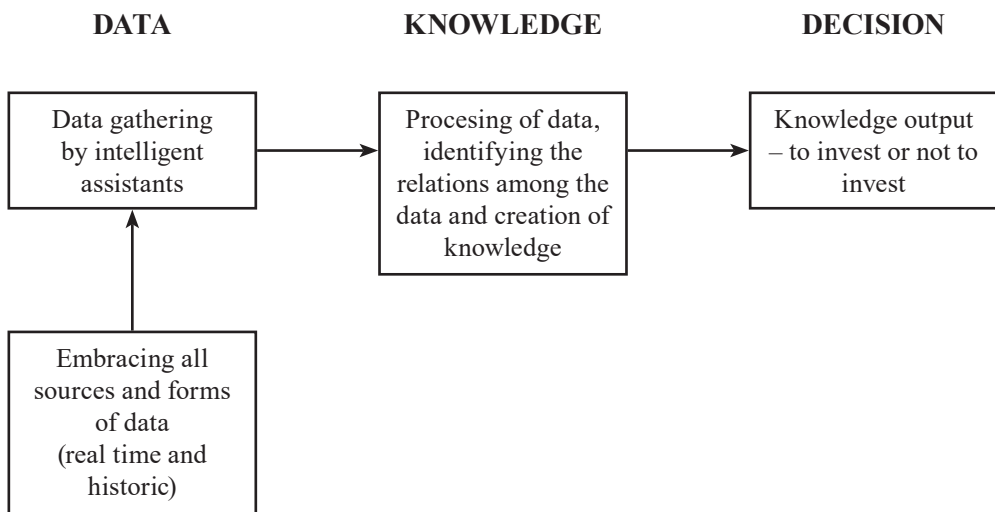
Source: The authors

Using AI tools such as ANN, the intelligent system gets insight into the data and creates knowledge (Alpaydin, 2016). The appropriate AI tool for employment of the proposed Data-Knowledge-Decision (DKD) model is the Artificial Neural Network (ANN). Therefore, the main result of the paper is the construction of a multi-layer neural network model. The model recognizes and gathers all available data valuable to the process of making the stock investment decision. The multi-layer neural network is considered the most prevalent neural network model able to learn complex non-linear functions with a significant accuracy rate (Oztekin et al., 2016). The neural network in this case consists of three layers. They are one input, one hidden and one output layer (Figure 2).

Figure 2: Three-layer neural network of stock investment decision

Input Layer   Hidden Layer   Output Layer
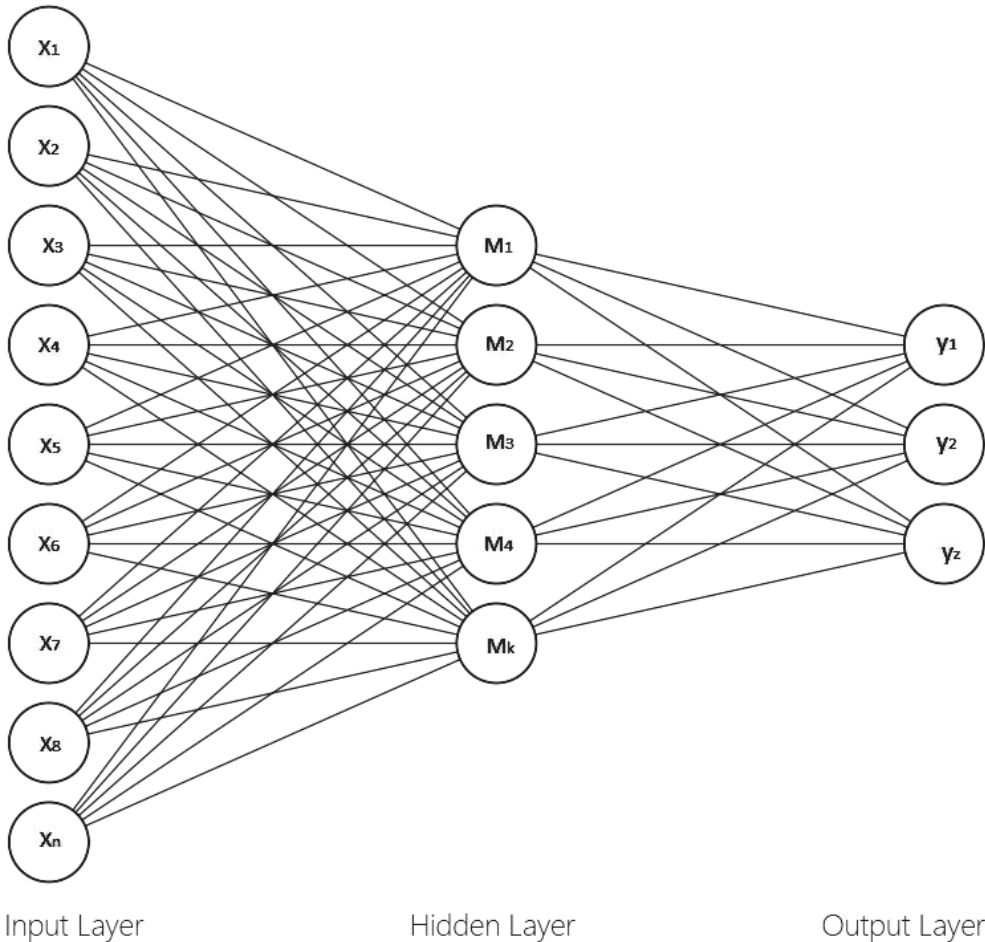
Source: The authors

The input layer is the initial layer consisted of n-nodes receiving various forms of archive and current data, as well as the inferred data. In our model, the investment decision in an asset like the stock could be influenced by the impact of many variables. The input layer consists of data coming from the internal stock and macro environment $(x_1, x_2, x_3, x_4, x_{5......} x_n)$ (Table 1). Since the fluctuations in the financial markets are getting unpredictable, it is crucially important for the input layer to catch any data influencing the stock value for the accuracy and relevancy of the decision.

The data of the internal stock environment refers to all available financial reports and analysis of the company. It encompasses financial ratios

like profitability, liquidity ratios, asset management ratios, debt ratios, market value ratios, audit reports, portfolio of assets, stock index, beta coefficient which measures the stock's tendency to move up and down with the market. The macro-environment data are connected with the economic variables influencing the expected returns of the particular stock. The possible variables include GDP growth, interest rates, exchange rate, tax rates, Consumer price index (CPI), unemployment, stock market returns, the beta of a portfolio, regulatory changes, monetary policy, budget deficit or surplus, payment balance, trade deficit or surplus, the credit rating of the country, stability of the country, environmental issues. From the economic point of view, the important information for an investor is one that influences the investor's decision seeking for his defined financial goals. For example, some announcements in social networks could influence the stock rating.

Table 1: Valuable data inputs

Data variables of the input layer	
X_1	Financial ratios (profitability, liquidity ratios, asset management ratios, debt ratios)
X_2	Market value ratios
X_3	Portfolio assets
X_4	Stock index
X_5	Beta coefficient
X_6	Stock market returns
X_7	Beta of portfolio
X_8	Audit reports
X_9	GDP growth
X_{10}	Interest rates
X_{11}	Tax rates
X_{12}	Exchange rates
X_{13}	Consumer price index (CPI)
X_{14}	Unemployment
X_{15}	Budget deficit or surplus
X_{16}	Monetary policy
X_{17}	Payment balance
X_{18}	Trade deficit or surplus
X_{19}	Regulatory changes
X_{20}	Stability of the country
X_n	…

Source: The authors

The second layer is known as a hidden layer. The nodes of the hidden layer depend on the outputs from the input layer as well as weights associated with the connections. The hidden layer performs computations on the weighed inputs and produces net input which is then applied by the activation function to produce the actual output. The hidden layer reveals the relationship between features of the inputs. The hidden layer is designed to produce an output specific to the intended output. In our model, the hidden layer uses the input data to measure the risk and expected return. People will invest in relatively risky assets only if they expect to receive relatively high returns (Erhardt and Brigham, 2011). The ANN processes and calculates the weight (M_1, M_2, M_3, M_4, ..., M_k) of the input data to assess more accurately the risk and the expected return of the asset investment.

The output layer is a third layer that creates the output (y_1, y_2, ..., y_z) in the form of the probability of the stock returns valued from 0 to 1. A higher value of the output indicates a higher probability of increasing the return of the stock in the next period. Hence, it provides promising predictions to invest or not to invest in the stock.

Conclusion

AI technology is growing rapidly and provides solutions for an efficient process of making decisions.

The paper proposes a data-knowledge-decision model as a new value in the process of making a stock investment decision. The model emphasizes the importance of the data as a base to create knowledge about the investment decision. We propose the artificial neural network (ANN) as a more appropriate AI tool for making an accurate investment decision. We have constructed a model as a composition of a three-layer neural network using large data sets where, through the process of learning and revealing the complex interactions of variables input, the AI system produces a prediction for investment. This AI tool has the potential to enhance the efficiency of information processing, thereby reducing information asymmetries. In the input layer, we identify and suggest the set of variables from the internal and external stock environment whose relations should be determined and identified in the hidden layer. The main output of the model is to reveal and predict the risk and return as dependent variables in the AI model of making an investment decision. Created knowledge about the risk and return is a prerequisite for delivering intelligence based recommendations about the intrinsic stock price and decision to invest or not to invest in the stock.

The future direction of the research will be oriented towards testing the model and obtaining the feedback from different stock markets.

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