Riga Technical University
Faculty of Engineering Economics and Management

RTU 62ND INTERNATIONAL SCIENTIFIC CONFERENCE ON ECONOMICS AND ENTREPRENEURSHIP SCEE'2021 PROCEEDINGS

Riga, Latvia, 14–15 October 2021

RTU Press

Riga 2021

Organized within the 62nd International Scientific Conference of Riga Technical University "Scientific Conference on Economics and Entrepreneurship SCEE'2021" Proceedings.
Riga: RTU Press, 2021

Editor-in-Chief

Prof. Elīna Gaile-Sarkane, Riga Technical University, Latvia

Managing Editor

Prof. Dr. Tatjana Tambovceva, Riga Technical University, Latvia

International Editorial Board

Prof. Dr. Ineta Geipele, Riga Technical University, Latvia
Prof. Dr. Natalja Lāce, Riga Technical University, Latvia
Prof. Dr. Inga Lapiņa, Riga Technical University, Latvia
Prof. Dr. Hana Lostakova, University of Pardubice, Czech Republic
Prof. Dr. Leonid Melnyk, Sumy State University, Ukraine
Prof. Dr. Remigijs Počs, Riga Technical University, Latvia
Prof. Dr. Asta Savanevičienė, Kaunas University of Technology, Lithuania
Ass. Prof. Dr. Iveta Šimberova, Brno University of Technology, Czech Republic
Prof. Dr. Tatjana Volkova, BA School of Business and Finance, Latvia
Assoc. Prof. Dr. Armands Auziņš, Riga Technical University, Latvia

Contacts:

Faculty of Engineering Economics and Management
Riga Technical University
Kalnciema iela 6-213
LV-1048, Riga, Latvia
Phone: +371 67089394
E-mail: SCEE2021@rtu.lv

ISSN: 2661-5533 (online)

ISBN: 978-9934-22-679-3 (PDF)

The papers published in this proceeding reflect the opinion of the respective authors. Authors are responsible for the correctness of the publications and the accuracy of the text and technical data.

Authors contributing to the Open Access titles agree to publish their articles under the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Published by RTU Press, Riga Technical University, Kaļķu iela 1, Riga LV-1658, Latvia

CONTENTS

THE CORPORATE AGILITY'S BAROMETER OF THE CONSTRUCTION COMPANY
Kalaj E., Merko F. 4

ENTREPRENEURSHIP IN THE SYSTEM OF RESOURCES FOR THE URBAN AGGLOMERATIONS DEVELOPMENT: CASE OF KRASNODAR CITY AGGLOMERATION
Kolba A., Tereshina M.V. 12

THE CORPORATE AGILITY'S BAROMETER OF THE CONSTRUCTION COMPANY
Locovs J., Gaile-Sarkane E. 21

RENEWABLE ENERGY PROMOTION WITH ECONOMIC INCENTIVES: A CASE OF THE EU
Melnyk L., Kubatko O., Piven V. 32

PROJECT MANAGEMENT IN STATE AUTHORITIES OF SUBJECTS OF THE RUSSIAN FEDERATION: DEVELOPMENT FACTORS AND RESOURCES
Miroshnichenko I., Tereshina M., Shpiro L. 39

MARITIME MULTI-USE APPROACH IN THE BALTIC SEA REGION: OFFSHORE WIND ENERGY AND TOURISM CASES
Neimane L., Ozoliņa L., Saparniene D. 49

GREEN INVESTMENTS AS DRIVERS OF SUSTAINABLE ECONOMIC Growth IN THE EU COUNTRIES: A RETROSPECTIVE ANALYSIS
Pimonenko T., Tambovceva T., Lyulyov O., Us Y. 63

DIFFERENT MODELS OF CAREER REINVENTION AND RETOOLING IN THE POST-PANDEMIC ERA
Raimi L. 73

DIGITAL TRANSFORMATION AND THE CHANGING SHAPE OF QUALITY MANAGEMENT PRACTICES
Robertsone G., Lapiņa I. 82

THE ROLE OF AUDIENCE SEGMENTS ON MEDIA CONSUMPTION
Saulīte L. 100

MODEL FOR EVALUATION OF THE SUCCESSFUL MEDICAL DEVICE PROJECT
Semjonova N. 113

https://doi.org/10.7250/scee.2021.001

HOW DIGITAL ARE ALBANIAN ENTERPRISES: A MICROECONOMIC ANALYSES

Ermira KALAJ[1], Flora MERKO[2]

[1] *University "Luigj Gurakuqi", Shkoder, Albania*

[2] *University "Aleksandër Moisiu", Durrës, Albania*

Corresponding author e-mail: ermira.kalaj@unishk.edu.al

Abstract. This paper focuses on the analyses of the digitalization of enterprises and its performance impact in Albania. Using data from 2019 Enterprise Surveys (ES) we try to give answer questions related to digitalization that characterize Albanian enterprises. The survey was a shared project of the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), and the World Bank Group (WBG). The data are collected in Albania between January and May 2019. The objective of the survey is to better understand firms` experience in the private sector. Collected data are based on firms' experiences and perceptions of the environment in which they operate. The paper uses these specific questions to study Internet adoption. ES questionnaires focus on the following questions: (1) Does the firm have a high-speed Internet connection on its premises? (2) Does the establishment have its website? The dependent variable is the performance of the firms measured in terms of sales growth and labor productivity, while the vector of independent variables is composed of enterprise characteristics such as firm size, ownership structure, legal status, region, etc. Moreover, dummy variables are used to capture access to formal banking services and gender ownership.

Keywords*: Information, Firm Performance, Entrepreneurship, Digitalization*

JEL Classification: L15, L25, L26, L86

INTRODUCTION

According to recent studies (Katz et al. 2012; Bertschek et al. 2013; Arvin & Pradhan, 2014) broadband connectivity contributes; to productivity improvements by enabling the implementation of more efficient marketing, inventory management processes; in enhanced innovation by creating new customer applications and services; and in more efficient functional distribution of labor, access to inputs, and customers. Through their websites, enterprises can offer detailed information about their products and services, campaigns, organizations, customers' reviews, and financial statements.

Traditionally, enterprises in developing countries such as Albania have encountered higher barriers in connecting and in gain access to information from markets. The use of the internet (Clarke & Wallsten, 2006; Clarke, 2008; Ferro, 2011) plays an important role in lowering communication costs and barriers to entering new markets. Empirical evidence shows that increased internet adoption contributes to total trade through websites that facilitate communication and trading relationships.

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

Therefore, it is important to study the microeconomic relationship between an enterprise's internet use and economic performance.

1. LITERATURE REVIEW

Few studies investigate the role of digitalization in Albanian enterprises and its contribution to their economic performance. Research is mainly concentrated mainly in the tourism (Noti & Tartaraj, 2016; Kordha, et al., 2019; Pano & Gjika, 2020) and financial service sector (Tolica et al., 2015; Balla, 2020) and analyzing the level of ICT penetration rather than its contribution in firms' performance.

The study of Curraj (2017) on business digitalization in Albania shows that the size, age, and location of the enterprises affect performance and are related to business digitalization more than strategy. Moreover, the entrepreneurial characteristics of the owner impact the level of enterprise digitalization. His research gives evidence that there is growing interest in ICT, digitalization, BI, and KM, but innovation is still at low levels due to limited financial and human resources.

Abedini and Hani (2017) analyze challenges and strategies for reducing the barriers to the adoption of information and communication technology in Albanian enterprises. Their findings indicate a positive correlation between ICT and economic efficiency and the competitiveness of enterprises. Authors conclude that ICT impact is higher are marketing, communication, networks, and resources.

The tourism sector's entrepreneurship is positively affected by ICT use according to Bekteshi (2017). However, the massive use of ICT is not a reality because of the perceived high costs of hardware and software. The results of the paper show that innovation plays an important role in increasing competition in the tourism sector. Innovation deficiencies that are found in this sector, are related to inadequate ICT investments by enterprises.

An interesting study by Gosavi (2017) analyses the adoption of the Internet by female-owned firms in India. Using Enterprise Surveys for 2014 she found out that female-owned firms in the country were more likely to use the Internet than their male counterparts. Similarly, these firms were more likely to use websites to communicate with their clients. The adoption of the Internet by enterprises, in any case, leads to better performance of firms.

Enterprises from Ghana and Nigeria were studied (Karakara & Osabuohien, 2020) to determine whether there are differences in how ICT adoption affects innovation. It was established that competition leads to innovation. ICT usage positively affects innovation of firms in both countries, but the effects are different.

Using the Enterprise Survey firm-level data in the three rounds (2002, 2005, and 2008) Gërguri et al. (2017) investigate the impact of (ICT) and innovation activities on firm performance. The Probit model results show a significant effect of some of the innovation activities determinants, which are under the theoretical literature. Empirical results indicate that larger firms in transition economies tend to carry out more innovation activities than smaller ones.

Further investigation is needed to better understand the level of digitalization of enterprises in Albania and how much this digitalization affects their performance.

2. DIGITALIZATION OF ENTERPRISES

Digitalization plays an important role in all sectors of the economy and enterprises are not an exception. In 2020, the percentage of enterprises that use computers for work purposes with internet access is 98.2 % of the total enterprises (see Fig.1.).

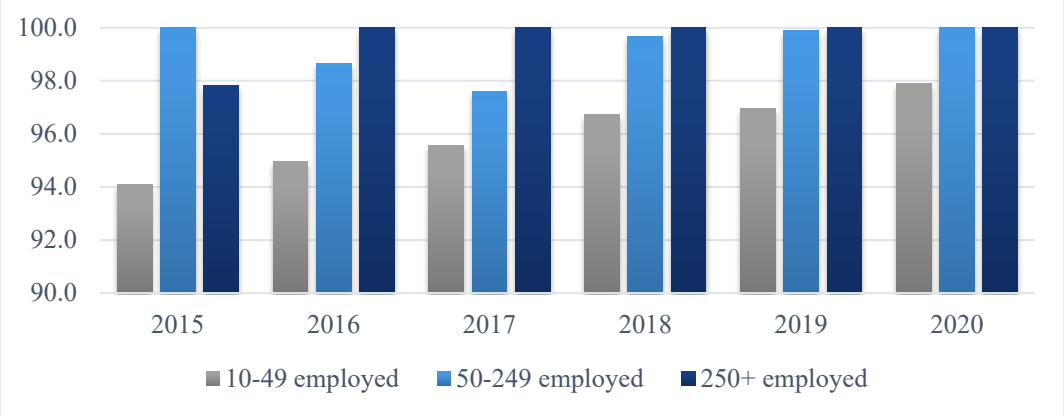


Fig. 1. Enterprises using computers (10+)

However, the percentage of employees using computers at their work remains low as Figure 2 shows.

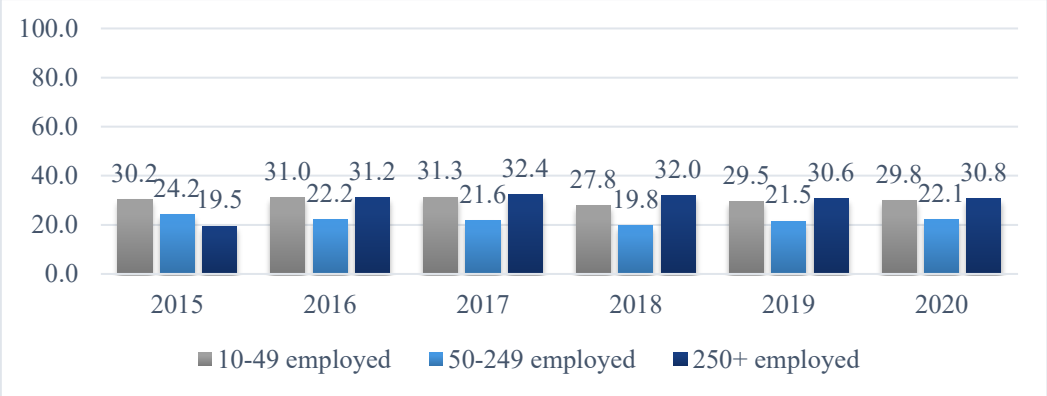


Fig. 2. Employees using computers at their work

According to INSTAT (2020), the share of employees using computers for work purposes is 27.2 percent from 26.8 percent that was in 2019. The lowest share of employees using the computer is respectively in manufacturing activities with 8.0 percent and construction activity with 16.2 percent. Computers are used to a greater level by employees of enterprises that perform in information and communication sectors by 75.5 percent, repair of computers and communication equipment by 73.7 percent, and professional, scientific, and technical activities by 64.9 percent as shown in Figure 3.

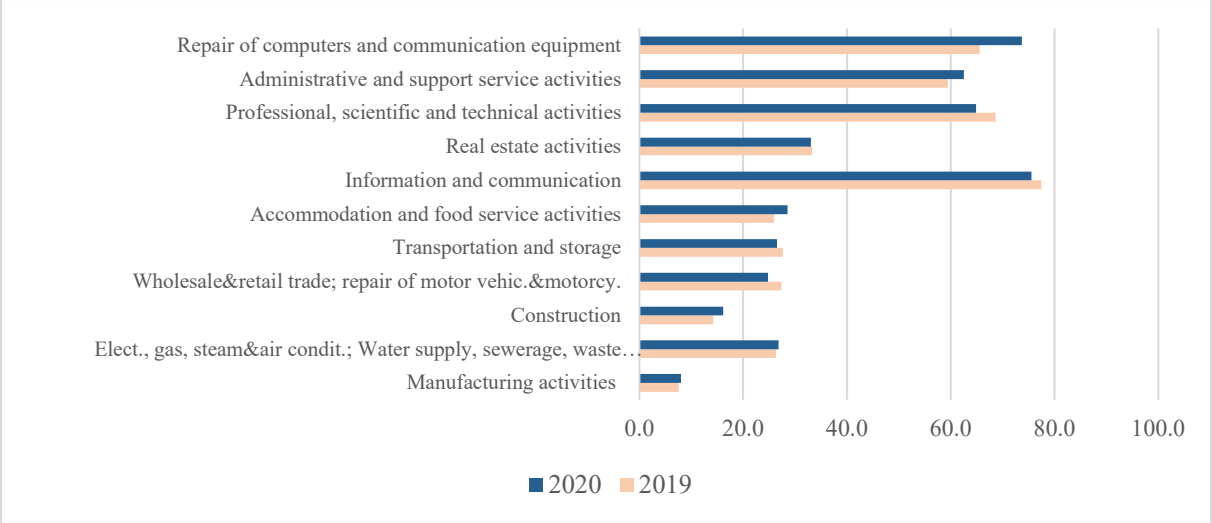


Fig. 3. Employees using computers at their work by sector

In 2020, as Figure 4 represents, 12.8 percent of enterprises have sold products/services via their website or dedicated applications, e-commerce marketplace websites and apps used by several enterprises for trading goods or services.

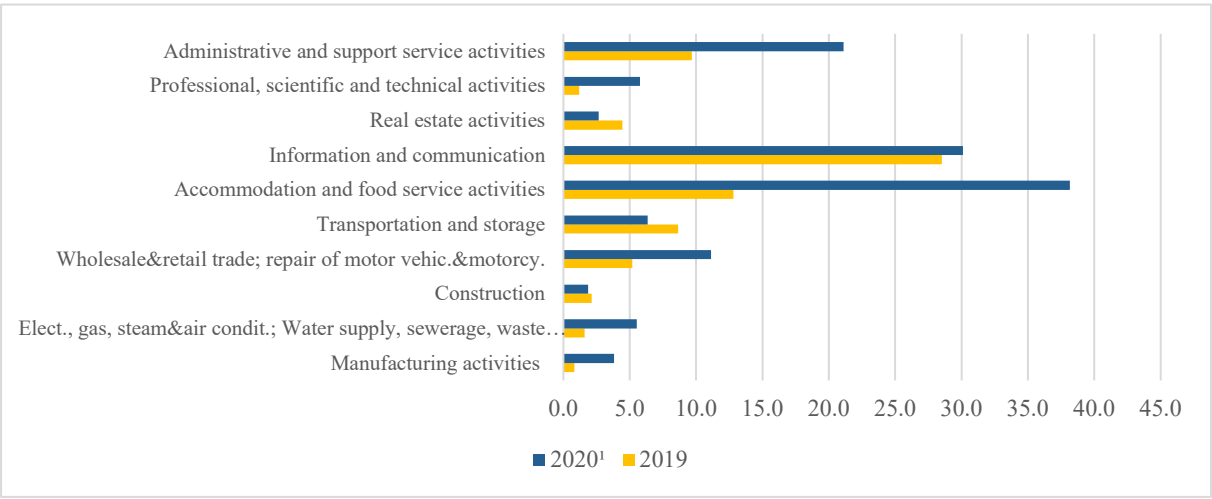


Fig. 4. Enterprises that did e-commerce sales (10+) by sector

The highest share of electronic commerce is carried out by enterprises operating in the accommodation and food service activities by 38.2 percent, information and communication activities by 30.1 percent and administrative and support service activities by 21.1 percent. Still, the trend of online commerce is increasing, and further investigation is needed to better understand factors behind this tendency.

3. EMPIRICAL RESULTS

In this paper, the authors use data from 2019 Enterprise Surveys (ES) and focus on digitalization patterns that characterize Albanian enterprises. The survey was a shared project of the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), and the World Bank Group (WBG), the data are collected in Albania between January and May 2019. The objective of the ES is to

contribute to the understanding of what firms experience in the private sector. Collected data are based on firms' experiences and enterprises' perceptions of the environment in which they operate.

The data are stratified into three levels for Albania: industry, establishment size, and region. Industry stratification was completed as follows: Manufacturing – combining all the relevant activities, Retail, and Other Services. Moreover, 2019 Albanian ES was based on the following size stratification: small (5 to 19 employees), medium (20 to 99 employees), and large (100 or more employees). Regional stratification was done across three regions: Northern Albania comprising Dibër, Durrës, Kukës, Lezhë, Shkodër, Central Albania comprising Tirana and Elbasan, and Southern Albania comprising Berat, Fier, Gjirokastër, Korçë, and Vlorë (WB, 2019).

According to the information related to the existence of the establishment's own website data are collected in graph 5. It is quite controversy that small enterprises respondents confirm the greater percentage of website presence. The fact that service enterprises have the major frequency of websites is consistent with the literature (Curraj, 2017; Gërguri et al., 2017); Balla, 2020).

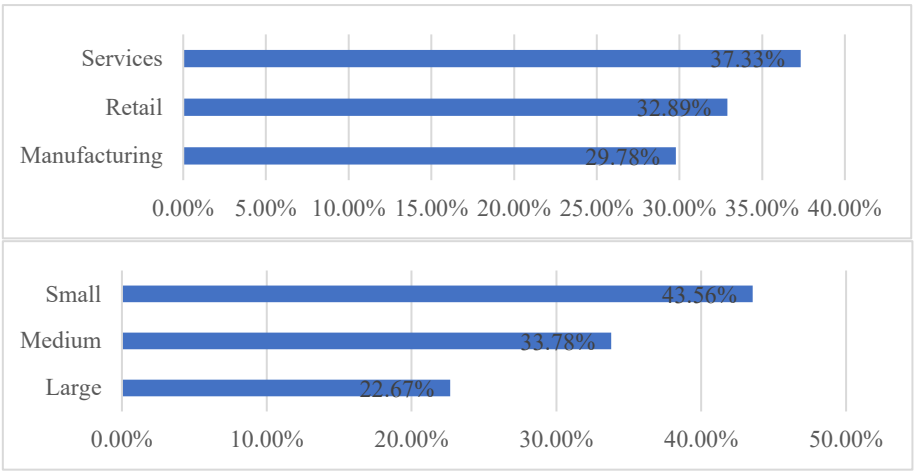


Fig. 5. Establishment has its own website by sector, by size

To investigate the impact of digitalization and give answer to our research questions we use the following model:

$$Y_i = \beta_0 + \beta_1 Internet_i + \beta_2 Website_i + \gamma X_i + \mu_i \quad (1)$$

where:

Y_i is one of the components of performance of the firms measured in terms of sales growth and labor productivity.

Internet and *website* are dummy variables to indicate the adoption of high-speed Internet or the usage of websites by firms,

X_i is vector of variables including: the size, age, status, foreign ownership, location, exporter, and female-ownership etc.

The econometric results of the model are shown in table 1. The first column describes coefficients related to the effect in sales growth of the selected independent variables. To compute the dependent variable sales growth, we follow Clarke et al.

(2015) and Gosavi (2017) and use ES data from the years 2017. As mentioned earlier in the paper we include firm characteristics variables and ICT variables to check for digitalization and its impact.

Table 1. Empirical results on sales growth and labour productivity

	Sales growth (1)	**Labour Productivity (2)**
Has website	0.601	0.042**
	(1.67)	(2.67)
Internet connection	1.31	0.128
	(0.01)	(0.42)
Formal banking	0.117	-0.051**
	(0.31)	(5.46)
Small	0.086	0.048
	(0.26)	(0.14)
Medium	0.118	0.293
	(0.36)	(0.85)
Manufacturing	-0.453	0.0225
	(-1.36)	(0.07)
Retail	-0.182	-0.123
	(-0.57)	(-0.43)
Sole proprietorship	0.279	0.643*
	(0.70)	(2.01)
Foreign owned	0.913*	0.134
	(2.15)	(0.33)
Exporter	0.481**	0.260**
	(10.61)	(9.35)
Female owned	0.260	0.434
	(0.84)	(1.60)
cut1		
_cons	-0.0193	0.239
	(-0.06)	(0.65)
R^2	0.23	0.68
N	377	377

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

According to the results shown in table 1 only few coefficients are statistically significant and further investigation is needed. Enterprises having websites exhibit higher labor productivity than others, and the result is statistically significant, but the magnitude is relatively low. The results are not statistically significant when it comes to sales growth.

Female ownership does not mean statistically higher sales growth or labor productivity. Nevertheless, coefficients have positive signs meaning that there is space for further analyses. These findings are like those of other gender studies in Albania (Kalaj and Merko, 2020). Interesting is the positive result for foreign and exporter enterprises. Enterprises that are involved in export activities are more likely to use both high-speed Internet and websites.

CONCLUSION

This study is concentrated on the analyses of the digitalization of Albanian enterprises. Digitalization is measured in this context by the adoption of high-speed

Internet and the usage of firms' websites. To study this phenomenon, the paper used the World Bank's ES data set for 2019.

Empirical results show that digitalization affects enterprise performance only in part. The effect is positive and statistically significant when it comes to labor productivity. This is quite interesting meaning that employees using digital tools during operations become more productive. Nevertheless, this finding may be more related to the sector. If compared to other sectors, manufacturing-sector enterprises are less likely to use the technology than others.

This study offers an informative frame for the policy formulation on how to help enterprises in their way toward digitalization. Still, additional research is needed mainly by using data during the pandemic to investigate in what direction and how much lockdown periods affected the way enterprises behave in terms of ICT adoption.

REFERENCES

Abedini, L. V., & Hani, R. Z. (2017). Challenges of ICT Approval in Small And Medium Enterprises in the Republic of Albania. *UBT Proceedings*, 43–48.

Arvin, M., & Pradhan, R. (2014). Broadband penetration and economic growth nexus: Evidence from cross-country panel data. *Journal of Applied Economics, 35*(46), 4360–4369.

Balla, R. (2020). Digitalization of Financial Services in Albania Under Restricted Measures Covid-19. *European Journal of Marketing and Economics, II*(3), 17–31.

Bekteshi, L., & Bekteshi, J. (2017). Use of ICT and development of tourism sector in Albania. *European Scientific Journal, 13*(25), 138–149.

Bertschek, I., Cerquera, D., & Klein, G. J. (2013). More bits–more bucks? Measuring the impact of broadband internet on firm performance. *Information Economics and Policy, III*(25), 190–203.

Clarke, G. R., Qiang, C. Z., & Xu, L. C. (2015). The Internet as a general-purpose technology: Firm-level evidence from around the world. *Economics Letters, 135*, 24–27.

Clarke, R. G. (2008). Has the Internet Increased Exports for Firms from Low and Middle-Income Countries? *Information Economics and Policy, I*(20), 16–37.

Clarke, R. G., & Wallsten, S. J. (2006). Has the Internet Increased Trade? Developed and Developing Country Evidence. *Economic Inquiry, III*(44), 465–84.

Curraj, E. (2017). Business Digitalization in Albania: Where do SMEs Stand? *European Journal of Economics and Business Studies, I*(3), 148–152.

Ferro, E. (2011). Signaling and Technological Marketing Tools for Exporters. *World Bank Policy Research Working Paper 5547*, WB.

Gërguri-Rashiti, S., Ramadani, V., Abazi-Alili, H., Dana, L. P., & & Ratten, V. (2017). ICT, innovation and firm performance: the transition economies context. *Thunderbird International Business Review, I*(59), 93–102.

Gosavi, A. (2017). Use of the Internet and its impact on productivity and sales growth in female-owned firms: Evidence from India. *Journal of Entrepreneurship, Management and Innovation, II*(13), 155–178.

INSTAT. (2020). *Usage of Information and Communication Technologies in Enterprises*. Republika e Shqipërisë: Instituti i Statistikave.

Kalaj, E., & Merko, F. (2020). Analyses of Financial Obstacles Facing SME-S: Evidence from Albania. *Scientific Papers, I*(43), 117–121.

Karakara, A. A., & Osabuohien, E. (2020). ICT adoption, competition and innovation of informal firms in West Africa: a comparative study of Ghana and Nigeria. *Journal of Enterprising Communities: People and Places in the Global Economy*, 397–414.

Katz, R., Vaterlaus, S., Zenhausern, P., & Suter, S. (2012). The impact of broadband on jobs and the German economy. *Intereconomics, I*(45), 26–34.

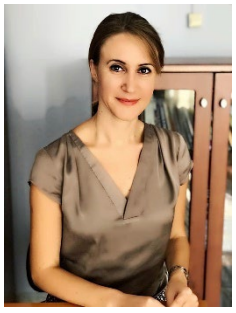
Kordha, E., Gorica, K., & Sevrani, K. (2019). The Importance of Digitalization for Sustainable Cultural Heritage Sites in Albania. *Cultural Sustainable Tourism*, 91–97.

Noti, E., & Tartaraj, A. (2016). E-commerce as an Added Value in the Tourism Services in Albania. *Academic Journal of Interdisciplinary Studies, I*(5), 324–329.

Pano, N., & Gjika, I. (2020). Our Way Towards the Integration of Digital Technology. *Journal of International Cooperation and Development, I*(3), 19–25.

Tolica, E. K., Sevrani, K., & Gorica, K. (2015). Albanian Situation Related to the Factors for ICT Development. In *Information Society Development through ICT Market Strategies*, Springer, Cham, 67–83.
WB. (2019). *Albania 2019 ES Implementation Report*. Washington : World Bank.

AUTHORS' SHORT BIOGRAPHY



Ermira Kalaj is a Professor of Public Economics at the University of Shkodra. She received her Ph.D. degree in "Economics and Management" from the University of Trento, Italy, and her M.A in "Management of Development" from University of Turin, Italy. She is a holder of CERGE-EI Foundation Teaching Fellows Career Integration Fellowship, (2017-2020, 2020-2023).
Ermira Kalaj joined the University of Shkodra in 2015. She previously held faculty positions at the University of Durrës. She has served as Chair of the Economics Department at the University of Durrës from September 2009 to November 2015.
Her current research interests include public sector economics; the effects of immigration; income distribution; and econometric methods for program and policy evaluation.
E-mail: ermira.kalaj@unishk.edu.al
ORCID: https://orcid.org/0000-0003-4692-6055

Flora Merko is a Professor of Economics at the Aleksander Moisiu University of Durres. She completed her higher studies at the Agricultural University of Tirana, Department of Economics in 1994 and Master of Science studies in 2003. She received her Ph.D. degree in February 2008 in "Economy and Agribusiness", and from December 2015 the title "Associate Professor". She is also the holder of the titles "Certified Public Accountant", and "Internal Auditor in the Public Sector", issued by the Ministry of Finance.
Assoc. Prof. Flora Merko joined the Aleksander Moisiu University of Durres in 2014. By May 2015 and on, she holds the position as Head of Economics Department in the Business Faculty of this University, and from June 2020, member of the Academic Senate of this University. For the last 15 years, she continues to give lessons as an invited lecture at the Agriculture University of Tirana, and the Aleksander Xhuvani University of Elbasan. Her scientific research is focused on taxation, good governance, environmental economics, labor market dynamics, economic policies in the function of sustainable economic growth, regional development, etc.
E-mail: floramerko@uamd.edu.al

https://doi.org/10.7250/scee.2021.0002

ENTREPRENEURSHIP IN THE SYSTEM OF RESOURCES FOR THE URBAN AGGLOMERATION DEVELOPMENT: THE CASE OF KRASNODAR CITY AGGLOMERATION

Alexey KOLBA[1], Maria TERESHINA[2]

[1,2] *Federal State Budgetary Educational Institution of Higher Education «Kuban State University», Krasnodar, Russia*

Corresponding author e-mail: mwstepanova@mail.ru

Abstract. Entrepreneurs, as a rule, are one of the significant subjects in the urban agglomeration development. Agglomeration effects create new business opportunities. However, analysis of specific situations does not always confirm these theoretical provisions. The results of the study conducted by the authors in the form of an expert survey to identify the problems and resources of the development of Krasnodar city agglomeration show that the development business is the most active participant and stakeholder in this project. At the same time, companies operating in this area prefer not to take their interests into the public space, but to implement them as part of lobbying activities at the level of regional authorities and municipalities. The interests of entrepreneurs representing other sectors of the economy are latent, and entrepreneurs, being potential beneficiaries of the systemic agglomeration development project, at this stage do not act as an independent entity. Opportunities and risks for most entrepreneurial structures (primarily small and medium-sized businesses) are not aggregated and articulated, which does not allow them to become a driver of agglomeration processes.

Keywords: *Krasnodar city agglomeration, Entrepreneurship, Business, Development, Public policy, Lobbying.*

JEL Classification: O18; R12

INTRODUCTION

Business, both big, for example, the largest retailers, as well as small and medium-sized enterprises, is traditionally considered as one of the significant subjects of the development of urban agglomerations and, at the same time, as one of the main stakeholders of agglomeration projects. Numerous studies conceptualize concentration processes of various types of entrepreneurial activity as a result of the business gravitation towards the cores of agglomerations generating capacious sales markets (Minakir, 2019). Entrepreneurs' interest in the development of agglomerations in general is associated with minimizing costs, as well as achieving positive effects of external (Marshall, 1984) and internal (Krugman, 1991) economies of scale. Researchers interpret agglomerations as poles of economic growth, generation of innovations (Liming Chen, 2021) and entrepreneurial activity. The indicators of the number of small and medium-sized businesses per population are one of the key

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

indicators for a number of methods for assessing the development of agglomerations (Puzanov, 2017).

At the same time, the role of entrepreneurial structures as a participant in the processes of modeling and managing the growth of agglomerations has not been sufficiently studied to date. This problem is also relevant for Krasnodar urban agglomeration, on the materials of which we carried out this study.

The authors assume that as Krasnodar agglomeration goes through various development stages, as well as new types of interactions between the main stakeholders (including proactive budgeting), the relationship between government and business will be subject to new challenges and open up new opportunities. The issues of empowering business in decision-making for agglomeration development, the search for effective tools for cooperation and coordination, ways and means of aligning interests involved in co-managing actors require empirical analysis and theoretical justification. The object of this study is the potential of business structures in the sustainable development of the Krasnodar agglomeration

1. THEORETICAL FOUNDATIONS AND METHODOLOGICAL APPROACHES OF THE STUDY

Stone (Stone, 1989), laid the foundation for the urban regime theory, for the first time defining the role of big business as a participant in "systemic power" to improve the efficiency of urban governance and the formation of its coalition character. This theory formed the basis for a number of research directions in the field of determining the mechanisms of inclusiveness, participation and subsidiarity of business (large, medium and small) as a resource for the development of cities and urban agglomerations (Peters, 2012; Mossberger, 2001).

Most modern research uses the model of urban co-management as a model of sustainable management of urban agglomerations' development, which determines the shift in focus from urban management to urban governance (Edelendos, 2018; Pierry, 1999). This approach is focused on multi-level management, the formation of effective networks of cooperation and the synergistic effect of the participation of various actors (including business representatives) in solving the problems of agglomeration development. The ability of governing bodies and businesses to set collective goals and achieve them, as well as create rules shared by the main stakeholders, makes it possible to respond to modern challenges more effectively (Deng, 2018; Connolly, 2020).

At the same time, despite the growing popularity of the urban co-governance model, the role of business and its readiness for appropriate transformations is rather controversial. There are more and more research questions related to the problem of consolidating multidirectional business interests, the formation of an effective model of cooperation and collaborative algorithms that allow achieving sustainable results, etc. In the Russian scientific discourse, only a few studies are devoted to this issue, considering mainly theoretical problems (Korotkova, 2016; Titov, 2021).

The neoinstitutional approach is the basis of this research. This approach considers the interactions of the actors of political and administrative management as derivatives of the existing rules and regulations of relations, predetermined by the nature of their institutionalization (North). From the point of view of this approach, the process of identifying and overcoming the problems of agglomeration development is mediated

by the current configuration of interests of political and administrative structures and related interest groups. In this context, the direction and nature of the use of political and administrative resources primarily depends on the extent to which the existing institutions of management allow to consolidate and take into account the opinions of the main subjects of development when making decisions.

2. RESEARCH METHODS

The authors chose the expert survey method as the main research method. This made it possible to identify and aggregate the opinions of specialists directly involved in the development of Krasnodar urban agglomeration.

The authors studied the following blocks of questions in the framework of the expert survey "Problems and resources for the development of Krasnodar urban agglomeration" conducted in April-June 2021:

- Choosing a model for managing the agglomeration.
- Establishment of the boundaries of the agglomeration.
- Problems, subjects, resources for the development of the agglomeration.
- Conflicts in the agglomeration development.
- Scenarios for the agglomeration development.

One of the key research questions was to identify the role of business in solving the problems of the development of the agglomeration, the influence on the choice of a model for managing it, and the settlement of emerging conflicts.

The authors interviewed 16 experts representing the scientific community, government bodies, public structures, and the business community. Based on the results of empirical research, the authors made a number of generalizations and conclusions.

The authors also used the analysis of regulatory documents and statistical data to characterize the development of entrepreneurship as a resource an agglomeration development.

3. RESULTS

Krasnodar urban agglomeration has evolved spontaneously for many years and is currently at the initial stage of its development. The following factors were decisive for the agglomeration processes: the administrative status of the regional center - makes it possible to obtain economic rent due to the effect of "capitalism" and the attractiveness of urban space for business and the population; intensive inter-municipal exchanges in the activities of industrial and commercial enterprises; daily commuting from suburbs to the regional a center for educational and labor purposes; large-scale residential development of suburban areas and traditionally high entrepreneurial activity for the South of Russia, contributing to the concentration of places for the employment of labor and the location of production.

The institutionalization of Krasnodar urban agglomeration is associated with three main documents: Strategy of socio-economic development of Krasnodar region until 2030 (Legislative Assembly of the Krasnodar Territory, 2018), Spatial development strategy of the Russian Federation for the period up to 2025 (Government of the Russian Federation, 2019) and Strategy of socio-economic development of the municipality of the city of Krasnodar until 2030 (The city Duma of Krasnodar, 2021). These documents

consider Krasnodar urban agglomeration as an important element of economic zoning and a territory with a diversified innovative economy, rational places of employment, a harmonious environment for business development, a promising large center of economic growth in the Russian Federation, capable of providing a significant contribution to the country's economic growth.

The structure of the economy of Krasnodar urban agglomeration is specific. In the basic industries, the largest share is occupied by retail trade (over 45%), industry (about 40%), construction (about 8%) and transport (about 6%). In addition, the traditional industries that have somewhat reduced their importance in recent years are agriculture and the resort and tourist complex. Manufacturing as a whole is characterized by low added value and insufficient development of "creative industries". At the same time, the leader in terms of key economic characteristics is the trade, transport and logistics complex. A total of 45,356 legal entities and 52,670 individual entrepreneurs are registered in Krasnodar. The development of an agglomeration provides obvious advantages and opportunities for business development, since potential consumers with better paying capacity are concentrated in a limited area, and the population has a demand for a more diverse range of products and services.

According to forecast models, the population of Krasnodar will reach 3 million 200 thousand people by 2040, and in the core of the agglomeration - 2 million 100 thousand. At the same time, the pace of housing construction outstrips the pace of infrastructure construction, and the density of the road network and green public spaces does not meet the standards.

The first agglomeration belt includes Novotitarovskaya, Dinskaya, Goryachy Klyuch, Severskaya and Vasyurinskaya as basic agglomeration centers. At the same time, several municipalities located on the territory of the Republic of Adygea historically gravitate towards Krasnodar. Their location objectively creates a number of advantages in development (proximity to the center of the agglomeration and the availability of free land, relatively cheap labor and housing, etc.), which is confirmed by the accelerated rates of economic growth of these territories in the last decade. The construction of a bridge across the Kuban River, connecting Krasnodar and the Republic of Adygea promoted a new vision of Krasnodar agglomeration development in the field of economic and infrastructural processes of spatial development.

Determining the strategic vision for development and the main points of growth of Krasnodar urban agglomeration is an important factor that can consolidate business interests and create incentives for entrepreneurs to participate in co-management. An attempt to implement this plan is seen in the project for the development of the north-eastern part of Krasnodar. On an area of 2.2 thousand hectares, it is planned to build a new residential neighborhood with social facilities and infrastructure for the residence of about 187 thousand people. An advanced medical cluster will also be built there as well as a multimodal transport hub in the immediate vicinity of the district. Such projects can become an effective tool for attracting investments and developing public-private partnerships. In general, experts believe that in order to create an agglomeration effect, Krasnodar needs a megaproject that would attract not only private, but also public investment to the city.

Systemic problems are associated with the growing imbalance of investments in new housing construction and modernization of the old buildings. Experts emphasize the need to build transparent and open relationships between public authorities, business, housing and communal services and the population.

The strengths of the entrepreneurial and investment sector for the development of Krasnodar urban agglomeration include:

- active promotion of the investment potential of the city, as a result of which the city of Krasnodar is the leader in attracted investments in the south of Russia;
- state support for investors (subsidies, tax incentives, project support);
- a rapidly growing population, a correspondingly growing sales market and a high capacity of the labor market;
- synergistic effect of agglomeration: all other things being equal, agglomeration is more attractive for investments.

Weaknesses include:

- weak diversification of Krasnodar investment portfolio: the main investors are several companies representing one area - housing construction. Manufacturing industries (including the food industry), as well as other high-tech industries in the investment portfolio are not fully represented;
- insufficient use of such instruments as land tax relief, land rent;
- underutilization of the potential of municipal-private and public-private partnerships;
- insufficient efficiency of involvement in the economic turnover of municipal property;
- shortage of sites fully prepared for the implementation of investment projects;
- infrastructural constraints - the quality of engineering and road infrastructure;
- lack of qualified personnel for promising investment projects.

Successful practices aimed at creating incentives for business development within an agglomeration include:

- availability of an approved investment strategy;
- availability of well-developed legislation on the protection of investors' rights and mechanisms for supporting investment activities;
- the presence of an institutional structure - the Council for Improving the Investment Climate;
- availability of infrastructure for the placement of production and other facilities of investors;
- creation of a unified regulation for support of investment projects on the principle of "one window";
- formation of channels of direct communication between investors and city authorities for the prompt solution of problems and issues arising in the process of investment activities.

At the same time, it should be noted that these mechanisms are institutionalized within the city of Krasnodar and are not actually included in the development of the agglomeration as a whole.

Despite the approval of the agglomeration model for the development of the city of Krasnodar, chosen in 2019, experts point to a number of problems in its implementation. These include: lack of a clear understanding of how and in what time frame this model will be implemented; postponement for an indefinite period of the conclusion of an interregional agreement on the development of the agglomeration, the relatively weak interest of municipal and regional authorities in the creation of common governance structures (the lack of interest of Adygea side is especially emphasized).

Also, so far there is little interest from business (with the exception of developer) in this project.

The real estate developers primarily source the lands directly adjacent to the metropolitan area of this agglomeration. Disproportionate development of Krasnodar on the right bank of the Kuban River leads to large-scale development of free spaces in the eastern, northern and western zones and the construction of new multi-storey and cottage commuter towns. The expansion of the commuter towns actually connects the city with the industrial suburbs and satellite settlements, between which there were large spaces of inter-settlement territory.

One of the important development problems that impede the organizational design of an agglomeration is the uncertainty with the choice of its management model. Most experts are inclined to believe that it is necessary to preserve the existing municipalities. At the same time, some emphasize the possibility of creating a single one-tier or two-tier municipality. It should be noted that at present such a combination of municipalities belonging to different constituent entities of the Russian Federation is prohibited by Russian legislation. The best option may be to manage the agglomeration on the basis of inter-municipal agreements, which should be preceded by an agreement between the regions (Krasnodar Krai and the Republic of Adygea).

Business representatives are one of the target groups interested in implementing an agglomeration development project. At the same time, experts note that due to more favorable conditions, namely, low rental rates, businesses are more actively building up land within the Republic of Adygea. This, in turn, causes contradictions between municipalities. This state of affairs can become a serious obstacle to the further development of the project.

Most experts consider the key stakeholders of the project to be large companies with good inter-municipal and inter-regional economic ties. For them, in particular, it is beneficial to place part of their structures directly in the core of the agglomeration, and the other part on its periphery.

Small and medium-sized enterprises close to the, both included in the "first belt" of the agglomeration, and more remote, actively use its resources (wholesale centers, shopping malls, etc.) for their needs. Enterprises at its core, to a certain extent, are interested in the migration inflow, expanding the market demand for its goods and services. In turn, the absence of workers away from the core contributes to such an influx and excess population growth. At the same time, the ecological balance of spatial development can be achieved only in vast territories, since the existing dense development of the core of the agglomeration is unable to provide ecological balance and ecological requirements in the field of green areas, public spaces, and overall environmental quality.

A number of experts believe that at this stage the agglomeration process contributes to the development of production. Development business, retail and related industries are actively growing. There is also a relatively low involvement of business in the formation and implementation of the agenda on basic development issues. Entrepreneurs are "users" of the metropolitan area rather than actors. They are very limitedly represented in the sphere of public policy as such, and practically do not express their opinions on various aspects of the creation and implementation of an agglomeration project.

CONCLUSION

According to expert opinion, a one-tier contractual model seems to be the most acceptable institutional solution for Krasnodar urban agglomeration. Let us note that this is what the municipal legislation of the Russian Federation postulates. However, in practice, more complex variations are possible, since the game involves a number of influential actors who often remain outside the scope of control system modeling. These include, first of all, a number of business structures in the construction industry with increased *opportunities* for lobby at the regional and local levels.

The interests of businesses from other spheres and industries are objectively related to the development of the agglomeration (both positively and negatively), but they are predominantly latent, weakly expressed. Being potential beneficiaries in the implementation of the project of systemic development of the agglomeration, for the most part, business structures at this stage do not act as an independent entity. This is largely due to the lack of mechanisms and institutional foundations that allow aggregating and articulating these interests according to sectoral, territorial and a number of other characteristics.

In general, the authors can argue that the controlled development of the agglomeration, the particularization of its institutional foundations will make it possible to more effectively structure investment entrepreneurial projects in accordance with territorial development projects, smooth out disproportions in spatial development, overcome the limited territorial resources, strengthen network interactions and significantly increase the attractiveness of the project for entrepreneurial structures.

Opportunities for increasing business involvement in the development of Krasnodar urban agglomeration are the following:

- active use of tools of municipal-private and public-private partnerships;
- introduction of additional measures to support small and medium-sized businesses, as well as a more detailed study of investment proposals;
- diversification of the investment portfolio due to the emergence of high-tech projects that are fundamentally new for the economy of the agglomeration;
- elaboration of mechanisms for attracting and supporting medium-sized investors in terms of the volume of attracted funds.

Since inclusiveness is currently becoming an important attribute of the co-management system in the development of an agglomeration, the system of tasks facing the governing bodies requires constant adaptation to rapidly changing conditions in four main areas:

- adaptation of management processes to changes in the agglomeration development, decentralization, understanding the role of business participation and social integration, inclusive management;
- adaptation of the development strategy to the emerging challenges and interests of society, distribution of powers and analysis of the influence of stakeholders on the effectiveness of decisions made;
- determination of issues to be resolved in a collaborative manner, including using instruments of municipal-private and public-private partnerships;
- development of co-management tools in the areas of "smart" city, ESG factors, ecology and decarbonization, circular economy, infrastructure and implementation of information and communication technologies.

REFERENCES

Connolly, C. (2020). From resilience to multi-species flourishing: (Re)imagining urban-environmental governance in Penang, Malaysia. *Urban Studies, 57*(7), 1485–1501. https://doi.org/10.1177/0042098018807573

Deng, F. (2018). Stakes, stakeholders and urban governance: a theoretical framework for the Chinese city. *Eurasian Geography and Economics, 59*(3–4), 291–313. https://doi.org/10.1080/15387216.2019.1570298

Edelendos, J., & van Meerkerk I. (2018). Finding common ground in urban governance networks: what are its facilitating factors. *Journal of Environmental Planning and Management, 61*(12), 2094–2110. https://doi.org/10.1080/09640568.2017.1383232

Government of the Russian Federation (2019). Spatial development strategy of the Russian Federation for the period up to 2025 (in Russian). Retrieved from http://static.government.ru/media/files/UVAlqUtT08o60RktoOXl22JjAe7irNxc.pdf

Korotkova, E., Mokrushina K., Kuricheva E., Zhuravlev S., Irbitskaya I. (2016). Management of the spatial and economic development of the city: hidden resources. - Moscow: Center for Urban Studies of Skolkovo Business School.

Krugman, P.R. (1991). *Geography and Trade*. Cambridge, MA: MIT Press.

Legislative Assembly of the Krasnodar Territory (2018). Strategy of socio-economic development of Krasnodar region until 2030 (In Russian). Retrieved from https://www.economy.gov.ru/material/file/e4e8b9ddede078a93f60f5e7a08fce28/krasnodar.pdf

Liming, C., Rana, H., & Yi, J. (2021). Urban Agglomeration and Firm Innovation: Evidence from Asia. *The World Bank Economic Review, lhab022*. https://doi.org/10.1093/wber/lhab022

Marshall, A. (1984). *Principles of Political Economy*. V. II. M.: Progress.

Minakir, P.A. (2019). Russian Economic Space: Strategic Impasses. *Economy of Region (Ekonomika regiona), 15*(4), 967–980. https://doi.org/10.17059/2019-4-1

Mossberger, K., & Stoker, G. (2001). The evolution of urban regime theory the challenge of conceptualization. *Urban Affairs Review, 36*(6), 810–835. https://doi.org/10.1177/10780870122185109

North, D. (2021). *Economic Performance through Time*. Retrieved on 11.10.2021 from http://www.strana-oz.ru/2004/6/funkcionirovanie-ekonomiki-vo-vremeni

Peters, B.G., & Pierre J. (2012). Urban Governance. The Oxford Handbook of Urban Politics.

Pierry, J. (1999). Models of urban governance: The institutional dimension of urban politics. *Urban Affairs Review, 34*(3), 372–396. https://doi.org/10.1177/10780879922183988

Puzanov, A., & Popov, R. (2017). *Approaches to assessing the development of urban agglomerations*. Moscow: Institute of Urban Economics.

Stone, C.N. (1989). *Regime politics: Governing Atlanta*. University of Kansas Press.

Titov, E.A. (2021). Urban co-management: concept and modern research. *Issues of state and municipal management, 1*, 173–194.

The city Duma of Krasnodar (2021). Strategy of socio-economic development of the municipality of the city of Krasnodar until 2030 (in Russian). Retrieved from https://krd.ru/departament-ekonomicheskogo-razvitiya-investitsiy-i-vneshnikh-svyazey/strategicheskoe-razvitie/strategiya/podrazdel/

AUTHORS' SHORT BIOGRAPHY

Alexey Kolba (Dr. sc. pol.) is a Professor, Department of Public Administration, Kuban State University, Krasnodar, Russia
Research interests: Political and Regional Conflictology, Urban Agglomerations Management Policy; Conflict Management.
E-mail: alivka2000@mail.ru
ORCID: http://orcid.org/0000-0002-7663-8890

Maria Tereshina (Dr. oec.) is a Professor, Department of Public administration Kuban State University, Krasnodar, Russia
Research interests: Green and Circular Economy, Regional Sustainable Development, Urban Agglomerations Management; Regional Economy, Regional Innovative System.
E-mail: mwstepanova@mail.ru
ORCID: http://orcid.org/0000-0001-8982-5831

https://doi.org/10.7250/scee.2021.0003

THE CORPORATE AGILITY'S BAROMETER OF THE CONSTRUCTION COMPANY

Jevgenijs LOCOVS[1], Elīna GAILE-SARKANE[2]

[1,2] *Riga Technical University, Riga, Latvia*

Corresponding author e-mail: jevgenijs.locovs@gmail.com

Abstract. Corporate agility is not a futuristic dream. It is a contemporary tool each construction company should have in its toolbox for daily use. In this article the authors identified and discussed the factors allowing to determine the level of construction company's corporate flexibility. In their approach to determine all the major factors affecting construction company's level of corporate flexibility, the authors used available data from different pertinent sources for systematic literature overviews; they also held interviews with experts in the field. For this purpose, the authors created questionnaire sets to evaluate the level of corporate flexibility within a given construction company. The questionnaire had to determine the existing situation in the company, its functionality within different departments, its collegiality and inter-relationships between co-workers, subordinates, and superiors, to explore the level of corporate flexibility, and much more. Based on the research results, it became possible to make a direct correlation between the level of the corporate flexibility of the given construction company and its performance. The already repeatedly mentioned corporate flexibility directly affected both corporate activities (supportive and primary) and internal and external environment. The research confirmed that corporate flexibility is the balance between the needed bureaucracy and organizational flexibility. In evaluating the results, the conclusion was made that in order to maximize the outcome of corporate efforts, focus should be made on several issues: measures to reduce bureaucracy, and most importantly, the scale of overly high level of responsiveness and flexibility, which may raise concerns about a chaotic and misbalanced structural organization within the company, when subsequent decisions should be made to improve the existing situation and prevent a potential danger.

Keywords*: Corporate agility, Construction company, Performance improvement.*

JEL Classification: L26, M14, M21, O31

INTRODUCTION

As determined by many researchers (Sull, 2010; Aghina et al., 2015; Appelbaum et al., 2017, etc.), corporate agility plays an important role in the successful performance of any modern company. The segmentation (Oberlender, 2000), low productivity (Ritz, 1994), high level of all kinds of regulatory issues (de Witt et al., 2005) and slow pace of modernization (Langf & Male, 2001) bring construction industry to one of the first places among of industries lacking corporate agility. By measuring the corporate agility, it is possible to determine weaknesses in the company (Erande & Verma, 2008). The authors decided to conduct the field research and create a set of questionnaires that would allow to define the level of corporate agility of any

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

given construction company. Consequently, this research would assist the company to identify, based on its level of agility, the weak points in its functionality, and provide guidelines for improvement. A corporate agility of any construction company is shaped by quite a few parameters: Cultural aspects, organizational behaviour, corporate governance, strategy, human capital, etc. The improvement of corporate agility has a great positive affect on the performance of the company (Haneberg, 2011), on its responsiveness and flexibility, its ability to re-adjust responding to internal and external challenges, while using minimal resources.

The authors used the following theoretical and academic frameworks: the finding of Hofstede, corporate governance frameworks; organizational behavior frameworks, the Contingency theory, the Expectancy theory, Maslow's Theory of Human Motivation, the Bureaucracy theory, findings developed by Dr. Ichak Adizes, and also holding interviews with the representatives of construction industry.

The purpose of this article is to identify and give thoughts on the factors allowing to determine the corporate agility level of a construction company.

Methodology is based on literature overview and personal interviews conducted by the authors with different individuals representing construction industry.

There was a scientific goal set: To determine main factors that affect corporate agility of a construction company through interviews with industry's professionals.

The research structured using the so-called four blocks:

1. Identification of the factors allowing to determine the corporate agility level of a construction company;
2. The methodology for evaluation of the corporate agility level of a construction company;
3. Analysis and interpretation of the obtained data;
4. Implementation of the necessary changes.

The current article will review the first two blocks, while the last two will be left for the further research.

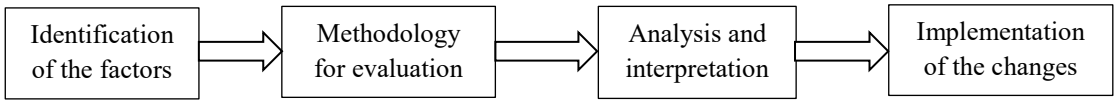


Fig. 1. The blocks of the research (created by authors).

In fact, a company may periodically use this questionnaire not only to determine, but also to monitor the changes.

1. IDENTIFICATION OF THE FACTORS AFFECTING THE CORPORATE AGILITY OF THE CONSTRUCTION COMPANY

Authors performed a systematic literature overview to determine main factors affecting corporate agility of a construction company. The results were confirmed by the interviews performed (face to face or via conference calls) with fifteen CEOs, CFOs, CLOs, Construction and HR Directors, Senior Project Managers from 4 countries and 11 construction companies. All the respondents were asked to list at least

five factors affecting, in their view, the corporate agility of their company. 84 (eighty-four) factors were mentioned. The authors used the content analysis approach to determine main factor affecting corporate agility of a construction company. The responses obtained were organized in broader groups and resulted in 8 (eight) main factors. Each factor has its own level of significance in evaluating the way it affects corporate agility.

Table 1. Eight factors affecting corporate agility (created by authors).

#	**The main factors affecting corporate agility**	**Shares of responses in %**
1	Poor structure (hierarchy, bureaucracy, procedures, experience)	25%
2	Human Resources (broad thinking, motivation, skilled manpower)	23%
3	Poor management	14%
4	Poor planning (including use of technology and analytical tools)	12%
5	Communication (Internal/External. Reputation)	9%
6	Lack of strategy/vision	8%
7	Financial issues	5%
8	Influence of PESTEL factors	4%
	Total	**100%**

The authors reviewed these factors in detail with following conclusions:

- **Poor structure** (hierarchy, bureaucracy, procedures, experience). The interviewed managers have attributed the biggest share to this particular factor. They mentioned that the improper hierarchical structure, operational system, overall unnecessary bureaucracy, incompetent shareholders' intervention in the operational process, rigid ubiquitous approaches do not allow a company properly and flexibly react to the changes. Moreover, even if a potential threat or change/challenge is timely determined, the reaction time appears to be too long and necessary resources to be used are too costly.
- **Human Resources** (broad thinking, motivation, skilled manpower). This factor was considered the next, reaching share of 23%, since the professional quality of all employees play the most important role in the company's success. All experts agreed that the main problem of construction industry is lack of broad thinking and presence of motivated professionals at all levels. This, in turn, leads to the delays and losses due to the poorly performed works. Another important issue related to human resources is a priority given by employees to their own personal goals over those of their team or company.
- **Poor management.** This factor is directly related to the quality of human capital. The lack of self-sample and proper leadership, pessimism among the top management, lack of ability by the top management to inspire the employees, poor and involvement in the daily operational decision-making leads to emotional distress, feeling of mess, of '*running through the thick forest*' instead of '*driving on the paved road'*. The gap between managerial strata enforces the inability of the company qualitatively operate and timely prevent threats and entertain the opportunities.
- **Poor planning** (including lack of use of technology and analytical tools). This factor is a non-stop persisting problem of the construction industry. The construction organizations often lose money because of allowing themselves to be involved in highly complex projects requiring significant resources because of lack of proper operational planning. Consequently, because of late orders, untimely or

missing information flow, poor risk management, lack of assisting tools (for instance, suitable software), missing the "no return" point as a result, and at the end mistakes/defects must be eliminated applying huge effort and resource investment. Such short-term planning and '*pumping out water out of the ship*' only allows to keep the ship afloat without any opportunity to navigate to the port of destination.

- **Communication** (internal/ external, reputation). Based on the results of the questionnaire, this factor was also named as quite important one with the share of 10%. The truth is, all employees highly appreciate the reputation of the company they are working for, as well as the relationship between their company and external stakeholders. However, the observation shows a permanently present distressing moment: poor exchange of information between different departments, lack of necessary information and leadership input to make decisions, practically non-existent feedback between decision-makers and their employees, - all of which serve as demotivating factor.
- **Lack of strategy/vision.** This problem, understandably, origins at the top-level management. As it was observed, It the decision-makers often lacks even the understanding, why those in power should set a clear strategy and define goals. However, even when trying to implement the necessary strategic points and define the efforts needed to reach the set goals, top managers do not consider it important to share their points of view related to the future development of the company to the lower levels of the chain of command. Thus, the lack of understanding of the goals, the inability of thinking "out of the box", failure of the core top management to set tasks, to implement proper strategy impedes company's development, and, as a result, nobody knows where they are going, nobody knows what to expect and what to be ready for; hence, demotivation and confusion. One of the corner stones of the corporate agility and responsiveness is a clear understanding of corporate goals and tasks, of ways how to achieve these goals, while ways, considering all the circumstances, can be adjusted. Otherwise, prompt and effective operation based on consistent transformation is impossible.
- **Financial issues.** There is not a construction company (actually, any company at all) that can operate without strong financial background (credit and guarantee lines, warranties, working capital, etc.). However, it should be noted that within the given research, this issue was discussed more as an existing and necessary source allowing fast development and proper reaction to changes. It is always better to have more money than less, however, often companies that have "deep pockets", do not act proactively, being reluctant to demonstrate agility.
- **Influence of PESTEL factors.** It was observed, that in relation to company's proper development, the influence of Political, Economic, Social, Technological, Environmental and Legal macro-external factors minimal impact on company's agility and/or responsiveness. Construction industry is one of the most bureaucratized ones, thus all the described external factors are considered as more or less given, and a company is supposed to operate as agile and responsive as possible, within the given limits. The important issue to be established here is whether these factors change too often or too quickly, meaning that a dynamic change of this degree may negatively affect a company by blocking its ability to be timely prepared.

It is important to outline that almost half of the responses - 48% - are attributable to only two factors – human resources and structural organization within a company, the next 36% were considered as contributed by management, planning, and

communication. The authors interpreted these factors within the framework of the concepts discussed above and concluded that these are human resources, corporate governance and organizational behaviour since the mentioned three components make 84% of responses related to their influence on the corporate agility. The significance of the factors under discussion was supported by both, theoretical and practical approach. The further research will focus on establishing a tool allowing to determine the level of corporate agility and to provide guidelines for its improvement.

2. THE METHODOLOGY FOR THE EVALUATION OF CONSTRUCTION COMPANY'S LEVEL OF CORPORATE AGILITY

To determine the level of corporate agility in a company, the authors developed questionnaires using the following theoretical and academic frameworks:

Table 2. Theoretical framework for a questionnaire

The research aspects	Literature and studies/The authors
Cultural aspects	Hofstede 2011, Gelfand et al 2009, Friberg & Eldring 2013
Best practices of corporate governance frameworks	Yao 2009, Maassen 2002, Kast &. Rosenweing 1979, L'huillier 2014, Epstein 1999
Best practices of organizational behaviour framework	Mintzberg et al. 2006, Kondalkar 2007, Wagner III & Hollenbeck 2010, Burnes 2017, Oberlander 2000, Ritz 1994, Langford & Male 2001, Rajasekhar 2017, Brockmann, & Girmscheid 2015, Cardosa et al 2015, Brooks& Spillane 2016
Best Human Resource practices	Mayo 1933, McGregor 1960, Dan-Asabe & Radosavljevic, 2009, Eaton 2008, Siew 2014, Burnes 2017, Cardosa et al 2015, Burnes 2017, Oberlander 2000, Ritz 1994, Langford & Male 2001, Brockmann, & Girmscheid 2015, Brooks& Spillane 2016
The Contingency theory	Mintzberg, 1979
The Expectancy theory	Vroom 1964, Vroom & Deci 1977
Maslow's Theory of Human Motivation	Maslow 1943
The Bureaucracy theory	Weber 1948, Friedrich 1952
Corporate lifecycle findings developed by Dr. Ichak Adizes	Adizes 1999
Interviews with construction industry's representatives	Construction industry's experts

This questionnaire should help to reveal the existing situation in a company, its functionality within different departments, its collegiality and inter-relationships between co-workers, subordinates and superiors, employees' attitude towards the organization, to explore the level of corporate agility of a company, and many more. Shortly speaking, it will include a variety of internal data, that most of the employees would not be willing to share, especially with the top managers of the company.

3. RESULTS

There might be different reasons why: possible fear to lose their job, personal issues, or peculiarities of their nature, or else; however, the crucial point of any assessment and analysis is the true and reliable data received during the initial phase of the interview, leading to conclusions and development of consequent improvement programs. This is the reason why the authors developed the seven-step program named

"AGILITY" to perform assessment of a construction organization, with analytical approach towards obtained results, providing respective recommendations. It would be highly advisable to distribute the questionnaire as broadly as possible within an organization.

"A" (Agent) - Selection of an independent agent. It is highly recommended the interview to be performed by a hired external consultant, a construction industry professional, with no personal involvement/interest/relationship with the company under assessment. This person should be known to be honest and reputable, so that potential respondents would trust their personal data/information would not be disclosed. allowing the interviewees to openly respond, with no fear. If, for any reason a company would decide to proceed with this assessment using internal resources, there should be serious consideration in convincing interviewees to provide veridical data. One of the options might be assessment provided by cross-department management, when head of one department performs an interview with employees of another department; however, this approach still does not exclude conflict of interests and/or similar divergences.

"G" (Guidance) - The Agent becomes a Guide. He/she should explain to the interviewees the questionnaire, its purpose and the whole process. The introductory communication is one of the most important phases of the interview, which cannot be skipped. The proper introduction and friendly environment help to develop sense of participation and cooperation among the interviewees, but while, on the other hand, the Agent/Guide still controls the process. Interviewees should clearly understand why they are questioned, what they should expect as consequences, being sure that their superiors are sincerely interested in their answers; the management must communicate the necessity for interviews within the company, and the whole process should be as transparent as possible. The purpose of the procedure should be explained, the strategic goals should be revealed, a few known failures or weaknesses should be described, however, the spirit of willingness to grow and to improve must prevail. Clear rules and limits of the deploying questionnaire must be set and communicated. All participants should believe in good faith and confidentiality of this the process. All questions must be read and explained, together with assessment criteria. There should be also discussed the process after the questionnaire is filled. Agent/Guide should encourage questions and active participation/involvement. The whole process may take place either in person or via video conference, less recommended are written instructions. The latter may compliment the visual component. It is important to emphasize that the respondents may use the additional field in questionnaires for remarks in case they are not sure about something or would like to expand/comment their answer.

"I" (Implementation) – Implementing the questionnaire, there should be as many people involved as possible. The person should complete his/her answers by giving numbers and indicating his/her agreement and/or disagreement with the one provided the questionnaire should be completed by as many employees as possible from all professional levels and departments. The respondents should not be asked to complete the questionnaire by hand, to avoid people fearing identification. The best way to proceed would be to provide a platform where no personal identification is required, and request for identification is set as optional. The interview could be performed with several individuals at the same time or by groups, via smartphones or laptops, and within certain period of time.

"L" (Learning) – Learn and analyze the results. Each answer has assigned a score. The total score is summarized after the whole table is full; the higher the number the lower is the level of company's agility, which may be determined, if necessary, completely, covering the whole organization under research, as well as its part. However, here is important to note that in analyzing the results, the focus should be given not only to the particular department, but also to a respondent per se, since the perception of any state of affairs, including description of corporate agility, varies depending on the professional position/professional level of the responding employee. List those who identified him/herself. Thus, it is important to assess the respondents by groups, allowing the researcher to see how different groups of respondents evaluate the corporate agility of their company and the working place/conditions. There are following issues to be considered: the working place/department, education, gender, years of experience, - all of which may help the researcher o come to proper conclusions from different angles of view. Another important issue is paying attention to the number of unanswered questions and additional remarks, which may also play an important role demonstrating what is missing within the company under research.

"I" (Interview) – It would be useful for research to have at least 10%-20% of participants to be interviewed personally, which is not always possible. Depending on the scale and structure of the company, the interviewer should define the number of people to be interviewed and their background. It is recommended to begin with those, who identified themselves, since the discussion with them will be more open and relaxed. It is not less important, while interviewing those who refused/avoided to identify themselves, to understand what the reason for such behavior was. It is always better to proceed with this interview in a cozy comfortable place, preferably not at the place of work helping the respondents to feel relaxed, for example, coffee place at work or outside the place of work or a joint walk with the interviewer. In any case, the interviewer, after analyzing the previously obtained written results, must figure out how to proceed with the mentioned personal interviews; there may be different approaches - it may be either a discussion in general, when important issues of interest are imperceptibly asked or the whole questionnaire may be openly discussed. In the latter case the data collected would be definitely more precise. In addition to the given questions, there should be also discussed ideas for improvement expressed by employees during the interview. It is recommended that all acting heads of departments, top management and, when possible, shareholders, are interviewed as well.

"T" (Truth) – This is the phase when the results are presented, and the true situation revealed. The result should include analysis of the situation in the whole company, as well as separately, in each department. Here should be presented the following results: The viewpoints of different groups interviewed, the discovered weak spots/insufficiencies/failures, after which recommended guidelines for improvement should be presented. If the client/company decides to deploy the suggested guidelines, the latter should turn into the clearly defined tasks, goals, and paths of actions. There may be a subsequent need of overall review of corporate structure and operation in a company per se, as well as in some particular departments.

"Y" –Year(s) – It must be noted here that the development and implementation of measures to deal with problems mentioned above is a highly time-consuming process, with no expectations for immediate results. Having a comprehensive picture in mind, it is recommended that a company under research repeat the questionnaire a year after all failures had been described and suggestions accepted and implemented; sometimes it may be worth even to rephrase the questions, to assure the actual answers and

memorized ones. Such an approach in no way excludes any follow-up meetings and monitoring discussions, the latter will provide a feeling or indication, while the overall questionnaire would give a comprehensive picture. The results of these activities would show real-time changes/improvements.

The 7 (seven) steps AGILITY model showing implementation of a questionnaire specifically developed to assess the level of corporate agility of a construction company.

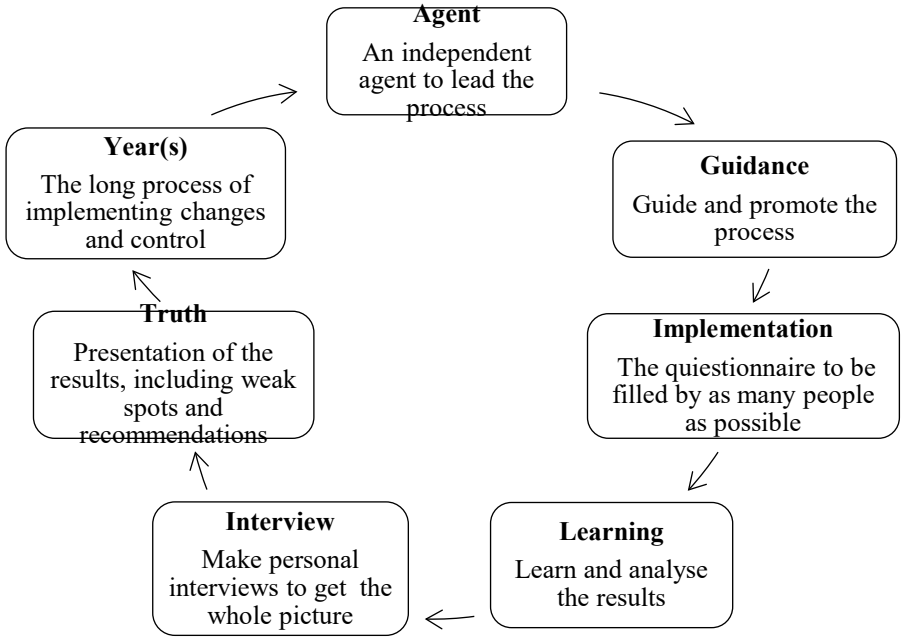


Fig. 2. The 7 (seven) steps AGILITY model (developed by the authors).

The authors developed the frameworks for the questionnaire based on both, theoretical and practical findings. In order to receive comprehensive and detailed analysis, the questionnaire should be divided into 9 blocks: Authors developed the frameworks for the questionnaire, which is based on both theoretical and practical findings. In order to receive comprehensive and detailed analysis, the questionnaire should be divided into 9 blocks: 1st block "Human resources", 2nd block questions "Communication including reputation", 3rd block "Operational planning and approach", 4th block "Management and Organizational behavior", 5th block "Structure and Corporate governance", 6th block "Strategy and Values", 7th block "Financial data", 8th block "The influence of PESTEL factors (political, economic, social, technological, environmental, legal – external macro factors)", 9th block "General valuation".

As was mentioned above the authors left the detailed elaboration of questionnaire for further research. Similarly, was done for two more steps needed to complete the evaluation of the corporate agility of the construction company: "Analysis and interpretation of the received data" and "Implementation of change". Authors suggest developing about 7-10 questions for each questionnaire block, addressing both personal and corporate aspects, which should be described by the employees.

The questionnaire per se is important, but it is only one of the tools the Agent should use is evaluating the company. Personal interviews, small group workshops, perhaps, a

box for suggestions might also be an option to understand and explore the internal corporate climate of a company.

CONCLUSION

The research's findings proved that level of corporate agility has a direct impact on the corporate performance. It affects both the internal and external environments of the construction company. The corporate agility of all departments has a direct positive impact on both supportive and primary activities.

While evaluating the questionnaire's results, it is important to remember that agility is total lack of any limitation and ability to accept any change. On the other hand, the excessive bureaucracy is an agility killer. The research's results clearly show the direct correlation between the corporate agility and the development of a company, with ability to adjust itself to any changes and/or challenges. Consequently, the excessive bureaucracy, corporate rigidity testifies to the opposite. Thus, evaluating and analyzing the obtained results, a company on its way to progress should focus on issues to reduce bureaucracy, simultaneously taking measures to balance the development between deep rigidity leading to lack of operational responsiveness and overly agile structure leading to chaotic environment without proper leadership and management.

It is recommended that the last two blocks: "Analysis and interpretation of the received data" and "Implementation of the necessary changes" should be explored during the further research and following discussions. The required changes to improve corporate agility may call for a different approach within corporate culture, development of a long-term process of "reformation", changing the relationship between the management and employees, as well es inter-relationship between the teams, leading to changes in their way of thinking. It may also require the structural change that may occur relatively rapidly but will be followed up by slower process of "getting used to" or, in other words, institutionalization. The latter l may initiate some cultural and behavioral changes within the organization, which, most probably, will occur in a natural way.

The required/recommended changes should be evaluated from the implementation point of view. It is highly important to take all factors into consideration while the improvement plan is being developed. The top management should be sure to understand whether their company is stable enough to undergo transformation in its culture and structure, if needed, which way would be better for their business – the smaller steps involving some particular procedures or an overall "corporate revolution".

REFERENCES

Adizes, I. (1999). *Managing Corporate Lifecycle*. Engelwood Cliffs, NJ: Prentice Hall.Burnes B., (2017). Managing change. 7th ed., Pearson, UK.

Aghina W., De Smet, A., & Weerde, K. (2015). *Agility: It rhymes with stability*. Mc Kinsey.

Appelbaum, S.H., Calla, R., Desautels, D., & Hasan L. (2017). The challenges of organizational agility, part 1. *Industrial and Commercial Training, 49*(1), 6–14. https://doi.org/10.1108/ICT-05-2016-0027

Brockmann, C. & Girmscheid, G. (2010). Inter- and Intra organizational Trust in International Construction Joint Ventures. *ASCE Journal for Construction Engineering Management, 136*, 353–360. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000142

Brooks, T. & Spillane J. (5-7 September 2016). Does Inappropriate Quality Control Demotivate Workers? A Critical Review. In: P W Chan and C J Neilson (Eds.) *Proceedings of the 32nd Annual ARCOM Conference, Manchester, UK. Association of Researchers in Construction Management, 2*, 823–832.

Cardosoa P., Domingueza C., & Paivaab A. (2015). Hints to Improve Motivation in Construction Companies. Conference on Enterprise Information Systems, International Conference on Project Management, Conference on Health and Social Care Information Systems and Technologies, CENTERIS, ProjMAN, HCist. *Procedia Computer Science, 64*, 1200–1207. https://doi.org/10.1016/j.procs.2015.08.513

Dailey, R. (2016). *Organizational behavior*. Edinburgh Business School.

DeWitt, S., Yakowenko, G., Bohuslav, T., Ferguson, T., Hoelker E., Molenaar K., Schiess G., Smythe J., Triplett J., Wagman R. (2005). *Construction Management Practices in Canada and Europe*. Office of International Programs. US Department of Transportation. Federal Highway Administration.

Dan-Asabe, D. & Radosavljevic, M. (7-9 September 2009). Do construction companies need to match employees' expectations? In: Dainty, A. (Ed) *Procs 25th Annual ARCOM Conference, Nottingham, UK, Association of Researchers in Construction Management*, 1223–32.

Langford, D., & Male, S. (2001). *Strategic Management in Construction*. Blackwell Publishing company, UK.

Eaton, D. (2008). *Human Resource Management in construction.* Salford.

Erande, A., & Verma, A. (2008). Measuring Agility of Organizations - A Comprehensive Agility Measurement Tool (CAMT). Old Dominion University, *Proceedings of the 2008 IAJC-IJME International Conference*.

Epstein, D., & O'Halloran, S. (1999). *Delegating Powers: A Transaction Cost Politics Approach to Policy Making Under Separate Powers*. Cambridge University Press.UK.

Friberg, J.H. & Eldring L. (2013). *Labour migrants from Central and Eastern Europe in the Nordic countries. Patterns of migration, working conditions and recruitment practices*. Nordic Council of Ministers.

Gelfand, M.J., Erez, M, and Aycan, Z. (2006). Cross-Cultural Organizational Behavior. *The Annual Review of Psychology, 58*, 479–514. https://doi.org/10.1146/annurev.psych.58.110405.085559

Haneberg, L. (2011). Training for agility, *T+D, 65*(9), 50–55.

Hofstede, G. (2011). *Dimensionalizing Cultures: The Hofstede Model in Context*. *Online Readings in Psychology and Culture, 2*(1). https://doi.org/10.9707/2307-0919.1014

Kondalkar V.G. (2007). *Organizational behaviour*. New Age International (P) Limited, Publishers, New Delhi, India.

Kast, F.E., & Rosenweing, J.E. (1979). *Organization and Management*. McGraw–Hill New York, USA.

L'huillier, B., (2014). What does 'corporate governance' actually mean? *Corporate Governance Int. Journal of Business in Society, 14*(3), 300–319. https://doi.org/10.1108/CG-10-2012-0073

Mintzberg, H., Ahlstrand, B., & Lampel, J. (2006). *Strategy Safari: A Guided Tour Through the Wilds of Strategic Management*, The Free Press, New York, USA.

Mintzberg, H. (1979). *The Structuring of organizations,* Prentice-Hall, USA.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*, 390–396.

Mayo, E. (1933). *The Human Problems of an Industrial Civilization*. Routledge; 1st edition, USA.

Maassen, G.F. (2002). *An International Comparison of Corporate Governance Models,* 3rd edition, Spencer.

McGregor, D. M. (1960). *The Human Side of Enterprise*. McGraw Hill, New York.

Oberlender, G.D. (2000). *Project management for engineering and construction.* International Edition. The McGraw-Hill Companies, Inc. USA.

Ritz G.J. (1944). *Total Construction Project Management*. McGraw-Hill, Inc. USA.

Rajasekhar, R. (January 2017). Financial Performance Evaluation of Construction Industries. *International Journal of Scientific and Research Publications, 7*(1), 157–175. Retrieved from http://www.ijsrp.org/research-paper-0117/ijsrp-p6129.pdf

Sull, D. (2010). *Competing through organizational agility*. McKinsey quarterly.

Siew R. Y. J. (2014). Human resource management in the Construction Industry - Sustainability Competencies. *Construction Economics and Building, 14*(2), 87–103. https://doi.org/10.5130/AJCEB.v14i2.3957

Vroom, V. H. (1964). *Work and Motivation*, New York, NY: Wiley.

Vroom, V. H. & Deci, E. L. (1977). *Management and Motivation: Selected Readings*, Penguin Education, Penguin Books Ltd., Harmondsworth, UK.

Weber, M. (1948). *Max Weber: Essays in sociology*. Routledge and Kegan Paul: London, UK.

Wagner III, J.A., Hollenbeck, J.R. (2010). *Organizational Behavior: Securing Competitive Advantage*., Routledge, New York, USA, p. 5.

Yao, Y. (2009). Historical Dynamics of the Development of the Corporate Governance, *Journal of Politics and Law, 2*(4), 167–174. https://doi.org/10.5539/jpl.v2n4p167

AUTHORS' SHORT BIOGRAPHY

Jevgenijs Locovs is a general & technical management executive, experienced leader with an extensive record of hands-on operations, tactical successes and strategic planning expertise in both real estate development and construction. Founder and CEO (till 2020) of international construction and manufacturing company with the turnover exceeding 100M eur. A passion for integration of sustainability programs that reduce costs, leverage company's core strengths and resources, develop top-performing, multi-disciplined functional teams operating in domestic and international markets, enhance competitiveness, increase revenues and ensure the best quality for the end consumer. Internationally trained multi-faceted professional with significant experience and comprehensive knowledge in: due-diligences, marketing and business planning, elaboration of design briefs and tenders documentation, formation and management of multi-disciplined international design and project management teams, contract drafting and negotiations, design and construction processes leading, management and supervision of more than 1 000 000 m2 of residential, office, retail, industrial, infrastructure and offshore construction projects. Proven ability of determination and implementation of the most practical, creative and innovative solutions within constraints of time and financing. Deep understanding of company's critical business requirements, identifying deficiencies and potential opportunities. Broad work experience with state and large international financial institutions. Jevgenijs holds degree of Executive Master of Business Administration from Stockholm School of Economics, and Bachelor's and Master's degree in civil engineering from Riga Technical University. Member of the Latvian Institution of Civil Engineers.
E-mail: jevgenijs.locovs@gmail.com

Prof. Dr. **Elina Gaile – Sarkane** is a dean of the Faculty of Engineering Economics and Management (FEEM), Riga Technical University (RTU), also she is teaching variety of courses in organization management and new product development. Dr. Gaile-Sarkane focuses her research on topics of management, innovation and technology transfer, entrepreneurship and various aspects of business
Elina Gaile-Sarkane have more than 150 scientific publications in management, economics and the related fields, and more than 35 of them published at internationally recognized journals or conference proceedings with indexing at international data basis (such as Thomson and Reuter, SCOPUS, EBSCO etc.). Dr. Gaile-Sarkane is an author and/or co-author of 4 text books, 3 monographs, 2 patents. She had been a supervisor of many PhD students and four doctors, contributed as the expert in promotional procedure of new doctors and as the consultant in doctoral thesis development in Latvia and abroad.
E-mail: elina.gaile-sarkane@rtu.lv
ORCID: http://orcid.org/0000-0002-7509-527

https://doi.org/10.7250/scee.2021.0004

RENEWABLE ENERGY PROMOTION WITH ECONOMIC INCENTIVES: THE CASE OF THE EU

Leonid MELNYK[1], Oleksandr KUBATKO[2], Vladyslav PIVEN[3]

[1–3] *Sumy State University, Sumy, Ukraine*

Corresponding author e-mail: vladislavpiven2002@gmail.com

Abstract. The paper investigates the economic ways of green energy promotion in the European Union. It is stated that environmental friendliness and economic expediency are the main drivers of renewable energy development. The paper emphasizes that the EU has significant achievements in green energy promotion. The EU encourages the use of renewables in a variety of ways, including tariff and non-tariff instruments. In the research different economic incentives are classified by certain criteria. It is outlined in the research that the feed-in tariff was the first and most widely used mechanism of support for green energy producers. At the same time, it is gradually being replaced by a feed-in premium (a system of allowances for additional generation). The paper also highlights the importance of non-tariff instruments, including tax incentives, green certificate system, investment grants, and subsidies.

Keywords*: Economic incentives, Feed-in tariff, Green energy, Renewable energy promotion, Sustainable development.*

JEL Classification: Q28, Q42, Q48, Q58.

INTRODUCTION

The transition to sustainable development is not possible without the effective use of energy resources. From an environmental and economic point of view, renewable sources are a high-quality alternative to traditional energy. The drivers for the introduction of green energy are, firstly, its environmental friendliness (a significant reduction in pollution and resistance to climate change) and a trend of falling the cost of solar, wind, and other alternative sources of energy. According to the International Renewable Energy Agency (IRENA), the cost of solar panels from 2010 to 2019 decreased from 0.378 USD/kWh to 0.068 USD/kWh, that is, a decrease of 82% (International Renewable Energy Agency, 2019).

Many leading countries set certain targets in order to minimize the role of traditional energy and increase the share of renewables in the total energy mix. The member states of the European Union (EU) are no exception. The European Union's energy policy is based on sustainable development and a low-carbon economy. Thus, by 2050, the EU has set a goal to become the first climate-neutral continent. In 2019, in the EU, the share of renewable energy in the total energy structure was 19.7%, which is significantly higher than in previous years (in 2010 this figure was 12.2%, and in 2004 - only 8.5%) (Renewable Energy Policy Network for the 21st Century, 2020).

The EU uses a wide range of different ways to encourage the use of alternative energy sources. At the national and interstate levels, various instruments are being

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

introduced in order to ensure energy security, appropriate environmental conditions, and the opportunity to develop a competitive economy. The purpose of the research is to investigate the main economic incentives of green energy promotion in the EU member states.

1. LITERATURE REVIEW

Many scientists study the role of green energy promotion for sustainable development. For example, T. Güney determined that such kind of energy has a beneficial and statistically significant impact on countries' environmental sustainability (Güney, 2019). G. Gozgor and colleagues study the role of economic factors on renewable energy development in OECD economies (Gozgor et al., 2020).

R. Elavarasan and other scientists revealed the role of the federal government and local authorities in green energy promotion in certain Indian states. They emphasized that the Indian government has set certain renewable energy targets, which correspond with the UN Sustainable Development Goals. The authors also explain that India as a densely populated country significantly influences the world energy mix (Elavarasan et al., 2020). The role of government in the support of renewables was discussed by Y. Guo and colleagues. They state that in China R&D expenditures have a significant effect on green energy promotion (Guo et al., 2018).

S. Winter and L. Schlesewky in their publication conducted empirical research on the impact of a feed-in tariff for German green energy sector promotion. It states that such incentive has a positive influence on the micro-level, but has certain threats for the national economy in general (Winter & Schlesewsky, 2019). In addition, many scientists discussed the expediency of the transition from a traditional feed-in tariff to feed-in premium. For example, P. Rövekamp and colleagues indicated that a feed-in premium helps to link the market electricity price with the revenue of energy generating companies (Rövekamp et al., 2021). T. Eichner and R. Pethig emphasized the importance of non-tariff economic incentives (besides, subsidies) to develop advanced green technologies (Eichner & Pethig, 2014). F. Taghizadeh-Hesary and N. Yoshino focus on the advantages and drawbacks of long-term «green» investments. However, they explain that a certain governmental policy and legislative framework can allow to prevent certain risks and cover the green financing gap.

2. METHODOLOGY

A variety of research methods were used in the study. The observational method of research was used to figure out the tendency of green energy development in the EU and to outline the main economic incentives for such energy promotion. The comparative analysis was implicated in order to find out the advantages and drawbacks of different tariff and non-tariff instruments of renewable sector support. Synthesis, induction, deduction was also used. The research has a retrospective approach because it analyzes the long-run past tendency of different economic incentives implementation.

3. RESULTS

There are many economic and non-economic incentives for green energy promotion. In our study, the authors focus on economic instruments for such support,

which are widespread in the EU, including a feed-in tariff, a feed-in premium, green auctions, tax incentives, green certificate system, investment grants, a quota system. In Table 1 the classification of economic incentives (in accordance with two criteria) is presented. Two criteria include such features as: more or less liberal incentive, and tariff or non-tariff incentives. More liberal tariff incentive is a feed-in premium, whereas more liberal non-tariff incentives include investment grants, green auctions and green certificate system. Feed-in tariff is considered to be less liberal tariff incentive, and subsidies with quota system are non-tariff incentives. In our opinion, such classification can be used by policy-makers when choosing a way to stimulate green energy generation.

Table 1. The classification of economic incentives (created by authors)

	More liberal	**Less liberal**
Tariff incentives	-feed-in premium	-feed-in tariff
Non-tariff incentives	-investment grants -green auctions	-subsidies -quota system

A **feed-in tariff** became the first and most popular system of support for producers of renewable energy. In Germany, such a system was first introduced in 1990, in Switzerland - in 1991, and in Italy - in 1992 (Hitaj & Löschel, 2019). A feed-in tariff is a system in which producers receive an income (which is calculated with a fixed tariff) for the electricity generated. This revenue is independent of a market price. This approach has several advantages: in practice, it has shown high efficiency and low risks for manufacturers. Therefore, it became extremely popular at the beginning of the development of the renewable energy industry.

The main types of feed-in tariffs that currently apply in EU countries include:

- fixed preferential tariff - the tariff remains unchanged during the term of the contract, does not depend on the retail price of electricity, inflation, fossil fuel prices, etc., thus creating stable conditions for investors (operates in Germany, Portugal).
- regulated preferential tariff, which is not strictly fixed from the moment of putting the generating object into operation.
- regressive preferential tariff - a tariff at which higher payment rates are offered in the first years of the project (usually the first 5-10 years), after which payments are reduced.

Such a tariff policy allows producers to get the most benefit during the period when it is necessary to repay the loans that were raised for the project, and maintain reliable sources of income after the borrowed capital is fully or to a greater extent repaid (in Switzerland, Slovenia).

However, a feed-in tariff does not respond to changes in the market price of electricity: this often leads to inefficient use of assets and is poorly combined with the principles of the free market. Therefore, it is gradually being replaced by a system of allowances (**feed-in premium**). It stipulates that producers sell electricity on the market and receive an additional generation income from renewable energy. The surcharge can be fixed or defined as the difference between the market price and the feed-in tariff for a particular type of generation (Milanés-Montero et al., 2018). It is noticeable that when an electricity price falls, the producer of green energy gets less revenue.

According to International Renewable Energy Agency, the price of green energy constantly falls. For example, in 2019 a levelised cost of energy (LCOE) of solar energy is on average only $0.08-0.09/kWh globally (IRENA, 2019). Therefore, in many countries, renewables can already compete in an economic way with traditional energy. The slow transition to green energy in the world, in our opinion, can be explained by the fact that it requires a lot of primary investments. The return period of such investments is 5-7 years. Though, the world is gradually moving from incentive systems at the expense of public funds (feed-in tariffs) to mechanisms that provide competition between market participants. Such a mechanism is **green auctions**. The state announces the total capacity of new facilities to be offered to companies that want to invest in renewable energy projects. Companies submit auction bids that include the capacity of future facilities and the price at which they are willing to sell electricity. The winners of the auction are the bidders who offer the lowest price, as well as meet other selection criteria. The main advantage of green auctions is the ability to create competition between investors and stimulate companies that offer low prices for their electricity.

There are also **tax incentives** for the development of renewable energy. They include exemption from the payment of value-added tax and customs duties on the import of materials, equipment, components used for the production of energy from renewable sources, exemption from corporate income tax, reduction of the land tax. For example, in the Netherlands, the production of electricity from alternative sources is stimulated by the imposition of a lowered income tax on investments in alternative energy projects.

The **green certificate system** has become a strong tool among various methods of promoting renewable energy sources in the world, especially in the EU. In member states of the EU green certificates are called «Guarantees of Origin». The volume of the European electricity «Guarantees of Origin» market reached 596 TWh in 2018 (Hamburger, 2019) . Green certificates are a widespread instrument for accounting (confirmation of origin) and support of renewable energy sources in the electric power industry (they are used for all types of renewable energy sources, including solar energy, wind energy, geothermal energy, water energy, biomass energy, and others).

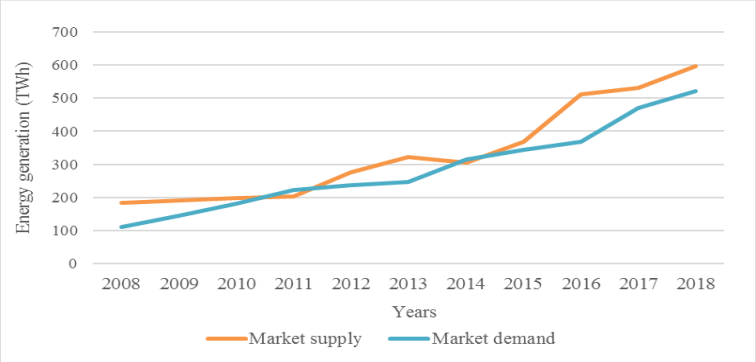


Fig. 1. The market state of Guarantees of Origin in the EU

The green certificate system usually works as follows: electricity from alternative energy sources, wholesalers, distribution companies, or retailers are required to supply and buy a certain percentage of electricity generated (Zhao et al., 2020). The main goal of this form of incentive is to achieve certain goals in increasing the share of alternative energy sources by fixing the volume of green electricity supplied by market participants. The price of green certificates is determined by the market (for example,

in TGE). Under favorable market conditions, this method of incentives should lead to the lowest costs of generating electricity from renewable sources.

Investment grants are widely used in many countries of the European Union. Grants are often awarded to stimulate business investment in energy efficiency, carbon footprint reduction, the introduction of innovative clean technologies, support for a waste-free economy, and improve the regulatory framework governing energy investment and resource efficiency. In Finland, in particular, investment grants and subsidies are the only ways to encourage the use of alternative energy sources. In 2020, the European Commission presented the Green Pact for Europe Investment Plan - a Sustainable Europe Investment Plan that aims to mobilize public investment and unlock private funds through EU financial instruments, in particular InvestEU, which will lead to an investment of at least 1 trillion euros. More than ever before, climate spending and environmental protection from the EU budget will focus on private financing, with the European Investment Bank playing a key role.

The Just Transition Mechanism (JTM) is a key tool for ensuring that the transition to a climate neutral economy happens in a fair manner. While all regions need funding and the Green Pact for Europe investment plan will provide this, the Facility is providing targeted support to help mobilize at least € 100 billion over the 2021–2027 period in the different regions for mitigation socio-economic impact of the transition. The mechanism will create the necessary investments to help workers and communities that rely on the fossil fuel value chain.

The Just Transition Fund will receive € 7.5 billion of EU funds, in addition to the Commission's proposal for the next long-term EU budget. In order to use their share in the Fund, Member States, in dialogue with the Commission, will have to identify suitable territories through special territorial equitable transition plans. They will also have to commit to matching each euro from the Equitable Transition Fund with money from the European Regional Development Fund and the European Social Fund Plus and to provide additional national resources. Together, this will provide financing of between 30 and 50 billion euros, which will attract even more investments. The foundation will mainly provide grants to the regions. This, for example, will help workers develop skills and competencies for the labor market of the future and help SMEs, start-ups and incubators create new economic opportunities in these regions. It will also support investments in clean energy transitions and energy efficiency.

A special scheme within the InvestEU is to mobilize up to 45 billion euros of investments. It will attract private investments, including in sustainable energy and transport, that benefits these regions and helps their economies find new sources of growth.

A public sector credit line with the European Investment Bank, funded by the EU budget, mobilizes investments of between 25 and 30 billion euros. It will be used for loans to the public sector, for example for investments in district heating networks and renovation of buildings. The Commission came up with a legislative proposal for its creation in March 2020.

The Just Transition Mechanism is more than funding: built on the Just Transition Platform, the Commission will provide technical assistance to Member States and investors and ensure the participation of communities, local authorities, social partners and non-governmental organizations. The Just Transition Mechanism will include a solid governance structure based on territorial Just Transition plans (Wang et al., 2020).

A **quota system** is a tool, in which a regulator has a certain minimum share of feed-in electricity, which must be in the total energy mix. At the same time, the regulator imposes obligations on the use of feed-in electricity on producers, retailers, and consumers by setting appropriate quotas. The system of such quotas is often combined with the use of green certificates for electricity from renewable sources. Such a mechanism of financial support for producers by the state is usually accompanied by possible penalties, which the parties pay in case of non-compliance with market rules (Alexander & Floyd, 2020). The most successful examples of quota systems use are Sweden and Norway.

CONCLUSION

The economic ways of renewable energy promotion in the European Union were discussed. It was determined that there are many tariff and non-tariff incentives, which have a direct or indirect impact on green energy promotion. The classification of economic incentives was developed according to two criteria. The feed-in tariff was the first and most commonly adopted source of support for green energy suppliers, according to the research. At the same time, a feed-in premium (a system of allowances for additional generation) is gradually replacing it. Non-tariff mechanisms, such as tax incentives, the green certificate system, investment grants, and subsidies, are also highlighted in the report. Therefore, the effective implementation of effective regulatory economic and legal mechanisms, the establishment of statutory goals to increase the share of renewable energy in the total energy mix have become the key to the rapid development of feed-in energy facilities in the EU.

ACKNOWLEDGMENT

This paper is prepared within the scientific research project «Sustainable development and resource security: from disruptive technologies to digital transformation of Ukrainian economy» (№0121U100470).

REFERENCES

Alexander, S., & Floyd, J. (2020). The political economy of deep decarbonization: Tradable energy quotas for energy descent futures. *Energies, 13*(17), 4304. https://doi.org/10.3390/en13174304

Eichner, T., & Pethig, R. (2014). International carbon emissions trading and strategic incentives to subsidize green energy. *Resource and Energy Economics*, *36*(2), 469–486. https://doi.org/10.1016/j.reseneeco.2013.06.001

Elavarasan, R. M., Shafiullah, G., Padmanaban, S., Kumar, N. M., Annam, A., Vetrichelvan, A. M., Mihet-Popa, L., & Holm-Nielsen, J. B. (2020). A Comprehensive Review on Renewable Energy Development, Challenges, and Policies of Leading Indian States with an International Perspective. In *IEEE Access*. https://doi.org/10.1109/ACCESS.2020.2988011

Gozgor, G., Mahalik, M. K., Demir, E., & Padhan, H. (2020). The impact of economic globalization on renewable energy in the OECD countries. *Energy Policy, 139*, 111365. https://doi.org/10.1016/j.enpol.2020.111365

Güney, T. (2019). Renewable energy, non-renewable energy and sustainable development. International *Journal of Sustainable Development and World Ecology, 26*(5), 389–397. https://doi.org/10.1080/13504509.2019.1595214

Guo, Y., Xia, X., Zhang, S., & Zhang, D. (2018). Environmental regulation, government R & D funding and green technology innovation: Evidence from China provincial data. *Sustainability, 10*(4), 940. https://doi.org/10.3390/su10040940

Hamburger, Á. (2019). Is guarantee of origin really an effective energy policy tool in Europe? A critical approach. *Society and Economy, 41*(4), 487–507. https://doi.org/10.1556/204.2019.41.4.6

Hitaj, C., & Löschel, A. (2019). The impact of a feed-in tariff on wind power development in Germany. *Resource and Energy Economics, 57*, 18–35. https://doi.org/10.1016/j.reseneeco.2018.12.001

International Renewable Energy Agency. (2019). IRENA (2019), Global Energy Transformation: A Roadmap to 2050. In *Global Energy Transformation. A Roadmap to 2050*.

Milanés-Montero, P., Arroyo-Farrona, A., & Pérez-Calderón, E. (2018). Assessment of the influence of feed-in tariffs on the profitability of European photovoltaic companies. *Sustainability, 10*(10), 3427. https://doi.org/10.3390/su10103427

Renewable Energy Policy Network for the 21st Century. (2020). Renewables 2020 Global Status Report. In *Renewables Global Status Report*.

Rövekamp, P., Schöpf, M., Wagon, F., Weibelzahl, M., & Fridgen, G. (2021). Renewable electricity business models in a post feed-in tariff era. *Energy, 216*, 119228. https://doi.org/10.1016/j.energy.2020.119228

Wang, Y., Zhi, Q., Zioło, M., Bąk, I., Cheba, K., Spoz, A., Rempel, A., Gupta, J., Caprotti, F., Essex, S., Phillips, J., de Groot, J., Baker, L., Caby, J., Ziane, Y., Lamarque, E., Jones, R., Baker, T., Huet, K., … Buda, D. (2020). A New Financial Tool for Renewable Energy Investments: Green Bonds. Journal of Sustainable Finance and Investment.

Winter, S., & Schlesewsky, L. (2019). The German feed-in tariff revisited - an empirical investigation on its distributional effects. *Energy Policy, 132*, 344–356. https://doi.org/10.1016/j.enpol.2019.05.043

Zhao, F., Guo, X., & Chan, W. K. (2020). Individual green certificates on blockchain: A simulation approach. *Sustainability, 12*(9), 3942. https://doi.org/10.3390/su12093942

AUTHORS' SHORT BIOGRAPHY

Leonid Hr. Melnyk works as a Professor of Department of Economics, Entrepreneurship and Business Administration, Director of Research Institute for Development Economics (IDE) at Sumy State University. In 1990 he defended a thesis and received a degree Doctor of Economic Sciences. The scientist is an expert from the Scientific Committee «Ukraine in the EU» on programs «Horizon 2020». Leonid Melnyk is an author of more than 500 scientific works, including 45 books and more than 300 articles.
E-mail: melnyk@econ.sumdu.edu.ua

Oleksandr V. Kubatko works as an Associate Professor of Department of Economics, Entrepreneurship and Business Administration, Sumy State University. In 2018 he defended a thesis on specialty «Economics of Nature Using and Environment Protection» and received a degree Doctor of Economic Sciences. Since 2019 the scientist is a Professor of Department of Economics, Entrepreneurship and Business Administration. Oleksandr Kubatko is an Associate Editor of the International Journal «Environment, Development and Sustainability» (indexed by Scopus and Web of Science).
E-mail: okubatko@econ.sumdu.edu.ua

Vladyslav S. Piven works as a Research Assistant at Sumy State University and as an expert of National Agency for Higher Education Quality Assurance of Ukraine. Vladyslav Piven is a BA student of Academic and Research Institute of Business, Economics and Management at Sumy State University. His major is Economics.
E-mail: vladislavpiven2002@gmail.com

https://doi.org/10.7250/scee.2021.0005

PROJECT MANAGEMENT IN STATE AUTHORITIES OF SUBJECTS OF THE RUSSIAN FEDERATION: DEVELOPMENT FACTORS AND RESOURCES

Inna MIROSHNICHENKO[1], Maria TERESHINA[2], Laura SHPIRO[3]

[1,2,3]*Federal State Budgetary Educational Institution of Higher Education «Kuban State University», Krasnodar, Russia*

Corresponding author e-mail: mwstepanova@mail.ru

Abstract. The article describes the Russian experience in the implementation and development of the project approach in the public administration system at the federal and regional levels. The authors characterize the two-level institutional design of the project management system in the Russian Federation in the form of strategic design and project management. At the same time, the authors note that the greatest variability and riskiness is represented by the project management subsystem, which at the level of the constituent entities of the Russian Federation has a poly-variate character. Based on the results of the empirical study, the authors have identified the factors of an institutional and subjective nature that affect the success of the implementation of project management in the constituent entities of the Russian Federation. The authors also describe a set of resources for the development of a project approach in regional authorities and local self-governments of the Russian Federation: political and administrative, socio-economic, communication-network, personnel.

Keywords: *Project Management, Government Bodies, Constituent Entities of the Russian Federation, Institutional and Subjective Factors of Development.*

JEL Classification: D78, H11

INTRODUCTION

The Russian Federation, as many modern states, is going through a round of administrative reforms aimed at creating new qualities of the administrative management system through the introduction of a project approach. The integration of business tools into the public administration system in the Russian Federation took place under the conditions of a number of contextual constraints:

- of socio-economic nature (isolation of Russia in the context of imposed sanctions, economic crisis and growth of socio-economic inequality of the population;
- of a political nature (the priorities declared by the political leadership of the country for achieving a high quality of life of the population in conditions of limited resources, increasing the competitiveness of the Russian Federation in the world economy through the development of innovative potential, as well as conventional and unconventional "requests" of society for the openness of government in interaction with citizens and its effectiveness).

The project approach has become an instrumental "response" to the challenges of the modern system of public administration in the Russian Federation. With its help,

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

one planned to ensure the sustainable development of the country and the performance in achieving indicators in all spheres of society. Its implementation laid the foundations for a new managerial ideology, capable of changing not only the principles of making management decisions to achieve the priority goals of social development, but also the nature and style of management activities associated with the formation of an innovative culture and a qualitatively different personnel potential of civil servants of the Russian Federation.

This method is widely used in business all over the world, as well as in public administration systems in Europe, North and Latin America, Australia, and the countries of the East. Despite its versatility, the practice of introducing project management into government bodies shows that the national context determines its organizational and sociocultural "setting".

The main social problem in Russian practice is the conflict between the established administrative culture of management and the project culture inculcated "from above," the lack of synchronization between the organizational structure of the project and the organizational structure of state authorities, the intersection administration and project management functions.

Difficulties in introducing the principles of project management into the activities of state authorities and local authorities arise from the lack of flexibility and bureaucratic regulation of state structures, the orientation towards the observance of all necessary formal processes, and not towards the achievement of the final result, the lack of necessary competencies and resistance to changes by public officials at all levels.

The existing institutional model of project management in the Russian Federation includes two interrelated sets of institutional mechanisms (strategic design and project management) at the national and regional levels. The authors identified successful practices in the implementation of project management at the federal and regional levels in the Russian Federation, as well as a complex of factors (institutional structure, interdepartmental interaction, the potential for socio-economic development of the region) and resources (personnel, network, information, institutional) that affect the efficiency of implementation of project management in the constituent entities of the Russian Federation.

Scientific understanding of the Russian experience of project management in the public sector is important for understanding the factors and technologies that affect the success of the goals and objectives in the context of multi-level institutional design.

1. THEORETICAL FOUNDATIONS AND METHODOLOGICAL APPROACHES OF THE STUDY

The concept of new public management acts as a theoretical basis for the study. It is both a theoretical and practical response to the inability of the traditional model of public administration to respond to new economic challenges. This concept presupposes the introduction of mechanisms characteristic of the private sector into the system of public administration. There is a transformation of the hierarchically organized function of administration in the system of public administration as a way of managing the economic and social development of the country. This makes it possible to involve business and civil society institutions in solving the problems of state policy,

to encourage original ideas for attracting resources from the non-state sector (Osborne & Gaebler, 1992; Christensen & Lagreid, 2001; Hood, 1991).

The concept of "new public management" substantiates the requirements for the efficiency and effectiveness of public administration. This is reflected in various forms: economic (the ratio of costs and benefits), social (the quality of public services that ensure the satisfaction of public needs) and organizational (consolidation of public sector resources to address strategic priorities of public policy).

Thanks to a set of economic and strategic tools that characterize project management, it became possible to develop the following elements of new public management: a focus on achieving results, monitoring quantitative and qualitative performance indicators based on information technology, saving budget funds, creative organizational culture, change management and innovation potential (Barnes, 2003). The project-oriented approach in public administration is a management system in which the goals of the executive bodies of state power are achieved mainly through the implementation of projects and programs (Dwivedi & William, 2011).

The universal applicability of the project approach in the context of the principles of new public management has been demonstrated in the practice of modern states. However, scientific understanding of broad practical applicability does not have an unambiguous assessment in scientific discussions in relation to what determines the achievement of successful results in the implementation of state projects. M. Brunet notes two key factors that determine the success of project management: the formation of a viable institutional structure for project management and an understanding of government project management practices (Brunet, 2019). A number of researchers, analyzing the experience of both developed and developing countries, emphasize that the project approach is effective mainly for achieving the goals of public infrastructure development (Khan, 2019). In the latest studies, the authors pay attention not to the institutional factors that determine the success of projects in the public administration system, but to the project competencies of the specialists who implement them (Derus, 2016). G. Žurga (2018) emphasizes that subjective factors (professional competence of project managers, their personal responsibility for the results of project implementation, as well as ensuring the continuous implementation of project activities regardless of the "political agenda") are decisive in integrating project management into a tough administrative environment.

2. RESEARCH METHODS

Among the empirical research methods, the authors used the traditional analysis of documents characterizing the state of the project management system in government bodies at the federal and regional levels of the Russian Federation: analytical and reporting materials, official documents presented on the official websites of the President of the Russian Federation, the Government of the Russian Federation, the Scientific and Educational Center for Project Management of the Russian Academy of National Economy and Public Administration, the autonomous non-profit organization Center for Assessment and Development of Project Management "Project Olympus".

A qualitative approach (expert survey) was used by the authors to analyze the ongoing processes from the perspective of the everyday practices of public officials, on which the real results of project activities depend. Qualitative methodology was chosen by the authors to present a subjective picture - through establishing a connection

between the actions of subjects and their intentions, needs, values, motives, as well as describing the context of the study phenomenon.

The authors also conducted an expert survey of representatives of the regional project office (Department of Project Management of Krasnodar Krai Administration), departmental project offices, project management experts who are involved in the implementation of training programs, and practical experts from business structures, providing the basis for conclusions regarding the specifics of project management implementation and its resource availability. In total, two waves of empirical research were carried out (in 2019 and 2021), a total of 40 experts were interviewed.

3. RESULTS

The system of project management in the state authorities of the Russian Federation has a two-tier institutional structure, which is reflected:

- in strategic design (selection of goals and priorities, formation of a portfolio of priority national projects, determination of the necessary resources for their implementation);
- in project management (preparation, implementation, monitoring and completion of projects by specialized project structures at the level of the Russian Federation and the constituent entities of the Russian Federation).

Strategic design of national development priorities is carried out at the level of the President of the Russian Federation in the relevant bylaws (Decree of the President…, 2018), which fix the substantive characteristics and target quantitative indicators of their achievement in the following areas:

- preservation of the population, health and well-being of people;
- opportunities for self-realization and development of talents;
- comfortable and safe living environment;
- decent, efficient work and successful entrepreneurship;
- digital transformation.

Decree of the President of the Russian Federation No. 474 of July 21, 2020 secures 15 national projects of the Russian Federation, including 80 federal projects, combined into three 3 groups: human capital, comfortable living environment and economic growth (National projects, n.d.). At the level of the constituent entities of the Russian Federation, regional projects are being implemented, embedded in the system of national and federal projects. Regional projects should ensure the achievement of the goals, indicators and results of the federal project, the activities of which relate to the legislatively established powers of the constituent entity of the Russian Federation, as well as to issues of local importance of municipalities located on the territory of the specified constituent entity of the Russian Federation.

The institutional subsystem of project management is the organizational structure of project management in the Russian Federation. The main body that regulates project activities at the federal level is the Presidium of the Council for Strategic Development and National Projects under the President of the Russian Federation. The functional structure of project activities in the Russian Federation includes:

- the project office of the Government of the Russian Federation (Department of the organization of project activities of the Government of the Russian Federation);
- Ministry of Economic Development of the Russian Federation;
- departmental project offices based on federal executive authorities;
- project offices of the constituent entities of the Russian Federation (regional and departmental);
- heads, administrators, participants of national and federal projects;
- a public expert council (a collegial body formed from representatives of expert, public and business associations, organizations and groups of citizens);
- Competence Center for Design Activities (CCDA RANEPA);
- Analytical Center for the Government of the Russian Federation (ensures the performance of the functions of the project office) (Decree of the Government of the Russian Federation, 2016).

The introduction of a project management system significantly transforms the traditional administrative activities of state authorities and local government, which acquires fundamentally new characteristics and features.

Table 1. Activity components that provide a process and project approach in public administration (distinctive characteristics)

Activity	Process activities	Project activities
Analytics	– assessment of the problem situation ("requests" of the external environment") occurs at the "start" of decision-making; – evaluating the effectiveness of the administrative processes that determine the quality of the "products" produced by the organization; – performance assessment based on key performance indicators.	– assessment of the problem situation, to which the project should be directed; – quality assessment of the main project ideas (resources and risks of their implementation); – evaluation of project activities (efficiency of project processes); – evaluation of intermediate (monitoring of implementation) and final results (achievement of final unique results) based on qualitative and quantitative criteria.
Organization and management	– building an organizational structure based on the differentiation of administrative processes with a rigid definition of the functionality of the corresponding departments; – a clear system of functional one-man command; – regulation and standardization of the activities of employees implementing production processes; – performance assessment based on key performance indicators.	– formation of a unique project team, the professional qualifications of the participants of which correspond to the goals and objectives of the project; – the project manager is endowed with unique resources and powers, regardless of his position; – management of the team and project activities as a flexible system, regulation is carried out on the basis of international standards of project management and the project passport; – evaluation of the effectiveness of project activities based on the achievement of the planned project results.

Communication	– regulation of communications within the organizational environment and production processes; – regulation of communications with the external environment (clients of the organization); – formation of corporate culture as the basis for effective communication in the organizational environment.	– development of a unified cognitive scheme (language and perception) among the project team members; – management of communications with stakeholders; – formation of a project culture as the basis for effective communication in a project team.
Documentation support	– the institutional foundations of the activity are the legislative and regulatory framework, strategic development priorities; – regulation of activity processes occurs on the basis of orders, orders, regulations, regulations, plans, road maps; – the results of activities are consolidated and approved by reports on the achievement of the strategic priorities of the organization in terms of indicators and indicators.	– the institutional foundations of the activity are the legislative and regulatory framework, strategic priorities for the development of the state and territories; – regulation of activity processes takes place on the basis of international, national standards of project activity, charter or project passport, plans, network schedule, decisions on making adjustments; – the results of activities are consolidated and approved by reports on the achievement of unique project results in terms of criteria and indicators.

Integration of the project and process approach promotes a new institutional design of the public administration system, including the following:

– new principles of goal-setting, focused on the final results with the solution of specific problems of the federal, regional and municipal levels, not the development of budget funds;

– formation of a multi-level public administration communications system (interdepartmental interaction within the administrative system, interaction with businesses, civil society institutions, network structures);

– human resources that meet the needs of innovative development and combine design and process tools in public decision-making (Miroshnichenko, 2019).

The main difference between project and process (operational) activities in public administration is that the second one is aimed at maintaining the stability of current tasks, while project activities are aimed at cardinal changes (Pridiba, 2018).

The authors analyzed the practice of project management in government bodies at the federal and regional levels and found that the success of the implementation and development of the project approach is due to institutional and subjective factors, mainly regional localization.

Institutional factors include:

– determination of an independent executive body of the constituent entity of the Russian Federation, responsible for the implementation of project management and implementation of projects at the regional and municipal levels;

- inclusion in a single institutional design of project management of all state and municipal authorities of the region;
- creation of an environment for the assessment and selection of projects for implementation (expert commissions for the consideration of projects, the involvement of external experts);
- building an administration system "from the project executor to the head of the authority";
- formalization of project management (project documentation, roles, procedures, orders);
- the presence of a normatively fixed motivational policy in the field of project management at the level of the constituent entities of the Russian Federation and municipalities, focused both on the participation of employees in projects and on their successful completion (in the form of material incentives for state and municipal employees who have successfully completed the implementation of the project, as well as the assignment employees of ranks in the field of project management).

The subjective factors in the development of the project approach, which significantly transform the rigid organizational system, include:

- a high level of support for the application of the principles of project management on the part of the senior official of the constituent entity of the Russian Federation (personal interest and involvement of the governor in the implementation of national projects);
- regularly informing the management about the progress of project management implementation and project implementation;
- wide involvement of employees in project activities on the basis of material and non-material incentives and their professional retraining.

The results of an expert survey conducted by the authors showed that the specificity of the implementation of project management in the constituent entities of the Russian Federation is determined by its socio-economic and socio-political characteristics that determine the institutional design of project management and its resource provision. The effective implementation of project activities is largely determined by a set of resources, which include:

- political and administrative resources in the form of a formed and normatively fixed institutional system of project management bodies;
- socio-economic resources, conditioned by the potential of socio-economic development of the region in the form of strategic priorities enshrined in regional and municipal Strategies, their resource provision and connection with national projects;
- communication and network resources, characterized by the density of horizontal connections within the framework of interdepartmental interaction at the level of sectoral executive bodies of the constituent entities of the Russian Federation and local governments;

- human resources (competence of participants in project activities, involvement in the activities of project teams, readiness of state and municipal employees for flexible project methods of work, for changes).

CONCLUSION

Scientific comprehension of the experience of the development of the project approach in government bodies in modern Russia has shown that its successful implementation and development is possible with a combination of a set of factors of an institutional and subjective nature. One of the necessary conditions is building the organizational architecture of project management bodies in the traditional institutional design of regional executive bodies and local self-government of the constituent entities of the Russian Federation. It is also extremely important to form human capital in the form of a community of professionals with both technical and soft skills (teamwork and communication ability), as well as the political skills necessary for project team leaders to manage and work both "inside" the project and with stakeholders.

The key resource of project management in the public sector is a new type of managers who combine administrative-process and project tools in making public decisions in a dynamically changing socio-economic and political environment. The combination of these factors and the formation of human resources contributes to the development of institutional models of project activities based on a multi-level system of public administration communications, as well as the formation and viability of "teams of changes" in regions and municipalities.

At the same time, for Russia, which has five years of experience in introducing project management into the system of public authority, there are still problematic issues related to the following:

- assessment of the effectiveness of the implementation of the project approach, both in terms of organizational structures and procedural mechanisms, and the activities of project teams;
- institutional consolidation of project-based labor functions in the professional activities of state civil and municipal employees at the level of legislation and official regulations;
- development of human resources institutions in the system of state and municipal administration, providing training in continuous education with a demanded set of competencies, the spread of value and behavioral orientations of a new culture of participation, necessary for the actualization of various forms of civic solidarity, public-private partnership.

REFERENCES

Osborne, D., & Gaebler, T. (1992). *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector*. Reading, MA: Addison-Wesley.

Christensen, T., & Lagreid, P. (2001). *New Public Management – the Transformation of Ideas and Practice*. Aldershot: Ashgate.

Hood, C. (1991). A Public Management for All Seasons? // Public Administration. Vol. 69.

Bevir, M., Rodes, R.A.W., (2003). Weller P. Traditions of Governance: Interpreting the Changing Role of the Public Sector // Public Administration. Vol. 81. P. 1-17.

Barnes, M. (2003). *Government and Project Management*. Voropaev, V. (ed.), Project Oriented Business and Society, Moscow: IPMA – SOVNET, pp. 1-4.

Dwivedi, O.P. & William, G. (2011). *Public Administration and IASIA: Promoting Administrative Excellence Globally*. Dwivedi, O.P. (ed.), Public Administration in a Global Context: IASIA at 50, Brussels: Bruylant, pp. 21-52.

Brunet, M. (2019). Governance-as-practice for major public infrastructure projects: A case of multilevel projectgoverning. *International journal of project management, 37*(2), 283–297.

Khan, A. (2019). Deficiencies in Project Governance: An Analysis of Infrastructure Development Program / A. Khan, M. Waris, I. Ismail, MR. Sajid, M. Ullah, F. Usman. *Administrative sciences, 9*(1), 9.

Gorod, A. A Systemic Approach to Complex Project Management: Integration of Command-and-Control and Network Governance / A. Gorod, L. Hallo, T. Nguyen. *Systems research and behavioral science, 35*(6), 811–837.

Derus, M.M. (2016). Critical Technical Competencies of Public Sector Project Managers in Developing Countries / M.M. Derus, A.R. Abdul-Aziz. *Pertanika journal of social science and humanities, 24*(2), 587–604.

Žurga, G. (2018). Project Management in Public Administration. TPM – Total Project Management Maturity Model. The Case of Slovenian Public Administration. *Transylvanian Review of Administrative Sciences, 53*, 144–159.

Decree of the President of the Russian Federation No. 204 (May 07, 2018). On national goals and strategic objectives of the development of the Russian Federation for the period up to 2024. Retrieved from: http://publication.pravo.gov.ru/Document/View/0001201805070038;

Decree of the President of the Russian Federation No. 474 (July 21, 2020). On the national development goals of the Russian Federation for the period up to 2030. Retrieved from: http://publication.pravo.gov.ru/Document/View/0001202007210012

National projects (n.d.). "Healthcare", "Education", "Demography", "Science", "Culture", "Housing and Urban Environment", "Safe and High-Quality Highways", "Small and Medium Enterprises", "International Cooperation and Export", " Digital Economy "," Labor Productivity"," Ecology "," Tourism and the Hospitality Industry "," Comprehensive Plan for the Modernization and Expansion of the Backbone Infrastructure "," Development of Nuclear Science and Technology ". Official portal of national projects of the Russian Federation. Retrieved from Национальные проекты России (xn--80aapampemcchfmo7a3c9ehj.xn--p1ai)

Decree of the Government of the Russian Federation No. 1050 (October 15, 2016). On the organization of project activities in the Government of the Russian Federation.

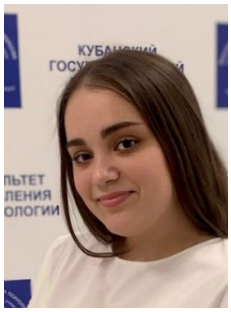
Miroshnichenko I.V. (2019). Personnel training for national projects: expert opinion on the Russian Investment Forum. Retrieved from: https://roscongress.org/sessions/iif-2019-podgotovka-kadrov-dlya-realizatsii-natsionalnykh-proektov/expert/

Pridiba O.V. (2018). Implementation of modern technologies in the public sector: foreign countries' experience. *State and municipal administration. Scholarly Scrapbook, 2*, 259.

AUTHORS' SHORT BIOGRAPHY

Inna Miroshnichenko (Dr sc. pol.) is a Professor, Head of the Department of Public Administration, Kuban State University, Krasnodar, Russia.
Research interests: Development Policy, Network Methodology of Political Studies, Socio-Cultural Approach in Policy Research, Political Institutions, Processes and Technology
E-mail: mirinna78@mail.ru
ORCID: http://orcid.org/0000-0002-2650-6662

Maria Tereshina (Dr. oec.) is a Professor, Department of Public administration Kuban State University, Krasnodar, Russia
Research interests: Green and Circular Economy, Regional Sustainable Development, Urban Agglomerations Management; Regional Economy, Regional Iinnovative System.
E-mail: mwstepanova@mail.ru
ORCID: http://orcid.org/0000-0001-8982-5831



Laura Shpiro is a Master of Science, Research Officer Department of Public Administration Kuban State University, Krasnodar, Russia
Research interests: Development Policy, Project Management, Political Institutions, Processes and Technology
E-mail: laurok98@mail.ru

https://doi.org/10.7250/scee.2021.0006

MARITIME MULTI-USE APPROACH IN THE BALTIC SEA REGION: OFFSHORE WIND ENERGY AND TOURISM CASES

Leila NEIMANE[1], Liga OZOLIŅA[2], Diana SAPARNIENE[3]

[1] *University of Latvia, Riga, Latvia*

[2] *"Grupa93", Riga, Latvia*

[3] *Klaipeda University, Klaipeda, Lithuania*

Corresponding author e-mail: leila.neimane@lu.lv

Abstract. This research aims at analysing maritime spatial planning (MSP) development in the countries of the Baltic Sea Region through the lens of the concept of a multi-use approach to maritime space. Special focus is on the offshore wind energy and coastal and offshore tourism sectors. The goal is to contribute to the progress of a sustainable blue economy. The research methods used include analysis (using such techniques as monographic, dogmatically comparable, and special analytical) and synthesis through examination of marine plans, regional and national policy documents, and MSP-related legislation in the European Union Member States of the Baltic Sea Region. The results of the research confirm that in a contemporary understanding a holistic multi-use approach to maritime space forms an integral part of MSP for resource and space sharing between two or more activities with the aim of benefiting all users. Conceptually, it evidences the emergence of the multi-use principle in the MSP process. However, while offshore wind development is prominently prioritised in the currently adopted marine plans, accentuation of applying the multi-use principle is rather cautious. In this aspect, knowledge transfer from countries with longer-established experience in offshore wind development and its combination with other activities, such as tourism, is crucial. At the same time, it should be borne in mind that large-scale offshore renewable energy and the concept of multi-use maritime space will also mark the long-term future development of MSP in line with global and European Union targets for achieving carbon neutrality and zero pollution, promoting the circular economy, and restoring biodiversity by 2050.

Keywords*: Baltic Sea Region, Coastal tourism, Maritime spatial planning (MSP), Multi-use approach, Multi-use principle, Offshore tourism, Offshore wind*

JEL Classification: K32, O21, Q20, R58, Z32

INTRODUCTION

The sustainability paradigm encompasses ecological, economic, and social aspects, with maritime spatial planning (MSP) acting as a lever to balance these dimensions. One of the main constraints and difficulties faced by the development of maritime activities is their coexistence, based on the *de facto* large number and diversification of sectors (EC, 2021a). For example, the tourism and offshore wind energy industries frequently compete for the same space: shallow, close-to-shore waters (Schultz-Zehden

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

et al., 2018). However, the current demand for maritime space poses not only tensions and risks, but also opportunities related to such "informal coexistence" and the process of maritimisation or intensification of competition for existing maritime space (EC, 2021a). These options justify the demand for multi-use (MU) of space (Royal Decree establishing the marine spatial planning for the period 2020 to 2026 in the Belgian sea-areas, 2019) and the shift from traditional sectoral governance to more coherent, holistic, and integrated governance (VASAB Secretariat, 2021b; Schultz-Zehden et al., 2018).

Currently, the concept of MU of space is already being considered by several Member States of the European Union (EU). The inclusion of a MU approach in MSP is a method for coordinating these processes to ensure better integration of MSP by 2050, as already emphasized in MSP implementation model countries such as Belgium, the Netherlands, and the United Kingdom, and in scientific and practical research in the framework of several pilot projects (e.g., MARIBE, MUSES, UNITED, MULTI-FRAME (EC, 2021a; European MSP Platform, n.d.b; Przedrzymirska et al., 2018a)).

Notable Polish MSP researcher Professor Jacek Zaucha (VASAB Secretariat, 2021a), as a challenge to MSP, citing the issue of jurisdiction, offers an intuitive hierarchy of MSP levels, illustrated by relevant examples: the EU level (MSP Directive), the sea basin level (guidelines for regional intergovernmental organizations), the national level (maritime areas or spatial plans), the sub- national level (building permits) and the local level (port investments). **Based on two elements of this approach, namely the EU level and the sea basin level, and taking into account, *inter alia*, that 31 March 2021 was the deadline for EU Member States to complete maritime spatial plans, the aim of the article is to examine current MSP issues and the development of MSP in the Baltic Sea Region (BSR) in the light of the growing importance of the concept of MU of maritime space and the MU principle, with a focus on offshore wind energy and coastal and offshore tourism.** To that end, firstly, the article provides an overview of the MSP legal framework in the EU, specifically focusing on the purpose and essence of MU. Secondly, the article analyses and describes the macro-regional and national regulatory scales of MSP in the BSR. Thirdly, the article presents MU achievements so far and reflects on the way forward in MU application. In this section, it is recognized that diverse combinations of activities are possible in terms of MU. At the same time, however, the interaction between offshore wind energy and tourism is specifically underlined. Based on these observations, the research results are extrapolated, and the generalized suggestions are highlighted in the concluding part with the aim of fostering offshore wind energy and tourism development in the BSR while integrating MU in MSP in a meaningful and effective way.

Analyses (using methodologies such as monographic, dogmatically comparable, and special analytical) and synthesis of marine plans, regional and national policy documents, and MSP-related legislation in EU Member States of the BSR are employed in the conduct of the research. However, due to the limitation on the scope of the article, the overview of national legal frameworks is presented in summary form, based on the authors' previous research.

The added value of the article is that it sets the broader scene for improvements to the MSP process and its implementation through the MU concept to promote progress of the sustainable blue economy and to ensure a link between global and EU ambitions

concerning carbon neutrality and zero pollution, the circular economy, and biodiversity and their effective implementation.

1. LEGAL FRAMEWORK FOR MARITIME SPATIAL PLANNING IN THE EUROPEAN UNION

The European Commission (2010, p.17) has stated: "The key to successful maritime spatial planning lies in acknowledging that all existing EU legislation and initiatives related to marine activities are inter-twined and should be treated as different branches of one same tree." This "branching" includes the European Green Deal (EC, 2019) and the European Recovery Plan (EC, 2020b, 2020c), as well as policies (maritime affairs, energy, climate, agriculture, fisheries), strategies and action plans and many other regulations and directives, as well as guidelines, missions, and territorial cooperation programmes. In addition, it should be borne in mind that legislation is constantly being reviewed and adapted (see more, e.g., EC, 2021b), while new implementing acts and action plans related to policy documents are prepared. MSP as an integrative tool to address the economic and socio-ecological use of the sea and to achieve wider sustainability goals at sea (Tafon, 2018) functions inside a branching framework of policy documents and legislation, based on the notion of synergy, in a changing context of shifting policy priorities.

In line with its commitment to be "a strong global actor" (EC / High Representative of the Union for Foreign Affairs and Security Policy, 2016, p. 4), the EU is a world leader in maritime governance (Van Tatenhove, 2013), especially given that it has the largest maritime area in the world (EC, 2012b) and is one of the "key ocean players" (EC / High Representative of the Union for Foreign Affairs and Security Policy, 2016, p. 7). At a global level, the EU is also a leader in the development and implementation of maritime spatial plans (Friess and Grémaud-Colombier, 2019; VASAB Secretariat, 2021f) to address policy requirements in areas such as offshore renewable energy, emerging sectors and increased demand for marine resources and space in an efficient and integrated manner (EC, 2021a, 2021b). Additionally, the EU's technological and industrial leadership in offshore renewable energy is evidenced by its share of the world's total offshore wind market capacity (42% or 12 GW in 2019), as well as work in European laboratories and industries in the rapid development of other offshore renewable energy technologies (EC, 2020a).

In the framework of the EU's Integrated Maritime Policy, launched in 2007, MSP was identified as one of the three most important areas for legal certainty (EC, 2021a, 2021b) – "a key planning tool for sustainable decision-making [..] a fundamental tool for the sustainable development of marine areas and coastal regions, and for the restoration of Europe's seas to environmental health" (CEC, 2007, pp. 5–6). A specific roadmap was adopted on MSP (EC, 2008), which sets out ten guiding principles for MSP and puts at the forefront the development of a common approach to MSP in the Member States. In recent years, work has also followed on an international roadmap for accelerating MSP processes worldwide (DG MARE / IOC-UNESCO, 2017). The Marine Strategy Framework Directive (2008/56/EC), which emphasized the diversity and complementarity of the EU's maritime regions, continued to help further the implementation of MSP as a cross-cutting instrument in maritime policy (CEC, 2009a).

In support of initiatives in the blue economy (EC, 2012a), and given the intensification, diversification and cross-border dimension of maritime economic

activities (Friess and Grémaud-Colombier, 2019), in 2014, the EU also adopted Directive 2014/89/EU establishing a framework for MSP (MSPD), which "ensures that potential negative impacts on the natural environment are identified and avoided **at a very early stage in the planning process** and that national maritime spatial plans are coherent with national energy and climate plans, as well as with good environmental status as defined in the Marine Strategy Framework Directive" (EC, 2021b, p. 15). Thus, under the MSPD, academic / technical principles have been translated into operational capacity (Grimmel et al., 2019), envisaging completion of maritime spatial plans in Member States by 31 March 2021 (Article 15, paragraph 3).

1.1. Purpose of Maritime Spatial Planning

The MSPD (Article 3, point 2) defines MSP as a process led by public authorities to analyse and organize human activities to achieve environmental, economic, and social objectives at sea. Recital 19 of the Directive states: "The main purpose of maritime spatial planning is to promote sustainable development and to identify the utilisation of maritime space for different sea uses as well as to manage spatial uses and conflicts in marine areas. Maritime spatial planning also aims at identifying and encouraging multi-purpose uses, in accordance with the relevant national policies and legislation." However, Article 5, paragraph 1, of the Directive refers only to the obligation of the Member States "**to promote** coexistence of relevant activities and uses", although established maritime spatial plans shall "identify the spatial and temporal distribution of relevant existing and future activities and uses in their marine waters" (Article 8, paragraph 1). Further, Article 8, paragraph 2, of the MSPD lists activities and uses whose interactions need to be taken into account, including tourism and installations and infrastructures for the production of offshore renewable energy.

In the draft MSPD, Article 7 was formulated in the following way: "Maritime spatial plans shall contain at least a mapping of marine waters which identifies the actual and potential spatial and temporal distribution of all relevant maritime activities" (Soininen and Hassan, 2019, p. 110). Niko Soininen and Daud Hassan (2019, p. 110) comment: "The biggest difference between the adopted version and draft approach is that the Member States *do not* have an obligation to produce *a map* of activities in the marine areas. This can severely cripple the spatial strengths of MSP in the EU." Therefore, it can be concluded that while MSPD focuses on harmonization of maritime spatial plans across the Member States, discretion is left for each Member State as to **how to plan** maritime activities. As stated in Article 4, paragraph 3, 2nd sentence, of MSPD: "This Directive shall not interfere with Member States' competence to design and determine the format and content of that plan or those plans." This means that national maritime spatial plans differ significantly in terms of how the MU is addressed, if at all.

1.2. Essence of Multi-use

MU (multi-use) is a concept used to describe a situation in which at least two maritime sectors or activities are present or – put differently – "being together" (Przedrzymirska et al., 2021). Przedrzymirska et al. (2021) describe that "the term being together refers to either spatial proximity, overlap or concurrence, or economic interaction." As a result, during the last 20 years, many different labels for the same concept notion have emerged: co- and translocation, multi-functional use, multiple-use, co-use, secondary and additional use, coexistence, and interdependencies, to mention a few (Przedrzymirska et al., 2021, 2018a).

The definition widely used in the EU (EC, 2021a) refers to MU as the sharing of resources in geographical proximity; it is an "umbrella" term that encompasses a combination of many uses and diverges radically from the concept of exclusive resource rights to inclusive resource sharing by one or more users (Zaucha et al., 2016). Such a resource can be biotic (such as fish stocks) or abiotic (such as ocean space, platforms, logistics and other infrastructure) and can be used directly (such as fishing) or indirectly (such as nature conservation) (Zaucha et al., 2016). Therefore, MU is based on a **conscious (intentional)** desire to share resources and space between two or more activities for the benefit of all users (EC, 2021a; Zaucha et al., 2016) which in essence means multi-functional and symbiotic mixtures (Przedrzymirska et al., 2021).

According to experience gained in the field of MU of maritime space (EC, 2021a; Przedrzymirska et al., 2018a; Schultz-Zehden et al., 2018), MU can be ensured in two main ways, as follows: 1) addition of activities, i.e., as well as an existing or historically created activity, a new activity is introduced (staggered development); 2) development of joint activities from the beginning of the project (joint development). This scenario means increasing added value by more closely combining and integrating uses. The higher the level of connectivity means the greater the need for two or more actions to be coordinated from the outset. This implies that aquaculture and fishing and wave and tidal energy extraction can take place not only directly (activities in or near the safety zone of an offshore wind farm and / or by attaching equipment to plant bases) but also indirectly (using the same cable block), while tourism can also be carried on outside the safety zone of power plants and even virtually.

MSP can contribute to the boost of MU envisaging MU arrangements when allocating marine space in maritime spatial plans, even though other tools are available that enhance MU progress, such as market, policies, and research and development (Przedrzymirska et al., 2021). In its turn, the MU approach ensures, in particular, reduction of conflicts, efficient use of maritime space, plus delivery of environmental benefits and socio-economic values. Additionally, it has been found in practice that while offshore wind energy developers prioritize risk management of their activities, which may be adversely affected by other activities in the same place and / or at the same time, one of the driving forces in terms of generating interest in the MU of space among these developers is the opportunity to create a better image of society and thus increase social acceptability (VASAB Secretariat, 2021b) by overcoming project acceptability concerns regarding offshore wind production and the "NIMBY" ("Not In My Backyard") phenomenon (Schultz-Zehden et al., 2018). Thus, based on the perspective of this approach, it is possible not only to reduce conflicts, but also to create opportunities in the MSP process (Schultz-Zehden et al., 2018; VASAB Secretariat, 2021b). This shows the existence of interactions between MSP and MU and that these processes complement each other if the MU principle is integrated in the planning. For example, currently, the MU principle is defined in the Belgian Maritime Spatial Plan 2020–2026 (Royal Decree establishing the marine spatial planning for the period 2020 to 2026 in the Belgian sea-areas, 2019), and its aspects are included in the Dutch North Sea Spatial Planning Program 2050 (Ministry of Infrastructure and the Environment, co-production with Ministry of Economic Affairs, 2014) and the MSP framework of the United Kingdom (HM Government et al., 2011).

2. MACRO-REGIONAL AND NATIONAL REGULATORY SCALES OF MARITIME SPATIAL PLANNING IN THE BALTIC SEA REGION

The Marine Region Concept, as introduced by the MSFD, includes the BSR as one of its constituents. The EU Strategy for the Baltic Sea Region (EUSBSR) (CEC, 2009b) as the first of four macro-regional EU strategies aims at strengthening cooperation between countries bordering the Baltic Sea in order to address common challenges and take advantage of common opportunities. The HELCOM-VASAB Working Group (see below) co-chair Joacim Johannesson (VASAB Secretariat, 2021e) has underlined that although the region's countries have similar legislation in this area, implementation varies; thus, a uniform regional framework might provide a variety of benefits.

With the aim of achieving the three objectives of "Save the Sea, Connect the Region and Increase Prosperity", the EUSBSR is being implemented in fourteen policy areas, including spatial planning as part of a macro-regional approach under the updated EUSBSR Action Plan to promote sustainability and improve quality of life (EC, 2021c). While united by the functional ecosystem of the Baltic Sea, the countries concerned have varied legal and institutional cultures and planning cultures (e.g., hard vs. soft sustainability) (Piwowarczyk et al., 2019) and, additionally, the region is "also clearly divided between a prosperous, highly innovative North and West and a developing East and South" (CEC, 2009b, p. 7). Therefore, according to the renewed EUSBSR Action Plan, the overall objective of the "spatial planning" policy area is to increase territorial cohesion in the BSR to become a more integrated and coherent macro-region in 2030 with reduced socio-economic disparities between its components, turning global challenges into opportunities and benefits (EC, 2021c). Among other things, a regional approach can address the challenges of identifying the best locations and MU, thus *inter alia* ensuring that the planning and implementation of large-scale offshore renewable energy production is successful (EC, 2020a).

The EUSBSR is not only a regional framework, but also a collaborative platform that delivers significant benefits across different networks, bringing together stakeholders and implementing all geographical levels, including policy and operational coherence (VASAB Secretariat, 2021e). The actors involved in the strategy reach a wide range of stakeholders, thus creating synergies between the work of regional organizations and networks, promoting cooperation, and improving governance in maritime affairs (EC, 2011). The contribution of the Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM or Helsinki Commission) and the network of ministers for spatial planning and development in the BSR – Vision and Strategies around the Baltic Sea (VASAB) in this area is particularly important. MSP has been one of VASAB's priorities since 2001 (VASAB Secretariat, 2021d). VASAB is also cooperating with HELCOM by launching a special working group of the two organizations in 2010 to foster regional coherence through soft mechanisms, discourse, and experience sharing (Hassler et al., 2018) to ensure the coherence of maritime spatial plans. The HELCOM-VASAB Working Group has developed a number of strategic documents in this area, such as MSP principles (2010), an MSP roadmap (2013) and an ecosystem-based MSP guideline (2016). Thus, HELCOM and VASAB, as regional spatial planning coordinators, give the EUSBSR a territorial dimension and provide the necessary expertise to achieve its goals, making the BSR a model for MSP regional dialogue, coordination, and practical development, as well as use of scientific knowledge (VASAB Secretariat, 2021a, 2021e; Zaucha,

2014; EC, 2021c, 2014). At the same time, the tasks of the HELCOM-VASAB Working Group "proved to be challenging, because the differences between national frameworks unsurprisingly make the composition of the workgroup similarly diverse" (Hassler et al., 2018, p. 143).

According to the authors' research, based on national MSP legal frameworks and presented here in summarized form (see, e.g., European MSP Platform, n.d.a; VASAB, n.d.), it can be concluded that preparation of plans is carried out at different levels; moreover, the interaction patterns are very different between levels, for example, according to the federal state system in Germany or only at national level (Denmark, Lithuania). MSP is mostly implemented in different combinations at national, regional, and local levels, and the level of integration of maritime regulations also varies (Latvia, Poland). MSP approaches in the BSR are also broad, ranging from strategic and general maritime visions of the future potential of marine space for various existing and emerging activities (Finland, Sweden) to binding conditions for other planning documents and public authorities (Latvia, Lithuania) and even a very detailed spatial distribution (Denmark, Estonia, Poland, Germany). Only Germany and Lithuania have made progress in gathering expertise with developing second-generation plans among the BSR nations.

3. ACHIEVEMENTS AND WAY FORWARD IN MULTI-USE APPLICATION

Analysis of the experience of pilot projects shows that the practical application of the MU approach to maritime space varies from one European country to another and, generally, is relatively underdeveloped (Schultz-Zehden et al., 2018; VASAB Secretariat, 2021b), early in the development process, mainly in the trial and pilot phase (Przedrzymirska et al., 2021). However, important evidence exists (EC, 2020a, p. 8) that offshore renewable energy "can and should coexist with many other activities, in particular in crowded areas." For example, "the development of energy infrastructures **is not incompatible** with shipping routes" and also "it is possible to develop sustainable economic activities in marine protected areas" (EC, 2020a, p. 8), as well as to restore marine habitats and improve their condition in offshore wind farm areas (VASAB Secretariat, 2021b). Experience from pilot projects (EC, 2021a; Schultz-Zehden et al., 2018; UNITED, n.d.) also shows that most use combinations that involve offshore wind energy infrastructure and are mainly related to other forms of energy production (wave and tidal energy, desalination, hydrogen, etc.) or aquaculture (e.g., seaweed, molluscs) as well as tourism and fishing. In the Netherlands (Noordzeeloket, n.d.), it is also considered that, additionally, offshore wind energy production can be combined with activities in sectors such as oil and gas extraction, cable and piping installation, recreation, and military use of space. In turn, tourism can be combined with environmental protection and fisheries or underwater cultural heritage, aquaculture, and offshore wind production (Schultz-Zehden et al., 2018), as well as shipping and military use of space (Noordzeeloket, n.d.).

In the Baltic Sea, the interaction between MSP and offshore wind energy has taken the form that offshore wind energy has been a key driver of MSP, while MSP has had a strong leverage effect on offshore wind energy, i.e., MSP has ensured that enough sea space is allocated in a timely manner for achievement of renewable energy targets (VASAB Secretariat, 2021c). For its part, the European Commission (2021a) has pointed out that energy projects in particular are likely to have been the driving force

behind the development of MU at sea and can be seen as a powerful approach to tackling constraints associated with other maritime activities. The world's first offshore wind farm was also located on the southern coast of Denmark, in Vindeby, in 1991 (EC, 2020a). In terms of the contribution of the BSR countries to offshore wind energy, according to WindEurope (Ramirez et al., 2021) data in the EU: Germany operates 29 offshore wind farms (ranking 1st in terms of wind energy production after the United Kingdom's withdrawal from the EU), followed by Denmark (5th place, 14 wind farms), Sweden (6th place, 5 wind farms) and Finland (7th place, 3 wind farms).

In that light and because the dominant sectors in a specific marine basin appear to have a significant impact on MU development (Przedrzymirska et al., 2018a), wind energy, in combination with tourism and aquaculture, unsurprisingly plays a key role in MU in the western part of the Baltic Sea. In Denmark, Germany, and Sweden, wind farms have been deliberately integrated into regional offshore and coastal tourism (Schultz-Zehden et al., 2018; VASAB Secretariat, 2021b). In the North Sea, the experience of Belgium, the Netherlands and the United Kingdom also provides useful insights on approaches addressing the combination of offshore wind energy production and tourism. Tourism-related activities most frequently involve sight-seeing boat tours (sometimes combined with angling), offshore restaurants, and diving around the turbine foundations, as well as shared onshore facilities (information centres, museums, and platforms for observation wind farms with telescopes) and even helicopter flights around offshore wind farms (Przedrzymirska et al., 2021; Schultz-Zehden et al., 2018). However, in the eastern part of the Baltic Sea the most frequent MU variety is environmental protection sites and underwater cultural heritage sites in combination with tourist activities, although this also occurs in the western part of the Baltic Sea (Przedrzymirska et al., 2021). Accordingly, in the MUSES project (Przedrzymirska et al., 2018b), the primary driving sectors for MU have been identified as tourism and energy. As a result, tourism as a MU driver should be adequately acknowledged in policy supporting MU (Przedrzymirska et al., 2018a). Additionally, taking into account, the global and EU ambitions of climate neutrality and biodiversity, it would be proper to look at the closer link between these two sectors **throughout the Baltic Sea**, especially given that offshore wind capacity installed in the Baltic Sea could reach more than 83 GW by 2050, compared to today's 2.2 GW (almost 40 times more than at present) (Freeman et al., 2019; VASAB Secretariat, 2021c) and more complex cross-border renewable energy projects will become increasingly important in most European sea basins (EC, 2020a).

Assessing spatial distribution in current maritime spatial plans in the BSR, it can be concluded that offshore renewable energy, especially with regard to offshore wind energy, is an important component of MSP, largely determining its research and installation in priority areas. As a result, most countries use the principle of prioritization and the principle of hierarchy, with certain areas designated for priority use, while other uses and functions that are incompatible with the priority function are prohibited or severely restricted. As a result, it can be concluded that the concept of MU is only cautiously emphasized in the current versions of maritime spatial plans (Denmark, Estonia, Poland, Sweden) or is missing altogether. In this regard, an important caveat must be taken into account in connection with the European Commission's recommendations (2021a) in the field of MU: the MU principle is unlikely to be widely applied in setting permit conditions if MU is not initially included in the maritime spatial plan (VASAB Secretariat, 2021b).

Further progress in the MU area is accompanied by many shortcomings and threats. These are due to lack of available data and knowledge on the impact on the marine environment, traditional economic sectors and emerging sectors or opportunities and political and legal barriers, as well as lack of regulation and the challenges of implementing MSP. For example: there is no common maritime classification system for statistical territorial units (Nomenclature of Territorial Units for Statistics (NUTS)) that offers spatial and temporal statistical classification (UNESCO, 2021; Fairgrieve, 2019). Other obstacles include conflicting cross-sectoral policymaking and management / decision-making schemes, lack of continuity of legislation from land to sea, inadequacy of the regulatory framework for MU of maritime space (there are separate rules tailored to each sector), funding, liability, and insurance issues, and others (see more EC, 2021a; Schultz-Zehden et al., 2018; VASAB Secretariat, 2021b). Sectoral, mutually incompatible, or overlapping spatial plans are still common in today's world (EC, 2021a), and are aging relatively quickly (UNESCO, 2021). The latter aspect is governed by the MSPD (Article 6, paragraph 3), which provides for review of maritime spatial plans at least every ten years. However, for example, the experience of MSP in Germany (UNESCO, 2021) shows that the demands and needs of today's rapidly changing society also pose one of the biggest challenges for MSP, as once a new maritime spatial plan is developed stakeholders may significantly change their views in the process of implementing, reviewing, and developing it. Potential innovations regarding uses of maritime space, as well as the availability of new data and knowledge, may cause substantial changes (UNESCO, 2021).

In the light of the above, the recommendations of the European Commission (2021a) are worthy in terms of promoting MU projects, including ensuring close integration between maritime activities through, for example, hybrid projects and multifunctional platforms (see also in this regard EC, 2020a; OECD, 2016; Przedrzymirska et al., 2018a). They propose identifying pre-defined multifunctional areas in the MSP process (such as marine protected areas) that are suitable for MU development (e.g., access to communication networks), to make MU mandatory for sector-specific activities and identify its potential benefits in the context of strategic environmental and social assessment. One can agree that sector-specific measures such as active involvement by tourism boards and other tourism industry representatives in the MSP and offshore wind energy farm planning consultation processes, encouragement of shared ownership and collection and exchange of information regarding what types of agreements should be established between the two sectors (Shultz-Zehden et al., 2018) for sea basin / macro-regional projects to be applied.

These operational activities could develop the content of the MU principle of maritime space. This will be supported, *inter alia*, by the evaluation framework planned under the MULTI-FRAME pilot project – a streamlined global guide for policy makers, legislators, planners and developers on how to assess MU potential in terms of environmental, economic and social sustainability (SUBMARINER Network for Blue Growth EEIG, n.d.; VASAB Secretariat, 2021b). In this respect, it is also important to gather national and transnational experience in the implementation of maritime spatial plans (Ehler, 2014; UNESCO, 2021). This could be used in the preparation of second and future generations of maritime spatial plans. As is aptly indicated in Swedish marine spatial plans for the Gulf of Bothnia, the Baltic Sea and the Skagerrak/Kattegat (Swedish Agency for Marine and Water Management, 2019, p. 145): "Future claims for new activities in the sea will be part of continuing marine spatial planning, with **coexistence as the guiding principle**".

CONCLUSION

Policy requirements and experience from pilot projects demonstrate that a multi-use approach based on the concept of spatial efficiency and / or economic benefits is becoming an integral part of maritime spatial planning. This involves the emergence of the multi-use principle. However, the multi-use concept of space is only cautiously highlighted or absent entirely in existing versions of maritime spatial plans in the Baltic Sea Region. In turn, the principle of prioritization and the principle of hierarchy clearly dominate in these maritime spatial plans regarding spatial designations. Consequently, the multi-use principle of maritime space would appear to be rather left for application in the future. As a result, the outline of the multi-use principle is still unclear, and its meaningful application would require further specification.

Although offshore renewable energy projects offer different options and perspectives in the context of a multi-use approach to maritime space, several countries in the Baltic Sea Region have not yet developed practical experience in this area, so the potential is not yet fully realized. As a result, the situation is considerably diverse in the Western Baltic Sea where the primary multi-use driver is offshore wind energy and the Eastern Baltic Sea where the catalyst role is played by tourism. Firstly, in line with the experience of pilot projects and their conclusions, it would mean that while drafting multi-use supporting policy, the role of tourism should be properly recognized and integrated. Secondly, a stronger relationship between offshore wind energy and tourism throughout the Baltic Sea would be beneficial to global and EU aspirations of climate neutrality and biodiversity.

In this regard, exchanges of experience and cooperation with countries in the region, especially Denmark, Finland, Germany, and Sweden, which have a long tradition of offshore wind energy and practical experience in the field of multi-use, are also useful here. At the same time, maritime spatial planning and multi-use complement each other if the multi-use principle is integrated in planning at all. Multi-use needs to be reflected in the maritime spatial plan in order to affect the conditions for granting a specific operating permit, and in some cases, this may even run counter to the principle of prioritization. Therefore, in this aspect, it is also critical to gain experience with the implementation of maritime spatial plans. This experience can then be applied to the development of such plans in the future. In short, the Baltic Sea Region can draw useful lessons from integration of the multi-use principle into maritime spatial planning and practical approaches on addressing offshore wind production and tourism from the North Sea (especially, Belgium, the Netherlands, and the United Kingdom) as the forerunner in this field.

It should be borne in mind that large-scale offshore renewable energy and the concept of multi-use maritime space will not only be the guiding principle for second-generation maritime spatial planning over the next ten years, but will also guide long-term maritime spatial planning development, with the global and European Union goal of achieving carbon neutrality and zero pollution, promoting the circular economy, and restoring biodiversity by 2050.

ACKNOWLEDGMENT

This work is an output of the research project and has been financially supported by specific support objective activity 1.1.1.2. "Post-doctoral Research Aid" of the Republic of Latvia (project No. 1.1.1.2/VIAA/3/19/514 "Effective Maritime Spatial Planning Regulation Framework and

Implementation Challenges and Best Practice Examples for the Context of the Baltic Sea"), funded by the European Regional Development Fund (project No. 1.1.1.2/16/I/001).

REFERENCES

Commission of the European Communities (CEC). (2009a). *Progress Report on the EU's Integrated Maritime Policy*. Report from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. COM(2009) 540 final.

Commission of the European Communities (CEC). (2009b). *Concerning the EU Strategy for the Baltic Sea Region.* Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2009) 248 final.

Commission of the European Communities (CEC). (2008). *Communication from the Commission "Roadmap for Maritime Spatial Planning: Achieving Common Principles in the EU."* COM(2008) 791 final.

Commission of the European Communities (CEC). (2007). *An Integrated Maritime Policy for the European Union*. COM(2007) 575 final.

Directive 2014/89/EU. *Establishing a framework for Maritime Spatial Planning*. European Parliament, Council.

Directive 2008/56/EC. *Marine Strategy Framework Directive*. European Parliament, Council.

Directorate General for Maritime Affairs and Fisheries of the European Commission (DG MARE) / Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO). (2017). *Joint Roadmap to accelerate Maritime/Marine Spatial Planning processes worldwide (MSP)*. Conference Conclusions: adoption of a joint roadmap. 2nd International Conference on Marine/Maritime Spatial Planning. 15 – 17 March 2017, Paris UNESCO HQ.

Ehler C.N. (2014). *A Guide to Evaluating Marine Spatial Plans*. UNESCO, IOC Manuals and Guides, 70, ICAM Dossier 8.

European Commission (EC). (2021a). *Best Practice Guidance in Multi-Use Issues and Licensing Procedures*. Short Background Study. Publications Office of the European Union.

European Commission (EC). (2021b). *On a new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future*. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2021) 240 final.

European Commission (EC). (2021c). *EU Strategy for the Baltic Sea Region. Action Plan [COM(2009) 248]. Revised Action Plan replacing the Action Plan of 17 March 2017 – SWD(2017) 118 final*. SWD(2021) 24 final.

European Commission (EC). (2020a). *An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future.* Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2020) 741 final.

European Commission (EC). (2020b). *Europe's moment: Repair and Prepare for the Next Generation.* Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2020) 456 final.

European Commission (EC). (2020c). *The EU budget powering the recovery plan for Europe.* Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2020) 442 final.

European Commission (EC). (2019). *The European Green Deal.* Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2019) 640 final.

European Commission (EC) / High Representative of the Union for Foreign Affairs and Security Policy. (2016). *International ocean governance: an agenda for the future of our oceans*. Joint Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. JOIN(2016) 49 final.

European Commission (EC) (2014). *A Sustainable Blue Growth Agenda for the Baltic Sea Region*. SWD (2014) 167 final. Commission staff working document.

European Commission (EC). (2012a). *Blue Growth opportunities for marine and maritime sustainable growth.* Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2012) 494 final.

European Commission (EC). (2012b). *Progress of the EU's Integrated Maritime Policy.* Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2012) 491 final.

European Commission (EC). (2011). *On the Implementation of the EU Strategy for the Baltic Sea Region (EUSBSR)*. Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2011) 381 final.

European Commission (EC). (2010). *Maritime Spatial Planning for the EU's seas and oceans: what's it all about?* Publications Office of the European Union.

European MSP Platform. (n.d.a). *MSP in the EU. Countries*. https://www.msp-platform.eu/msp-practice/countries

European MSP Platform. (n.d.b). *MSP in the EU. MSP Projects*. Retrieved from https://www.msp-platform.eu/msp-practice/msp-projects

Fairgrieve, R. (2019). *The Role of Regions in Maritime Spatial Planning within the North Sea area*. NorthSEE Project, INTERREG North Sea Region Programme, Grant Agreement 38-2-2-15.

Freeman, K., Frost, C., Hundleby, G., Roberts, A., Valpy, B., Holttinen, H., Ramirez, L., & Pineda, I., in Walsh, C. (ed.). (2019). *Our energy, our future: How offshore wind will help Europe go carbon-neutral*. WindEurope.

Friess, B., & Grémaud-Colombier, M. (2019). Policy outlook: Recent evolutions of maritime spatial planning in the European Union. *Marine Policy, 132*, 103428. https://doi.org/10.1016/j.marpol.2019.01.017

Grimmel, H., Calado, H., Fonseca, C., & Suarez de Vivero, J.L. (2019). Integration of the social dimension into marine spatial planning – Theoretical aspects and recommendations. *Ocean and Coastal Management*, *173*, 139–147. https://doi.org/10.1016/j.ocecoaman.2019.02.013

Hassler, B., Gee, K., Gilek, M., Luttmann, A., Morf, A., Saunders, F., Stalmokaite, I., Strand, H., & Zaucha, J. (2018). Collective action and agency in Baltic Sea marine spatial planning: Transnational policy coordination in the promotion of regional coherence. *Marine Policy, 92*, 138–147. https://doi.org/10.1016/j.marpol.2018.03.002

HELCOM-VASAB. (2016). Guideline for the implementation of ecosystem-based approach in Maritime Spatial Planning (MSP) in the Baltic Sea area. Retrieved September 23, 2021, from https://helcom.fi/media/documents/Guideline-for-the-implementation-of-ecosystem-based-approach-in-MSP-in-the-Baltic-Sea-area_June-2016.pdf

HELCOM-VASAB. (2013). Regional Baltic MSP Roadmap 2013-2020. 2013. Retrieved from https://helcom.fi/media/documents/Regional-Baltic-MSP-Roadmap-2013-2020.pdf

HELCOM-VASAB. (2010). Baltic Sea Broad-Scale Maritime Spatial Planning Principles. Retrieved October 7, 2021, from https://helcom.fi/media/documents/HELCOM-VASAB-MSP-Principles.pdf

HM Government, Northern Ireland Executive, Scottish Government, Welsh Assembly Government. (2011). *UK Marine Policy Statement*. London.

Ministry of Infrastructure and the Environment, co-production with Ministry of Economic Affairs. (2014). *North Sea 2050 Spatial Agenda. The report of joint research into the long-term potential of sea and coastal areas, translated into a vision, series of ambitions, opportunities, points of action and maps*. The Hague.

Noordzeeloket. (n.d.). Interactions of uses. Retrieved September 5, 2021, from https://www.noordzeeloket.nl/en/functions-and-use/interacties/

Organisation for Economic Co-operation and Development (OECD). (2016). *The Ocean Economy in 2030*. OECD Publishing. ISBN 9789264251717

Piwowarczyk, J., Gee, K., Gilek, M., Hassler, B., Luttmann, A., Maack, L., Matczak, M., Morf, A., Saunders, F., Stalmokaite, I., & Zaucha, J. (2019). Insights into integration challenges in the Baltic Sea Region marine spatial planning: Implications for the HELCOM-VASAB principles. *Ocean and Coastal Management, 175*, 98–109. https://doi.org/10.1016/j.ocecoaman.2019.03.023

Przedrzymirska, J., Zaucha, J., Calado, H., Lukic, I., Bocci, M., Ramieri, E., Depellegrin, D., de Sousa Vergilio, M., Cana Varona, M., Barbanti, A., Krause, G., Papaioannou, E., Buck, B.H., Schultz-Zehden, A., Onyango, V., Schupp, M.F., Lakamp, R., Szefler, K., Michalek, M., Maniopoulou, M., Gawlikowska-Hueckel, K., Szultka, S., Vassilopoulou, V., Kyriazi Z., Orobello, C., Gee, K., Buchanan, B., & Lazic, M. (2021). Multi-Use of the Sea as a Sustainable Development Instrument in Five EU Sea Basins. *Sustainability, 13*, 8159. https://doi.org/10.3390/su13158159

Przedrzymirska, J., Zaucha, J., Depellgrin, D., Fairgrieve, R., Kafas, A., Gregorio Pina Calado, H.M., Horta de Sousa Vergilio, M., Cana Varona, M., Lazic, M., Schultz-Zehden, A., Lukic, I., Papaioannou, E., Bocci, M., Läkamp, R., Giannelos, I., Kovacheva, A., & Buck, B. (2018a). Multi-use of the sea: from research to practice. *GLOBMAR2018, SHS Web of Conferences 58*, 01025. https://doi.org/10.1051/shsconf/20185801025

Przedrzymirska, J., Depellegrin, S., Barbanti, A., Venier, C., Vassilopoulou, V., Kyriazi, Z., Maniopoulou, M., Mourmouris A., Fernandez, J., Gregorio Pina Calado, H.M., Horta de Sousa Vergilio, M., Cana Varona, M., Onyango, V., Papaioannou, E., Schultz-Zehden, A., Lukic, I., Kovacheva, A., Giannelos, I., Läkamp, R., Lazic, M., & Zaucha, J. (2018b). *Multi-use concept in European Sea Basins*. MUSES Project (2016–2018).

Ramirez, L., Fraile, D., & Brindley, G. (2021). *Offshore wind in Europe*: *Key trends and statistics 2020*. WindEurope.

Royal Decree establishing the marine spatial planning for the period 2020 to 2026 in the Belgian sea-areas [Arrêté royal relatif à l'établissement du plan d'aménagement des espaces marins pour la période de 2020 à 2026 dans les espaces marins belges]. Annex 2. Long-term vision, objectives and indicators and spatial policy decisions [Annexe 2. Vision à long terme, objectifs et indicateurs, et choix stratégiques en matière d'aménagement]. (2019). 2019013159.

Schultz-Zehden, A., Lukic, I., Ansong, J.O., Altvater, S., Bamlett, R., Barbanti, A., Bocci, M., Buck, B.H., Calado, H., Caña-Varona, M., Castellani, C., Depellegrin, D., Schupp, M.F., Giannelos, I., Kafas, A., Kovacheva, A., Krause, G., Kyriazi, Z., Läkamp, R., Lazic, M., Mourmouris, A., Onyango, V., Papaioannou, E., Przedrzymirska, J., Ramieri, E., Sangiuliano, S., van de Velde, I., Vassilopoulou, V., Venier, C., Vergilio, M., Zaucha, J., & Buchanan, B. (2018). *Ocean Multi-Use Action Plan*. MUSES Project (2016–2018).

Soininen, N., & Hassan, D. (2019). Marine spatial planning and the new frontiers of marine governance. In D. Hassan, & S. Karim (eds.), *International Marine Environmental Law and Policy* (pp. 101–120). Routledge.

SUBMARINER Network for Blue Growth EEIG. (n.d.). Assessment Framework for successful development of viable ocean multi-use systems (MULTI-FRAME). SUBMARINER Network. Retrieved from https://www.submariner-network.eu/multi-frame

Swedish Agency for Marine and Water Management. (2019). *Marine spatial plans for the Gulf of Bothnia, the Baltic Sea and Skagerrak/Kattegat: National planning in Sweden's territorial waters and exclusive economic zone (EEZ)*. Reg. No. 666-19.

Tafon, R.V. (2018). Taking power to sea: Towards a post-structuralist discourse theoretical critique of marine spatial planning. *Environment and Planning C: Politics and Space, 36(2)*, 258–273. https://doi.org/10.1177/2399654417707527

UNESCO. (2021). *Sharing national Marine Spatial Planning practices worldwide: Germany* (Kira Gee, Hemholtz Zentrum Geesthacht /Holger Janssen, Agency for Spatial Planning and State Planning Rostock Region / Secretariat of the Planning Association Rostock Region) [Video]. YouTube. Retrieved from https://www.youtube.com/watch?v=6uB-m_9Kr9E

UNITED. (n.d.). *Pilots*. Retrieved October 10, 2021, from https://www.h2020united.eu/pilots

Van Tatenhove, J.P.M. (2013). How to turn the tide: developing legitimate marine governance arrangements at the level of the regional seas. *Ocean & Coastal Management, 71*, 296–304. http://dx.doi.org/10.1016/j.ocecoaman.2012.11.004

VASAB Secretariat. (2021a, July 15). *4th Baltic MSP Forum: Addressing all levels – what does it mean in practice?* (Jacek Zaucha) [Video]. YouTube. Retrieved from https://www.youtube.com/watch?v=FDVptHpvRio&t=7s

VASAB Secretariat. (2021b, July 15). *4th Baltic MSP Forum. Workshop 5: Multi-use and Blue economy* [Video]. YouTube. Retrieved from https://www.youtube.com/watch?v=C0KCPA32f4s

VASAB Secretariat. (2021c, July 15). *4th Baltic MSP Forum. Workshop 2: Blue economy aspects in planning, role of regional and local level* [Video]. YouTube. Retrieved from https://www.youtube.com/watch?v=NEXtcpe2Uds

VASAB Secretariat. (2021d, July 15). *4th Baltic MSP Forum. Workshop 1: Fostering MSP through stakeholder involvement* [Video]. YouTube. Retrieved from https://www.youtube.com/watch?v=7IFPJeWgqJQ

VASAB Secretariat. (2021e, July 13). *4th Baltic MSP Forum – Panel Discussion on Regional Frameworks* [Video]. YouTube. Retrieved from https://www.youtube.com/watch?v=7DKEZ3v66XQ&t=1054s

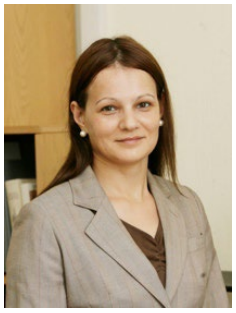
VASAB Secretariat. (2021f, July 13). *4th Baltic MSP Forum - How can MSP address many ambitions, challenges?* [Video]. YouTube. Retrieved from https://www.youtube.com/watch?v=VjUBUOhKCWg&t=7s

VASAB. (n.d.). *MSP Country Fiches*. Retrieved September 15, 2021, from https://vasab.org/theme-posts/maritimespatial-planning/msp-country-fiches/

Zaucha, J., Bocci, M., Depellegrin, D., Lukic, I., Buck, B., Schupp, M., Cana Varona, M., Buchanan B., Kovacheva, A., Karachle, P.K. (2016). *Analytical Framework (AF) – Analysing Multi-Use (MU) in the European Sea Basins*. MUSES Project (2016–2018).

Zaucha, J. (2014). *The key to governing the fragile Baltic Sea. Maritime spatial planning in the Baltic Sea Region and way forward*. Vision and Strategies around the Baltic Sea (VASAB).

AUTHORS' SHORT BIOGRAPHY



Leila Neimane is a Post-doctoral Researcher at the University of Latvia, Faculty of Law, Institute of Legal Science, for the "Effective Maritime Spatial Planning Regulation Framework and Implementation Challenges and Best Practice Examples for the Context of the Baltic Sea" (No. 1.1.1.2/VIAA/3/19/514) project, funded by European Regional Development Fund. She was awarded a Ph.D. degree from the University of Latvia, Faculty of Law in 2019. During doctoral studies, she participated in several local and international projects as a researcher at the University of Basel (Switzerland) and the University of Pretoria (South Africa). Her principal academic interests are maritime spatial planning, blue growth, and regional development, as well as environmental rights, environmental democracy, environmental justice, environmental impact assessment, and strategic environmental assessment.
E-mail: leila.neimane@lu.lv
ORCID: http://orcid.org/0000-0002-7905-0208

Liga Ozolina is a Planner and Project Manager with one of the leading spatial planning companies in Latvia "Grupa93." Holder of a diploma in social work as well as a master's degree in Public Administration, she has extensive experience and excellent skills in spatial planning and large-scale development project management, coordination of spatial plans, development programmes, strategies and detailed plans and preparation of nature protection plans. With her extensive knowledge of the spatial planning and regional development system plus experience and a wide network of contacts in Latvian municipalities and planning-related institutions, Liga Ozolina specializes in public sector governance issues, regional development processes, public participation, and involvement.
E-mail: liga@g93.lv
ORCID: http://orcid.org/0000-0002-1061-5012

Diana Saparniene has been a professor at Klaipeda University (since 2016) and Siauliai Academy of Vilnius University (formerly – Siauliai University) (since 2001). At Klaipeda University she serves in the capacity of Head of the Recreation and Tourism study programmes. From 2014 to 2016, she held the position of Vice-Rector for Research and Art, and between 2004 and 2014 was Head of the Public Administration Department at Siauliai University. With over 50 publications as author and joint author to her credit, Diana Saparniene is also joint author of five books and a member of the Editorial Board of four scientific journals. She has experience participating and managing over fifteen research projects, for example sustainable tourism, nature guides training, eLearning, Gender Equality in ICT, and University Governance. Since 2007, she has been a Member of the Group of Independent Experts on the European Charter of Local Self-Government. Research interests and courses in higher educational establishments include, for example, innovation leadership, e-governance and democracy, social research methodology, regional research methodology, tourism and recreation research methodology, and management information systems.
E-mail: diana.saparniene@gmail.com
ORCID: http://orcid.org/0000-0002-0597-3309

https://doi.org/10.7250/scee.2021.0007

GREEN INVESTMENTS AS DRIVERS OF SUSTAINABLE ECONOMIC GROWTH IN THE EU COUNTRIES: A RETROSPECTIVE ANALYSIS

Tetyana PIMONENKO[1], Tatjana TAMBOVCEVA[2], Oleksii LYULYOV[3], Yana US[4]

[1,3,4] *Sumy State University, Ukraine*

[2] *Riga Technical University, Latvia*

Corresponding author e-mail: y.us@fem.sumdu.edu.ua

Abstract. This article addresses sustainable economic development under the green investing impact. The authors emphasize that a favorable investment climate attracts green and socially responsible investors contributing to green economic transformation. The research aimed to conduct a retrospective analysis of green transformation to determine the main driving forces and preconditions for sustainable economic growth. The relevance of the decision of the investigated scientific problem is that the green investments contribute to the harmonization of the three main pillars of sustainable development (society, economy, and environment) under the growing burden of climate change. The research object was the EU countries. The analysis covered data from 2014 to 2019 for empirical calculation and from 2000 to 2020 for bibliometric analysis. To achieve the research goal, the study involved the scope of bibliometric and econometric tools. The findings of bibliometric analysis allowed to determine the main driving forces of the economic growth and green investments considered in the literature. The obtained results empirically confirmed and theoretically proved that strengthening and developing sustainable economic performance significantly depends on the success of the green transformation under investments growth. The authors stated the necessity to further explore green investment markets on the national levels to improve the incentive mechanism for developing a green investment market.

Keywords*: Green growth, Green investments, Green investors, Economic performance, Sustainable development.*

JEL Classification: E22, O44, Q56

INTRODUCTION

The world community has become more concerned about adverse climate change. In this view, green investments have a crucial role since they allow to mitigate climate change through empowering the projects addressed the reducing CO2 emissions, air, and water pollution, accelerating the achievement of sustainable development goals, increasing green awareness, etc. It stands to note the lack of consensus on the definitions of green investments (green bonds, environmental, social and governance investing, green securitization, green mutual funds, socially responsible investing, etc.) (Inderst et al., 2012). Generally, green investments must be focused on preserving and

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

improving the environment while meeting the International Capital Market Association (ICMA).

Remarkably, ICMA determines the main green projects addressing renewable energy sources, energy efficiency, preventing pollution, environmentally sustainable development, clean transportation, sustainable management, mitigating and overcoming climate changes, green infrastructure, etc.). Thus, the environmental, social and governance indicators are the crucial factors for attracting investments to boost economic development. They allow estimating the potential risks and opportunities of business activity while increasing the information transparency for making investment decisions.

Figure 1 demonstrates that the size of the green bond market increases worldwide. Besides, it is worth emphasizing that Europe is a prominent leader for 2014-2020. Since 2014, the European green bonds market has remarkably increased by 8.62 times (156 bln USD). North America occupied second place (62 bln USD), while the Asia-Pacific region – the third (53 bln USD) in 2020.

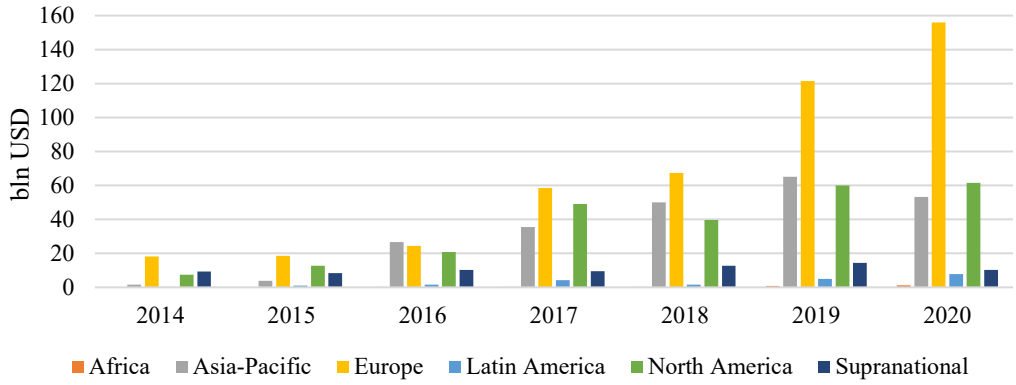


Fig. 1. The dynamic of green bonds market development by regions, 2014-2020 (Climate Bonds Initiative, 2021).

On the other hand, the EU shows good practice in reducing CO2 emissions (Figure 2).

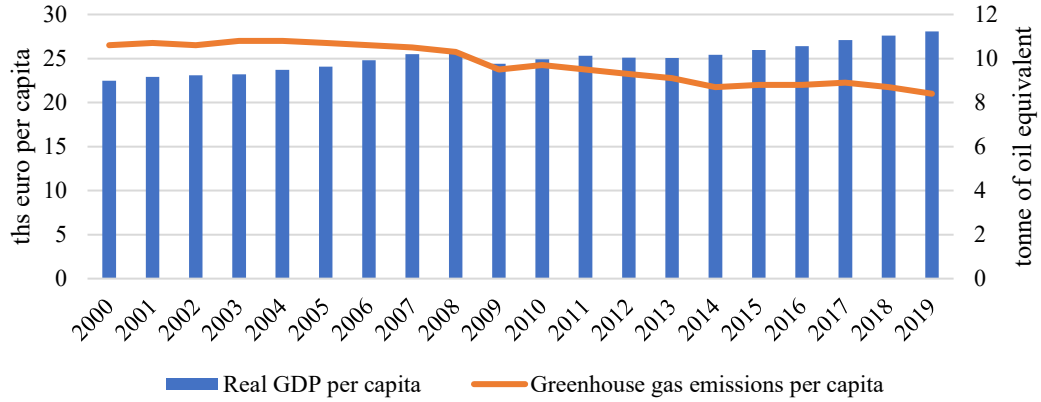


Fig. 2. The dynamic of GDP per capita and CO2 emissions in EU-27, 2000-2019 (Climate Bonds Initiative, 2021).

It stands to note that an economic slowdown caused the break-neck fall in CO2 emissions because of the global financial crisis. However, CO2 emissions remain downtrend, while the real GDP per capita has a growing tendency. In 2019, the level of

CO2 emissions per capita was less by 11.5% compared to 2009, while GDP per capita was higher by 15%.

Based on the above, it could be assumed that the EU provides an effective policy for economic development while reducing the environmental burden under the growth of the market of green investments. Indeed, that follows the principles of sustainable development. Therefore, it is appropriate to verify the impact of green investing on economic performance and the environment.

The main hypothesis of this research is as follow:

H1: Green investments accelerate sustainable economic growth while decreasing environmental pressure.

Further, in this study, Section 2 provides the literature review of the studies under research topic; Section 3 is about the methodology used in this study to verify the research hypothesis; Section 4 demonstrates the results of empirical analysis; Section 5 gives the main conclusion concerning the impact of green investments on the economic performance and environment.

1. LITERATURE REVIEW

The findings of bibliometric analysis of the literature addressing the research topic identified six main clusters concerning green transformation and sustainable development (see Fig. 3). The publications are retrieved from the Scopus database for 2000-2020.

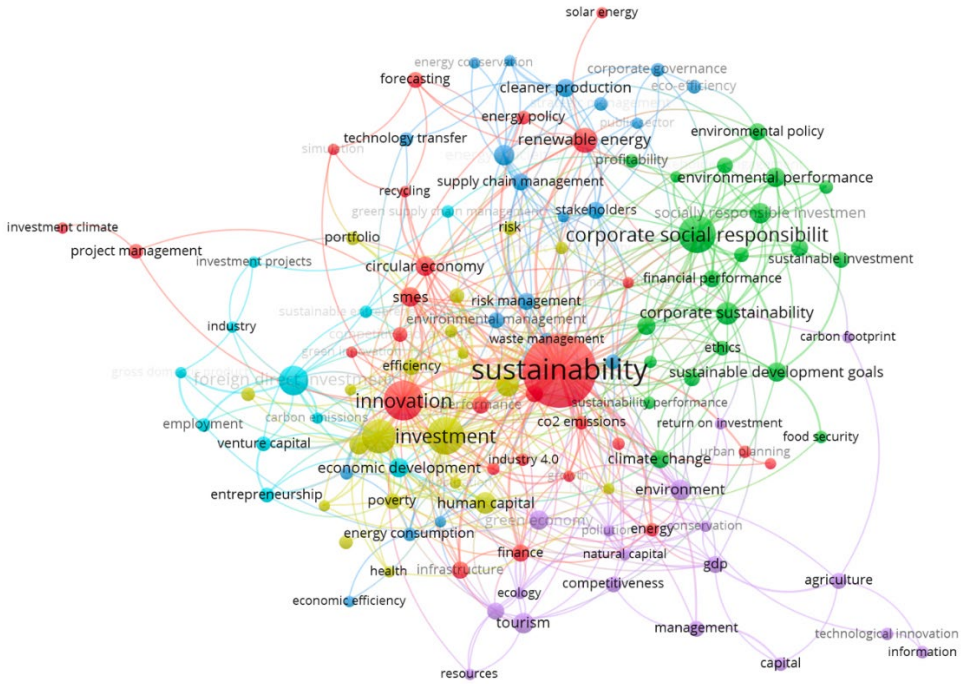


Fig. 3. The network map of keywords co-occurrences under research topic, 2000-2020 (developed by the authors based on Scopus data, 2021).

The biggest cluster (red) identified the scientific interest towards the issues of CO2 emissions, energy policy, renewable energy consumption, innovations, investment

climate, and industrial developments in the view of sustainability (Pimonenko et al., 2017; Suarez & Vargas, 2021; Bilan et al., 2020; Segers & Gaile-Sarkane, 2020).

The second cluster (green) focused on the investigations devoted to the transformations in corporate social responsibility issues under sustainable development principles (Chukwu & Kasztelnik, 2021; Kasych & Vochozka, 2017; Kyslyy et al., 2021). Several studies (Pimonenko et al., 2019a; Khadidja & Gachi, 2021; Chigrin & Pimonenko, 2014) addressed investigating the role of green investments in corporate activity. Aastvedt et al. (2021) confirmed that green investments contribute to the financial performance of US and EU companies. Therefore, green investments could be assumed to contribute to economic performance and strengthen the competitive advances at the corporate level. Remarkably, green investments don't provide the here-and-now profit for the company since they aim to gain social and environmental effects in the long term by reducing greenhouse gas emissions from economic activity. In turn, it requires modernizing the production processes, investigating new renewable sources of energy, implementing energy-efficient technologies, etc.

The third cluster (blue) combines the studies devoted to eco-efficiency. The scientists focused on the aspects of cleaner production (Pimonenko et al., 2019b), waste management (Starchenko et al., 2021), sustainable production (Vasylieva et al., 2017), etc.

The fourth (yellow) cluster covers the studies that addressed the linkages between sustainable growth and investment activity (Kwilinski et al., 2020; Dubina et al., 2020). In turn, the fifth cluster (purple) indicates the studies focused on the economic growth and its impact on the environment (carbon footprint, pollution, agriculture, recourse deployment, etc.). In this research direction, it is appropriate to indicate the works by Borychowski et al. (2020), Kolosok et al. (2020), Polcyn (2021), Pimonenko et al. (2021), etc.

The sixth cluster (cyan) is formed with studies addressing the economic development and green transformations under the contribution of foreign direct investments (Kiss, 2020; Pimonenko et al., 2018; Chygryn, 2017; Bublyk et al., 2017).

Based on the above findings, this study identified that scientists investigated sustainable economic development from different points of view while mostly concerning green investments and the growth of renewable energy consumption (Yelnikova and Barhaq, 2020; Marshall et al., 2021; Lyeonov et al., 2021, Lyulyov et al., 2021).

The scientific community considers green investments as one of the forceful approaches to overcoming climate change. Marshall et al. (2021) noted that nowadays, investors pay more attention to environmental concerns and support environmentally friendly projects. Several studies were devoted to exploring the drivers of renewable energy development (Cebula & Pimonenko, 2015; Tambovceva et al., 2020; Us et al., 2020; Ibrahiem and Hanafy, 2021; Pimonenko et al., 2020). Remarkably, Ibrahiem and Hanafy (2021) applied the Panel PMG ARDL and Granger causality methodology to confirm that foreign direct investments enhance renewable energy development in African countries.

Therefore, based on the results of bibliometric analysis and available data, it makes appropriate to check the relationship between economic development (real GDP per capita), renewable energy consumption, green investments in environmental initiatives (contribution to the international 100bn USD commitment on climate-related

expending and national expenditure on environmental protection), and environmental burden (greenhouse gas emissions per capita).

2. METHODOLOGY

For checking the research hypothesis on the contribution of green investments to sustainable economic prosperity, this study employed the intensive form of the Cobb–Douglas function (1) based on the methodology proposed by Lyulyov et al. (2021).

$$RE = f(GDP; GI; NEEP; GHG) \quad (1)$$

where *RE* – the share of renewable energy in the final energy consumption; *GI* – contribution to the international 100bn USD commitment on climate-related expending; *NEEP* – national expenditure on environmental protection; *GHG* – greenhouse gas emissions per capita.

Table 1 demonstrates the interpretations of research variables.

Table 1. Interpretation of variables

N	Variables	Denotation	Meaning	Unit
1	Real GDP per capita	GDP	Value of the total final output of goods and services per capita within a certain time	euro per capita
2	Contribution to the international 100bn USD commitment on climate-related expending	GI	Overall spending from the annual budget (EU countries, the European Commission and the European Investment Bank) for climate finance under the United Nations Framework Convention on Climate Change	million euro
3	National expenditure on environmental protection	NEEP	Current expenditure and investments for environmental protection in a given period	Percentage of GDP
4	Share of renewable energy in gross final energy consumption	RE	Indicator of renewable energy extensity	Percentage
5	Greenhouse gas emissions per capita	GHG	All greenhouse gases without emissions and removals related to land use, land-use change and forestry, indirect CO2 emissions and international aviation	tonne of oil equivalent

This study considers the data from 27 EU countries for 2014-2019. The source of data is the Eurostat database. The empirical calculations were conducted using the EViews software tools. For testing the panel series for the stationarity, the panel unit root test was used. Then, panel time series were tested for cointegration applied the Kao Engle-Granger based tests by Johansen methodology. All variables were linearized by taking logarithms.

3. RESULTS

Table 2 demonstrates the findings of descriptive statistics for the investigated variables GDP, GI, NEEP, RE, and GHG for the whole panel of 162 observations without logarithmic transformation. The average score of the GI index for 27 EU countries is 504,58 million euro, while minimum and maximum levels of GI are 8534,08 and 0,01 million euro relatively, while the standard deviation is 1501,32. Thus, the findings on descriptive statistics indicated the significant gap in green investing between EU countries from 2014 to 2019.

Table 2. The descriptive statistic summary

	GDP	GI	NEEP	RE	GHG
Mean	26213,58	504,58	1,88	20,91	9,23
Median	20485,00	7,51	1,8	17,43	8,45
Maximum	85030	8534,08	3,3	56,39	21,6
Minimum	5470	0,01	0,6	4,46	5,00
Std. Dev.	17006,73	1501,32	0,62	11,74	3,35
Skewness	1,49	3,71	0,28	0,92	1,48
Kurtosis	5,64	16,05	2,72	3,41	5,68
Jarque-Bera	107,77	1521,09	2,73	23,78	10,04
Probability	0,00	0,00	0,25	0,00	0,00
Sum	4246600	81741,39	304,55	3387,85	1494,8
Sum Sq. Dev.	4,66E+10	3,63E+08	61,16	22203,76	1806,8
Observations	27	27	27	27	27

Source: compiled by the authors.

To test all variables on stationarity, the first stage of empirical analysis provides running the unit root test by the methods of Levin, Lin & Chu (LLC), Im, Pesaran, Shin W-Stat (IPS), ADF-Fisher Chi-square (ADF), and PP-Fisher Chi-square (PPF). Remarkably, all data are linearized by taking a logarithm. Table 3 demonstrates that all variables had unit roots in the levels. After the first-order difference, all variables for EU countries became stationary that allows avoiding the spurious regression.

Table 3. Panel unit root results for GDP, GI, NEEP, RE, GHG

Tests	Statistic Param.	Unit root in level					Unit root in 1st difference				
		Variables									
		GDP	GI	NEEP	RE	GHG	GDP	GI	NEEP	RE	GHG
LLC	Statistics	-3,46	-4,33	-12,18	0,96	-4,84	-19,85	-17,9	-24,79	-10,41	-10,01
	Probab.	0,00	0,00	0,00	0,83	0,00	0,00	0,00	0,00	0,00	0,00
IPS	Statistics	3,58	-0,14	-2,18	3,14	-0,06	-4,8	-7,5	-7,40	-3,05	-3,07
	Probab.	0,99	0,44	0,01	0,99	0,47	0,00	0,00	0,00	0,00	0,00
ADF	Statistics	30,49	58,64	72,58	29,17	64,10	88,34	126,47	107,55	78,47	77,86
	Probab.	0,99	0,25	0,00	0,99	0,16	0,00	0,00	0,00	0,01	0,02
PPS	Statistics	52,91	72,59	107,51	35,29	85,48	112,05	154,02	121,21	84,27	94,24
	Probab.	0,51	0,03	0,00	0,97	0,00	0,00	0,00	0,00	0,01	0,00

At the next stage, the panel cointegration test was performed to test the existence of the long-run relationship between variables. The Kao Residual Cointegration test findings under Dickey-Fuller (DF) tests rejected the null hypothesis (non-cointegration among investigated variables). Therefore, the alternative hypothesis (cointegration among variables) was accepted (Table 4).

Table 4. Kao Panel cointegration test results

	rho	Prob.	t-Statistic	Prob.
DF	-3,25	0,00	-5,09	0,00
DF*	-1,86	0,03	-4,42	0,00

Following the above, the FMOLS and DOLS methodologies were used to estimate the long-term relationship among these variables. In this context, the impact of GI, NEEP, RE, and GHG on GDP, while DP, GI, NEEP, GHG on RE were analyzed.

Table 5 presents the obtained results on checking the above assumption by FMOLS and DOLS panel cointegration techniques.

Table 5. The findings of long-term relationship among GI, GDP, RE, NEEP and GHG by FMOLS and DOLS panel cointegration techniques

Variables	Statistic Parameters	FMLOS		DOLS	
		Dependent			
		GDP	RE	GDP	RE
GDP	Coefficient		0,49		0,58
	Prob.		0,00		0,00
GI	Coefficient	0,01	0,02	0,05	0,15
	Prob.	0,04	0,05	0,02	0,00
NEEP	Coefficient	0,27	0,02	0,35	0,07
	Prob.	0,89	0,98	0,00	0,03
RE	Coefficient	1,65		1,58	
	Prob.	0,00		0,00	
GHG	Coefficient	2,37	-1,01	2,33	-1,11
	Prob.	0,00	0,00	0,00	0,00

The obtained result from DOLS panel cointegration techniques showed that all variables are statistically significant. In contrast, the findings by FMOLS panel cointegration techniques showed that NEEP is a statistically insignificant variable. Herewith DOLS results confirmed that green investments contribute to sustainable economic development. Thus, the 1% growth of GI increases GDP by 0,05%, RE – by 0,15%. At the same time, increasing the NEEP by 1% leads to 0,35% growth of GDP and 0,07% of RE. Given FMOLS results, the impact of NEEP on GDP and RE is statically insignificant.

On the other hand, GI growth by 1% results in 0,01% growth of GDP and 0,02% of RE (FMOLS). Besides, the findings showed the relationship between economic development and GHG growth. The growth of GHG by 1% increases GDP by 2,37% (FMOLS) and 2,33% (DOLS). Remarkably, that increasing the share of renewable energy in gross final energy consumption (RE) by 1% leads to a 1,65% growth of GDP (FMOLS) and 1,58% (DOLS).

CONCLUSION

The obtained results supported the research hypothesis that green investments contribute sustainable economic development. Thus, the findings of FMOLS techniques showed that green investment growth by 1% results in 0,01% growth of GDP and 0,02% of renewable energy (FMOLS). Remarkably, FMOLS results indicated no statistically significant impact of national expenditures on environmental protection on GDP and the share of renewable energy in gross final energy consumption.

On the other hand, DOLS results showed that the 1% growth of green investment increases the GDP by 0,05% and the share of renewable energy in gross final energy consumption by 0,15% while increasing the national expenditures on environmental protection by 1% leads to 0,35% growth of GDP, and 0,07% growth of the share of renewable energy in gross final energy consumption.

The obtained results confirmed the research hypothesis that green investments accelerate sustainable economic growth under renewable energy development.

Therefore, investing in environmentally friendly initiatives is crucial to boosting economic growth without additional environmental pressure. Moreover, it contributes to mitigating and overcoming the negative climate changes.

ACKNOWLEDGMENT

This research was funded by the National Research Foundation of Ukraine "Stochastic modeling of road map for harmonizing national and European standards for energy market regulation in the transition to a circular and carbon-free economy", 0120U104807.

REFERENCES

Aastvedt, T. M., Behmiri, N. B., & Lu, L. (2021). Does green innovation damage financial performance of oil and gas companies? *Resources Policy*, *73*, 102235. https://doi.org/10.1016/j.resourpol.2021.102235

Bilan, Y., Pimonenko, T., & Starchenko, L. (2020). Sustainable business models for innovation and success: bibliometric analysis. *In E3S Web of Conferences, 159*, 04037). EDP Sciences.

Borychowski, M., Stępień, S., Polcyn, J., Tošović-Stevanović, A., Ćalović, D., Lalić, G., & Žuža, M. (2020). Socio-Economic Determinants of Small Family Farms' Resilience in Selected Central and Eastern European Countries. *Sustainability*, *12*(24), 10362. https://doi.org/10.3390/su122410362

Bublyk, M., Koval, V., & Redkva, O. (2017). Analysis impact of the structural competition preconditions for ensuring economic security of the machine building complex. *Marketing and Management of Innovations*, *4*, 229–240. https://doi.org/10.21272/mmi.2017.4-20

Cebula, J., & Pimonenko, T. (2015). Comparison financing conditions of the development biogas sector in Poland and Ukraine. *International Journal of Ecology and Development, 30*(2), 20–30.

Chygryn, O. (2017). Green entrepreneurship: EU experience and Ukraine perspectives. *Centre for Studies in European Integration Working Papers Series*, *6,* 6–13.

Chigrin, O., & Pimonenko, T. (2014). The ways of corporate sector firms financing for sustainability of performance. *International Journal of Ecology and Development, 29*(3), 1–13.

Chukwu, A.O., Kasztelnik, K. (2021). Innovative Strategies for Social-Economic Development Financial Strategies In The Development Country. *SocioEconomic Challenges*, *5*(1), 44–65. https://doi.org/10.21272/sec.5(1).44-65.2021

Climate Bonds Initiative (2021). Retrieved from: https://www.climatebonds.net/about

Dubina, O., Us, Y., Pimonenko, T., & Lyulyov, O. (2020). Customer Loyalty to Bank Services: The Bibliometric Analysis. *Virtual Economics*, *3*(3), 52–66. https://doi.org/10.34021/ve.2020.03.03(3)

Ibrahiem, D. M., & Hanafy, S. A. (2021). Do energy security and environmental quality contribute to renewable energy? The role of trade openness and energy use in North African countries. *Renewable Energy*, *179*, 667–678. https://doi.org/10.1016/j.renene.2021.07.019

Yelnikova, Ju., Barhaq, A.R. (2020). Transparency of Responsible Investment Environment. *Business Ethics and Leadership*, *4*(4), 68–75. https://doi.org/10.21272/bel.4(4).68-75.2020

Inderst, G., Kaminker, Ch., Stewart, F. (2012). Defining and Measuring Green Investments: Implications for Institutional Investors' Asset Allocations, *OECD Working Papers on Finance, Insurance and Private Pensions*, No.24, OECD Publishing

Kasych, A., & Vochozka, M. (2017). Theoretical and methodical principles of managing enterprise sustainable development. *Marketing and Management of Innovations,* 2, 298–305. https://doi.org/10.21272/mmi.2017.2-28

Khadidja, Z., Gachi, F. (2021). The integration of the corporate social responsibility (CSR) in the Algerian banks. *Financial Markets, Institutions and Risks*, *5*(3), 39–44. https://doi.org/10.21272/fmir.5(3).39-44.2021

Kyslyy, V., Bondar, T., Kabluchko, Ye., & Lieonov, H. (2021). Improving company communication activity amidst the COVID-19 restrictions. *Health Economics and Management Review, 2*(2), 92–104. https://doi.org/10.21272/hem.2021.2-09

Kiss, L.B. (2020). The Importance of Business Partnership on the World Wide Web. *Business Ethics and Leadership*, *4*(1), 68–79. http://doi.org/10.21272/bel.4(1).68-79.2020

Kolosok, S., Pimonenko, T., Yevdokymova, A., Nazim, O. H., Palienko, M., & Prasol, L. (2020). Energy efficiency policy: impact of green innovations. *Marketing and Management of Innovations*, *4*, 50–60. http://doi.org/10.21272/mmi.2020.4-04

Kwilinski, A., Dzwigol, H., & Dementyev, V. (2020). Model of entrepreneurship financial activity of the transnational company based on intellectual technology. *International Journal of Entrepreneurship*, *24*(1), 1–5.

Lyeonov, S., Pimonenko, T., Chygryn, O., Reznik, O., & Gaynulina, R. (2021). Green brand as a marketing instrument: Principle, features and parameters. *International Journal of Global Energy Issues*, *43*(2-3), 147–165. https://doi.org/10.1504/IJGEI.2021.115141

Lyulyov, O., Pimonenko, T., Kwilinski, A., & Us, Y. (2021). The heterogeneous effect of democracy, economic and political globalisation on renewable energy. *In E3S Web of Conferences, 250*, 03006. EDP Sciences. https://doi.org/10.1051/e3sconf/202125003006

Lyulyov, O., Pimonenko, T., Kwilinski, A., Dzwigol, H., Dzwigol-Barosz, M., Pavlyk, V., & Barosz, P. (2021). The Impact of the Government Policy on the Energy Efficient Gap: The Evidence from Ukraine. *Energies*, *14*(2), 373. https://doi.org/10.3390/en14020373

Marshall, B. R., Nguyen, H. T., Nguyen, N. H., Visaltanachoti, N., & Young, M. (2021). Do climate risks matter for green investment? Journal of International Financial Markets, *Institutions and Money*, *75*. https://doi.org/10.1016/j.intfin.2021.101438

Pimonenko T., Us J., Leus D., Fedyna S. (2017). The modern ecological and economic instruments for sustainable development. *Bulletin of Sumy State University. Economy Ser.*, *2*, 57–67.

Pimonenko, T., Liuliov, O., & Us, Y. (2019a). Marketing strategies of green investments: basic concepts and specific features. *Herald of Ternopil National Economic University*, *1*(91), 177–185.

Pimonenko, T., Lyulyov, O., Chygryn, O. (2018). Marketing of green investment: collaboration between main stakeholders. *Reporter of the Priazovskyi State Technical University. Section: Economic Sciences*, *36*, 214–220.

Pimonenko, T., Lyulyov, O., Chygryn, O. (2019b). Company's image and greenwashing in the framework of green investment concept. *Scientific Bulletin of the Odessa National Economic University*, *2*, 143–157.

Pimonenko, T., Us, Ya., Lyulyova, L., Kotenko, N. (2020). The impact of the macroeconomic stability on the energy-efficiency of the (European) countries: a bibliometric analysis, *E3S Web Conf.* The International Conference on Innovation, Modern Applied Science & Environmental Studies (ICIES2020), Vol. 234. https://doi.org/10.1051/e3sconf/202123400013

Pimonenko, T., Us, Ya., Myroshnychenko, Yu., Dubyna, O., Vasylyna, T. (2021). Green Financing for Carbon-Free Growth: Role of Banks Marketing Strategy. *Financial Markets, Institutions and Risks*, *5*(3), 71–78. https://doi.org/10.21272/fmir.5(3).71-78.2021

Polcyn, J. (2021). Eco-Efficiency and Human Capital Efficiency: Example of Small- and Medium-Sized Family Farms in Selected European Countries. *Sustainability*, *13*(12), 6846. https://doi.org/10.3390/su13126846

Segers, J.P., & Gaile-Sarkane, E. (2020). From creative destruction to creative disruption: Lessons for selected and strategic industries. In *Proceedings of the WMSCI 2020 - 24th World Multi-Conference on Systemics, Cybernetics and Informatics, 3*, 103–107.

Starchenko, L., Lyeonov, S., Vasylieva, T., Pimonenko, T., & Lyulyov, O. (2021). Environmental management and green brand for sustainable entrepreneurship. Paper presented at the *E3S Web of Conferences, 234*. https://doi.org/10.1051/e3sconf/202123400015

Suarez B., Vargas, A. (2021). Innovation Management, from Materiality Assessment to Sustainability Reporting, opening the Social Impact Black Box. *SocioEconomic Challenges*, *5*(1), 13–27. https://doi.org/10.21272/sec.5(1).13-27.2021

Tambovceva, T., Atstaja, D., Tereshina, M., Uvarova, I., & Livina, A. (2020). Sustainability Challenges and Drivers of Cross-Border Greenway Tourism in Rural Areas. *Sustainability*, *12*(15), 5927. https://doi.org/10.3390/su12155927

Us, Ya., Pimonenko, T., Lyulyov, O. (2020). Energy efficiency profiles in developing the free-carbon economy: on the example of Ukraine and the V4 countries, *Polityka Energetyczna – Energy Policy Journal*, *23*(4), 49–66. https://doi.org/10.33223/epj/127397

Vasylieva, T. A., Lieonov, S. V., Makarenko, I. O., & Sirkovska, N. (2017). Sustainability information disclosure as an instrument of marketing communication with stakeholders: markets, social and economic aspects. *Marketing and Management of Innovations*, *4*, 350–357. https://doi.org/10.21272/mmi.2017.4-31

AUTHORS' SHORT BIOGRAPHY

Tetyana Pimonenko (Dr.oec.) is an Associate Professor, Department of Marketing, Sumy State University, Ukraine
Member of European Marketing and Management Association (EUMMAS)
Guest Editor of Special Issue "Green Economics and Sustainable Management of Energy Sources", Energies (Scopus)
Research interests: Green Marketing, Green Brand, Green Investment, Green Economics, Green Bonds, Alternative Energy Resources; Environmental Management and Audit in Corporate Sector of Economy, Sustainable Development and Education
Dissertation for the degree of Doctor of Sciences: "Marketing and Management of Green Investment" (specialty: Economics and Management of Enterprises)
E-mail: tetyana_pimonenko@econ.sumdu.edu.ua
ORCID: http://orcid.org/0000-0001-6442-3684

Tatjana Tambovceva (Dr.oec.) is a Professor, Department of Civil Construction and Real Estate Economics and Management, Riga Technical University, Latvia. She is a member and expert in a number of international Societies, Councils and Foundations. Managing editor of international scientific journal "Economics and business".
Research interests: Circular Economy, Green Production and Consumption; Change of Consumer Behaviour; Corporate Social and Environmental Responsibility; Project Management and Use of ICT.
E-mail: Tatjana.Tambovceva@rtu.lv
ORCID: http://orcid.org/0000-0002-9516-1530

Olexii Lylyov (Dr.oec.) is a Professor, Head of Department of Marketing, Sumy State University, Ukraine
Member of European Marketing and Management Association (EUMMAS)
Guest Editor of Special Issue "Green Economics and Sustainable Management of Energy Sources", Energies (Scopus)
Deputy Editor-in-Chief SJ "Marketing and Management of Innovations" (Web of Science)
Research interests: Marketing Policy of the Country, Image of the Country, Macroeconomic Stability, Innovative Development, Modeling And Forecasting Of Development Trends
Dissertation for the degree of Doctor of Sciences: "Macroeconomic stability of the national economy: social, political, and marketing determinants" (specialty: Economics and management of national economy)
E-mail: alex_lyulev@econ.sumdu.edu.ua
ORCID: http://orcid.org/0000-0002-4865-7306

Yana Us, PhD student, Department of Marketing, Sumy State University, Ukraine
Member of European Marketing and Management Association (EUMMAS)
Head of Scientific Association of Students and Postgraduates of Academic and Research Institute of Business, Economics and Management, Sumy State University
Research interests: Carbon-Free Economy, Green Brand Environmental Marketing, Sustainable Development, Gender Stereotypes in Eco-Behavior, Alternative Energy Resources, Green Investments
Thesis for a master's degree: "Energy efficiency in private sector: perspectives and economic instruments for promotion" (specialty: Economics)
E-mail: y.us@biem.sumdu.edu.ua
ORCID: http://orcid.org/0000-0003-1451-0450

https://doi.org/10.7250/scee.2021.0008

DIFFERENT MODELS OF CAREER REINVENTION AND RETOOLING IN THE POST-PANDEMIC ERA

Lukman RAIMI

Universiti Brunei Darussalam, Brunei, Darussalam

Corresponding author e-mail: Luq_man2001@yahoo.com

Abstract. To contribute to human capital development in readiness for the Post-pandemic era, this paper discusses different models of reinvention/retooling as a resilience strategy in the face of vulnerabilities in the labour market. Using a critical literature review (CLR), this paper discusses different models of career reinvention/retooling, including the imperatives in the Post-pandemic era. At the end of the CLR, three insights emerged. First, the twelve (12) different models of career reinvention/retooling in readiness for the Post-pandemic era are task, position, knowledge, occupation, expertise, technical skills, attitude, brand/value, conceptual skills, competencies, managerial skills and entrepreneurial skills. Second, the different models of career reinvention/retooling are imperative because of environmental factors such as economic recession, pandemic/epidemic organisational downsizing, outsourcing, change management, mergers & acquisitions, the emergence of new technologies, globalisation waves, demographic shifts, climate change, migration, and disruptive business models in the labour market, among others. Third, career reinvention/retooling requires tripartite collaboration from critical stakeholders, particularly governments, employees, and business organisations. The paper concludes with policy, managerial and theoretical implications, and suggestions for future research.

Keywords*: Career reinvention, Retooling, Human capital development, Post-pandemic Era, Models.*

JEL Classification: A11, A20, C67, D02, D51, D78, E24, F44, G01, H12

INTRODUCTION

Globally, the COVID-19 pandemic has destroyed jobs, rendering several skills obsolete—a situation that calls for a pragmatic adaptation of skills and competencies to help employees and employers come to grips with the new realities (Osland et al., 2020). In the midst of the mixed effects of the crisis, some proactive companies are already rethinking and reinventing their business models and embracing career reinvention/retooling in the face of the uncertainty caused by the pandemic (Kilic & Marin, 2020). For instance, a tailoring factory in Argentina reinvented operations at the peak of COVID-19, from sewing police uniforms to the production of surgical masks. Surgical masks prevent infection and safeguard economic operations (Duff, 2020). Similarly, the largest printing presses in Latin America retooled the machines and reinvented operations from book publishing to the production of 3D protective masks and hand sanitisers (Duff, 2020). However, lagging companies are counting business

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

losses and waiting for external interventions in the face of frightening and scary statistics on the pandemic!

In addition, reliable reports have indicated that the pandemic has reduced the demand for jobs with low levels of education by 40% in Australia and the United Kingdom, whereas the preference for highly skilled workers has increased by 25% (OECD, 2021). Similarly, the new norm of working from home (WFH) has become pervasive in Australia, Canada, New Zealand, the United Kingdom, and the United States (OECD, 2021). For low-skilled employees and vulnerable workers, retraining and upskilling are urgent to foster and accelerate the development of the required competencies and skills (Chopra-McGowan & Reddy, 2021). Consequently, it has become normal to dispense with employees in the pandemic ear through permanent layoff, temporary layoff, voluntary temporary layoff and suspension of non-essential recruitments (University of Washington, 2021).

The International Labour Organisation/ILO (2021a) reported an unprecedented disruption of the labour market by the pandemic. The COVID-19 pandemic disrupted businesses and heightened massive job losses in some sectors and led to a reduction in the workforce in several others (Raimi, 2021). It brought working hours in the 4th quarter of 2020 down by 8.8 percent, which corresponds to 255 million full-time jobs (ILO, 2021a). Most of the companies are laying off, but those actively employing and expanding business operations are those in the logistics, health, medicine, retailing sectors (Lane, 2021).

The objective of this paper is to discuss the different models of career reinvention and retooling in the Post Pandemic Era, the roles of stakeholders and the reasons why both strategies are expedient. In specific terms, the paper provides answers to three research questions (RQ): (a) What are the different models of career reinvention/retooling and outcomes? (b) What are the roles of stakeholders in career reinvention/retooling? and (c) Why is career reinvention/retooling imperative?

1. METHODS AND APPROACH

A qualitative research method – an interpretivist paradigm – was adopted. The required primary data were sourced from scholarly articles, working papers, text, and online line resources. The critical literature review (CLR) was used to analyse the insightful information in the sourced primary data. The process entails analysing several articles, texts, and working papers based on a content-oriented criterion following a three-stage protocol highlighted below:

i. Stage 1: Data sourcing - Exploration of academic databases for articles from which over 70 relevant articles were selected purposively.
ii. Stage 2: Data development and conversion – Compilation of articles on career reinvention and retooling in readiness for analysis data.
iii. Stage 3: Data analysis –The articles were critiqued, critically appraised, and analysed, and insightful findings were reported (Croom et al., 2000; Jepson, 2009; Saunders & Rojan, 2011; Soni & Kodali, 2012).

2. LITERATURE REVIEW

Defining Career Reinvention/Retooling

Career reinvention is a psychosocial issue that is influenced by internal and external factors that necessitate role adjustments (Watts et al., 2015; Walker, 2019). The solution to job loss and redundancy caused by the pandemic is to adopt a career reinvention strategy. Years back, Henry Mintzberg (1987) posited that strategy reinvents itself as Five-Ps, namely, Plan, Ploy, Position, Pattern, and Perspective.

Therefore, career reinvention could also be described as a reskilling pathway for millions of unemployed global workforces (Chopra-McGowan & Reddy, 2021). Moreover, it also refers to an occupational change and psychological transition that requires taking up a completely new role and set of tasks (Ibarra, 2004; Walker, 2019). In addition, career reinvention is inevitable in periods of economic recession and environmental crisis because jobs are destroyed and cherished careers are lost. A scholar asked a pertinent question and provided the needed answer: "How can one design a career when career as an institution is dead? Entrepreneurs have an answer." (Denning, 2002). In the strategy literature, one of the resilient maxims for coping with economic recessions and environmental crises is "Tough times never last, but tough people do" (Nair, 2014).

From the foregoing quotes, career reinvention represents a deliberate work change, which takes the forms of a task change, a position change, and an occupation change – and all three forms lead to a completely new role and set of tasks (Heppner, 1998; Walker, 2019). Other scholars of career development described career reinventing using synonyms such as career reimagining (Burns, 2015), career reinventing' (Ibarra, 2004), career recrafting' (Mintzberg, 1987), career reorienting (Bridges, 2004), career reframing (Brown, 2015), and renewing' (Wang, Olsen & Shulz, 2013).

With regard to career retooling, the literature describes it as an initiative to obtain training, education, and cutting-edge skills for the purpose of growing in a profession (Boese, 2006). The process of career retooling demands commitment because it takes at least one year, but two years are the most ideal (Kreeger, 2000). Furthermore, career retooling connotes acquiring a unique kind of aptitude, specialised training, expertise, and new knowledge in certain professions for the purpose of meeting the needs of a growing labour market (Katz et al., 2009). Rutgers Continuing Studies (2021) describes career retooling as updating skills to re-enter the workforce or launch a new career.

Perspectives on COVID-19 Pandemic

In the literature, there are two perspectives on crises, public health crises, environmental crises, and economic recessions, namely, vulnerability and resilience perspectives (Raimi & Manishimwe, 2021). The insights from both perspectives are explained in Figure 1.

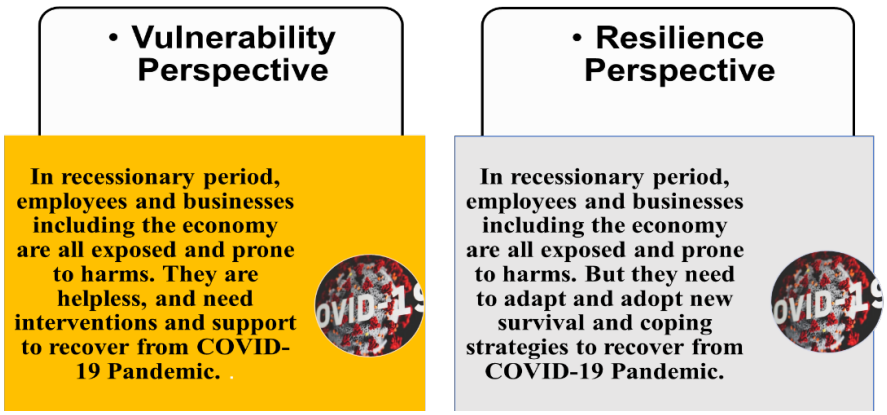


Fig. 1. Review of Literature: Perspectives on COVID-19 Pandemic (developed by the author's adapted from Raimi & Manishimwe, 2021).

3. IMPERATIVES OF CAREER REINVENTION/ RETOOLING

The insights from the CLR indicated that career reinvention/retooling is imperative because of internal and external factors that force role adjustments on employees and employers (Watts et al., 2015; Walker, 2019). Common internal factors include downsizing, organisational deregulation, outsourcing, technological change, and mergers & acquisitions (Gysbers, Heppner, & Johnston, 1998; Heppner, 1998). Other internal factors are age, sicknesses, job dissatisfaction, skills obsolescence, changes in features of jobs, demand for social skills, and new workplace lifestyle behaviours.

Moreover, the external factors that drive career reinvention/retooling are the COVID19 pandemic, new technologies, globalisation waves, demographic shifts, climate change imperatives, and migration, recession, newly emerging opportunities in critical sectors of the economy (ILO, 2021b). The highlighted internal and external factors require employees to develop three key competencies in the labour market, namely, critical digital and cognitive capabilities, (b) social and emotional skills, and (c) adaptability and resilience (Agrawal, et al., 2020). Where these key competencies are not forthcoming, alternatives are often inevitable to keep the labour market going. In Slovenia, the Czech Republic, and Slovakia, every thousand workers are to be replaced with two robots (Killc & Marin, 2020).

Career reinvention/retooling is the best trade-off for saving jobs and ensuring business continuity in the pandemic era, as it would help to save human lives by providing Post-pandemic workplaces with the highly desired workforce with the right knowledge, skills, competencies. Consequently, it would serve as a sustainable human capital development strategy to the existential threat to the planet, people & profits posed by the pandemic. The foregoing is supported by three cases and global statistics presented below.

The first case is Amazon company, which needs its employees to reinvent careers to cope with the dynamism of the global economy. The management, therefore, implemented proactive workplace career reinvention in early 2019, several months before the COVID-19 pandemic. Amazon committed $700 million to retrain its 100,000 employees in the US in readiness for 2025 higher-skilled jobs in technology and software engineering (Bloomberg, 2019). When the pandemic struck, the leadership of Amazon expanded its career reinvention scope to support 29 million

people across the world upscaling and upgraded their tech skills through free cloud computing skills training and AWS-designed programmes by 2025 so that beneficiaries could fit the high-demand occupations in the Post pandemic era (Carlson, 2020).

The second case is JPMorgan Chase company, which made a five-year $350 million financial commitment tagged "New Skills at Work investment" before the pandemic. The goal is to upskill the technical skills and competencies of its workforce and non-workforce stakeholders in readiness for future work (JPMorgan Chase, 2019). When the pandemic hit the global landscape, JPMorgan Chase expanded the scope of its upskilling programme. In France alone, it injected over €4.3 million into the career reinvention and reskilling of young people and long-term unemployed people in vulnerable communities in preparedness for stable, well-paid careers (Business Wire, 2021).

The third case is Walmart, which invested more in cross-training programs as part of its readiness for the Post-pandemic era. For automation, career reinvention, and business continuity, the sum of $14 billion was budgeted (Golden, 2020; Tyko, 2021). Consequently, the management retained, retrained, and rewarded the employees during the pandemic, when others were firing and downsizing. The company-led career reinvention strategy extends to acquiring the capabilities to handle new leadership roles in digital workgroups, including skills to work in condensed modular automated warehouses and local fulfilment centres, where Walmart stockpiles pantry items, frozen foods, consumables and electronics for meeting the needs of customers in a changing world (Tyko, 2021).

The fourth case is Brooks Brothers and New Balance organisations that implemented a career reinvention programme to save jobs and boost business continuity in the midst of the pandemic. Thinking differently about laying off and closing down operations, both companies converted the acute shortage of personal protective equipment (PPE) into an economic opportunity. They therefore retool their machines and manufacturing plants and retrain redundant employees to handle the production of surgical masks and gowns for sale to hospitals, clinics, and other users (Jesuthasan et al., 2020; Zavyiboroda, 2021).

The fifth case explicated the exploits of Tesla, Ford, and General Motors. The three automobile companies exhibited enviable lessons on social experiments of the future of work and career reinvention/retooling. At the peak of the pandemic, the demand for cars dropped drastically; hence, they shut down their production plants during the lockdown. In the face of the shortage of ventilators in hospitals and clinics, both companies quickly saw economic opportunities in the situation. Consequently, the three proactive companies retrained their engineers on new skills in response to the rapid changes in technology and market needs and retooled their machines and plants to produce ventilators for hospitals from automobile spare parts and other stored-up components in their factories (Jesuthasan et al., 2020).

Different Models of Career Reinvention/Retooling

The insights from the reviewed literature on career reinvention/retooling and its imperatives and twelve (12) different career reinvention/retooling models have emerged, as depicted in Figures 2 and 3 below.

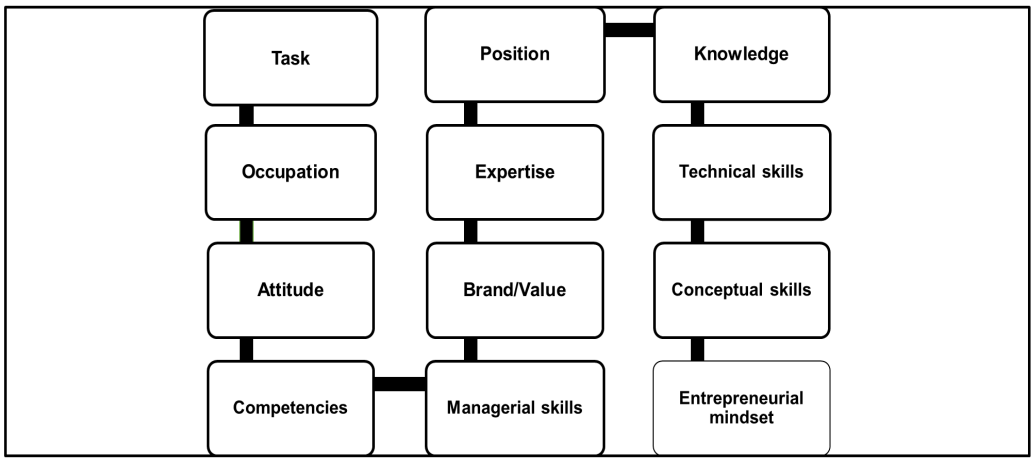


Fig. 2. 12 Models of Career Reinvention/ Retooling (De Vos, 2019; Claus, 2019; Heppner, 1998; Mintzberg, 1978; Omair, 2010; Ibarra, 2004; Walker, 2019).

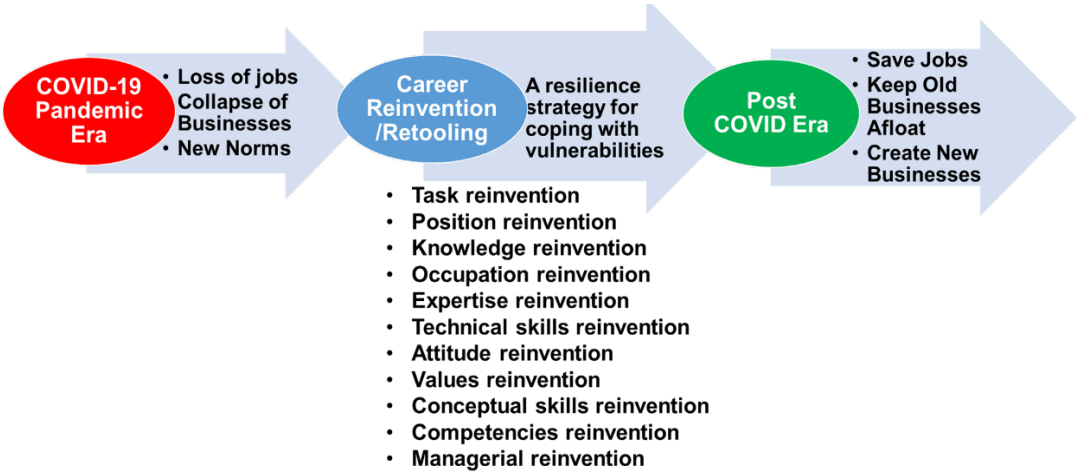


Fig. 3. Career Reinvention/ Retool Fast-tracks Transition from Pandemic Era to Post-Pandemic Era (developed by the author's).

The 12 different models require different levels of readjustment of task, position, knowledge, occupation, expertise, technical skills, attitudes, brand/value, conceptual skills, competencies, managerial skills, and entrepreneurial skills to meet the needs of future workplaces.

4. ROLES OF GOVERNMENTS, EMPLOYEES, AND EMPLOYERS

Career reinvention/retooling requires tripartite collaboration from three critical actors in industrial ecosystems, namely, governments, employers, and employees. The role of governments is to initiate policies to support and accelerate the development of new competencies and skills of citizens to meet the changing needs of labour markets and foster their resilience capabilities. The role of employees is to create personal career paths, embrace self-development, and upgrade themselves as indispensable "brands" for business organisations. The role of employers is to conduct skills inventory and

need assessment, invest in career reinvention to fill skills and knowledge gaps, remove inhibiting obstacles to employee development and update the skills to cope with technological advances (Agrawal et al., 2020; Castrillon, 2019; Worthington, 2006; ILO, 2021b).

5. POLICY, MANAGERIAL AND THEORETICAL IMPLICATIONS

For economic recovery, policymakers need to initiate policies on career reinvention to support citizens' reskilling, upscaling and relearning to meet the changing needs of the labour markets. To save jobs and improve personal wellbeing, employees should embrace career reinvention by upgrading their skills for future jobs. For business continuity and sustainability, managers must invest in career reinvention to fill skills, competencies and knowledge gaps to keep pace with technological advances, foster resilience capabilities, and meet the emerging needs of labour markets. In research, career reinvention connects the two perspectives on recession: It is a resilience tool for coping with vulnerabilities caused by the recession.

REFERENCES

Agrawal, S., De Smet, A., Lacroix, S., & Reich, A. (2020). *To emerge stronger from the COVID-19 crisis, companies should start reskilling their workforces now*. McKinsey Insights.

Boese, K.C. (2006) Career development, or, retooling for a relevant future. *The Bottom Line, 19*(2). https://doi.org/10.1108/bl.2006.17019baa.001

Business Wire (2021). J.*P. Morgan Invests €4.3 Million in Skills Development for the Young and Long-Term Unemployed in Paris*. Retrieved from https://www.businesswire.com/news/home/20210627005052/en/J.P.-Morgan-Invests-%E2%82%AC4.3-Million-in-Skills-Development-for-the-Young-and-Long-Term-Unemployed-in-Paris

Castrillon, C. (2019, November) *How To Reinvent Your Career After 40*. Forbes.

Carlson, T. (2020, December) *Amazon to help 29 million people around the world grow their tech skills with free cloud computing skills training by 2025*. Amazon. Retrieved from https://www.aboutamazon.com/news/workplace/amazon-to-help-29-million-people-around-the-world-grow-their-tech-skills-with-free-cloud-computing-skills-training-by-2025

Chopra-McGowan, A. & Reddy, S. B. (2020, July) *COVID-19: How can companies offer effective reskilling for employees?* Retrieved from https://www.weforum.org/agenda/2020/07/reskill-covid19-workforce

Claus, L. (2019). HR disruption—Time already to reinvent talent management. *BRQ Business Research Quarterly*, *22*(3), 207–215. https://doi.org/10.1016/j.brq.2019.04.002

Croom, S., Romano, P., & Giannakis, M. (2000). Supply chain management: an analytical framework for critical literature review. *European journal of purchasing & supply management*, *6*(1), 67–83. https://doi.org/10.1016/S0969-7012(99)00030-1

De Vos, M. (2019). How the future of work can work for the workers. In *Law, Labour and the Humanities* (pp. 46–61). Routledge.

Duff, J. (2020, March). *COVID-19 Proves Workers Are Essential and Capitalists Are A Drain*. Retrieved from https://www.hamptonthink.org/read/covid-19-proves-that-workers-are-essential-and-capitalists-are-a-drain

Golden, R. (2020). *Why Walmart is cross-training associates during the pandemic*. Publication of HRDIVE. Retrieved from https://www.hrdive.com/news/why-walmart-is-cross-training-associates-during-the-pandemic/589201/

Ibarra, H. (2004). *Working Identity: Unconventional Strategies for Reinventing Your Career*. Boston: Harvard Business School Publishing.

Ibarra, H. (2020, April). *Reinventing Your Career in the Time of Coronavirus*. Harward Business Review. Retrieved from https://hbr.org/2020/04/reinventing-your-career-in-the-time-of-coronavirus

International Labour Organisation (2021a, January). *ILO Monitor: COVID-19 and the world of work*. 7th edition. Updated estimates and analysis.

International Labour Organisation (2021b). *Skilling, upskilling and reskilling of employees, apprentices and interns during the COVID-19 pandemic: Findings from a global survey of enterprises*. International Labour Office – Geneva: ILO.

Jepson, D. (2009). Studying leadership at cross-country level: A critical analysis. *Leadership*, *5*(1), 61-80. https://doi.org/10.1177/1742715008098310

Jesuthasan, R., Malcolm, T. and Cantrell, S. (2020, April). *Crisis Management - How the Coronavirus Crisis Is Redefining Jobs*. Harvard Business Review.

JPMorgan Chase (2019). *JPMorgan Chase Makes $350 Million Global Investment in the Future of Work*. https://www.jpmorganchase.com/news-stories/jpmorgan-chase-global-investment-in-the-future-of-work

Katz, P. R., Burton, J. R., Drach, G. W., O'Leary, J. P., Strasser, D. C., Eisner, J. & Lundebjerg, N. E. (2009). The Jahnigen scholars program: a model for faculty career development. *Journal of the American Geriatrics Society, 57*(12), 2324–2327. https://doi.org/10.1111/j.1532-5415.2009.02551.x

Kilic, K., & Marin, D. (2020). How COVID-19 is transforming the world economy. *VoxEU. org*, *10*. Retrieved from https://voxeu.org/article/how-covid-19-transforming-world-economy

Kreeger, K. Y. (2000). Retooling for bioinformatics. *The Scientist, 14*(23), 35. https://link.gale.com/apps/doc/A68644151/AONE?u=anon~afb876b1&sid=googleScholar&xid=0a9cc22f

Mottaeva, A. (2018). Formation of mechanism of programme management for the development of medical organisations. In *MATEC Web of Conferences* (Vol. 170, p. 01053). EDP Sciences.

Nair, S. D. (2014). Tough times never last, but tough people do. *Indian Coconut Journal*, *57*(3), 6-10.

OECD (2021, April). *OECD Policy Responses to Coronavirus (COVID-19) An assessment of the impact of COVID-19 on job and skills demand using online job vacancy data*. Retrieved from https://read.oecd-ilibrary.org/view/?ref=1071_1071334-wh692jshet&title=An-assessment-of-the-impact-of-COVID-19-on-job-and-skills-demand-using-online-job-vacancy-data

Omair, K. (2010), Typology of career development for Arab women managers in the United Arab Emirates. *Career Development International*, *15*(2), 121–143. https://doi.org/10.1108/13620431011040932

Osland, J.S., Mendenhall, M.E., Reiche, B.S., Szkudlarek, B., Bolden, R., Courtice, P., Vaiman, V., Vaiman, M., Lyndgaard, D., Nielsen, K., Terrell, S., Taylor, S., Lee, Y., Stahl, G., Boyacigiller, N., Huesing, T., Miska, C., Zilinskaite, M., Ruiz, L., Shi, H., Bird, A., Soutphommasane, T., Girola, A., Pless, N., Maak, T., Neeley, T., Levy, O., Adler, N. and Maznevski, M. (2020). *Perspectives on Global Leadership and the COVID-19 Crisis*. Osland, J.S., Szkudlarek, B., Mendenhall, M.E. and Reiche, B.S. (Ed.) Advances in Global Leadership (Advances in Global Leadership, Vol. 13), Emerald Publishing Limited, Bingley, pp. 3–56.

Raimi, L. & Manishimwe, T. (2021). Small Business Survival of onslaughts of Boko Haram Insurgency, COVID-19 Pandemic and Economic Crisis in Yola, North-East Nigeria: Leveraging Entrepreneurial Marketing. In: Stephens, S. (Ed.). (2022). *Cases on Small Business Economics and Development During Economic Crises*. IGI Global. http://doi.org/10.4018/978-1-7998-7657-1 .

Rutgers Continuing Studies (2021). *Career Retooling*. Retrieved from https://lifelonglearning.rutgers.edu/career-retooling

Saunders, M. N. & Rojon C (2011). On the attributes of a critical literature review. *Coaching, 4*(2):156–162. https://doi.org/10.1080/17521882.2011.596485

Soni, G. & Kodali, R. (2012). A critical review of empirical research methodology in supply chain management. *Journal of Manufacturing Technology Management, 23*(6), 753–779. https://doi.org/10.1108/17410381211253326

Tyko, K. (2021). *Walmart raising pay for 425,000 workers starting March 13 after strong holiday sales amid COVID-19*. USA Today.

Worthington, J. (2012). *Reinventing the workplace*. Routledge.

AUTHORS' SHORT BIOGRAPHY

Dr. Lukman Raimi is an Assistant Professor of Entrepreneurship in the School of Business and Economics (SBE), Universiti Brunei Darussalam (UBD). Prior to joining the UBD, he was an Assistant Professor and the Chair of Entrepreneurship at the American University of Nigeria (AUN). Additionally, he was formerly the Coordinator of the Graduate Program in the School of Business & Entrepreneurship and the Director Centre for Entrepreneurship in AUN. He is an entrepreneurship educator trained at the Entrepreneurship Development Institute (EDI), Ahmedabad, India, under the World Bank-Step B Project. He had specialised training in Enterprise Education for Employability (EEE) at Pan-Atlantic University Nigeria under the British Council's sponsorship. He was an alumnus of the Cumberland Lodge Residential Mentoring (2014), Windsor, United Kingdom. He attended the 2019 Experiential Classroom XX organised for Entrepreneurship Educators at the University of Tampa, Tampa, Florida, United States. He had attended/delivered conferences/seminar papers in Turkey, Malaysia, Ghana, Togo, India, Belfast, Leicester, United States. His publications are listed in Scopus, Researchgate, Publons, and Google Scholar. His research interests include social entrepreneurship, entrepreneurial/digital innovation, medical entrepreneurship, development economics, CSR & sustainability, SDGs, and family business.

E-mail: Lukman.raimi@ubd.edu.bn
ORCID: http://orcid.org/0000-0002-5329-8715

https://doi.org/10.7250/scee.2021.0009

DIGITAL TRANSFORMATION AND THE CHANGING SHAPE OF QUALITY MANAGEMENT PRACTICES

Gaļina ROBERTSONE[1], Inga LAPIŅA[2]

[1,2]*Riga Technical University, Riga, Latvia*

Corresponding author e-mail: galina.robertsone@rtu.lv

Abstract. The main purpose of this paper is to explore how digital transformation influences and changes quality management practices adopted by the organisation. The methodology employed in this study is qualitative content analysis with open coding of selected literature followed by an empirical study in three logistic companies. Quality management practices related to leadership and culture, strategy, customer focus, improvement, relationship management, organisation and people, decision-making and processes are likely to transform with the integration of digital technologies. Innovation and digitalisation itself have all prospects to become a new addition to the core quality management concept. This study reviewed the general influence of digital transformation on quality management practices. The impacts of particular digital technology integration, such as blockchain, Internet of Things, robotics, etc. on quality management practices were not considered. The future research can be conducted on aspects of digitalisation of quality management systems and on the role of quality management practitioners in digital transformation. This study could be beneficial for the managers of organisations and quality professionals considering different aspects of digitalisation and adoption of digital technologies in their companies. This paper adds to the general knowledge about the relations between quality management and digital transformation which are not studied widely enough in the existing literature. The findings of the study provide a new insight on quality management in the light of digital transformation.

Keywords*: Digitalisation, Digital Transformation, Industry 4.0, Quality 4.0, Quality Management, Quality Management Practices*

JEL Classification: L15, O33, Q55

INTRODUCTION

Digital transformation is a hot topic nowadays. The digitalisation changes our life and business environment. It transforms the way the authors interact with each other, do our daily routines and learn. The organisations are being transformed as due to digitalisation there are not only new ways of how the authors design, produce and sell our products and services, but also new organisational structures, roles, culture, processes, new ways of working and methods of collaboration, new approach to dealing and solving problems, decision making and implementation. This transformation is not only about an adoption and integration of the newest technologies, but it also has several dimensions – Strategy, People, Organisation, Customer, Ecosystem, Technology, and Innovation (Ivančić et al., 2019) and it penetrates right through the whole ecosystem. To be successful there is a need for a new kind of leadership – leadership for

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

digitalisation, new digital vision and digital strategy. To secure long-term outcomes of digitalisation the top management commitment, customer orientation and technology focus on satisfying customers and business needs are imperative (Elg et al., 2020). Here comes the role of quality management in digitalisation and reshaping of quality management practices in the course of digital transformation.

Quality management embraces the whole organisation and impacts all its activities. The principles of quality management are fundamental beliefs, values, norms and rules that are used as a basis for managing quality. The seven core quality management principles elaborated by international experts of the International Organisation for Standardisation (ISO) are Customer focus, Leadership, Engagement of people, Process approach, Improvement, Evidence-based decision making and Relationship management (International Organization for Standardization, 2015; Quality management principles, 2015). These principles are used as guidelines for organisational development and performance improvement. We have chosen ISO based quality management principles for this study because quality management systems of the companies that participated in the research are built on these principles, although the companies are not formally certified.

Quality management practices can be defined as "the actions and procedures undertaken by a company or organization to ensure the delivery of a high-quality service or product" (Barros et al., 2014). In the context of this paper, by quality management practices the authors understand adoption and practical application of quality management principles within the organisation and its business activities for the purpose of achieving the highest quality of products and services provided. These practices include – but are not limited to – management leadership, human resources, education and training, teamwork, customer focus, supplier management, quality data and reporting, strategic planning, quality systems, quality culture, employee management, process management, product/service design, continuous improvement, quality tools and techniques, project management, change management, service-level management (SLM), content management, information and security management and service reporting (Basu & Bhola, 2016). Both digitalisation and quality management strive for improvements in the organisation in terms of product and service quality, processes, relationships, customer satisfaction, leadership and culture. Can they be the two sides of the same coin? What impact the digital transformation has on quality management practices, what changes there are for quality management and quality management professionals, what concepts of quality management may evolve in the future under this change – all these questions emerge and not all of them have an answer yet. Some propositions exist already that the digitalisation may become in the future one of the quality management keystones along with innovation, adaptability and resilience (Mayakova, 2019).

Digital transformation impacts all processes within the organisation as well as its external environment and vice versa. The integration of digital solutions and approaches into the management system of organisations has not been explored widely enough yet. Quality management may have a direct impact on digital transformation, being at the same time affected by it. Quality management and quality management practices are applied in all organisational levels and processes throughout the whole value chain. As digitalisation impacts and transforms the organisation it also changes quality management practices adopted by it. How and what changes there are for quality management due to digital transformation is to be explored in this paper.

1. DIGITAL TRANSFORMATION

Digitalisation has firmly entered our lives. We cannot imagine ourselves living without mobile applications, remote banking, online shopping, digital television and, since quite recently, online schooling, remote working and Zoom conferencing – due to COVID-19. On the business level, digitalisation and digital transformation play an important and, in some cases, vital role in the sustainable development and survival of organisations.

Digitalisation and digital transformation definitions describe the same phenomenon– the process of transformation of an organisation targeted at the creation of unified digital environment by combination of various data management tools and techniques through the whole cycle of product creation (Kovrigin & Vasiliev, 2020). In other words, digitalisation is described as a transformation of data to a new form and exchange of data through digital communication channels, so the data are more concordant with the new technology and digital tools (Ipatov et al., 2020). Digital transformation being by its nature a "fundamental change that completely changes the way the authors operate in all aspects: development and design, production, sales, and after-sales" (Prokhin, 2020) affects all levels and spheres of organisations. It contributes to the nascency of new conceptual and business models. What impact the digital transformation has on organisations is still to be studied.

Several studies have addressed the impact of digital transformation on the organisations. Ivančić (Ivančić et al., 2019) has identified the following digital transformation dimensions: Strategy, People, Organisation, Customer, Ecosystem, Technology, and Innovation. The benefits, disadvantages and risks connected to the integration of digital technologies (Mayakova, 2019; Ralea et al., 2019), challenges of the implementation (Kovrigin & Vasiliev, 2020; Sjödin et al., 2018) and key lessons learned (Tabrizi et al., 2019) are also discussed in the scientific literature. Some studies focus on human aspects of digitalisation (Elg et al., 2020; Dengler & Tisch, 2020) and another research has been done on trends and tendencies of digital transformation (Lola & Bakeev, 2020).

The general impact of digital transformation on the organisation can be characterised as positive. It provides a competitive advantage for companies by reducing mistakes and errors, improving quality and increasing production speed (Sjödin et al., 2018), raising productivity (Prokhin, 2020; Dewhurst et al., 1999), increasing efficiency and improving quality of management decisions and their execution (Mayakova, 2019), value-chain integration and exploitation of new markets and territories (Ebert & Duarte, 2018), value creation (Sjödin et al., 2018), decreasing production lead time, improving usage of data and data quality (Armengaud et al., 2017), accelerating speed to market (Tabrizi et al., 2019; Sjödin et al., 2018), improving customer service (Mazzuto & Ciarapica, 2019; Prokhin, 2020), rising employees' flexibility and initiative (Dewhurst et al., 1999) and, as the result, ensuring the growth of sales and increased profitability (Sjödin et al., 2018). The usage of Artificial Intelligence (AI) applications ensures regulatory compliance and improve work safety (IBM, 2017). The digital transformation is an enabler for the development of new business models based on digital platforms (Prokhin, 2020; Elg et al., 2020). Also, the participation of customers in product design and development directly expressing their needs and expectations adds to the competitive advantages of the companies ensured by digital technologies (Mazzuto & Ciarapica, 2019; Carvalho et al., 2020). However, in certain cases the implementation of new technologies may lead

to reduction of organisational productivity due to lack of internal knowledge or wrong application (Tabrizi et al., 2019).

The role of digital transformation in creation of better customer experience and value is tremendous. With the introduction of 3D technologies customers can take an active part in product development, have access to data via usage of applications and devices, can monitor processes in a real time and change settings (Prokhin, 2020; Elg et al., 2020). Mazzuto and Ciarapica (Mazzuto & Ciarapica, 2019) add that digitalisation allows to include customers more and more in pre-sales and post-sales activities with the usage of Internet platforms, including the potential and prospective customers. Integration with suppliers and formation of united ecosystem, value chain integration can be considered as direct beneficiaries of digital transformation. Digital technologies allow building digital infrastructures, include customers and suppliers in company processes via digital platforms, share data thus opening doors to cross-industry collaboration (Ebert & Duarte, 2018). Some authors believe that digitalisation impacts also external environment providing connection via applications, augmented and/or virtual reality and other technologies (Ralea et al., 2019; Mayakova, 2019).

Digital transformation is directly connected with innovation – an innovation is being pre-requisite and enabler of digital transformation (Armengaud et al., 2017), which in turn boosts innovation further and contributes to the emergence of culture of innovation (Tabrizi et al., 2019; Mayakova, 2019; Manita et al., 2020).

Digital transformation calls for changes within the organisation, in corporate relations, strategy, culture, leadership, decision-making and internal processes. In order for digital transformation to be successful it requires development of digital culture, culture of knowledge-sharing and improvement. There is also a need for a strategic approach to digitalisation. Digitalisation should be incorporated in the vision of the organisation and in its organisational structure (Ralea et al., 2019; Prokhin, 2020). Although it has been shown by previous research that digital transformation improves collaboration between departments and leads to creation of new cross-functional teams (Ponsignon et al., 2019; Mazzuto & Ciarapica, 2019; Armengaud et al., 2017; Prokhin, 2020), it is also worth mentioning that the interdependency of other functions, such as IT, increases (Elg et al., 2020) and there can be a risk of digitalisation transformation failure due to unwillingness to cooperate between departments (Kovrigin & Vasiliev, 2020).

Dealing with constant changes due to digitalisation may cause stress and fatigue for the whole organisation. At the same time, it makes the organisations employ the newest management methods, such as Scrum, Agile, Business Process Management (Ivančić et al., 2019), thus increasing adaptability and resilience (Ebert & Duarte, 2018). Digitalisation contributes to the formation of autonomous and cross-functional teams. The new ways of working, such as hybrid and completely remote, also has become possible due to technology (Tabrizi et al., 2019; Prokhin, 2020; Mayakova, 2019). Leading such teams requires a new set of skills and abilities from management and leaders (Ebert & Duarte, 2018). The decision-making process is taking new forms under the influence of digital transformation. The availability of Big Data, the usage of predictive and prescriptive analytics allows managers taking decisions faster and improves the quality of the decisions (Menshikova et al., 2019; Mandrakov et al., 2020). Cognitive technologies based on Artificial Intelligence and machine-learning allow to analyse data and propose better solutions based on learning from previous experience (Manita et al., 2020).

The downside of such state of affairs is increased dependency on the quality of data, cyber security, security and privacy concerns (Diong, 2017; Ralea et al., 2019; Ebert & Duarte, 2018; Armengaud et al., 2017; Kovrigin & Vasiliev, 2020; Carvalho et al., 2020). At the same time digitalisation is able to improve and enhance cybersecurity (IBM, 2017).

"Digital transformation is not about technology" (Tabrizi et al., 2019). It asks for a change in the mindset of people as well organisational structure. There are new roles and positions being created to deal with digital tools and techniques (Dewhurst et al., 1999; Armengaud et al., 2017; Ponsignon et al., 2019), e.g. Chief Data Officer (CDO), Data producer, Data consumer, Data broker. In this respect it needs to be analysed if these new roles require re-designing of the organisational structure. With the introduction and implementation of new digital technologies repetitive, monotonous and routine tasks can be automated and human involvement substituted (Dewhurst et al., 1999; Sjödin et al., 2018; Mandrakov et al., 2020, Manita et al., 2020; Branca et al., 2020). There is also a great potential for substitution of physical work, however, regarding the substitution of intellectual jobs the opinions vary. Some authors note that psychosocial work exposure is not associated with substitution potential (Dengler & Tisch, 2020). In this perspective the value of human resources which cannot be replaced by machines will certainly increase (Ebert & Duarte, 2018; Branca et al., 2020). Others argue that with AI, neural networks, machine learning and other technologies decisions can be made by robots. (Kovrigin & Vasiliev, 2020; Prokhin, 2020). The implementation and deployment of digital technologies may induce employees' fear of losing their jobs and they can sabotage the digitalisation efforts in the organisation (Dewhurst et al., 1999; Kovrigin & Vasiliev, 2020). In general, digital transformation is changing the shape of labour market and can increase inequality between genders and occupational groups (Dengler & Tisch, 2020). There is no doubt that digitalisation contributes to the formation and development of new skills, abilities and competences of personnel, not limited only to digital and IT skills, but also abilities to work with Big Data, dealing with complexity and problem solving in a new business environment (Dewhurst et al., 1999; Mayakova, 2019; Lola & Bakeev, 2020; Kovrigin & Vasiliev, 2020). Lack of the required employees' skills and lack of qualified employees in the market may also hinder the integration of the digital strategy and tools (Ebert & Duarte, 2018). Digitalisation in companies is also associated with large financial investments and this can be one of the reasons it is mostly adopted by larger companies and enterprises (Kovrigin & Vasiliev, 2020).

Digitalisation opens wide perspectives for advancement of quality management (QM). It can reduce the impact of the "human factor" in detection and prevention of non-conformities and errors (Menshikova et al., 2019; Manita et al., 2020). Various sensors and applications allow registration of performance indicators and control processes in a real time (Prokhin, 2020), thus enabling process and performance management through digitalisation of quality control practices. Better product traceability, which is crucial for some industries, such as food and pharmaceutical, is ensured via RFID and other digital technologies (Ebert & Duarte, 2018; Savina et al., 2020). Digital transformation offers and promotes usage of AI, predictive analytics, big data, image and product-recognition technologies for the benefits of QM. Mobile and interactive applications ensure connection with customers and other stakeholders (Ralea et al., 2019). Digital transformation enhances the revision, optimisation and standardisation of business processes and procedures (Sjödin et al., 2018; Mayakova, 2019; Tabrizi et al., 2019; Menshikova et al., 2019), as well as calls for the revision and

standardisation of business process terminology (Ivančić et al., 2019). Digitalisation may also become one of new quality management principles along with innovation and adaptability (Mayakova, 2019). However, the role of quality management in the process of digital transformation and the resulting changes in the practices of quality management have been studied quite little, therefore, these issues invite for the further research.

Based on the above, the authors can conclude that digital transformation affects the whole organisation and its all stakeholders. It transforms business processes and procedures, organisational structure, changes the shape of labour market as well as the mindset of people, organisational culture and strategy, relationships within teams, companies and the whole ecosystem. Quality management is an imperative part of any business activity, thus digital transformation shall, in no doubt, change the shape of quality practices. Therefore, the following research questions arise:

RQ1: What aspects of organisations are being impacted by digitalisation?

RQ2: What quality management practices are affected?

RQ3: How are these quality management practices changing with digital transformation?

2. METHODS AND PROCEDURES

We have chosen a four-phase methodology. First, the authors conducted a brief literature review. Then, to answer RQ1 and RQ2 the authors have performed literature qualitative content analysis with open coding. For the qualitative content analysis, the scientific papers citied in the Web of Science, Scopus and EBSCO databases were selected using the combinations of keywords. To broaden the scope and employing "berry picking" technique (Bates, 1989) some other papers from Google Scholar database were included. The selection criteria were the relevance of the paper to the research questions.

In the third phase, the authors chose to confirm empirically the results – answers to RQ1 and RQ2, acquired in literature content analysis and to answer RQ3 by performing an analysis of digitalisation in three logistics companies belonging to one international group of companies. We conducted nine 45 to 60 minutes semi-structured interviews with the representatives of the companies who were directly involved in the implementation of 2 digital solutions in their companies and/or are the users of these solutions, namely process owners, project managers, chief operations officers and quality specialists. Table 1 contains information about the interviewed persons and their positions in the companies. The records of the interviews were decoded, the results analysed, structured and interpreted.

In the fourth phase the authors validated the results with the same representatives of the companies in order to confirm the authors had interpreted the answers correctly.

Table 1. Information about the interviewed persons and their positions

	SIA	**OU**	**UAB**
Project manager	X	-	X
Process owner	X	X	-
Chief operations officer	X	X	X
Quality specialist	-	X	X

3. LITERATURE ANALYSIS

As a result of qualitative content analysis of the selected literature sources 12 categories and their frequency on the Digitalisation impact on the organisation have been identified (see Fig. 1).

Fig. 1. Categories and their frequency: digitalisation impact on the organisation

Brings improvement category is related to the improved quality and increased productivity, reduced errors and mistakes, increased efficiency, business adaptability and agility, thus ensuring a competitive advantage.

Changes the organisation category is related to substitution of routine and repetitive tasks, changing corporate relations and organisational structure, increase of inequality between occupational groups and genders, improved collaboration between departments.

Requires digital leadership and strategy category is related to changes in leadership and execution caused by the digitalisation, implementation of digital culture and incorporation of digital vision in organisation strategy.

Changes employees' behaviour and abilities category is related to employees' fear of losing their jobs due to digitalisation, acquisition of new skills, possible sabotage of digitalisation efforts.

Increases customer satisfaction category is related to provision of better products and services to customers which is enhanced by digitalisation, customers inclusion in the design and development of new products and services, direct customer interaction, increased product speed to market, new customer experience.

Improves relationships within the ecosystem category is related to integration of customers and suppliers in the value chain via digital infrastructure, cross-industry collaboration, digitalisation of external environment.

Boost innovation category is related to innovation enhanced by digital transformation and creation of new business models.

Increases the importance of data quality and security category is related to the increasing dependence on big data with the digitalisation and data quality. The issues of cybersecurity, data protection and risk management are becoming crucial for organisations.

Promotes the usage of technology category is related to application of digital technologies for collection and analysis of big data, process management and performance monitoring, quality control, detection and prevention of errors and mistakes, decision-making.

Forces the revision of processes category is related to revision, optimisation and standardisation of business processes, procedures and related terminology in the course of digital transformation.

Facilitates digital and improvement culture category is related to the promotion of digital culture and culture of continuous improvement based on digital technologies, improved communication and knowledge-sharing.

Changes the decision-making category is related to improved quality of the decisions that are made using AI and based on big data, machine-learning and neural networks as well as decisions made by machines and robots.

There was one sub-category with n=1 not fitting into any of the categories mentioned above – failure of digitalisation to improve productivity due to lack of internal knowledge thus not included in the categories, however, worth mentioning.

The qualitative content analysis results show that the impact of digitalisation lays in the same areas as the application of core quality management principles. The findings also generally support the conclusions of a previous study that identified seven dimensions of digital transformation, although the authors have identified several categories not fitting those dimensions. The summary of literature content analysis findings, quality management principles and dimensions of digital transformation identified in the previous research are presented in Figure 2.

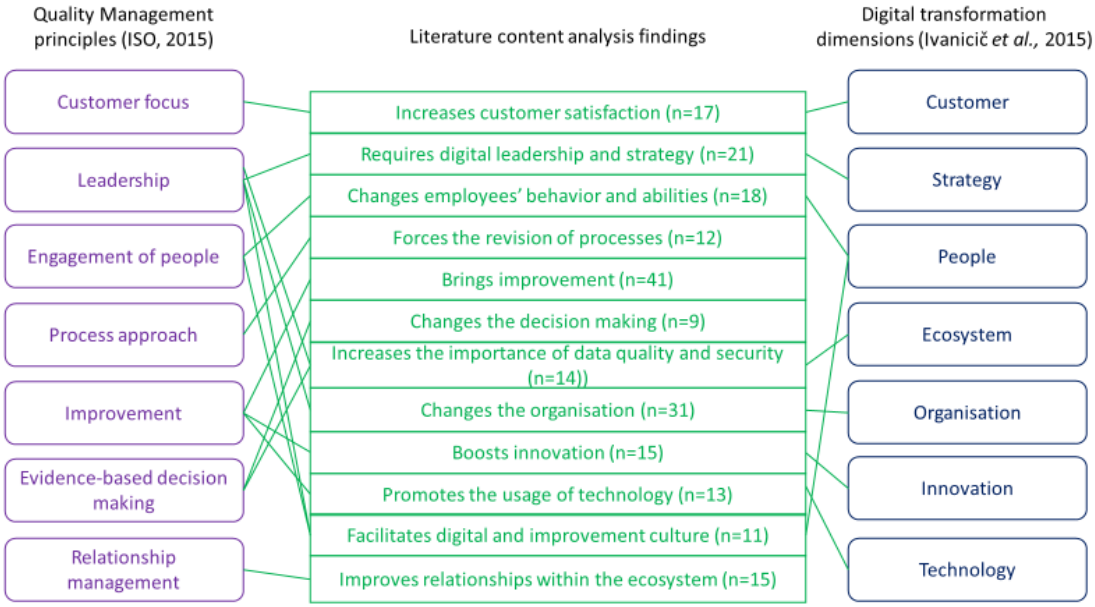


Fig. 2. Comparison of QM principles, digitalisation dimensions and literature content analysis findings

The figure 2 shows digital transformation and quality management affect the same areas of the organisation such as leadership and strategy, customers, people, relationship, processes improvement and decision-making. Cultural and organisational aspects are not stated as separate core principles of QM; however, leadership and strategy contribute to the formation of culture with certain values and may impose changes in the organisation. Building a strong improvement and, in case of digital transformation, also digital culture, requires engagement of people, thus making all those aspects interconnected and interdependent. Therefore, the authors can say cultural and organisational aspects are incorporated in quality management principles and those are also the aspects of digital transformation.

Innovation and integration of technology are important elements of digital transformation, not being addressed by fundamental quality management principles. Innovation is an important part of continuous improvement, whilst technology is a tool. Most innovations are driven by technology, even concepts or business models, because application and integration of technology stimulate thinking, experimentation, research and development, which in turn accelerate innovation. To satisfy customers and gain competitive advantage which are the main goals and tasks of quality management the innovation and integration of new technologies are imperative, therefore they shall be addressed by quality management.

The increasing with the digitalisation dependence on data and data quality increases the importance of security issues in the organisation, especially cybersecurity and protection of personal data. This affects the decision-making process and requires the management to identify and address them.

4. LOGISTIC COMPANIES PARTICIPATED IN THE EMPIRICAL PART OF THE RESEARCH

Three logistics companies that participated in this research are part of large international corporation. The companies provide warehouse logistics services in the Baltic states for retail companies. For data protection purposes the authors have named the company in Latvia as SIA, in Estonia – OU and in Lithuania – UAB. The basic data for the companies are represented in Table 2.

Table 2. Basic information about the companies participated in the research

	SIA (Latvia)	OU (Estonia)	UAB (Lithuania)
Company foundation year	1995	2006	2002
Number of employees	700	180	175
Number of warehouses	2	2	1

SIA is the biggest among these companies operating 24 hours a day, seven days a week.

The main activities of the warehouse operations consist of goods receiving, storage, picking, dispatch, inventory management, receiving of returns and waste collection. There are two main processes how goods are stored and assembled in a warehouse: JUST IN TIME (JIT) – goods that are assembled immediately after receipt and STOCK – goods that are assembled from defined storage locations (see Fig. 3).

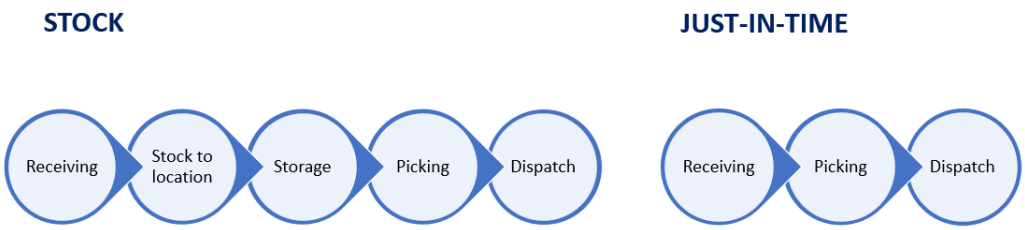


Fig. 3. STOCK and JIT warehouse operations

The difference in the processes is that in STOCK operations a picker goes to the specified location to pick up goods for the exact order. In JIT a picker picks goods from pallets and distributes them to several orders, therefore the risk of mistake is very high.

During the recent years, the companies have implemented many digital solutions in order to optimise their operations, providing better services to the customers, ensuring competitive advantage and sustainability. In this research 2 such solutions and their implications were in focus. Table 3 shows the implementation timeline

Table 3. DriveIn and Voicy implementation timeline

	SIA (Latvia)	OU (Estonia)	UAB (Lithuania)
DriveIn implementation period	12/2018	05/2020	12/2018
Voicy implementation period for STOCK	01/2020	01/2020	11/2019
Voicy implementation period for JIT	-	12/2020	04/2021

DriveIn – implementation of warehouse entrance registration programme for suppliers and service providers. The suppliers have the possibility to pre-register delivery using an interface that is connected to the DriveIn application and also warehouse management system (WMS) completing information about purchase order number, date and estimated time of delivery, and truck number. Upon the arrival, the system via license plate reading camera automatically recognizes and lets the truck in. If the pre-registration is not done, on arrival the driver inputs information into the kiosk in the arrival area, then the system checks the conformance of the supplier or service provider data with WMS data and lets the truck or car into the warehouse territory. Simultaneously the driver receives an SMS with the ramp number where he shall unload. The implementation of the solution allowed to fasten the registration process, improved goods traceability and warehouse security, and allowed eliminating several positions of inbound operators.

Voicy – implementation of goods picking solution where the commands what goods to pick and from what warehouse location are given by voice. The placement of goods for storage and registration in the system are also done by voice: the system directs the picker to the location and then he confirms the goods are placed there. Prior to the implementation of Voicy the picking and placement were done using scanners. Voicy allows employees having free hands, therefore the productivity shall increase. With the implementation of Voicy the picking sequence was optimised as well, thus reducing driving distance between the picking locations. Also, the solution positively impacts work safety as the pickers do not have to look at the scanner when driving the warehouse equipment and performing the assembly of goods.

In JIT operations Voicy gives voice commands about the picking not from the exact warehouse location, but directly from the received goods placed on pallets in the JIT

picking zone where they are delivered immediately after receiving. The store orders assembly logic is different, therefore the deployment of the same solution in two types of operations were considered as two separate projects.

Voicy had been tested but was not implemented in SIA for JIT operations because due to big volumes another automated solution was sought after.

5. DIGITALISATION IN THE RESEARCH COMPANIES

The digitalisation of suppliers' check-in process had two objectives – to optimise the time of registration and to reduce costs by elimination of physical operators at inbound. Additional benefits are improved security and visibility, as well as product traceability which is a crucial component of food safety management, as the process is fully automated, and records are kept in the system. DriveIn connection with WMS ensures access to all suppliers' database, ex-works conditions and all purchase orders. Human errors have been minimised, because in case of data discrepancy the system rejects the supplier. It has also improved the communication with the driver, his phone number is in the system and the driver can be contacted directly.

Digitalisation allowed to reduce 6 full time operator positions in SIA which has resulted in total savings of approximately 120 000 EUR annually. In UAB the reduction of 4 full time positions was achieved. However, in OU the situation is different. Although more than two years have passed since the digitalisation of the check-in process, there are still some technical issues which require physical employee presence, thus this objective has not been achieved. All three companies reported significant reduction of registration time and increased transparency of the process. It is important to note though, in case of system technical issues or errors, there still must be available operators to let the drivers in and report an issue to the technical support personnel. Many errors still appear due to incorrect actions by the suppliers' drivers. Hence the importance of correct written guidelines for the users emerges.

The suppliers and service providers check-in process became much faster with the digitalisation. In the beginning it caused dissatisfaction of some customers as the drivers had to adjust and learn the new registration process. Also, pre-registration required certain activities to be done on the customer side which was not initially appreciated. Over time, customers positively assessed the benefits of the solution, which were described above.

Voicy implementation expected to increase employee productivity and improve work safety. In UAB and OU implementation in STOCK operations went relatively smoothly, even taking into consideration the changes in the salary system. The minor issues with employees were solved by additional training (training had to be repeated several times) and explanations provided. Individual approach and investigation of each case when something went wrong, and the employee was involved or unsatisfied also helped. The expected productivity was reached in UAB within two months, and in OU within three months from the beginning of implementation. Most employees accepted the solution and there were minor technical and systemic issues necessary to be solved and improved. The adjustments were made continuously without implementation process interruption. The quality of picking remained on the previous level.

However, in SIA there was huge resistance from employees and many more technical issues. Due to these issues instead of productivity increase it went in the opposite direction.

SIA Chief operations officer: "The person (employee) was being constantly interrupted by the system; we were losing 10% in productivity".

System improvements took a long-time and caused frustration among pickers as well as between developers and those responsible for the digitalisation internally – project manager, process owner and operations manager. Additional resources were spent for training, adjustment, improvement workshops and the general education of employees. The process was reviewed several times and the supporting documentation underwent significant changes resulting in the creation of many versions. The deployment if the solution increased the importance if data, meaning both master data about goods in WMS and the precision of information received by voice from the pickers in goods placement to stock process. The pickers were constantly complaining about listening to the voice and reported certain problems even after work, like seeing bad dreams. In SIA the expected productivity was achieved only 6 months after the implementation of the solution.

Digitalisation of JIT processes is more complex. The picking is done from the pallets to several orders simultaneously, thus increasing the possibility of human mistakes. In UAB the process was not initially developed in the correct way: the sequence of picking was wrong (heavy goods placed on top of fragile ones), different labelling was required, orders were mixed. Often the system did not recognise what the picker said resulting in the incorrect information in the system. With Voicy employees need more concentration; if some goods remained on the pallet during the picking, it is not possible to check in Voicy, the picker needs to connect to a scanner and see where the goods were missed. There was no such problem when scanning with a scanner. Many human mistakes and errors occurred, especially with new employees, thus affecting negatively the quality and productivity. The quality of picking was stabilised after several improvements of the system and many additional trainings. The productivity is still not on the expected level, but the trend is positive. In OU the technical issues and the process inconsistency led to reduced quality and productivity, frustration and complaints from employees. There was a huge resistance from employees, who could not get used to the new way of working. Even the most experienced and long-term employees made mistakes. Whilst technical issues and process amelioration were solved during three-four months since the digitalisation start, the employee attitude and ability to work in a new digital environment is still an issue despite the fact that many trainings were organized, including individual.

The digitalisation process in these cases included many adjustments and modifications. For DriveIn there were improvements on the system and interface side initiated by internal needs and by customers. New languages were added to the kiosk registration application for the drivers having the possibility to register using their own languages (e.g. Polish).

For Voicy there were several technical issues that had not been foreseen in the development process, therefore during the implementation process many improvements and adjustments were made. There was also a tension between the developers and project managers responsible for the digitalisation; and between project managers and users of the solution – process owners and operations managers, who are their internal customers. Whilst operations managers blamed digitalisation in the decrease in productivity and quality, project managers explained it with human factors.

UAB project manager: "Voicy – it is not about the devices, not about the technology, it is about people's way of working."

The implementation of these solutions was not run as a separate process, rather as a continuous improvement from the strategic point of view. Digitalisation of these processes required the review of the process, evaluation of risks, calculation of costs, estimation of expected benefits, development of new solutions, implementation, persuasion and education of employees, development of process documentation, followed by adjustment and improvements and continuous work with employees. It is important that many improvement solutions came from the users of the solution – the pickers in case of Voicy, the drivers and customer representatives in case of DriveIn. The future plan for DriveIn is development of an even more user-friendly interface, the possibility to use it on the phone or tablet. For Voicy the future plans are to improve the picking sequence ensuring better quality of orders picked and making the whole process more efficient.

6. EMPIRICAL RESEARCH RESULTS

Based on the information received during the interviews the authors have identified that quality management practices related to leadership and strategy, quality culture, engagement of people and process approach are pre-requisites for successful digitalisation.

Customer focus in all three company cases implementation of those 2 digital solutions was neither pre-requisite, nor the driver for the digitalisation. The digitalisation efforts were rather having internal drivers, such as optimisation and cost reduction, keeping, however, customer interests in mind. Nevertheless, customers with no doubt have benefited from the implementation of these digital solutions.

Quality management practices related to improvement, relationship management and evidence-based decision making are being impacted by the digitalisation. Figure 4 represents the Interrelation between digitalization and quality management practices.

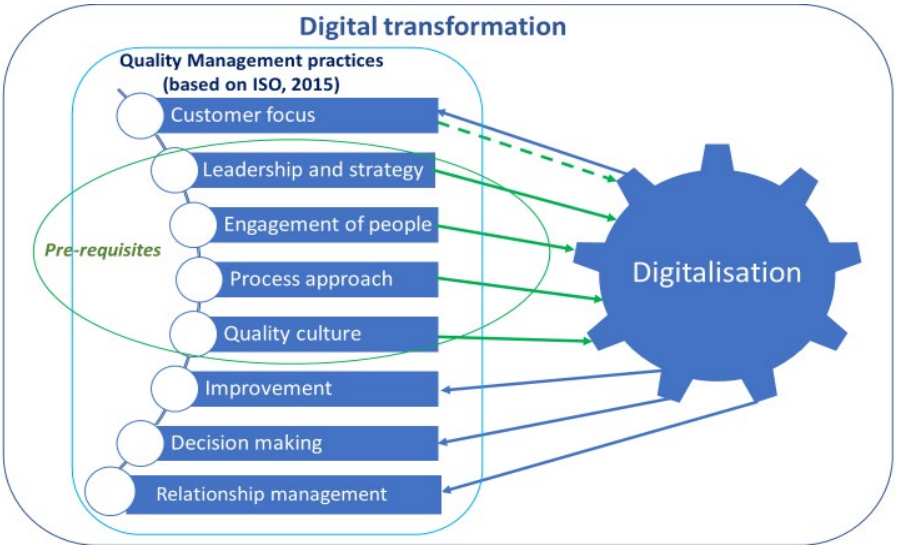


Fig. 4. Interrelation between digitalisation and quality management practices

Engagement of people. Engagement of people, their education and development become the most important quality management practice for digital transformation. Digitalisation without true transformation of people's mind-set, relationships and culture would not bring the desired improvement. The implementation of DriveIn did

not provoke straight resistance from the employees, as incoming operators were not directly involved in the process. However, there was a certain turbulence in the organisation noted in SIA and UAB caused by the changes in the organisational structures, e.g. reduction of employees. Some operators were transferred to other positions within the organisation, but several employees were made redundant which, understandably, caused a negative reaction among employees. There was a huge resistance from employees during the deployment of Voicy for stock operations in SIA and for JIT operations in UAB and OU. Also, the productivity and quality decreased as employees could not get used to the new way of working. These obstacles were overcome by additional training, education, persuasion of employees, individual approach and investigation of each case separately, where quality specialists played an important role.

Leadership and strategy. In all three companies the implementation of these solutions was a strategic decision. Each solution was thoroughly calculated and reviewed as a separate business case. The realisation of the projects was included in two to three years' strategic development plan. It was approved and supported by top management of the company. All respondents in all three companies stressed that the company sees digital transformation as the future of the company. Leadership played an important role in dispute resolution when there was a tension between the developers, implementors and the users of the solutions. The development and implementation of these solutions required significant financial investments, which did not bring immediate returns, thus top management leadership and commitment are extremely important to support digitalisation. Quality management practices related to leadership are one of key pre-requisites for digitalisation.

Process approach. Quality management practices related to process approach also become one of the prerequisites for digitalisation as digitalisation requires revision of the existing processes, development of new processes based on big amount of data, creation of new process documentation and working instructions for employees. At the same time digitalisation itself is the process changing the way of working and decision making. This process was, and still remains as it continues, iterative requiring many adjustments and improvements.

Quality culture. Having quality culture, culture of continuous improvement with no blaming and "witch hunting" is imperative for digital transformation. In UAB the process of digitalisation went more smoothly than in SIA and OU where the internal culture and communication issues became at some point limiting factors for digitalisation and hindered the process. The planting of quality culture for digitalisation, which can be defined as digital improvement culture, the changing the mindset of people toward improvements via digital tools and solution application are one of key quality management practices in the course of digital transformation.

Customer focus. During the interviews the authors got the confirmation that digitalisation in all three companies was not driven by the customers yet taking into the consideration their interest and offering certain benefits to them. Thus, the authors can conclude that customer related quality management practices are being transformed as the customer is not a first priority in the course of digitalisation. The customer benefits in case of DriveIn are the traceability of products and faster registration – therefore their employees spend much less time at the warehouse. In case of Voicy implementation productivity increase allowed offering better service price.

Improvement. Digitalisation certainly facilitated improvement in the organisations under this study. Digital transformation starts with the review of the existing processes and becomes a process of continuous improvement itself where quality management practices are in the development of new ways of working, review and improvement of processes and development of supporting documentation.

Decision-making. The decision-making practices are affected drastically. On the one hand, the digitalisation allowed completely substituting inbound operators in SIA and UAB, letting the system take the decision. In case of Voicy the decisions about picking sequence and the location are also done by the system. On the other hand, the dependence on data quality and cybersecurity increased enormously. The focus of quality management shifts from evidence-based decision making, based on reports and KPIs towards risk management, data quality and security.

Relationship management. The digitalisation in an organization cannot take place without the participation of stakeholders. In case of DriveIn implementation a continuous dialog with the customers and the suppliers was held. Many improvements were initiated by the suppliers and their needs (e.g. improvements of the interface, addition of Polish language). There was also some resistance from customers and the suppliers who needed to do additional work and acquire, like in case of supplier drivers, additional skills. Also, within the organisation establishing connections between different departments is a key task of quality management for digital transformation. In case of Voicy implementation in SIA and OU there were issues and misunderstanding of where the root of the problem was, if it was technical or human related, if it belonged to the developers or operations. Quality management practices in such cases transformed towards being mediating and educating.

CONCLUSION

Digitalisation of any organisation requires leadership and strategy, structured approach and change in the mindset of people involved. The integration of technology alone is not enough. The beauty of digitalisation is establishing connections and improving relationships with the ecosystem via the digital infrastructure. Digital transformation calls for organisation re-design, the acquisition of new skills and abilities of personnel, revision of processes, development of new strategy and taking care about the customer needs. These are the same tasks and goals for the quality management - ensure customer satisfaction providing better services and products, satisfy stakeholders' needs, establish relationships, enhance collaboration, create environment for excellence within the organisation via improved culture and strategy with the involvement of people and top management commitment. Digital transformation and quality practices go hand in hand and the transformation brought by the integration of digital technologies changes inevitably the way quality management practices are applied for the benefits of the organisation, its customers and the whole ecosystem.

In this study the authors have discovered that certain quality management practices become imperative as pre-requisites for digitalisation and for successful digital transformation, whilst other practices are being impacted and affected by digitalisation.

Leadership and strategy for digitalisation is the first cornerstone, which confirms the literature qualitative content analysis findings where the category "Requires digital leadership and strategy" had a frequency n=21. Quality management practices related

to the engagement of people, changes of way of working and organisation itself are another crucial pre-requisite for digitalisation. "Digital transformation is not about technology" (Tabrizi et al., 2019) was confirmed by UAB project manager saying that digitalisation was not about tools or technology, but it was about way of working adopted by employees. Similar conclusions derived from literature content analysis where digitalisation impact on employee behaviour and abilities (n=18) and changes in the organisation (n=31) are among the categories with the highest frequencies. Digital transformation is a continuous improvement process, the engagement of people hence plays an utmost important role, as they may support this transformation or hinder it. Human resource perspective of quality management (Foster, 2007) can contribute to the solution of employee related digitalisation issues. Similar findings were noted in other research (e.g. Branca et al., 2020).

Literature analysis showed that digitalisation facilitated digital and improvement culture in organisations (n=11), however, in our study the authors conclude that quality management practices related to quality culture shall be adopted by the organisation for the digitalisation being successful and smother. As empirical study and literature analysis showed the digitalisation of the processes brings improvements into the organisation (n=41); however, this path is thorny and difficult. In order to achieve those benefits the continuous improvement process approach shall be employed. Both literature and empirical study showed that digital transformation starts with the review of existing processes (n=12) and becomes a process of continuous improvement itself where quality management practices lay in the area of the development of new ways of working, review and improvement of processes and development of supporting documentation.

Quality management practices shift from being customer-centric towards playing a mediating role for digital transformation. Although digitalisation offers better customer experience (Ralea et al., 2019; Prokhin, 2020), new products and services (Elg et al., 2020), better satisfaction of end customer needs by increasing collaboration between the organisation and its customers (Mazzuto & Ciarapica, 2019), the customer satisfaction category (n=17) is not among the impacts with highest frequencies detected in the literature content analysis. Our empirical study confirms that digitalisation was not driven by the customer needs, although at the end there were certain benefits for the customers. The authors have also shown that digitalisation not only allows the substitution of monotonous and repeating tasks along with physical work as was described by Manita and Dengler and Tisch (Manita et al., 2020; Dengler & Tisch, 2020), but also the decision making can be done by the digital system confirming the findings of previous research by Prokhin (Prokhin, 2020).

The results of this research show that quality management practices related to leadership and culture, strategy, customer focus, improvement, relationship management, organisation and people, decision-making and processes are likely to transform with the integration of digital technologies some of them becoming extremely important being prerequisites for the transformation, whilst others are being transformed under the impact of digitalisation. The focus of quality management practices in the digitalisation process shifts from being customer-centric towards playing mediating role with the increasing importance of human resource perspective of QM.

REFERENCES

Armengaud, E., Sams, C., von Falck, G., List, G., Kreiner, C., & Riel, A. (2017). Industry 4.0 as Digitalization over the Entire Product Lifecycle: Opportunities in the Automotive Domain. *Communications in Computer and Information Science*, 334–351. https://doi.org/10.1007/978-3-319-64218-528

Barros, S., Sampaio, P., & Saraiva, P. (2014). Quality management principles and practices impact on the companies' quality performance. *Proceedings of the 1st International Conference on Quality Engineering and Management*, 237–247.

Basu, R., & Bhola, P. (2016). Impact of quality management practices on performance stimulating growth. *International Journal of Quality & Reliability Management*, *33*(8), 1179–1201. https://doi.org/10.1108/ijqrm-10-2015-0153

Bates, M. J. (1989). *The Design of Browsing and Berrypicking Techniques*. Pages.gseis.ucla.edu. Retrieved from https://pages.gseis.ucla.edu/faculty/bates/berrypicking.html

Branca, T. A., Fornai, B., Colla, V., Murri, M. M., Streppa, E., & Schröder, A. J. (2020). The Challenge of Digitalization in the Steel Sector. *Metals*, *10*(2), 288. https://doi.org/10.3390/met10020288

Carvalho, A., Sampaio, P., Rebentisch, E., & Oehmen, J. (2020). *Title: Technology and quality management: a review of concepts and opportunities in the digital transformation,* 698–714. Retrieved from http://hdl.handle.net/1822/70713

Dengler, K., & Tisch, A. (2020). Examining the Relationship Between Digital Transformation and Work Quality: Substitution Potential and Work Exposure in Gender-Specific Occupations. *KZfSS Kölner Zeitschrift Für Soziologie Und Sozialpsychologie*, *72*(S1), 427–453. https://doi.org/10.1007/s11577-020-00674-3

Dewhurst, F., Martínez Lorente, A. R., & Dale, B. G. (1999). Total quality management and information technologies: an exploration of the issues. *International Journal of Quality & Reliability Management*, *16*(4), 392–406. https://doi.org/10.1108/02656719910249333

Diong, T. (2017). The Future of Management Systems. *Quality Magazine*. https://www.qualitymag.com/articles/94207-the-future-of-management-systems

Ebert, C., & Duarte, C. H. C. (2018). Digital Transformation. *IEEE Software*, *35*(4), 16–21. https://doi.org/10.1109/ms.2018.2801537

Elg, M., Birch-Jensen, A., Gremyr, I., Martin, J., & Melin, U. (2020). Digitalisation and quality management: problems and prospects. *Production Planning & Control*, 1–14. https://doi.org/10.1080/09537287.2020.1780509

Foster, S. T. (2007). *Managing quality : integrating the supply chain*. Pearson Prentice Hall.

IBM. (2017, March 13). *7 keys to digitize manufacturing*. 7 Keys to Digitize Manufacturing. Retrieved from https://www.ibm.com/industries/industrial/resources/7-keys-business-transformation/#section-4

International Organization for Standardization. (2015). *ISO 9000 Quality management systems - Fundamentals and Vocabulary* (Fourth revision).

Ipatov, O., Barinova, D., Odinokaya, M., Rubtsova, A., & Pyatnitsky, A. (2020). The Impact of Digital Transformation Process of the Russian University. *DAAAM Proceedings*, 0271–0275. https://doi.org/10.2507/31st.daaam.proceedings.037

Ivančić, L., Vukšić, V., & Spremić, M. (2019). Mastering the Digital Transformation Process: Business Practices and Lessons Learned. *Technology Innovation Management Review*, *9*(2), 36–50. https://doi.org/10.22215/timreview/1217

Kovrigin, E. A., & Vasiliev, V. A. (2020). Barriers in the Integration of Modern Digital Technologies in the System of Quality Management of Enterprises of the Aerospace Industry. *2020 International Conference Quality Management, Transport and Information Security, Information Technologies (IT&QM&IS)*. https://doi.org/10.1109/itqmis51053.2020.9322960

Lola, I. S., & Bakeev, M. (2020). Pilot study of Industry 4.0 and digital technology prevalence in Russian manufacturing companies. *Management and Production Engineering Review*, *11*(3), 26--37. https://doi.org/10.24425/mper.2020.134929

Mandrakov, E. S., Vasiliev, V. A., & Dudina, D. A. (2020). Non-conforming Products Management in a Digital Quality Management System. *2020 International Conference Quality Management, Transport and Information Security, Information Technologies (IT&QM&IS)*. https://doi.org/10.1109/itqmis51053.2020.9322931

Manita, R., Elommal, N., Baudier, P., & Hikkerova, L. (2020). The digital transformation of external audit and its impact on corporate governance. *Technological Forecasting and Social Change*, *150*, 119751. https://doi.org/10.1016/j.techfore.2019.119751

Mayakova, A. (2019). Digital transformation of modern quality management. *Economic Annals-XXI*, *180*(11-12), 138–145. https://doi.org/10.21003/ea.v180-15

Mazzuto, G., & Ciarapica, F. E. (2019). A big data analytics approach to quality, reliability and risk management. *International Journal of Quality & Reliability Management*, *36*(1), 2–6. https://doi.org/10.1108/ijqrm-01-2019-294

Menshikova, M. A., Piunova, Y. V., & Makhova, M. N. (2019). Digital Transformation in the Quality Management System. *2019 International Conference "Quality Management, Transport and Information Security, Information Technologies" (IT&QM&IS)*. https://doi.org/10.1109/itqmis.2019.8928438

Ponsignon, F., Kleinhans, S., & Bressolles, G. (2019). The contribution of quality management to an organisation's digital transformation: a qualitative study. *Total Quality Management & Business Excellence*, *30*(sup1), S17–S34. https://doi.org/10.1080/14783363.2019.1665770

Prokhin, E. (2020). *Digital Transformation of Industrial Companies: What is Management 4.0?* The 11th International Conference on E-business, Management and Economics, Beijing China.

Quality management principles. (2015). International Organization for Standardization. Retrieved from https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100080.pdf

Ralea, C., Barbu, C., Tanase, C., & Dobrin, O.-C. (2019). Looking to the Future: Digital Transformation of Quality Management. *Proceedings of the International Management Conference*, *13*(1), 121–132.

Savina, A., Malyavkina, L., Baturina, N., Bolshakfova, L., Zimina, L., & Vlasova, M. (2020). Information and technological support of the system of food quality and safety management in the digital economical environment. *Proceedings of the International Scientific Conference - Digital Transformation on Manufacturing, Infrastructure and Service*. https://doi.org/10.1145/3446434.3446443

Sjödin, D. R., Parida, V., Leksell, M., & Petrovic, A. (2018). Smart Factory Implementation and Process Innovation. *Research-Technology Management*, *61*(5), 22–31. https://doi.org/10.1080/08956308.2018.1471277

Tabrizi, B., Lam, E., Girard, K., & Irvin, V. (2019, March 13). *Digital Transformation Is Not About Technology*. Harvard Business Review. Retrieved from https://hbr.org/2019/03/digital-transformation-is-not-about-technology

AUTHORS' SHORT BIOGRAPHY

Galina Robertsone is RTU PhD student and assistant researcher. She is also a Quality Manager responsible for Baltic countries at a group of logistics companies. She has gained significant work experience in quality management by working in leading positions at a textile manufacturing company and as a quality and procurement manager in a representative office of an automotive industry corporation in Latvia. Key research areas are integrated management systems, lean, theory of constraints, quality management, excellence models, production management, digitization and digital transformation.
E-mail: galina.robertsone@rtu.lv
ORCID: http://www.orcid.org/0000-0001-9244-8424

Inga Lapiņa is a professor at Riga Technical University. She has more than 25 years' experience in higher education, research and project management. Passionate about delivering quality education that meets real-life business needs and fostering creativity, entrepreneurial spirit and innovative thinking among students. She strongly believes that out-of-the-box thinking, creativity and continuous improvement are crucial to success in business and life. Main research areas are quality management, conformity assessment, quality of education, development of human and intellectual capital and competence, corporate social responsibility and sustainability.
E-mail: inga.lapina@rtu.lv
ORCID: https://orcid.org/0000-0003-3019-2472

https://doi.org/10.7250/scee.2021.0010

THE ROLE OF AUDIENCE SEGMENTS ON MEDIA CONSUMPTION

Linda SAULITE

Riga Technical University, Riga, Latvia

Corresponding author e-mail: Linda.Saulite_1@edu.rtu.lv

Abstract. The research aims to present the role of the media brand associations on media content consumption by Generation Z. Technological convergence and content distribution and accessibility via multi- platforms brought new patterns in media content consumption regarding volume, channel, device and time. Digitalisation and technology advancement brought utterly new aspects in media consumption. Due to accessibility, content is distributed and consumed via multiple platforms. Convergence between different demand and supply channels makes content consumption easier in the meantime; content supply becomes more cluttered with new media entering the market. Social network sites created new possibilities for content distribution, readership, branding. Content consumption on-demand and via multi-platforms bring not only possibilities for media brands but also challenges. Media brands should reinvent their branding strategies as content consumption via multi-platforms dilutes brand associations, and therefore more and more of the audience becoming indifferent to media brands and more focused on content experience. Jenkins (2008) referred that consumers content consumption behaviour now is mobile, non-linear, modular, and not device/outlet/platform dependent. The main impact of the increasing audience fragmentation, the development of distribution channels, and the advancement of technology that allows for time and platform shifting according to the audience's immediate needs all contribute to an environment where the value of media brand or channel branding is valued might be diminishing. For Generation Z, this behaviour is even more pronounced as they consume traditional media below average and prefer media content on online platforms, access online content via mobile devices, use social media more than other age groups and choose international media and social network platforms over local media content. Changes create difficulties for national media brands to attract and grow the future audience – Generation Z. This audience use less local media content, use less media content in their national language, and consume it via social media platforms. The author analyses the consumption trends of national media brands in Latvia and highlights the significant brand associations that positively impact media brand content consumption for a younger media audience. The research shows that the distinctive content seamless and appropriate content experience to each consumption platform positively influences and strengthens media brand associations and, therefore, increase media brand usage. The more the target audience feels connected, engaged and associated with the media brand community, the more it feels towards the media brand. Thus, the research confirms many scholars findings that audience becomes a significant part of media brand and interaction or content experience is crucial for building media brand associations.

Keywords*: Content experience, Media brand, Media brand associations, Media consumption*

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

JEL Classification: M31

INTRODUCTION

Digitalisation and technological advancement changed information supply and demand ways in many industries. (Eremina, Lace, Bistrova, 2019) noted that digitalisation processes have accelerated all industries' development by connecting, fast, and controllable while also providing easy access to data and necessary information. This also applies to media companies highly impacted by digitalisation and social media network development worldwide. In the last fifteen years of academic research on media brands and branding, two aspects dominate when researching the digitalisation process impact on media brands: technological convergence resulting in content consumption on-demand via multiple platforms and audience fragmentation due to development and popularity of social media platforms and increasing content consumption access points.

1. MEDIA BRAND CONTENT CONSUMPTION CHANGES AND ITS EFFECT ON THE MEDIA BRAND

The development of technologies brought significant changes to how the audience consumes media content. Chan-Olmsted (2011) stated that with the increase of connected devices, the focus is on the act of consumption, not the devices or access points. Jenkins (2008) states that today's media audience, especially the younger audience, requires a media content consumption experience that is mobile, non-linear, modular and not the device, platform or outlet dependent.

The primary changes directly influence media brand content distribution and consumption:

- a shift from traditional media to a digital environment media content consumption.
- media content consumption on-demand via multiple platforms.
- media content consumption via social media platforms.

According to Saulite et al. (2020), technological convergence and content distribution and accessibility via multi- platforms brought new patterns in media content consumption regarding volume, channel, device and time. Social network sites created new possibilities for content distribution, readership, branding. Increasing usage of global social network sites brings opportunities for media brands to distribute content and reach the audience and new challenges and competition for local and national media. Content consumption on-demand and via multi-platforms bring not only possibilities for media brands but also challenges. The growing multichannel, multimedia marketing environment presented a new layer of brand management challenges to media branding (Chan-Olmsted, 2011, p. 3–19). According to Chan-Olmsted (2011) from a macro perspective, this meant media brands had to ensure their products and content were synergistic across different media and channels, in the meantime taking advantage of each medium's unique characteristics.

The author analyses the consumption trends of national media brands in Latvia. The research aims to define media brand associations that positively impacts media brand consumption by Generation Z in the convergent and multi-platform marketplace

focusing on news media and measuring content unrelated brand associations that increase media brand usage and engagement for a younger audience.

2. METHODOLOGY

First, to confirm media consumption changes in Latvia influenced by digitalisation and technology advancement, the author used a secondary research method. The research framework is based on secondary data, quantitative consumer research done every two years from 2012 till 2021 by SIA Dentsu Aegis Network Latvia. At this media agency, the author holds a member of the board and managing director position, and the author responsibilities include quantitative consumer research management. Data is updated every two years, conducted in 65 countries, including Latvia. The data collection method is an online interview with a length of 90 minutes. The questionaries include online and offline activities, favourite channels and platforms, media reach and impact. Research simple size in Latvia is 3163, using nationally representative sample and quota by socio-demographics and internet usage. The research consists of fieldwork in the length of three months and data analyses.

Second, using consumer-based brand equity framework and news media aspects and media consumption data that support research actuality, the author used quantitative research, survey research, a sample size of 300 respondents aged 15–24 years, weighted data in Latvia in May- June 2018. The author chose the most used local news media brands aged 15–24 to determine non-product related brand associations that increase media brand consumption and engagement. The research built on choice questionaries to determine how Generation Z uses national media and access particular media brands. The research aim was to find the media brand associations that first influence media brand choice, then increase usage and engagement with the brand. The fieldwork and data analyses were done over two months, May – June 2018. First, the responders graded the importance of selected brand associations that increase content consumption, engagement and following social networks. Then the data were analysed and correlated between the main product and non-product associations determined to observe variables to establish a statistically corresponding relationship between them]. The aim was to identify variables that have some ties to create some change in the other.

3. RESULTS. THE SHIFTING PARADIGMS IN MEDIA CONSUMPTION

From traditional media to a digital environment, content consumption

The digitalisation process impact on media brands brought technological convergence between different media outlets. Development of technologies and internet accessibility increase audience volume that access content online and consume it daily. In 2020 regular internet users (use at least one time per week) in Latvia increased by 3.2% compared to 2019 and reached 86.9% of the population. In the age group 16-24 y.o, the regular internet users reach 97.9% of this age group. In the age group 25-54 y.o, this data is 95.2%, but in the age group 55-74 y.o. 69.6% (Dentsu Aegis Network Latvia, 2020). 81.7% of all internet users in online environments read online news media, print or magazine online versions. The most popular online activities for younger audiences (16 – 24 y.o.) are social media platforms, instant messaging, and email services (Dentsu Aegis Network Latvia, 2020). Following this,

the content consumption from traditional forms like TV, Radio, Print moves to the online environment. If we compare the share of time spent by media type, online media content consumption increased from 27% in 2014 to 44% in 2021 (see Fig. 1).

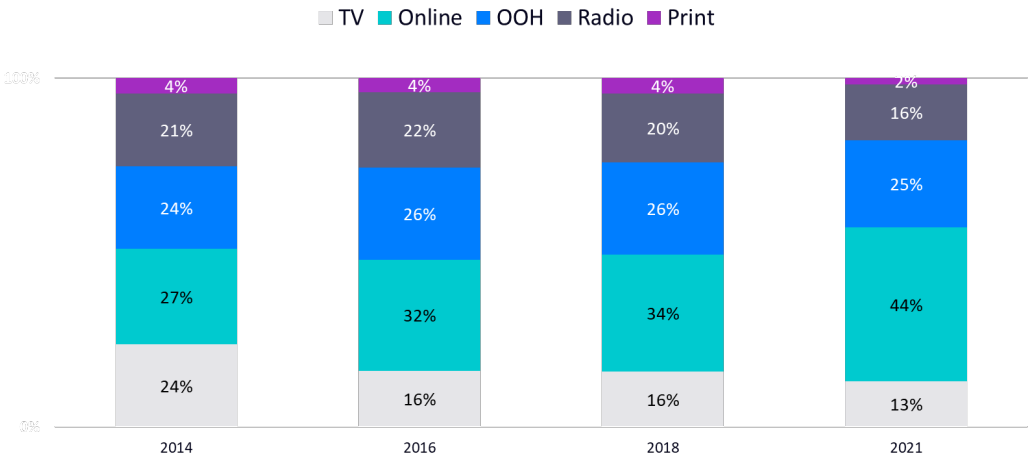


Fig. 1. Share of time spent with media 2014 - 2021, base: All 15-64, Latvia, (Consumer Connection System, Dentsu Aegis Network Latvia)

Meanwhile, traditional media content consumption timeshare like radio decreased from 21% in 2014 to 16% in 2021. Likewise, time spent with TV media decreased from 24% in 2014 to 13% in 2021(Dentsu Aegis Network Latvia, 2021). Data confirms the shift in content consumption from traditional media forms to online consumption in all age groups. (Dentsu Aegis Network Latvia, 2021) Also, the data can be interpreted as an assumption of decreasing TV or Radio content usage or decreasing time with media; the opposite is true. In 2016, on average, a person in Latvia consumed media 12 hours 1 minute per day, while in 2014 - only 9 hours 55 minutes hours per day (Dentsu Aegis Network Latvia, 2016). Accessibility and technologies increased audiences' time with media, but how the audience consumes media content changed from traditional to online.

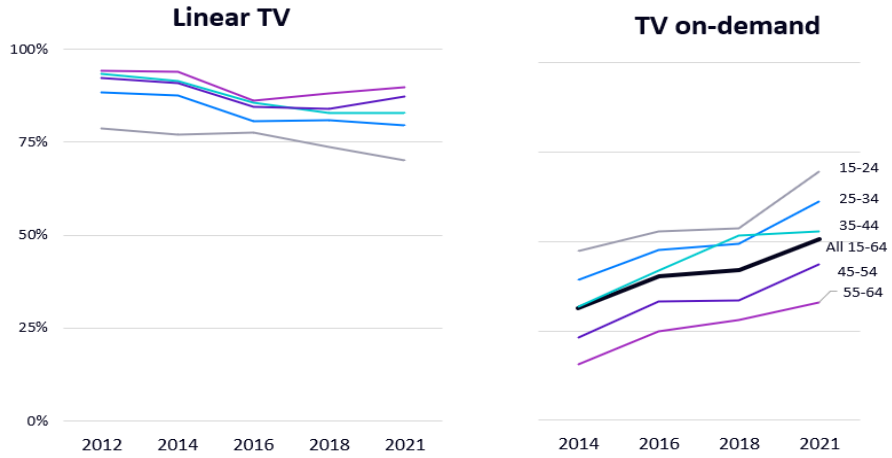
Content consumption on-demand via multiple devices and channels

Media consumption across the globe is increasingly happening in digital formats. The increase in the number of devices capable of supporting digital media and increasing internet access speed has provided consumers with an option to access the media content of their choice, be it information, entertainment or social activity anytime, anywhere (Deloitte Touche Tohmatsu India Private Limited, 2015).

In the TV audience analyses, the content consumption patterns of the TV audience, the time-shifted viewing and video-on-demand content consumption are growing in Latvia. Linear TV content consumption means that the audience watches a TV program on the channel it is presented on at its scheduled time. In terms of daily reach, Linear TV audience reach decreased from 81% in 2012 to 65% in 2021. The monthly and weekly reach decreased slightly less (Dentsu Aegis Network Latvia, 2021).

The younger the audience, the less this audience linearly consume TV content. In 2021 70% of the audience age group, 15-24 y.o. is reached weekly via Liner TV, compering to reach 79% of this audience in 2012 weekly (Dentsu Aegis Network Latvia, 2021). Increasing audience data on time-shifted and on-demand TV content

viewing shows audience need for not a device, platform or outlet dependent media content consumption. Time-shifting is the recording of programming to a storage medium to be viewed or listened to after the live broadcasting. TV content consumption on-demand is growing in all age group audience segments. The younger the audience, the higher content usage is on-demand. In 2021 weekly reach of this age group is 70%



compared to 47% in 2014. For all 15-64 y.o. audience in Latvia weekly reach consuming media content on-demand is 51% in 2021, compering to 32% in 2014 (see Fig. 2).

Fig. 2. The linear TV and TV on-demand weekly reach by ages groups, Latvia, 2014-2021, base: all 15-64 (Consumer Connections System, Dentsu Aegis Network Latvia, 2021)

The content consumption on-demand also increases in radio media audience. Radio media audience reach remains stable over time with growing audience share streaming music on paid or free platforms —28% of all audience streaming music daily in 2021 compering to 16% in 2016. Content consumption via streaming platforms depends on the age group where younger audience 15-24 y.o. consumes content at a significantly higher level – 55% of this age group consume weekly content while others are below 40% in 2021 (see Fig. 3).

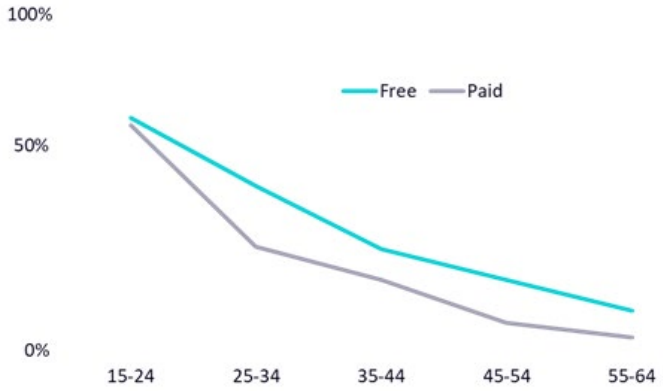


Fig. 3. The radio streaming weekly reach by age groups, Latvia, 2021, base: all 15-64 (Consumer Connections System, Dentsu Aegis Network Latvia, 2021)

The digitalisation of media content consumption is present in all age groups of media audiences. Moreover, technology development and accessibility let audiences consume content on their terms independently from programming times, platforms and devices.

The development of technologies and social media platforms changed how media brand content is distributed and consumed by the audience. Categorising media brands depends on the aspect of how is a look at on media products. Media brand product characteristics vary considerably, and they experience significantly different business environments. Picard (2005) defines two significant categories of media products and services can be seen fundamentally: single creation products and continuous creation products. Depending on the media product categories, media brand content distribution and consumption changes vary; nevertheless, all media brand products are affected by technological convergence and audience fragmentation. Technologies and social media platforms development create new possibilities for media content distribution, audience reach and content consumption. The growing media content consumption via digital platforms and social media platforms, increasing media content consumption on-demand choosing a time and a platform, and the growth of mobile technologies regarding media content consumption create ample opportunities for media brands to reach the audience. Chan-Olmsted (2011) states that when branded content is accessible via multiple platforms, there are more brand touchpoints and better responsiveness to consumer needs. Social media platforms present opportunities to distribute content to the broader audience, deepen relationships with the existing audience. Due to the nature of media products as experience goods, recommendations on social networks are crucial and can help media brands reach new audiences (Rohn, Baumann, 2015).

As a result, national digital news media brands develop new content distribution and consumption patterns in volume, platforms, devices, and time. For example, in 2016, Facebook generated 30% of the total visits for 37 American and European news websites (Piechota, 2016, p.48). In early 2018, Facebook was the leading social media traffic source (Myllylahti, 2018).

In the last years, above 50% of national news media content was accessed and consumed through social networking sites and mobile platforms, increasing non-direct and referral audience traffic while decreasing direct visits to media brands (Dentsu Aegis Network Latvia, 2017). The growing content consumption and audience share on social network sites reached 77% daily reach from all Latvian audiences in 2021 and almost 85% weekly reach from all Latvian audiences in 2021. The daily audience reach via social media platforms increased from 65% in 2018 to 77% in 2021.

Technology convergence and social media platforms present opportunities for content distribution and audience reach, in the meantime, bring challenges for national digital news media brands. The audience patterns in content consumption change. The audience more and more switches their content usage from traditional media to social media platforms. For example, comparing the data about national media online sites 2014 and 2021, the share of audience visits decreased by 12% and compared the share of audience visits for international media brands and social media platforms increased by 14% (see Fig. 4).

We can see that national news media share of visits decreases over the years while the number of visits for international and social media platforms increases significantly.

It means that social media platforms bring ample opportunities to media brands and cannibalisation of national media audience volumes.

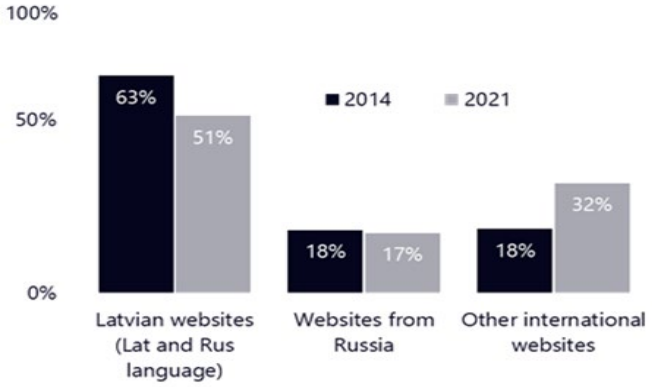


Fig. 4. Share of website visits 2014 and 2021, base: All 15-64
(Consumer Connection system, Dentsu Aegis Network Latvia, 2021)

Background of media content consumption by Generation Z

The media consumption habits for a younger audience (15–24 y.o.), generation Z, differ from universe data in Latvia. According to Saulite et al. (2020), the younger audience in Latvia consumes traditional media below average and prefer media content on online platforms; they choose international media and social network platforms over local media content. The younger audience's higher share of audience visits belongs to international media brands (see Fig. 5).

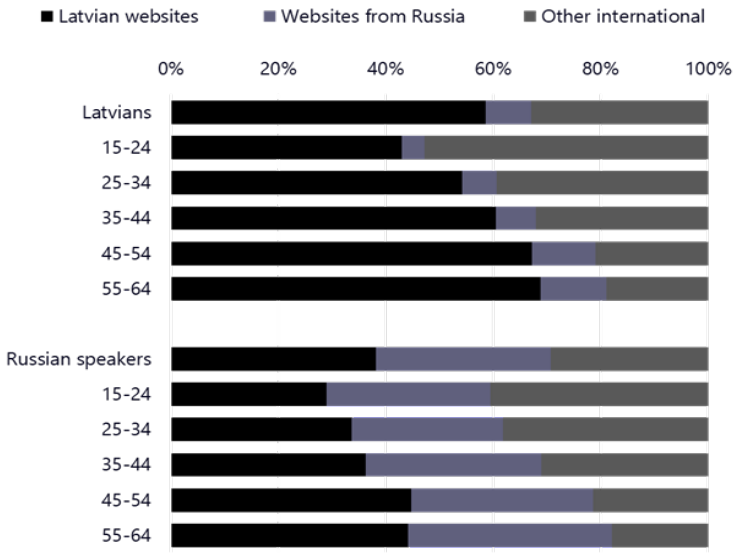


Fig. 5. Share of audience visits by age groups, Latvia base: all 15-64
(Consumer Connection system, Dentsu Aegis Network Latvia, 2021)

Also, globally for Generation Z, however, there were distinct differences. Playing video games was their favourite activity (26%), followed by listening to music (14%), browsing the internet (12%), and engaging on social platforms (11%). Only 10% of Generation Z said that watching TV or movies at home was their favourite form of entertainment (Deloitte's Center for Technology, Media & Telecommunications, 2021). One o the more extensive researches recently done by Reuters Institute for the Study of

Journalism (2019) found that younger audiences are different from older groups not just in what they do, but in their core attitudes regarding what they want from the news. The younger generation is primarily driven by progress and enjoyment in their lives, which translates into what they look for in the news. They still need and want, but they do not necessarily see the traditional media as the best or only way to do that. To summarise, how news brands and young people view the role and value of news are different. Traditional news brands see news as what you should know. Young audiences see news as what you should know (to an extent), useful, interesting, and fun to know. The data highlight that Generation Z is very reliant on mobile and spend much time with a wide range of different social networks. The Reuters study (2019) also revealed that the differences in the relationships young people have with the news depend on three key areas: the moment of consumption, the person and the medium.

The role of media audience role in media consumption

The media audience evaluates the media based on their respective users. The recipients need to know about their fellows. They want to identify with them; they do not want a possibly negative user image to reflect on themselves. (Scherer, 2015) define that media audience becomes an integral part of a media brand. A literature overview shows that media use represents social distinction and that other persons are judged based on their media use. Bourdieu (1982) states that media use is a part of our lifestyle and an expression of habitus. Different social groups are characterised by different media use. This is a well-known fact and can be clearly analysed by grouping media audiences by their beliefs and attitudes into so-called social bubbles. Living in bubbles is the natural state of affairs for human beings. We unfriend those whose opinion elicits a breathy scoff until a feeling of contentment sets in as we resume scrolling through a curated feed of like-minded friends, highly targeted advertisements and news that fits our views. No socio demographical parameter can predict which bubble someone belongs to. However, the combination of several factors, like age, residence, and education, can.

The figure below shows two different audience segments build according to both demographics, beliefs and statements the audience agrees. These two audience segments are groups in two central bubbles: stability and tradition-oriented audience and progress and open-minded oriented audience. In Latvia, 158 000 people belong to the stability and tradition audience bubble or 13% of all 15-64. 118 000 people 10% of all media audience 15-64 belongs to progress and open-minded audience bubble (Dentsu Aegis Network Latvia, 2021). Of course, there are duplications between audiences to some extend. As we can see, age plays a role when analysing social audience bubbles by age group. The younger the audience, the more open-minded and progressive they are (see Fig. 6).

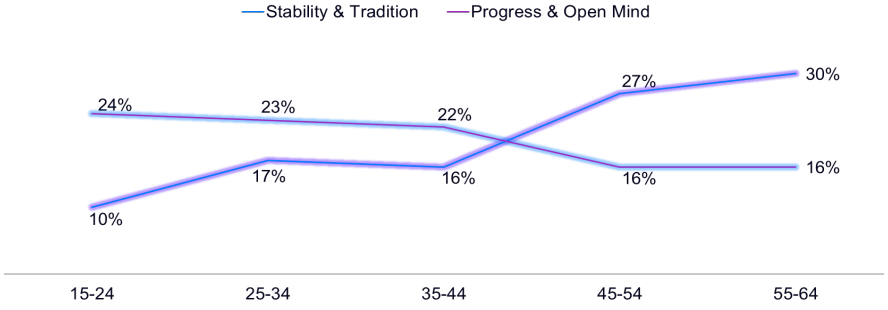


Fig. 6. Audience social bubbles by ages groups, Latvia, base all 15-64 (Consumer Connection System, Dentsu Aegis Network Latvia, 2021)

Both bubbles have somewhat different sources of information and communication habits in a social environment to confirm or approve their needs and beliefs. The uses and gratifications theory (Bulmer, Katz,1974) suggests that media users actively choose and use the media. The theory suggests that the audience seeks out the media source that best fulfils their needs. Data shows that while Traditionalists stick to classical media channels like TV and Radio, Progressive Thinkers prefer digital to consume video and music content on demand (see Fig. 7).

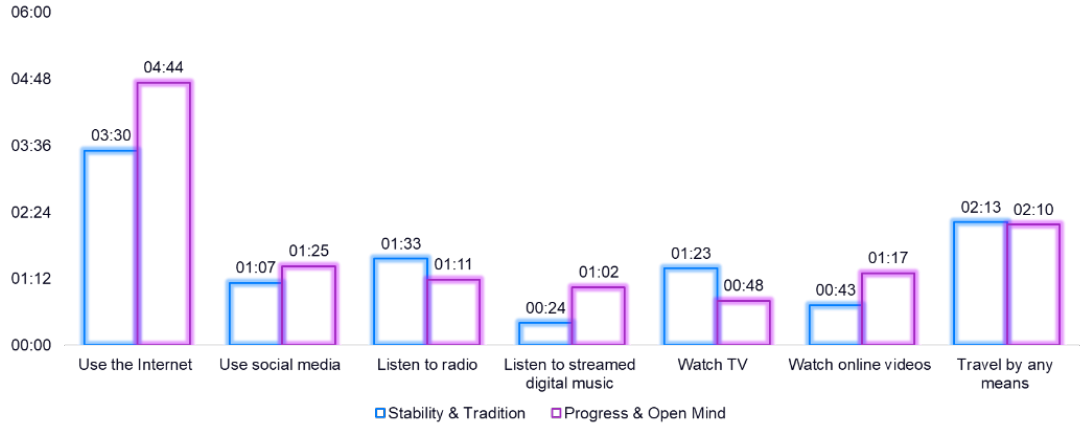


Fig. 7. Media usage by types, Latvia, base all 15-64 (Consumer Connection System, Dentsu Aegis Network Latvia, 2021)

People use media to convey to others an image of their personality. In doing so, they communicate which social groups they belong to and which they distance themselves from. Consequently, media are used for distinction. With growing audience shares on social media platforms and those platforms development, media and especially social media serve as symbolic self-completion and impression management. If to look at social media behaviour from an audience perspective using audience social bubbles, Progressive Thinkers are active social platforms users. They also tend to create their content more often compared to Traditionalists (see Fig. 8).

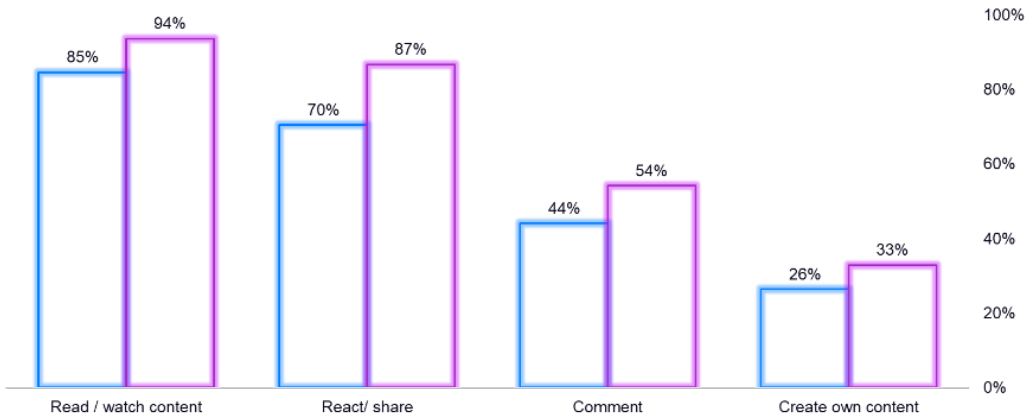


Fig. 8. Audience social bubbles social media behaviour segments, Latvia, base all 15-64 (Consumer Connection System, Dentsu Aegis Network Latvia, 2021)

The media use of individuals is one of the attributes that can be employed to judge others. We are socially evaluated based on our media use. Audiences are now visibly taking part in creating media brands, and media branding is concerned with managing this challenging process. This includes in media branding the vital attribute - the audience's image or user imagery attribute.

4. AUDIENCE AS A PART OF MEDIA BRAND – USAGE IMAGERY OR CONTENT EXPERIENCE AND USER IMAGERY ATTRIBUTE ROLE IN MEDIA BRAND

The increasing media consumption usage online via multiple platforms provides more access points but also deluding media brand associations, the power of audience as a part of media brand and the role for content experience in media brand associations requires for marketers to research what media brand elements are crucial in nowadays interactive and changing marketplace. Keller and Lehmann (2020) research shows that when evaluating elements of a brand that impact brand strength, we can divide elements into three main sections: brand image or customer beliefs and thoughts about the brand; brand awareness or customer knowledge about the brand; and third, customer response to the brand. The critical brand element is brand equity that combines all mentioned elements and creates intangible or added value for the brand. Brand equity is defined as this intangible or added value of the brand. High brand equity combines brand elements such as logo, product, name, attributes, marketing activities, unique brand associations, and brand image in customer minds. Customer-based brand equity occurs when the consumer is familiar with the brand and holds some favourable, strong, and unique brand associations in memory (Keller, 1993, p.1-22). According to Keller (1993) unique brand associations are the key element of building consumer-based substantial brand equity.

The research focuses on aspects of media brand associations that positively impact brand image and usage. The level of favourability, strengths and uniqueness of associations determines the brand association's impact on brand image and audience attitude toward the media brand. Due to the decrease of media brand associations when content consumption occurs via multiple platforms (Saulite et al., 2020) and the increase of global media brand usage and low level of local media brand usage and image, there is a need to revaluate media brand-building strategies via association towards a younger audience.

The author used quantitative research, survey research, a sample size of 300 respondents aged 15-24 years, weighted data in Latvia in May- June 2018. The author chose the most used local news media brands aged 15 – 24 to determine non-product related brand associations that increase media brand consumption and engagement. The research built on choice questionaries to determine how Generation Z uses national media and access particular media brands. The research aim was to find the media brand associations that first influence media brand choice, then increase usage and engagement with the brand. The fieldwork and data analyses were done over two months, May – June 2018. First, the responders graded the importance of selected brand associations that increase content consumption, engagement and following social networks. Then the data were analysed and correlated between the main product and non-product associations determined to observe variables to establish a statistically corresponding relationship between them. The aim was to identify variables that have some ties to create. The research data confirmed two non-product related attributes that

positively influence media brand associations and, therefore, media consumption. These are user imagery and usage imagery.

Media brand user imagery and usage imagery on social network sites build the favorability and strength of media brand associations. These are user imagery, which strongly correlates with a positive brand image and higher media usage. Keller (1993) defines user imagery association as what type of person uses the product or service, and usage imagery is association connected where and in what kinds of situations the product or service is used. User and usage imagery attributes can be formed directly from a consumer's own experiences and contact with brand users or indirectly by depicting the target market as communicated in brand advertising or other sources of information. Associations of a typical brand user may be based on demographic factors, psychographic factors and other factors. Associations of a typical usage situation may be based on the time of day, week, or year, the location (Keller, 1993, p.1-22). Media branding has changed from identifying to creating an emotional attachment with the customer. This emotional relationship creates a unique brand value for their customers, conveyed through interactive and innovative communication processes (Beig & Nika, p. 410–417). The scholars state that to create and strengthen a unique brand impression in customers' minds, the brand narrative should be communicated through interactive ways, which creates a distinctive customer experience. The overall customer experience is pivotal in forming a deep emotional bond with a brand, resulting in a solid customer-brand relationship (Fournier, 1998, p. 343–373). Customer experience has been used to improve mass customised products (Addis & Holbrook, 2001) and deliver a genuine customer value (Prahalad & Ramaswamy, 2004). Consumption experience is defined as the perfect basis for brand differentiation and distinctiveness (Pine & Gilmore, 1999; Schmitt, 1999).

User and usage of image attributes can also produce brand personality attributes. For example, the media brand user profile or community image contributes to the more favourable, durable and unique media brand association. Furthermore, the more the target audience feels connected, engaged and associated with the media brand audience community, the positive it feels towards the media brand (Saulite et al., 2020). Thus, the research confirms many scholars finding that audience becomes a significant part of media brand and interaction or content experience is crucial for building media brand associations. Furthermore, the engagement model data shows that the distinctiveness of media brand products on social media influences media brand engagement. These two attributes - audience perception and consumption experience (formats, way of delivery) correlate with Generation Z's higher media brand usage and engagement.

CONCLUSION

These findings are critical to review and adapt media branding systems in a new way. The distribution drivers positively affect supply efficiency to the audience, and from the other side, this efficiency negatively influences media brand associations and, therefore, brand equity. The necessity for content branding experience via different platforms according to unique aspects of each platform could strongly increase positive consumption experience and therefore create audience memories that strengthen brand associations and brand equity. Audience involvement and engagement in the media brand content life cycle could create more vital user imagery attributes and support audience belonging and willingness to belong to a particular media brand audience. More profound research on particular brand attributes via different platforms is needed

to analyse and apply the new aspects of media branding in a growing digital and interactive marketplace. The limitations of this research are that only national news media or the continuous creation media were analysed. Also, the next step in particular research would be how media brand associations are influenced by media content value from the audience perspective as media. One of the media's unique properties and characteristics is that there are multiple reuses, especially for continuous creation products, for media products, and the reuses may be more valuable than the original use (Vogel, 2004). Value of media product is widely measured from a financial and economic perspective, but in literature, there is a gap in how media product reuse and increasing value affect media brand equity through consumer experience and brand associations.

REFERENCES

Addis, M., & Holbrook, M. B. (2001). On the conceptual link between mass customisation and experiential consumption: An explosion of subjectivity. *Journal of Consumer Behaviour: An International Research Review, 1*(1), 50–66.

Beig, F. A., & Nika, F. A. (2019). Brand Experience and Brand Equity. *Vision, 23*(4), 410–417. https://doi.org/10.1177/0972262919860963

Bourdieu, P. (1982). *Die feinen Unterschiede. Kritik der gesellschaftlichen Urteilskraft*. Frankfurt/M.: Suhrkamp.

Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste/Pierre Bourdieu*; translated by Richard Nice. Cambridge, MA: Harvard University Press

Chan-Olmsted, S. (2011) Media branding in a changing world: Challenges and opportunities 2.0. *The International Journal on Media Management, 13*(1), 3–19.

Consumer Connection System Latvia (2018). *Dentsu Aegis Network Latvia consumer research, 2012-2018*.

Consumer Connection System Latvia (2021). *Dentsu Aegis Network Latvia, consumer research*, *2012-2021*.

Eremina, Y., Lace, N., Bistrova, J. (2019). Digital Maturity and Corporate Performance: The Case of the Baltic States. *J. Open Innov. Technol. Mark. Complex. 5*, 54. https://doi.org/10.3390/joitmc5030054

Galan, L., Osserman, J., Parker, Y., Taylor, M. (2019). *How Young People Consume News and The Implications for Mainstream Media*. Flamingo commissioned by the Reuters Institute for the Study of Journalism, Oxford University.

Fournier, S. (1998). Consumers and their brands: Developing relationship theory in consumer research. *Journal of Consumer Research, 24*(4), 343–373.

Holbrook, M. B., & Hirschman, E. C. (1982). The experiential aspects of consumption: Consumer fantasies, feelings, and fun. *Journal of Consumer Research, 9*(2), 132–140.

India, D. T. (2015). *Digital Media: The rise of On-demand Content*.

Jenkins, H. (2006) *Convergence Culture: Where Old and New Media Collide*. New York University Press.

Katz, E., Blumler, J. G., & Gurevitch, M. (1973-1974). Uses and gratifications research. *Public Opinion Quarterly, 37*(4), 509–523. https://doi.org/10.1086/268109

Keller, K.L. (2001). Building customer-based brand equity: A blueprint for creating strong brands, *Management Science Institute, 1*(107), 1–31.

Myllylahti, M. (2018). An attention economy trap? An empirical investigation into four news companies Facebook traffic and social media revenue. *Journal of Media Business Studies, 15*(4), 237–253.

Picard, R. G. (2005). Unique Characteristics and Business Dynamics of Media Products. *Journal of Media Business Studies, 2*(2), 61–69.

Rohn, U., Baumann, S. (2015). Media brands in social network sites: Problems German media companies have faced and lessons they have learned. *Journal of Brand Strategy, 4*(1), 70–82.

Saulite, L., Janusevska, G., Andersone, I., & Sceulovs, D. (2020). Trends in Media Branding: Case of Latvia. The Younger Audience in Focus. Winter Garden, Florida: *International Institute of Informatics and Systemics (IIIS), 3*, 98–102.

Scherer, H. (2015). The Groucho Marx Dilemma in Media Branding: Audience as Part and Signal of Media Brands. In: *Siegert G., Förster K., Chan-Olmsted S., Ots M. (eds) Handbook of Media Branding*. Springer, Cham. https://doi.org/10.1007/978-3-319-18236-0_18

Schmitt, B. H., & Rogers, D. L. (2008). *Handbook on brand and experience management*. Northampton, MA: Edward Elgar Publishing.

Siegert, G., Förster, K., Chan-Olmsted,S.M., M. Ots, M(Eds.) (2011). *Handbook of Media Branding*. Springer.

Vogel, H.L. (2004). *Entertainment Industry Economics: A Guide for Financial Analysis, 6th ed*. Cambridge: Cambridge University Press.

Westcott, K., Arbanas, J., Downs, K., Arkenberg, K., Jarvis, D. (2021). *Digital media trends, 15th ed.* Courting the consumer in a world of choice. Deloitte Insights. Retrieved on 2021 June 1 from https://www2.deloitte.com/us/en/insights/industry/technology/digital-media-trends-consumption-habits-survey/summary.html

Quantitative empirical research, a sample size of 300 respondents age group 15-24 years, weighted data, Latvia, May 2018.

AUTHORS' SHORT BIOGRAPHY

Linda Saulite received a master's degree in economics from the Stockholm School of Economics. Linda works as Research Assistant at Riga Technical University and is a PhD student at Riga Technical University. Her research interests are media branding and brand uniqueness aspects, particularly in brand uniqueness in the digital environment. The author is Managing Director and Member of the Board of the communication and media agency Dentsu Aegis Network Latvia.
E-mail: Linda.Saulite_1@edu.rtu.lv

https://doi.org/10.7250/scee.2021.0011

MODEL FOR EVALUATION OF THE SUCCESSFUL MEDICAL DEVICE PROJECT

Nadežda SEMJONOVA

Riga Technical University, Riga, Latvia

Corresponding author e-mail: Nadezda.Semjonova@rtu.lv

Abstract. General factors, determining success of the business projects, are well described both in papers and textbooks. Still, the weight and relative importance of these factors could vary significantly within the business area, moreover, in some areas, additional factors should be considered, too. The medical devices (MD) sector is a typical example: the MD market is one of the most regulated, which increases MD production costs. Another feature of the MD market is the high role of public and insurance financing. Nevertheless, small and medium enterprises (SMEs) traditionally have played a crucial role in the development of new products in the MD industry. The present paper summarizes the peculiarities of the MD market and proposes a set of parameters that could be used to estimate the success of the investment projects in the MD sector in Latvia. Besides that, the paper reviews possibilities for Latvian entrepreneurs to find financial support for implementation of medical devices projects. At the moment, Latvian Investment Development Agency and state-owned loan company ALTUM are the most promising funding sources for SMEs. On the other hand, only 13 out of 23 crediting institutions and only one leasing company out of 10 have separate programs for SMEs.

Keywords: *Medical device, Model; Regulatory, Investment*

JEL Classification: M21, O12

INTRODUCTION

With recent advances in medical technologies, the longevity of human life continues to grow. With such increase in proportion of older people in the society, the demand for healthcare services continues to grow, too. Alongside, limited physical activity, extended working hours, unhealthy food habits, overweight noticeably contributes to the burden of chronic diseases, provoke increase in cardiovascular heart diseases, stroke, cancer, diabetes. Need to cope with societal healthcare needs under limited resources, modern tendencies to shift the paradigm of healthcare service from hospital- based and doctor-centered toward home-based and patient –centered indicated that demand for medical devices (MD) will continue to grow, making MD sector attractive for entrepreneurs and investors. Experts (Business Research Company, 2021; Precedence Research, 2021) foresee MD sector will grow at the rate 5 – 6 % toward 2027.

All this expands the already wide list of prerequisites for the successful implementation of a business project in MD sector. Plenty of textbooks and papers, discussing factors that contribute to the success of business projects could be found

©2021 Author(s). This is an open access article licensed under the Creative Commons Attribution License (http://creativecommons.org/ licenses/by/4.0).

elsewhere, name effective project management and governance practices as the most crucial ones. The goal of the present paper is to add to these sources, outlining area – specific characteristics of MD projects and to develop a model of factors for assessing the success of an MD investment project

1. LITERATURE REVIEW

The factors, determining success of the busines project were widely explored in literature (Pandremmenou, Sirakoulis & Blanas, 2013; Sobieraj & Metelski, 2021). The core of the modern project success evaluation framework, that goes back to works of Pinto and Covin (1989), includes such success factors as 1) mapping from the beginning of the project's vision; 2) the continuous support from the top management, 3) the development of detailed plans and timetables, 4) the communication between the project manager and the customer, 5) the selection of a highly skillful trained project team, 6) the use of high technology equipment in the project in terms of technical excellence, 7) the degree of acceptance of the project's deliverable to the customer, 8) the formation of control system to the process running the project, 9) The ability to manage changes, crises and deviations during the project's lifecycle. The weight and relative importance of the above factors could vary significantly in dependence of the area, where business project is implemented, and the MD sector is not an exemption.

First of all, MD market is one of the most regulated (O'Dwyer & Cormican, 2017, Behan, Watson and Pandit, 2017). Obligation to comply with these regulations may be difficult for SMEs, especially young ones, trying to enter MD market for the first time. Provision of conformity could increase MD production costs several times, but the failure to comply with requirements would jeopardize the success if MD business project. From this point of view, mapping from the beginning of the project's vision and clear understanding of regulative processes become especially important.

Another important feature of the MD market is a high role of public and insurance financing (Mehta, 2008), that makes MD business sensitive to policies, regulating reimbursement of medical services and public procurement. In order to achieve high degree of acceptance of the project's results by the customers, continuous dialogue dialog between MD entrepreneurs, medical professionals and representatives from reimbursing structures is critical. Often, the acceptance of the product depends on whether it will become compensated by the state in the framework of medical service reimbursement scheme. The assessment of potential demand for MDs and demonstration of its efficacy for the healthcare system is impossible without estimation of social and commercial benefits of corresponding medical technologies. European Commission contributed to the harmonization of the health technology assessment methodology: the European The Regulation on health technology assessment (HTA) contributes to improving the availability of innovative technologies in the area of health, such as medicines and certain medical devices, for EU patients, it ensures efficient use of resources and strengthens the quality of HTA across the Union (European Commission, 2021).

Hidefjäll and Titkova (2015) emphasize, that MD projects often are based on prototypes developed by researchers instead of being developed on the base of thorough needs analysis followed by commercialization using clinical tests and an evolving business model to reflect learning from feedback. Instead of solely focusing on the development of the technology, MD project needs to be seen as part of a larger

commercialization process consisting of conceptual, material and institutional development with the business model design in focus to meet healthcare system requirements.

StarFish (2021), being leading Canada's MD design service provider with a full complement of design, development, and manufacturing services, provides a guideline for MD development, that involves series of stages, that ensure a smooth transition from product definition and proof of concept through quality management, clinical trial and, finally, approval by national health authorities. Note, that timeline of MD project should include post-market support: following EU regulation, member state should provide MD vigilance system. For instance, in Latvia, MD manufacturer or distributor should collect "vigilance incident report" on any incidents or potential incident related to the use of a MD that has resulted in or may result in death or serious harm to the health of a patient, user or third person. Simultaneously, the vigilance repost should be submitted to the State Agency of Medicines (ZVA, 2021).

Another example of framework for the development of MD projects is peovided by Japan Agency of Medical Research and Development (AMED, 2021). The Agency promotes collaborative networks between the national government and local regions so that medical device developers, including newcomers, can receive various support including pharmaceutical affairs, intellectual property, technology, and marketing in an integrated manner. This work aims at autonomous progress of development/ commercialization of medical devices through collaboration between medicine and engineering.

Valla (2019) notes, that for MD sector, an effective strategy to minimize residual risk is achieved by combining quality management and risk management processes and implementing them as early as possible in the course of project implementation.

Maresova et al. (2020) pay special attention to the need to conduct fairly accurate calculations of project costs and the assessment of an investment project.

Small and medium enterprises (SMEs) have traditionally played a crucial role in the development of new products in MD industry. SMEs are able quickly adapt to new market niches and poses considerable innovative potential. In recent decades, SMEs contributes to the development of more than 50% of all innovative MD products (Medical Device Network, 2010). Hereby, MD market seems to be a promising option for SMEs business development. But SMEs could meet difficulties in the selection of a highly skillful trained project team just because of limited resources. Thus, the individual qualification and skills of team members are more important in the case id SMEs.

2. METHODOLOGY

The study design is based on two stages. The first stage analyses the literature to assess the success of the project to develop a model for assessing the successful MD of the project.

The second stage is an analysis of Latvia's electronic resources to develop a model for attracting external financing for CME.

To determine the SME lending facility, 23 offers from banks and credit companies were analyzed using data from Finance Latvia Association (FLA, 2021) and The Financial and Capital Market Commission (FKTK, 2021). 10 leasing companies were

evaluated for the analysis of SME machinery and equipment leasing opportunities, using data from Latvian Leasing association (LLDA, 2021).

3. RESULTS

3.1. Model of the successful Medical Device project development

The indicator of success has a social aspect, it contains the subject of social approval. In project activities, a distinction is made between the success of the project and the success of project management. The success of the project characterizes the properties, timeliness and public perception of the project product, and the success of project management is the observance of the agreed parameters of project activities, professionalism and coherence of the project team.

Figure 1 summaries the most important factors, critical for the implementation of the MD business project. Since the industry is very highly regulated, it is necessary to constantly monitor changes in regulations in a particular country. Some restrictions may apply only to a certain class of MD. This will be very important for the successful management and completion of the project, which is why this is indicated in the model as the first item.

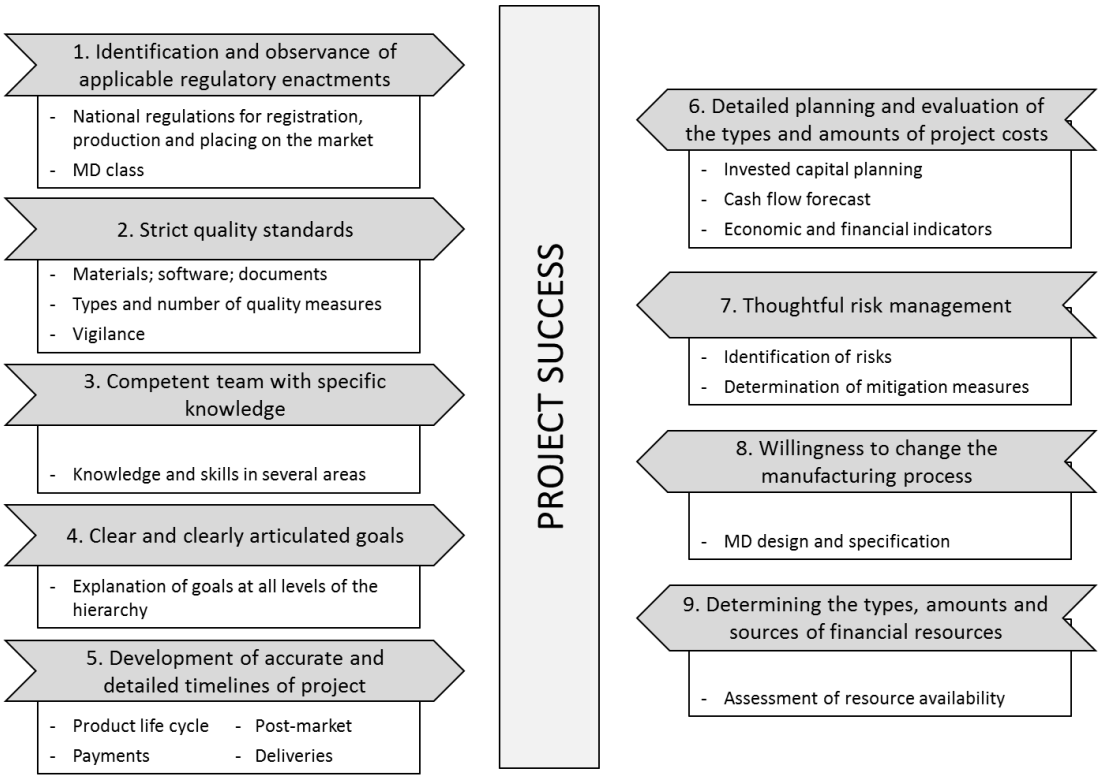


Fig. 1. Model of the successful Medical Device project

The special attention should be paid to the need to conduct fairly accurate calculations of project costs and the assessment of an investment project. Various indicators described by Maresova et al. are used here (Maresova et al., 2020).

When planning the cash flow, one should consider that the MD turnover on the market will be longer than its life cycle, at least for the warranty period. Even if the

enterprise has ceased to produce this type of MD, the costs continue to form because of post-market activities and vigilance system support.

The connecting link of all factors is the team that implements the investment project. The complexity of the situation lies in the fact that workers in SMEs in this industry must have knowledge in medicine, engineering, finance, and management. This could comprise a problem since education system still has some shortage in offering such comprehensive and multidisciplinary courses.

3.2. SME financing opportunities in Latvia

Despite there are many platforms in the world that support SMEs, the unawareness on possible funding sources and lack of financial skills make difficult development of small and medium enterprises in MD industry sector in Latvia.

Medical device innovations have been developed by a mix of private and public funding. The largest financial instruments within the framework of which Latvia receives financial assistance are the EU funds: European Regional Development Fund (ERDF), European Social Fund (ESF) and Cohesion Fund (CF), their management in Latvia is provided by the Ministry of Finance.

At the early stage of the MD development, EU funds resources could be used, although with a relatively low success rate. Alongside, one has to keep in mind that use of EU funds is possible only in cooperation with the universities.

More easily entrepreneurs could be supported by Latvian Investment Development Agency (LIAA). LIAA offers support to entrepreneurs who are looking for markets abroad and invites them to use the services offered by the agency - to establish new contacts in trade missions, national stands, contact exchanges, individual visits and to attend export seminars. One of the priorities of LIAA is to turn the results of the work of scientific institutions into commercially successful projects and to attract entrepreneurs to innovations (LIAA, 2021).

ALTUM is a state-owned development finance institution, which offers state aid for various target groups with the help of financial tools (such as loans, credit guarantees, investing in venture capital funds, etc.) (ALTUM, 2021).

It can be seen from the scheme (see Fig.2.) that the state-owned company Altum combines the offers of the public and private sectors as a result of extensive cooperation.

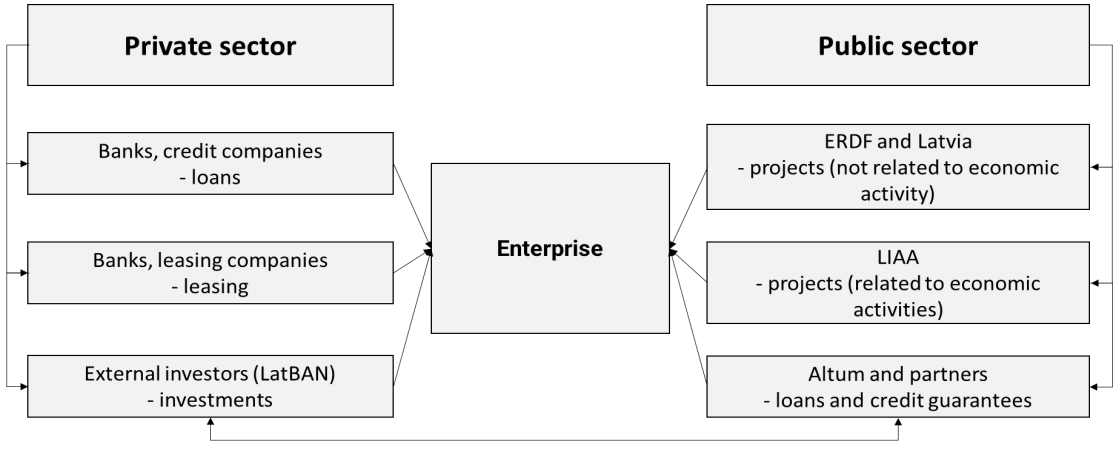


Fig. 2. SME external financing model in Latvia

Latvian Business Angel Network (LatBAN) is the association with the goal of the association is to extend and develop the network of investors in Latvia and support new and perspective projects. This is why we organize Investment Sessions, during which investors and new entrepreneurs meet with each other (LatBAN, 2021).

Out of 23 credit institutions, only 13 have separate programs for SMEs (FLA, FCMC, 2021) and only 1 leasing company out of 10 has an offer for SMEs (LLDA, 2021). However, this does not mean that resources are not available, it is just that the contracts will be concluded on general terms.

CONCLUSION

The presented model represents set of factors that could be used to characterize the success of the investment project on the medical device market. It can serve as a foundation for the preparation, evaluation, and implementation of MD investment projects. The investor should take into account the main peculiarities of MD sector projects: first, the need for continuous monitoring and adaptation to the changes in regulative acts and, second, extended requirements for the post – market stage, when manufacturer has to follow up the performance of the devices in the framework of vigilance system.

The external financing model gives an idea of the company's ability to increase its financial capabilities. In Latvia, the possibilities for SMEs to get support for research and development of entirely new MD technology is limited to university – affiliated scientific projects, that usually has low success rate. Form the other hand, there is more possibilities to attract funding, both private and governmental, for the projects at the higher technology readiness levels, when technology already was demonstrated as feasible.

ACKNOWLEDGMENT

This work has been supported by the European Regional Development Fund within the Activity 1.1.1.2 "Post-doctoral Research Aid" of the Specific Aid Objective 1.1.1 "To increase the research and innovative capacity of scientific institutions of Latvia and the ability to attract external financing, investing in human resources and infrastructure" of the Operational Programme "Growth and Employment" No.1.1.1.2/VIAA/2/18/343 The methodology for the commercialization of innovative biomedical devices and the evaluation of the productions financing model.

REFERENCES

Altum. (2021). *Services* Retrieved from https://www.altum.lv/en/services

AMED. (2021). *The development / commercialization programs.* Retrieved from https://www.amed.go.jp/en/program/list/02/01/006.html

Behan, R., Watson, M., & Pandit, A. (2017). New EU medical device regulations: Impact on the MedTech sector *Medical Writing, 26*(2), 20–24.

Business Research Company (2021) *Medical Devices Market*. Retrieved from https://www.thebusinessre--* searchcompa-ny.com/report/medical-devices-market

Guerrero J.C., García J.H., Hernández A.M. (2017) Study of Medical Device Purchasing Cycles through Temporal Series Analysis. In: Torres I., Bustamante J., Sierra D. (eds) VII Latin American Congress on Biomedical Engineering CLAIB 2016, Bucaramanga, Santander, Colombia, October 26th -28th, 2016. *IFMBE Proceedings, vol 60*. Springer, Singapore. https://doi.org/10.1007/978-981-10-4086-3_119

EU funds. (2021). *General Information*. Retrieved from https://www.esfondi.lv/general-information-1

European Commission (2021) *Regulation on Health Technology Assessment* Retrieved from https://ec.europa.eu/health/technology_assessment/eu_cooperation_en
FKTK. (2021). *Market* Retrieved from https://www.fktk.lv/en/market/
FLA. (2021). *Industry data*. Retrieved from https://www.financelatvia.eu/en/
Hidefjäll, P., & Titkova, D. (2015). Business model design for a wearable biofeedback system. *Studies in Health Technology and Informatics, 211*, 213-24. https://doi.org/10.3233/978-1-61499-516-6-213
LatBAN. (2021). *Do you have a business project that needs an investor – business angel?* Retrieved from https://latban.lv/en/projects
LIAA. (2021). *Invest in Latvia.* Retrieved from https://www.liaa.gov.lv/en
LLDA. (2021). *About us*. News. Retrieved from http://www.llda.lv/en/?menu_id=310
Marešová, P.; Peter, L.; Honegr, J.; Režný, L.; Penhaker, M.; Augustýnek, M.; Mohelská, H.; Klímová, B.; Kuča, K. Complexity (2020). Stage Model of the Medical Device Development Based on Economic Evaluation—MedDee. *Sustainability, 12*, 1755. https://doi.org/10.3390/su12051755
Medical Device Network. (2010). *Small Businesses have Big Impact on Device Market*. Retrieved from https://www.medicaldevice-network.com/features/feature73715/
Mehta, S. (2008). *Commercializing Successful Biomedical Technologies: Basic Principles for the Development of Drugs, Diagnostics and Devices*. Cambridge University Press. https://doi.org/10.1017/CBO9780511791345
O'Dwyer, C., & Cormican, K. (2017). Regulation – Do or Die: An Analysis of Factors Critical to New Product Development in a Regulatory Context. *Journal of Technology Management &Amp; Innovation*, *12*(1), 26–38. https://doi.org/10.4067/S0718-27242017000100004
StarFish. (2021). *Five Steps to Medical Device Development Success*. Retrieved from https://starfishmedical.com/blog/beta-medical-device/
Valla, V. (2019). Impact of Design on Medical Device Safety. *Therapeutic Innovation and Regulatory Science. 54(4),* 1–11. https://doi.org/1-11. 10.1007/s43441-019-00022-4
ZVA. (2021). *Medical devices* Retrieved from https://www.zva.gov.lv/en/healthcare-professionals-and-institutions/medical-devices

AUTHORS' SHORT BIOGRAPHY

Nadezhda Semjonova graduated from the Faculty of Engineering Economics and Management of the Riga Technical University in 1993 (Bachelor of Busines Administration) and in 1997 (Master of Busines administration). She received the PhD in Economics from the Riga Technical university in 2015. Her thesis topic was the modelling of the government debt policy.
She is Senior researcher at the Department of Corporate Finance and Economics since 2018, docent at the Department of Corporate Finance and Economics since 2015, lecturer at RTU from 2000.
Scientific interests: state finances, government debt management, medical device market research.

E-mail: Nadezda.Semjonova@rtu.lv
ORCID ID: http://orcid.org/0000-0002-8168-324X