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Research Articles

eHEALTH IN THE EUROPEAN UNION – COMPARATIVE STUDY

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Abstract

eHealth is one of the global modern trends in IT, medicine and politics. It is a broad term that refers to electronization of healthcare and health services and mainly describes the use of information and communication technologies in healthcare. In practice, the evaluation of eHealth is an important matter because it leads to selection of appropriate measures for further progress in the field of electronic healthcare. What is more, it proposes recommendations for the development of eHealth in the EU countries. The article is focused on the comparison of eHealth implementation in the European Union member states. The analysis is performed by means of ELECTRE III method. The results of the empirical research further evaluate the state of eHealth implementation in all European Union member states by selected criteria and enable the comparison of the eHealth implementation in the international context. The results are verified by application of MAPPAC method. It has been acknowledged that the best ranking countries in this area has been obtained by Denmark, Finland, Estonia and Sweden.

Keywords

eHealth; ELECTRE III; Evaluation; EU countries.

Introduction

Nowadays, the right to healthcare is legally anchored in the constitutions of most democratic countries. Generally, healthcare is considered by society as a public good that should be available to everyone and in the same extent. It is an important and necessary element in the whole socio-economic sphere [16]. The quality health system is, together with good health of citizens, the priority of all developed countries. Healthcare has become one of the most important economic sectors in the last few decades. This tendency is reinforced by the fact that it is unconditional of all national residents and also by the fact that spending on health services has been rising in European Union countries in long term [21], [20]. The main reason of this trend is connected with the consequence of demographic change (ageing population) and the improvements in medical treatment in Europe. Another factor influencing the growth of expenditures in this area is in great extend the involvement of information and communication technologies (ICT). ICT implementation in healthcare is a rapidly evolving and expensive resort, which is why financial demand of healthcare is increasing [13].

eHealth and mHealth are well-known current concepts in the medical field of ICT [2]. eHealth appeared at the turn of the 20th to the 21st century. This abbreviation is analogous to concepts related to electronization in many other areas [22]. It represents mainly the health service supported by ICT [17], [1]. As a sub-segment of eHealth, mHealth, which stands for mobile health [14], emerged. The term is most commonly used in reference to using mobile communication devices, such as mobile phones, tablet computers and personal digital assistants (PDAs), and wearable devices such as smart watches, for health services,

information, and data collection [4]. eHealth has quickly become a symbol of the democratization of healthcare, as well as an opportunity to meet the challenges caused by an ageing society, the epidemic of non-communicable and chronic diseases and the dramatically rising costs of healthcare [3], [5].

1 eHealth in the European Union

ICT has become a truly revolutionary part of European healthcare in recent years. Although eHealth tools and services have been well established in many EU countries and commonly used today, individual healthcare facilities, hospitals, and physicians very often chose the best, individual system for themselves without any coordination. Thus, the implementation of eHealth in individual European member states is greatly fragmented and disparate nowadays. Therefore, the potential cross-system communication is here yet one of the main steps that can encourage and enhance the benefits of computerization. For this reason, the aim of the European Union health policy is to link and coordinate individual national eHealth projects. This effort is also a part of the eEurope Action Plan, approved in 2000 [9]. Coordination includes fast access to shared and remote medical expertise through telecommunication and information technology, no matter where the patient or relevant information is located [23].

In the European Union, where people are absolutely free to move to other EU member states, there is a need to engage in mutual communication that should ensure the highest standards of health care, wherever the patients are. The main aim is to build a common European eHealth space that will successfully solve this problem and thus become one of the main objectives of the European Commission's work. In 2012, the eHealth-focused working group of European Commission produced a report on "Redesign of Health in Europe by 2020", see [10], highlighting the major challenges that prevent the reorganization of European healthcare with the use of existing information technology [15]. The goals of the European Commission are mainly to improve citizens' health by making health information available using digital health and care tools, including across border ones, to increase healthcare quality and access by making digital health and care part of health policy and coordinating EU member states' political, financial and technical strategies and to make digital health and care tools more effective, user-friendly and widely accepted by involving professionals and patients in strategy, design and implementation [9].

1.1 eEurope Action Plan

Healthcare systems are increasingly dependent on information and communication technologies. ICTs can help provide quality care for citizens. Clear steps for the field of electronization of healthcare are specifically set out in the "European eHealth Action Plan", see [11]. This is an overview of EU actions contributing to the creation of a European eHealth area [9]. The EU eHealth Action Plan covers the period from 2012 to 2020. It was launched in March 2011 as the second strategy (after 2004-2010 strategy) dedicated to the issue of healthcare electronization in the EU. It should provide opportunities to consolidate the steps already taken in this area. It provides a long-term vision of European eHealth in synergy with other documents as "Europe 2020" or the "Digital Agenda for Europe".

The policy objectives and initiatives for 2012-2020 cover:

- support of Member States and healthcare providers in that way that they can take benefit from ICT solutions in the best interests of patients, health care systems and society;
- helpful support towards the innovation of the environment and the best use of innovations in health care.

In addition, eHealth Action Plan aims to ensure the successful achievement of the "Digital Agenda" goals and the goals of the document "European Innovation Partnership on active and healthy aging" such as:

- Raising awareness of the benefits and opportunities of eHealth, supporting citizens, patients and health professionals.
- Removing barriers to interoperability of eHealth.
- Enhancing legal certainty for eHealth.
- Supporting innovation and research in eHealth and developing a competitive European and global market.

However, the European Union does not only participate in a strategy on specific steps in the field of electronization of healthcare but also on other partial concepts and intentions. The basic health initiatives coordinated by the European Union include the standardization committees and the Working Party on eHealth. This group is aimed at work with EU Member States to solve the ICT issues and contribute to the effective implementation of the i2010 strategy of the "European Information Society for growth and employment", which preceded the eHealth Action Plan and set out the concrete goals for 2010 [15].

The European Commission is working to provide its citizens access to safe and top-quality digital services in health and care. As part of the Commission's "Digital Single Market strategy", three priorities for EU actions were identified in mid-term review [9]:

- Enable citizen's secure access to and use of health data across-borders.
- Support a cross-border data infrastructure to advance research and personalised medicine.
- Facilitate feedback and interaction between patients and health care providers, supporting citizen empowerment.

The "Horizon 2020 programme" contributes significantly in the area of digital technology for health and ageing. In this context, the "European Innovation Partnership on Active and Healthy Ageing" provides a platform to link the efforts of many regions and ecosystems across Europe, some of which are recognized as reference sites on digital innovation for health and care [9].

eHealth concept in individual EU member states is mainly influenced by the concept of eHealth in the EU legislation and the recommendations of the World Health Organization (WHO).

1.2 Evaluation of eHealth in the European Union

eHealth deployment in Europe is the subject of evaluation of international organizations such as EU or OECD. eHealth evaluation is described as an act to assess whether an eHealth system is functioning and producing the effects as expected [18]. Fostering the development and implementation of national eHealth policies and strategies has been a key goal of the European Union eHealth Action Plan of 2004. In 2011 the European Commission awarded the eHealth strategies study "European countries on their journey towards national eHealth infrastructures - evidence of progress and recommendations for cooperative actions", see [13], to a group of partners [6]. This is an overview and synthesis report on eHealth in Europe. The study team has analysed the progress of the European Union Member States with regard to the following eHealth action plan priorities [7]:

- National eHealth policies, strategies and governance measures.

- Deployment of eHealth applications (EHR-like systems/patient summaries, ePrescription services and telehealth applications).
- Infrastructure implementation aspects (Electronic identifiers, eCards and standards).
- Institutional structures and legal issues.

The study results show that in virtually all European member states surveyed, political as well as stakeholder interest in eHealth policies, and the planning and implementation of national or regional infrastructures has strengthened considerably [6]. This comprehensive collection of country information constitutes a unique resource and important database of up to date evidence on eHealth progress across Europe updated and complemented the results of the earlier eHealth ERA study of 2007 [8].

In 2016, in cooperation with OECD the joint Commission and OECD report "Health at a Glance: Europe 2016" [20] was developed. New edition of "Health at a Glance" presents the most recent comparable data on the health status of populations and health system performance in OECD countries [21]. There was noted that the improvement in the adoption of digital technology in both the primary care and hospitals is needed across Europe. Many governments from Estonia to Portugal have already embarked on active eHealth policy implementation [21]. As another action of European Commission in the field of eHealth, a public consultation on the "Transformation of Health and Care in the Digital Single Market" was opened between July and October 2017. It gathered input on the scope of policy actions to be pursued in order to improve people's health and care. This consultation received nearly 1500 replies of which 90% of the respondents agree that citizens should be able to manage their own data. 80% of the respondents agree that sharing health data can be beneficial and around 60% of the respondents say that they do not have access to digital health services [9].

In 2017 the European Commission published a Eurobarometer survey [25] presenting European citizens' opinions on the impact of digitisation and automation on daily life. European citizens see digitisation and automation primarily as an opportunity but call for investment in better and faster internet services as well as effective public policy to accompany changes, in particular in areas such as employment, privacy and personal health. The results also show that the more people are informed or use technologies the more they are likely to have a positive opinion on them and to trust them. In the last 12 months, less than one in five respondents have used health and care services provided online (18%). 52% of all respondents would like to have online access to their medical and health records. Respondents are much more willing to share their health and wellbeing data with doctors and healthcare professionals (65%) than with companies (14%) or with public authorities, even if anonymised and for research purposes (21%) [9].

The eHealth study from 2017 "Transforming eHealth into a political and economic advantage", see [3], evaluates the level of eHealth implementation in EU member states. In the results a lack of harmonisation of eHealth implementation within the EU and unsatisfactory access to cross-border healthcare is demonstrated.

2 Research Objectives

The article is focused on the comparison of eHealth implementation in the European Union member states by means of the multi-criteria decision-making methods. The aim is the evaluation of EU member states according to the state of eHealth by means of ELECTRE III method. The ELECTRE III method was used since it represents a suitable tool for the selection and creation of ranking of a larger number of variants. The data for the presented

research were obtained from the study of European Commission on eHealth use among General Practitioners in EU [12].

In this paper, 27 EU member states (variants) were analysed according to 12 eHealth indicators (criteria). The Netherlands is not included in the research as the required data were not available. The analysis is made by means of selected MCDM method – ELECTRE III method. ELECTRE III method belongs to the operations research methods and is based on the evaluation of preference relations. The basis is the examining of the relationships between pairs of variants [24].

Indicators I1 – I12 describe the level of eHealth use among General Practitioners in EU member states. They cover the areas of: Electronic Health Record (EHR), Health Information Exchange (HIE), Telehealth and Personal Health Record (PHR). The results of the research are summarized as the ranking of EU countries according to the level of eHealth in 2018.

3 Research Methods

The research is based on the application of multi-criteria decision-making methods. The data are processed by means of ELECTRE III method. The results are further verified by processing of MAPPAC method. The MAPPAC method was chosen because, apart from the information from the multi-criteria matrix and the vector of weights, it does not need any additional information such as threshold values or the choice of generalized criteria.

3.1 ELECTRE III Method

The basis of the ELECTRE method (Election et Choix Traduisant la Réalité) is to divide the variants into effective and inefficient. In the research the method ELECTRE III was used. ELECTRE III method provides the arrangement of variants into indifferent classes in which the variants are rated equally, but there is a preference relationship between indifferent classes. The index sets of criteria and the degree of preference are determined, without taking into account the degree of indifference. For each pair of variants *Ai* and *Aj* there are grouped criteria that prefer the *Ai* variant to the *Aj* variant, and the set of their indices is labelled I_{ij}, and there are groups of criteria that prefer the variant *Aj* before the *Ai* variant and their set of indices is denoted I_{ji}. The *Ai* variant is preferred to the *Aj* variant with the preference threshold c * if for the degree of preference of the *Ai* variant before the variant *Aj* it is greater than the preference degree of the variant *Aj* before the *Ai* variant while being greater than the threshold of preference c *. The ELECTRE III method does not require the user to put preference thresholds, but the threshold values are gradually automatically generated. The variants are categorized into indifferent classes according to the indicator, which shows the difference between the number of variants before which the variant is preferred and the number of variants that are preferred before the given variant [26].

3.2 MAPPAC Method

MAPPAC method is the MCDM method based on paired comparisons of variants, whereby each pair of individual criteria results in a decision on which of the two objects is the more important, or whether they are indistinguishable in terms of the selected criteria. The MAPPAC method works with the criterion matrix and weights of the criteria. The method splits the variants into several preferential classes. MAPPAC method uses a normalized multi-criteria matrix $C = (c_{ij})$, where *r*-th row corresponds to variant a_r and *s*-th row corresponds to variant a_s. First the paired comparison of variants is processed. On the basis of the results there are possible two relationships between variants. Either preference (variant *a* was rated better than variant *b*) or indifference (variant *a* and variant *b* are assessed in the same way). In

the last step preferences are aggregated, resulting in a final order. The row totals of the aggregated matrix π are calculated according to the equation (1):

$$\sigma^l(a_i) = \sum_{j=1}^{p} \pi(a_i, a_j),\ i \in J^l \tag{1}$$

Variants with the highest σ^l values are placed on the first place in the ranking. The set of variants is reduced from these variants, new set of variants A^l is created, the set of indexes of variants from A^l are marked as J^l. The procedure is repeated for m steps where m is the number of preferential classes by the ranking from above. In a similar procedure the value of τ^1, τ^2,…, τ^n is reached, where n is the number of preferential classes in the ranking from bottom, by usage of equation (2):

$$\tau^t(a_i) = \sum_{j \in J^t} \pi(a_j, a_i),\ i \in J^t,\ t = 1, 2, \ldots n. \tag{2}$$

The overall ranking of variants is reached by averaging of the serial numbers of variants by the ranking from above and bottom. As the best evaluated is the variant which has the lowest overall serial number [19].

3.3 Weights of Criteria

In calculations using ELECTRE, there are considered also the weights of individual criteria. All criteria are maximizing nature. The weights were determined by factor analysis made in the research of European Commission [12]. The four main areas (EHR, HIE, Telehealth and PHR) were the same weight as they are equally relevant to the assessment of the eHealth in EU member states. The weights of individual criteria were calculated in Tab. 1.

Tab. 1: *Weights of eHealth indicators*

Area of eHealth	Indicator ($I_1 – I_{12}$)	Weights of indicators
EHR (25 %)	Health Info and Data – I_1	0.0825
	Clinical DSS – I_2	0.0700
	Order-entry management – I_3	0.0450
	Image – I_4	0.0250
	Admin – I_5	0.0275
HIE (25 %)	Clinical data – I_6	0.1425
	Patient admin – I_7	0.0600
	Management – I_8	0.0475
Telehealth (25 %)	Clinical practice – I_9	0.1275
	Training – I_{10}	0.1225
PHR (25 %)	Clinical info – I_{11}	0.1400
	Requests – I_{12}	0.1100

Source: [12], own calculations

4 Results

In this part of the article the application results of ELECTRE III method are presented. The results of the research are verified by MAPPAC method.

4.1 Ranking of EU Countries by Usage of ELECTRE III Method

Based on the results, it is possible to determine the order of the EU member states in terms of the eHealth implementation, from the best to the worst, as summarized in Tab. 2.

Tab. 2: *Ranking of EU countries according to eHealth by usage of ELECTRE III*

Order	Variant	Order	Variant
1	Denmark	15	Cyprus
2	Estonia	16	Romania
3	Sweden	17	Greece
4	Finland	18	Slovenia
5	Spain	19	Poland
6	United Kingdom	20	France
7	Croatia	21	Ireland
8	Italy	22	Bulgaria
9	Hungary	23	Austria
10	Czech Republic	24	Belgium
11	Latvia	25	Luxembourg
12	Malta	26	Slovakia
13	Germany	27	Lithuania
14	Portugal	N/A	Netherlands

Source: [12], own calculations

When evaluated by ELECTRE III method, the first five positions were occupied by Denmark, Estonia, Sweden, Finland and Spain. The worst state of eHealth was detected in Austria, Belgium, Luxembourg, Slovakia and Lithuania.

The EU member states reach the best results in the area of EHR. The best scores are achieved by Denmark and Estonia. EHR is a cornerstone of eHealth in the EU. This is the most developed part of EU eHealth in member states. The worst level in this indicator was observed in Lithuania. The area of HIE is developing in EU member states intensively. However, the level of implementation is significantly lower than in the case of EHR. The highest level is again in Denmark, Estonia and also in Sweden. The lowest level is in Malta, Poland, Greece and Slovakia. The least developed areas are Telehealth and PHR. These areas need a lot of support in the EU member states. Luxembourg, Slovakia and Romania lag most in these areas. On the contrary, the United Kingdom, Denmark and Finland are reaching the highest levels in Telehealth and PHR.

4.2 Verification of the Results by Usage of MAPPAC Method

EU member states ranked according to eHealth implementation based on the results of MAPPAC method are presented in Tab. 3.

Tab. 3: *Verification of the results by usage of MAPPAC method*

Order	Variant	Order	Variant
1	Denmark	13	Belgium, Slovenia
2	Estonia	14	Germany
3	Finland	15	Cyprus
4	United Kingdom	16	Austria
5	Sweden	17	Bulgaria, Poland
6	Spain	18	Romania
7	Croatia	19	Greece
8	Italy	20	Latvia
9	Hungary	21	Luxembourg
10	Czech Republic, Ireland	22	Slovakia
11	France	23	Malta
12	Portugal	24	Lithuania

Source: [12], own calculations

When evaluated by MAPPAC method, the first five positions were occupied by Denmark, Estonia, Finland, United Kingdom and Sweden. The worst state of eHealth was detected in Latvia, Luxembourg, Slovakia, Malta and Lithuania.

5 Discussion

According to the results of the presented research the implementation of eHealth in EU member states differ significantly. Based on the evaluation of eHealth in the EU member states, it was found that Denmark, Estonia, Sweden and Finland are on the top among EU member states when evaluating the practical usage of eHealth. The citizens there are generally keen to use the Internet and eHealth applications. In Denmark, for example, the health and care services provided online were used at least once a year by 42% of citizens (in Finland 49% and in Estonia 49%), see [25]. The internet usage and literacy levels of a region are also often associated for example with higher levels of EHR adoption [21]. According to the study "Transforming eHealth into a political and economic advantage" from 2017, see [3], the implementation of electronic health records, ePrescriptions and national eHealth programmes varies significantly across EU member states. The best evaluated countries are Denmark, Finland, Spain and Sweden that have the most developed eHealth solutions. The result is similar to the research presented in this article.

However, there are also countries ranked near the average among EU member states. In these countries, there are mainly serious shortcomings, particularly on the side of public digital services providers. Changing the attitude of government officials in the area of eHealth promotion is therefore required (Czech Republic, Hungary).

The results were verified by another MCDM method – MAPPAC. It was confirmed that Denmark, Estonia, Finland, Sweden and also the United Kingdom are among the best rated countries in the field of eHealth. Luxembourg, Lithuania and Slovakia, on the other hand, are among the worst rated countries. A large difference was found in the case of Malta, which ranked differently in the ELECTRE III and MAPPAC ratings. Otherwise, the evaluation of countries was comparable by both methods. The difference in the result is due to the difference in methods and different calculation principles. While ELECTRE III method is based on effective and inefficient variants, MAPPAC is based on preference or indifference between variants.

For the future of eHealth in EU member states, higher effort of European Commission in the field of eHealth harmonisation and standardisation is expected. Creation of common European registers of chronic diseases and actions to improve research data exchange between EU member states [3] are expected. The Commission was working with the member states to start exchanging e-prescriptions across borders in 2018. Cross-border telemedicine is a cornerstone of the "European Reference Networks" which will connect close to 1,000 clinics in Europe to diagnose and treat complex and rare diseases. Both schemes are supported by the "Connecting Europe Facility" and the system for exchange of prescriptions is based on a successful CIP project "epSOS" [9].

Conclusion

The article was focused on the evaluation of eHealth in the EU member states by means of MCDM methods. The research was based on the data set of the European Commission from the year 2018.

The results of the evaluation of EU member states in terms of the implementation state of eHealth by ELECTRE III method have acknowledged that the best ranking in this area have obtained Denmark, Finland, Estonia and Sweden. The worst state of eHealth was reported in Luxembourg, Slovakia and Lithuania. The results were verified by MAPPAC method.

eHealth is a useful tool for reducing the costs and it is also a time-saving benefit for residents. In general, the EU member states show a good level of EHR implementation. However, other areas of eHealth (HIE, Telehealth and PHR) have not been sufficiently developed yet and remain a challenge for the future.

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eHealth v Evropské unii – srovnávací studie

eHealth je jedním z moderních globálních trendů v oblasti IT, medicíny a politiky. Jedná se o široký pojem, který se týká elektronizace zdravotnictví a zdravotnických služeb, a hlavně popisuje použití informačních a komunikačních technologií ve zdravotnictví. V praxi je hodnocení eHealth důležitou záležitostí, protože vede k výběru vhodných opatření důležitých pro další pokrok v oblasti elektronické zdravotní péče a k návrhu doporučení pro rozvoj eHealth v zemích EU. Článek je zaměřen na komparaci stavu implementace eHealth v členských státech Evropské unie. Analýza je provedena metodou ELECTRE III. Výsledky empirického výzkumu hodnotí stav implementace eHealth ve všech členských státech Evropské unie podle vybraných kritérií a umožňují srovnání implementace eHealth v mezinárodním kontextu. Výsledky jsou ověřeny aplikací metody MAPPAC. Na základě výzkumu bylo potvrzeno, že nejlépe hodnocenými zeměmi v této oblasti jsou Dánsko, Finsko, Estonsko a Švédsko.

eHealth in der Europäischen Union – eine vergleichende Studie

eHealth ist einer der modernen globalen Trends in IT, Medizin und Politik. Es ist ein weit gefasster Begriff, der das elektronische Gesundheitswesen und die Gesundheitsdienste betrifft und hauptsächlich den Einsatz von Informations- und Kommunikationstechnologien im Gesundheitswesen beschreibt. In der Praxis ist die Bewertung von eHealth ein wichtiges Thema, da sie zur Auswahl geeigneter Maßnahmen führt, die für weitere Fortschritte im Bereich eHealth wichtig sind, und zur Ausarbeitung von Empfehlungen für die Entwicklung von eHealth in EU-Ländern. Der Artikel konzentriert sich auf den Vergleich der Implementierung von eHealth in den Mitgliedstaaten der Europäischen Union. Die Analyse wird unter Verwendung der ELECTRE III-Methode durchgeführt. Die Ergebnisse der empirischen Forschung bewerten dann den Stand der Implementierung von eHealth in allen Mitgliedstaaten der Europäischen Union anhand ausgewählter Kriterien und ermöglichen den Vergleich der Implementierung von eHealth im internationalen Kontext. Die Ergebnisse werden durch Anwendung der MAPPAC-Methode verifiziert. Die Untersuchungen haben gezeigt, dass Dänemark, Finnland, Estland und Schweden die besten Positionen in diesem Bereich haben.

e-Zdrowie w Unii Europejskiej – badania porównawcze

e-Zdrowie to jeden z nowoczesnych światowych trendów w dziedzinie IT, medycynie i polityce. To szerokie pojęcie, które dotyczy elektronizacji służby zdrowia i opieki zdrowotnej, opisujące przede wszystkim wykorzystanie technologii informacyjno-komunikacyjnych w służbie zdrowia. Ocena e-Zdrowia jest w praktyce istotną kwestią, gdyż przyczynia się do wyboru odpowiednich działań ważnych dla dalszego postępu w dziedzinie elektronicznej opieki zdrowotnej oraz do sformułowania zaleceń dotyczących rozwoju e-Zdrowia w krajach UE. Artykuł koncentruje się na porównaniu wdrażania e-Zdrowia w krajach Unii Europejskiej. Analiza wykonywana jest metodą ELECTRE III. Wyniki badań empirycznych oceniają stan wdrażania e-Zdrowia we wszystkich państwach członkowskich Unii Europejskiej według wybranych kryteriów i pozwalają na porównanie realizacji e-Zdrowia w kontekście międzynarodowym. Wyniki weryfikowane są metodą MAPPAC. Badania wykazały, że w tej dziedzinie przodują Dania, Finlandia, Estonia i Szwecja.

THE DEVELOPMENT OF THE NONPROFIT SECTOR IN RUSSIAN REGIONS: MAIN CHALLENGES

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Abstract

This article aims at identifying the main barriers hindering development of the nonprofit sector in Russian regions. The research is based on the conviction that the development of the nonprofit sector is crucial for the regional socio-economic system and depends upon civic engagement. The results of an analysis of available statistical data and a sociological survey conducted in one of the Russian regions reveal that the share of the Russians engaged in volunteer activities is low; over 80% of the population do not participate in public activities; less than 10% have definite knowledge of working nonprofit organizations. The study allowed identifying three groups of the main barriers and formulating some recommendations for their overcoming.

Keywords

Russia; Nonprofit sector; Nongovernmental organization; Civic participation; Civic engagement.

Introduction

Sustainable development of Russian regions requires the fullest use of their internal potential. As the public and private sectors cannot meet all demands concerning the provision of high living standards for all groups of the population, it is necessary for local authorities to find new opportunities for effective and mutually beneficial cooperation with other economic actors. In Russian regions, in this regard a new trend becomes evident – government starts to pay more attention to organizations of the third (nonprofit) sector.

While the importance of the nonprofit sector has been acknowledged worldwide, it is still at the stage of formation and development in Russia. Governmental bodies work at improving the regulatory and legal framework underlying the sector [1; 2] and introduce various support mechanisms [3; 4]. According to Knyazeva [5, p. 141], the impetus for the development of the nonprofit sector was the adoption of several laws regulating its activities, which allowed systemizing and legitimizing the main characteristics of its civil status. In recent years, the number of research papers describing the potential of the nonprofit sector in regional economy has been constantly increasing. However, the research focus is mainly on general trends and problems related to the adoption of new models of interaction between governmental and nonprofit organizations see e.g. [6; 7; 8; 9; 10].

In the world academic discourse scholars have come to the conclusion that the potential of the nonprofit sector is realized in a limited form. According to Salamon [11], the reason lies in four main "voluntary failures": philanthropic insufficiency, i.e. inability to generate reliable resources for an adequate response to community needs; philanthropic particularism, i.e. the tendency to focus on particular subgroups leaving less "deserving" groups to public

institutions; philanthropic paternalism resulting in situations when the nature of voluntary sector comes to be shaped by those providing resources; and philanthropic amateurism which means amateur approaches to serious problems and lack of professionalism. These failures are still characteristic for the activities of the nonprofit sector. As Enjolras et al. [12, pp. 131–141] note, lack of financial and human resources, insufficient level of professional and technical expertise are considered among the main barriers hindering the development of the sector and limiting its ability to promote civic engagement. On the contrary, nonprofit organizations play a distinctive role in encouraging civic engagement within local communities [13]. We assume that this is a reciprocal process, and the level of people's engagement has an impact on the size and efficiency of the nonprofit sector. Thus, when analyzing the development of the nonprofit sector in Russian regions, we focus on people's engagement in its activities.

1 Research Objective

The purpose of this study is to determine the main barriers hindering the development of the nonprofit sector in Russian regions. The research is based on the assumption that the development of the nonprofit sector depends upon civic engagement. This dictates the necessity of special scientific attention to this phenomenon. The article adopts a notion of civic participation rooted in Nakamura's [14] understanding of vital engagement: a type of involvement in which an individual experiences

> *"enjoyed absorption over a sustained amount of time, activity [that] provides a link to the individual and the world, and [is] meaningful and significant to the individual".*

The article's design includes a short description of general development features characteristic for the Russian nonprofit sector and focuses on determining the main challenges the sector faces.

2 Methods

The methodology of the study is based on analytical and system approaches, methods of comparative analysis and description. First of all, we analyzed scientific papers and legal acts concerning the functioning of the nonprofit sector and its role in the social sphere. The research information base was made up of data from specialized portals of U.S. Bureau of Labor Statistics, the Ministry of Justice of the Russian Federation, the Ministry of Economic Development of the Russian Federation, the Federal State Statistics Service, and the websites of the local governments of Russian regions. Systematization of the data obtained allowed us to draw the conclusions presented in the article. The study is based on the experience of foreign countries in which public administration (including the nonprofit sector) is successfully implemented on the basis of the principle of subsidiarity, which involves solving social problems at the lowest level – in the family or local community [15]. In a slightly modified form, this principle becomes relevant in modern Russian conditions, when there is a tendency towards regionalization of social and economic processes and local development factors are of particular importance [16].

For the analysis of the situation with civic engagement we used data obtained from the sociological survey of the Vologda Research Center of the Russian Academy of Sciences (VolRS RAS). The face-to-face survey was conducted by using a questionnaire containing 54 questions in autumn of 2019 in two large cities (Vologda, Cherepovets) and 13 municipal centers of the Vologda Oblast: Sheksna, Gryazovets, Sokol, Veliky Ustyug, Chagoda, Belozersk, Tarnogsky Gorodok, Shuyskoye, Kirillov, Ustyuzhna, Babaevo, Vozhega, Nikolsk. The assessment was conducted at the respondents´ place of residence. The sample

size was 1900 people aged 18 and older (604 respondents were from two large cities, 1296 were from the municipal centers). Sampling error does not exceed 3%. Vologda region is a typical region in the country based on its main socio-economic characteristics; therefore, we consider it as an example.

2.1 Limitations

Theoretical concepts of the "third" sector are still developing in Russia and scholars mainly rely on the works of foreign colleagues and use the definition given by Lester M. Salamon and his colleagues at Johns Hopkins Center for Civil Society Studies [17]. Despite the growing importance of the nonprofit sector in Russian regions, there are several weak points regarding its formal development that should be mentioned. Firstly, according to the definition given in national legal acts, governmental institutions are part of the third sector. This fact causes certain difficulties while analyzing statistical data on nonprofit entities and leads to conceptual problems [18]. Secondly, the variety of legal forms (more than 30) [19] and the fact that several governmental institutions are responsible for different types of NPOs, also lead to difficulties in interpreting the situation concerning the development of the nonprofit sector in the country. Partly, this problem is solved with the appearing of a recent phenomenon in the legislative system – socially oriented nonprofit organizations (SONPO). They make a core of the Russian nonprofit sector as about 60% of Russian NPOs are active in the social sphere, including education, social assistance and health [20]. For the aim of this research, we use statistical data available for SONPOs.

3 Results

The activities of nonprofit organizations are aimed at solving social problems and developing civil society in the country. At present, the nonprofit sector in Russian regions is characterized by developing trends but still has a long way to go. Thus, comparing nonprofit organizations' share in all establishments in the sphere of social assistance revealed that in the USA it comprises over 40% while in Russia it is approximately 3-6%. The number of socially oriented nonprofit organizations steadily increases in Russia; however, it is still quite low. Therewith, the share of regional organizations decreases contributing to interregional differentiation. Table 1 shows the dynamics of SONPOs in Russia and Vologda region.

Tab. 1: *Dynamics of SONPOs development in Russia*

Year	**Number of SONPOs**			**Number of people receiving services from SONPOs**		
	RF	**Vologda region**	**The share of regional SONPOs, in %**	**RF**	**Vologda region**	**The share of regional SONPOs, in %**
2017	142 641	1 465	1.03	35 536 819	257 366	0.72
2016	143 436	1 752	1.22	31 825 253	271 974	0.85
2015	140 031	1 721	1.23	26 319 671	208 747	0.79
2014	132 087	1 754	1.33	23 215 642	208 380	0.9
2013	113 237	1 696	1.5	17 882 629	191 201	1.07

Source: own calculations based on the data from Federal State Statistics Service. Available at: https://fedstat.ru/

One of the key indicators of nonprofit organizations development is the dynamics in volunteering activities. As studies show, the better developed nonprofit sector is, the higher the level of volunteering is [21]. In our opinion, this rule can be applied vice versa – the stronger people feel their responsibility for the development of their community, the more

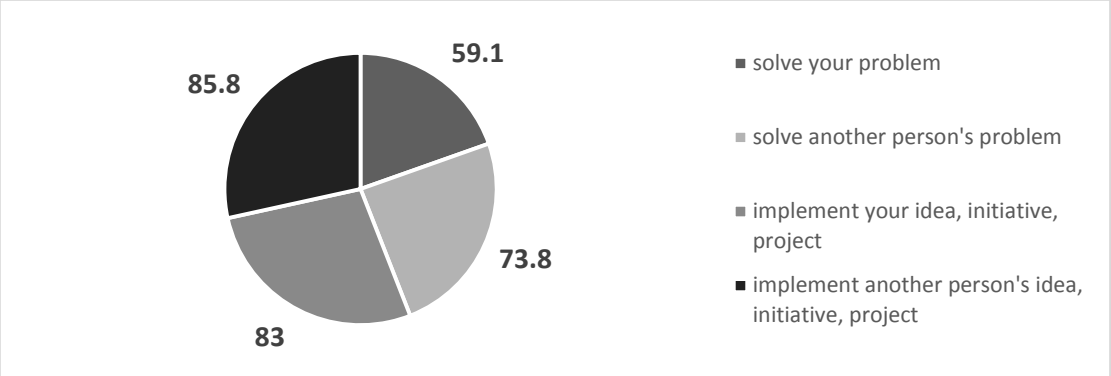
they are engaged in public activities, the faster the formation of nonprofit sector is. The analysis of statistical data showed that the share of people engaged in volunteer activities in Russia in general is approximately 2%, while in Russian regions it is even less (table 2).

Tab. 2: *Number of volunteers*

Year	Russian Federation			Vologda region		
	Population	**Average number of volunteers**	**%**	**Population**	**Average number of volunteers**	**%**
2017	146 804 372	2 710 023	1.9	1 180 300	17 000	1.4
2018	146 880 432	2 937 318	2.0	1 172 200	18 655	1.6

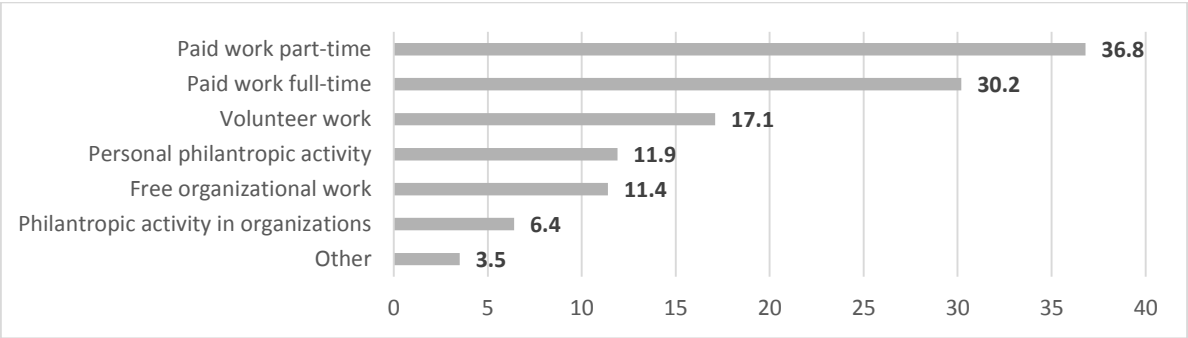
Source: Own calculations based on the data from http://www.statdata.ru/russia and Federal State Statistics Service available at https://fedstat.ru/

In order to reveal reasons of weak volunteering activities, we analyzed the results of a survey conducted in 2019 by the Vologda Research Center of the Russian Academy of Sciences on the people's attitude toward their engagement in public life. The survey showed that 19.6% of the respondents did not participate in the community life and only 5.4% of them evaluate their participation as active. 86.1% of respondents did not work as a volunteer within the last year. The answers to the question "*Did you have to initiate collective actions during the last 12 months to …?*" confirmed that the majority of respondents are unengaged (fig.1), but they are ready to engage in community life, however only on financial terms (fig. 2).



Source: VolRC RAS survey, 2019

Fig. 1: *Dynamics of the answer "no" to the question "Did you have to initiate collective actions during the last 12 months to …?" (in % of respondents' number)*



Source: VolRC RAS survey, 2019

Fig. 2: *Distribution of the answers to the question "What forms of participation in public life can be acceptable for you?" in %*

In most cases, the activities of volunteers are associated with the work of nongovernmental nonprofit organizations, which act as initiators, organizers and regulators of actions aimed at solving socially significant problems of the population. The participation of citizens in the

activities of public associations is an important indicator reflecting the level of civic participation as a whole. The results of the survey have revealed that NPOs in Russia are still in the process of gaining recognition (table 3).

Tab. 3: *Distribution of the respondents' answers*

Question	**Share of answers, in %**
In cities and towns people form nonprofit organizations. Do you know about them?	
In your town	
Yes, I know	8.7
I have heard something	44.7
No, I do not know	46.6
In your region	
Yes, I know	5.1
I have heard something	40.8
No, I do not know	54.1
In Russia	
Yes, I know	7.5
I have heard something	38.6
No, I do not know	53.9
Do you know, are you a member of, or do you participate in any events organized by nonprofit organizations?	
I do not know any	67.1
I am not a member	79.5
I do not participate	77.3

Source: VolRC RAS survey, 2019

The survey included a question "What stops you from participating in community life, in events of nonprofit organizations?" The answers to this question allowed us to determine the main reasons of people's inertness. Thus, the majority of the respondents do not participate in public life due to the lack of free time (36.3%) or interest in such activities (27%). Some answers indicate that people are not certain if they are fit (healthy) enough to engage in public life (20.1%), if they have necessary skills (12.4%), if there is any help from this engagement (11.3%). Also, it should be noted that some respondents consciously deny civic engagement because it does not help solve their individual problems and those of their relatives (8.6%) or does not offer them opportunities for personal development (9%). One of the important reasons of inactiveness is that people do not know where to go and do not have any information (4.8%).

4 Discussion

The results obtained within the framework of this research confirm previous findings to a certain extent. Various studies demonstrate that nonprofit organizations have limited use and people are more likely to seek help from family and friends [22; 23]. Representatives of the third sector often blame unfavorable external environment for such failures. However, based on the paper by a Russian researcher Zadorin I. V. and his colleagues [24], there are four levels of interaction affecting the development of the sector: between nonprofits and citizens, nonprofits and authorities, nonprofits and business, and internal issues of nonprofits. The relationship with authorities includes general attitudes of the latter regarding nonprofit organizations, forms and principles of interaction, efficiency of participation in the processes of decision-making. Relationship with business structures can be seen in the degree of motivation for interaction, opportunities for self-organization, and activity of the business in

social projects. Relationship between nonprofit organizations and individuals include understanding the role of NPOs, motivation to participate, and civic education. Internal issues of the third sector are related to environmental restrictions and opportunities, coordination and partnership, professionalism and competence, and the ability to recruit. In the Russian case, it is obvious that all four aspects should be significantly improved. The results of this study clearly show that despite the positive trend in the development of the nonprofit sector in the country, one of the most important challenges is the low level of civic engagement, and it puts at risk the main goal of nonprofit organizations which is to address public concerns and ensure high living standards of the population.

The challenges related to the decreasing civic engagement are characteristic for European countries as well. As the results obtained within the framework of the project "Third Sector Impact" show, 73% of the surveyed organizations regard limited public awareness as a serious problem [25, p. 4]. Nonprofit organizations face problems recruiting volunteers and board members; citizens are becoming more constrained and hesitant to take up responsibility, especially for long periods of time. Trends in the development of the nonprofit sector in Eastern Europe are quite similar to those in Russia: despite the general upward trend in terms of organizational growth, the membership base is shrinking and social anchorage is still limited [26]. A human resource shortage is a major challenge for local communities as it is rather difficult to engage professionals in voluntary activities on a regular basis. This results in problems with media coverage, public image, fundraising challenges, and recognition within different part of the society [27, p. 10]. Therefore, in our opinion, priority attention should be paid to the activities that allow overcoming challenges related to people' engagement and participation in community life.

Conclusion

Summarizing the results of the study, we defined three groups of barriers hindering a more active civic engagement and consequently a more rapid development of the Russian nonprofit sector:

1. Motivation barriers include lack of time or information. Nonprofit organizations have difficulties with finding not only initiative people, but also those who are simply open to participation in public activities. Experts point to the dominance of paternalistic attitudes, deep doubts that something could be demanded from the authorities. In order to overcome these barriers, local authorities should create working mechanisms for people to communicate and realize their ideas; for example, special online and offline platforms where they can meet and discuss initiatives. Public service announcements can help promote and spread information about nonprofit organizations and their activities, form new habits and practices of engagement. In addition to it, employers should be encouraged to provide opportunities for employees. It can concern working hours or financial means. At the same time, employers should also be rewarded for this behavior (tax reduction, special conditions within government contracts, etc.).
2. Hesitation barriers include insecurities connected with skills, health or difference people can make if they participate in public life. This barrier suggests that people are ready to engage and therefore it is necessary to give them this opportunity. In our opinion, the key players in such cases are local nonprofit organizations. Being close to potential activists they know what, when, where is needed, and how different people can contribute to the community. One of the challenges, however, is the fact that activists and leaders of NPOs often do not have knowledge how to engage these people as for the most part they belong to the category of "intuitive leaders". They have nowhere to acquire skills in organizing joint actions, negotiation skills, public speaking, preparing appeals, etc.

3. Inward-focused barriers include lack of interest or concentration on one's own life goals and problems. Weak interest in social activity is shown by people who are career-oriented and consider social activities costly and unpromising. However, we believe that the increase of mass-media attention to civic engagement practices will positively affect people's attitude towards this phenomenon.

Studies show that at the initial stage, nonprofit organizations always face the rigidity of the existing political, administrative, business structures, and people. At the same time, with organizational development, mobilization of resources and the accumulation of experience, the influence of NPOs on the society increases. As our research reveals, the Russian nonprofit sector is still developing and meets many challenges. They include not only problems in cooperation with the authorities or business but also difficulties in civic engagement; and in our opinion, this is the most important issue that has to be addressed. Under present circumstances in Russia, when government is working on the nonprofit sector development at least as much as the sector itself, the common goal is teaching people to be initiative citizens, explaining ways to express opinions and creating opportunities for sharing ideas.

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VÝVOJ NEZISKOVÉHO SEKTORU V RUSKÝCH REGIONECH: HLAVNÍ VÝZVY

Cílem tohoto článku je identifikovat hlavní překážky bránící rozvoji neziskového sektoru v ruských regionech. Výzkum je založen na přesvědčení, že jeho rozvoj je pro regionální sociálně-ekonomický systém zásadní a závisí na občanské angažovanosti. Výsledky analýzy dostupných statistických údajů a sociologického průzkumu provedeného v jednom z ruských regionů ukazují, že podíl Rusů zapojených do dobrovolnických aktivit je nízký; více než 80 % populace se neúčastní veřejných aktivit; méně než 10 % má určité znalosti o fungujících neziskových organizacích. Studie umožnila identifikovat tři skupiny hlavních překážek a formulovat některá doporučení pro jejich překonání.

DIE ENTWICKLUNG DES GEMEINNÜTZIGEN SEKTORS IN RUSSISCHEN REGIONEN: HAUPTHERAUSFORDERUNGEN

Dieser Artikel zielt darauf ab, die Haupthindernisse zu identifizieren, die seine Entwicklung in russischen Regionen behindern. Die Forschung basiert auf der Überzeugung, dass die Entwicklung des gemeinnützigen Sektors für das regionale sozioökonomische System von entscheidender Bedeutung ist und vom bürgerschaftlichen Engagement abhängt. Die Ergebnisse einer Analyse der verfügbaren statistischen Daten und einer soziologischen Untersuchung in einer der russischen Regionen zeigen, dass der Anteil der Russen, die sich freiwillig engagieren, gering ist. über 80% der Bevölkerung nehmen nicht an öffentlichen Aktivitäten teil; Weniger als 10% haben definitive Kenntnisse über gemeinnützige Organisationen. Die Studie ermöglichte es, drei Gruppen der Haupthindernisse zu identifizieren und einige Empfehlungen für deren Überwindung zu formulieren.

ROZWÓJ SEKTORA NON-PROFIT W REGIONACH ROSYJSKICH: GŁÓWNE WYZWANIA

Artykuł ma na celu zidentyfikowanie głównych barier utrudniających jego rozwój w regionach Rosji. Badanie opiera się na przekonaniu, że rozwój sektora non-profit ma kluczowe znaczenie dla regionalnego systemu społeczno-gospodarczego i zależy od zaangażowania obywatelskiego. Wyniki analizy dostępnych danych statystycznych oraz badania socjologicznego przeprowadzonego w jednym z regionów Rosji pokazują, że udział Rosjan w wolontariacie jest niski; ponad 80% ludności nie uczestniczy w działaniach publicznych; mniej niż 10% ma określoną wiedzę na temat pracy organizacji non-profit. Badanie pozwoliło na wyodrębnienie trzech grup głównych barier i sformułowanie zaleceń dotyczących ich pokonywania.

EVALUATION OF APPLICATION OF NEW DECISION-MAKING METHODS IN SELECTED COMPANIES: THE USE OF BUSINESS INTELLIGENCE IN PRACTICE

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Abstract

Growing pressure on increasing decision-making speed in all spheres of human life is one of the basic phenomena of today. Immediately after the first wave of the coronavirus pandemic, we can consider the ability of making good decisions quickly as one of the most important aspects of our being. The main objective of this article is to find out the utilization rate of several basic decision-making approaches in selected companies with an emphasis on newly used methods such as data analysis and business intelligence tools. The first part of the article presents a short introduction of the decision-making process and an overview of hitherto known and used tools facilitating the whole procedure. The submitted study of available literature leads to the presentation of own classification of the most widely used decision-making methods. Based on a questionnaire survey, in the second section, the pilot research examines the involvement of five different groups of methods in business decision-making, such as intuition and previous experiences, consultation with colleagues, data analysis (historical), MCDM methods and consultation with experts. Afterwards, the most common obstacles that employees must face in introducing new tools have been identified. In general, the results show that time and the associated pressure on decision-making speed play a crucial role in the decision-making process.

Keywords

Decision-making process; Decision-making methods; Business intelligence; Mann-Whitney test.

Introduction

The result of the current development is a technologically complex production and a diverse offer in the segment of services with high demands on managerial decision-making. The phenomenon of growing pressure on the speed of decision-making is caused by increasing demands placed on not only companies and thereby individual employees, but the entire society. New and complex technologies play a key role at all stages of business processes. New factors influencing managerial work are also emerging. Modern managers must take into account the social, environmental or, for example, demographic consequences of their decisions [1].

For these reasons, it is no longer sufficient for management to solely use management tools commonly identified by literature, e.g. Pareto Analysis, the exchange of ideas, guided discussion, mathematical-logical models, etc., and there is pressure to develop other methods.

Therefore, the presented list of methods also includes new approaches that support managerial decision-making. New developing and advanced computer technologies help change the organizational structure within the organization, set up the re-engineering process or directly

change management methods. Chen mentioned the significance of business intelligence and analytics in both academic and business communities. Further, the main opportunities associated with data and analysis are highlighted. It helps to reveal crucial business data to facilitate an enterprise's better understanding of its business and market and timely business decisions [2]. The findings obtained from another research recommend managers to focus on five crucial factors to gain greater profitability from business intelligence projects: BI solutions must be built with end users in mind, BI system needs to be closely tied to a company's vision, projects need to be properly scoped and prioritized, all technological issues need to be solved and non-technological issues should be avoided [3].

Isik provided a better understanding of the relationship between the decision environment and BI capabilities. According to the study outcomes, organizations must pay attention to the consideration of incorporating the necessary flexibility in decision making processes supported by BI, even for structured operational decisions. The results highlighted the importance of paying attention to business intelligence's technical and organizational capabilities involving the provision of appropriate user access to BI resources and ensuring the seamless integration of BI with other systems [4].

In order to fulfil the purposes of this article, its structure is as follows. After the short introduction, a brief literature review is presented. The second section includes the methodology used for this study, providing an overview of the research instrument. The third section focuses on mapping the current stance towards using these methods in selected companies, which represents the main goal of the article. Based on a questionnaire survey conducted among employees across the fields of business and working levels, evaluation of currently used tools will be performed with an emphasis on new approaches primarily using data analysis and business intelligence principles. The obtained results and data analysis are presented. At the end, a short conclusion with limitations and plans for future research is drawn.

1 Literature Review

The literature summary is divided into three sections. First, basic characteristics of the decision-making process are introduced, followed by a brief overview of the implemented methods and concluding with the self-determined proposal for sorting of methods.

1.1 Decision-Making Process

At a time when all technologies and knowledge are essentially available to everyone, human capital remains one of the few competitive advantages. Ambient pressure comes not only from competitors, but also from customers, suppliers and the public. The manager is faced with an environment in which the following factors are manifested [1]:

- growing competition,
- more complex operational and business environment,
- variability of customer requirements,
- changing markets,
- growing information needs,
- rising costs of incorrect decisions,
- declining reliability of forecasts.

All these trends together place high demands on the manager's ability to make the right decisions, predict future development and co-create a corporate vision.

The procedure for resolving a selected decision problem describes the decision process in detail. Individual activities and their content are closely connected with the structure of the decision-making process, they follow in time and can be divided into individual stages. The concept of individual phases and their division in the literature differs according to the author.

Blažek divides the whole process into 6 phases, which are divided into two larger subgroups according to the applied principle of thinking and the type of work with information [5]:

- divergent thinking, expanding the set of information:
  - the definition phase (setting goals),
  - the analysis phase (an overview of relevant and available information), and
  - the generation phase (a list of variants).
- convergent thinking, reducing the volume of information:
  - the classification phase (sorting options),
  - the evaluation phase (selection and use of a suitable decision-making method, recommendations leading to the selection of the most suitable alternative), and
  - the decision phase.

1.2 Decision-Making Methods

A huge number of publications dealing with decision-making in the business environment can be found in literature and professional journals. Some resources only address a selected set of methods, while others provide a summary overview. Examples mentioned hereinafter in this section only represent a brief selection of known and used methods.

One of the principles for sorting a large number of techniques available in several publications is a classification of methods according to the proportion of mathematics necessary for their application. Occam's razor, brainstorming, brainwriting, and the Delphi method stand at the beginning of this order. The next group includes the Pareto principle, cost-benefit analysis (CBA), and business intelligence (BI). Quantitative methods and mathematical models constitute a separate branch of decision analysis. These approaches utilize sophisticated mathematical programs, computer software, and/or principles of artificial intelligence [6].

Other authors examine multi-criteria decision making methods in their studies published in scholar journals most frequently. For example, a publication that comprehensively lists the following methods and their subsequent application [7]: AHP (analytic hierarchy process), ANP (analytic network process), SAW (simple additive weighting), TOPSIS (technique for order preference by similarity to ideal solution), ELECTRE (elimination and choice expressing reality) and PROMETHEE, GRA (gray relational model), fuzzy integral technique, rough sets, structural model. Another example, the handbook Multiple Criteria Decision Analysis (MCDA): State of the Art Surveys, presents well-established methodologies and theories and it divides literature streams dedicated to this topic as follows: MCDA today, foundations of MCDA, outranking methods, multi-attribute utility theory, non-classical MCDA approaches, multi-objective mathematical programming, applications, and MCDM software [8].

The authors frequently devote themselves to one method or a group of methods applied for the specific problem or situation. Table 1 shows a few such papers from recent times.

Tab. 1: *Outcomes of earlier studies*

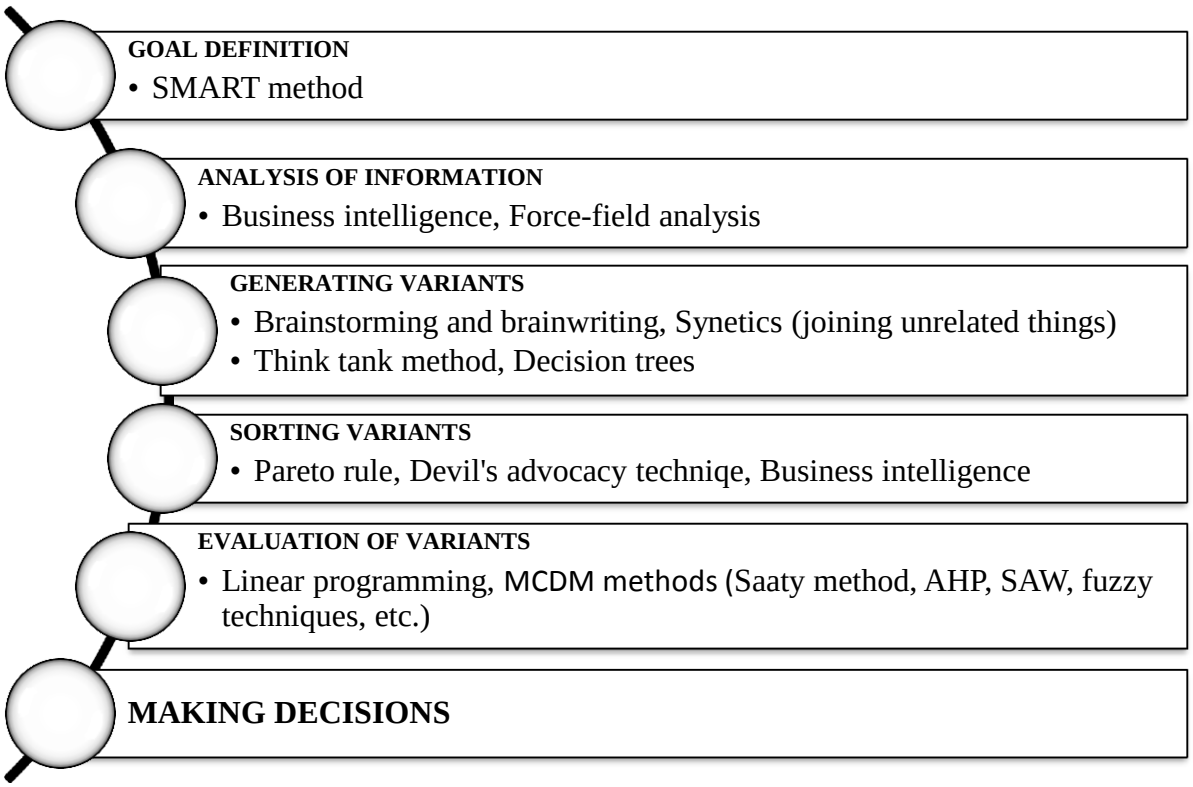
Title	Author(s)	Year of publication	Objective of the paper
Decision Making Methods Based on Fuzzy Aggregation Operators: Three Decades Review from 1986 to 2017	Mardani Abbas et al. [9]	2018	Systematic review of articles dealing with fuzzy set theory and aggregation operator theory.
Sensitivity Curve of the Decision-Making Process of a Company	Karel Chadt and Martin Petříček [10]	2018	Measurement capabilities for sensitivity of the decision-making process within the issue of the use of quantitative methods.
Stochastic Multi-Criteria Decision-Making: An Overview to Methods and Applications	Erkan Celik, Muhammet Gul, Melih Yucesan & Suleyman Mete [11]	2019	A comprehensive view on stochastic multi-criteria decision-making in respect to showing up-to-date literature.
Modelling procedure for the selection of steel pipes supplier by applying fuzzy AHP method	Kazimieras Zavadskas, E., Turskis, Z., Stević, Željko, & Mardani, A. [12]	2020	The study used fuzzy Analytic Hierarchy Process to choose the optimal supplier for the purchase of materials necessary for the production of pre-insulated pipes.

Source: Own

1.3 A Proposal of Decision-Making Method Classification

Based on the analysis of the presented literature, a possible approach to the classification of methods facilitating managerial decision-making is shown below. Most authors only deal with the detailed breakdown in the decision-making process in the variant evaluation phase. The proposed classification shown in Figure 1 is based on the concept of the decision-making process mentioned above.

The presented structure offers a comprehensive view that would include all types of methods. However, it is not intended to list all available tools and procedures. This is almost impossible in today's world, where new methods are constantly being developed or those already known are being advanced.



Source: Own

Fig. 1: *Classification of decision-making methods*

2 Research Methodology

The pilot research was conducted in several phases. First, a questionnaire was compiled containing questions covering the main topics of long-term research. The data was further processed using several statistical methods and the results are presented in the following section.

2.1 Questionnaire Survey

The questionnaire survey is ranked among the methods of quantitative research that enable researchers to obtain a large amount of information from a larger number of respondents in a shorter period of time than, for example, an interview. For this study, three basic types of questions were used. The respondents usually replied to yes or no questions, chose from a finite number of alternatives, or the Likert scale representing the degree of agreement was used.

A total of 90 questionnaires were distributed among employees, of which 75 completed forms could be included in the analysis. The respondents were contacted through the HR department and through a LinkedIn work network. This professional network was selected as a comprehensive source of respondents across business fields and job levels within the organizational structure.

The selection was made on a voluntary basis. The employees could work in the same organization, but they worked in different departments. This method is one of the least invasive techniques used when a relatively small sample is needed. The sample corresponds to the interest of the respondents. The risk is low representativeness and also the fact that similar personalities can report [13]. However, companies do not want to provide this type of

data. Accordingly, for the presented research, this sample was found to be sufficient and the results serve for the first idea of the researched topic within the long-term research.

The initial set of questions presented in the questionnaire focused on obtaining basic information about each employee. The aim was to classify respondents by the size of the enterprise, the business sector, their department and the usage of information systems within their company, not only in the decision-making process.

The methods of descriptive statistics (frequencies) are applied to describe the basic set. Tables 2 and 3 show the distribution of respondents according to the size of their organization and the classification of job positions in the organizational structure.

Tab. 2: *Distribution of respondents by enterprise size*

Enterprises by business size	**Number of respondents**
Micro and small sized enterprises (0-49 employees)	7
Medium-sized enterprises (50 to 249 employees)	15
Large enterprises (more than 250 employees)	53

Source: Own

Tab. 3: *Distribution of respondents by job level*

Job level	**Number of respondents**
Executive management	8
Middle management	21
Line management	6
Specialists	40

Source: Own

In the next section, respondents expressed their agreement with statements on the five-point Likert scale, where the highest value meant strong agreement and the lowest value total disagreement, as has been shown in Table 4.

Tab. 4: *Likert scale*

	*	**	***	****	*****
Consent rate	Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Source: Own

To confirm some differences between specific groups of respondents, the list of jobs has only been transferred to two groups: specialists and management members. After conversion, the new distribution looked like this: 43 specialists and 32 management members. To verify possible significant difference these hypotheses have been determined as follows:

H_0: There is no difference between the opinions of specialists and managers on the selected statement.

H_1: A difference between the opinions of specialists and managers exists on the selected statement.

2.2 Mann-Whitney U test

The Mann-Whitney U test (sometimes called the Mann Whitney Wilcoxon Test) has been applied by means of Statgraphics, since a non-parametric test allows two groups or conditions or treatments to be compared without making the assumption that values are normally distributed. Non-parametric tests test the null hypothesis, which only concerns the general properties of the distribution of the monitored quantity in statistical files. Non-parametric tests

are also suitable for ordinal variables, which are evaluated by a subjective scale of values [14].

3 Research Objectives

The main objective of this article is to find out the utilization rate of several basic decision-making approaches in selected companies with emphasis on newly used methods such as data analysis and business intelligence tools.

4 Research Results

One of the series of questions was devoted to the use of decision-making methods in practice. The respondents could choose from 5 different types of methods and complete the "Others" column as well. They could mark off any number of tools. The list of possibilities and their frequencies is presented in Table 5.

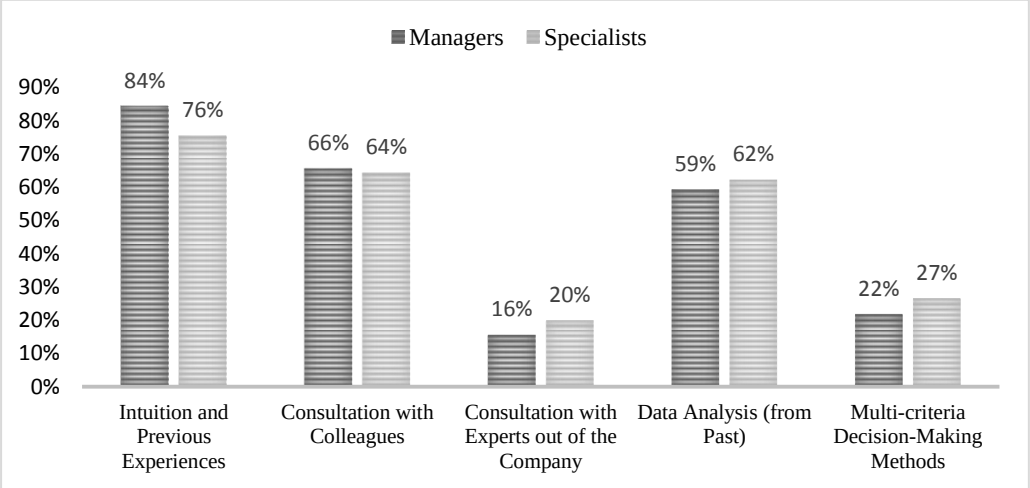
Tab. 5: *List of methods*

Method(s) based on	Total frequencies (out of 75)
Intuition and previous experiences	61
Consultation with colleagues	50
Data analysis (historical)	47
Multi-criteria decision-making (MCDM) methods	19
Consultation with experts outside of the company	14
Others	2

Source: Own

At first sight, the results show a close link between the lack of time, which is an integral part of all business sectors, and the pressure exerted on rapid decision-making. When making decisions, most respondents rely on their own intuition, their own experience and advice from their colleagues. According to the summary of frequencies in Table 5, more complex and time-consuming methods are less frequently used.

On average, the respondents selected 2.5 methods and slight differences between managers and specialists were determined. Figure 2 shows the results:



Source: Own

Fig. 2: *Utilization of methods (relative frequency)*

Managers are often considered to be the main users of results gained by data analysis and business intelligence tools. They often serve as a basis for decision-making based on MCDM.

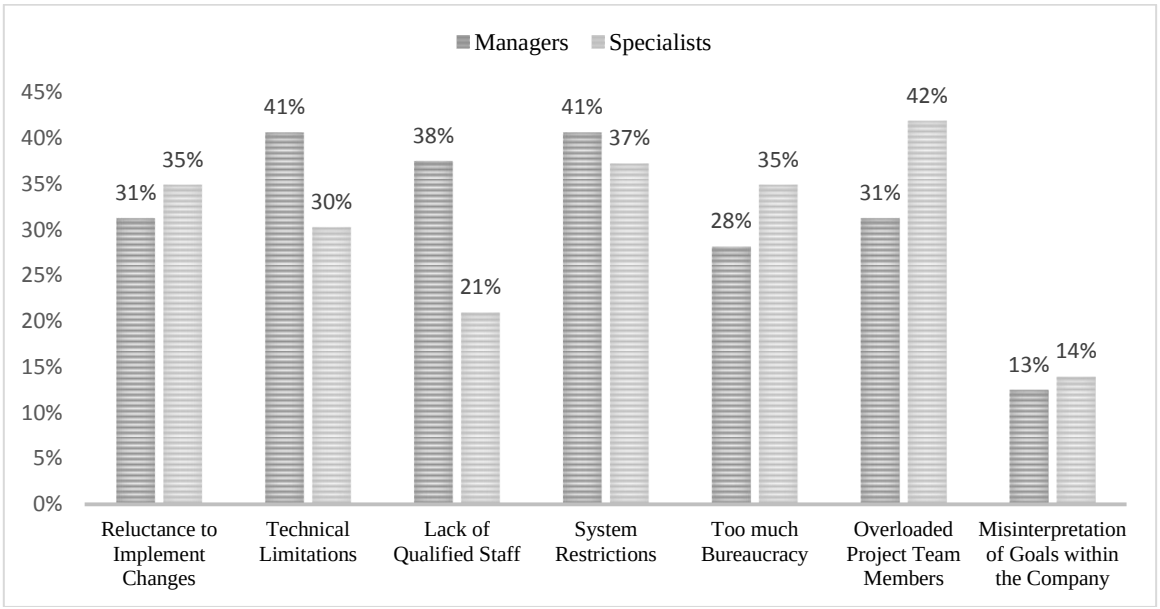
Hence, quite surprisingly, a larger share of users of data analysis and MCDM methods was recorded among specialists than among managers.

The outcomes of the comparison confirm the phenomenon mentioned above. There is not enough time left to apply more complex decision-making methods for both researched groups. Employees at all levels are often forced to make so-called ad-hoc decisions based on previous experience and intuition. This is also most likely due to the growing pressure caused by the rapid development of technology, increased demand for products and services and, thereby, increasing requirements imposed on employees and managers.

If we build on the previous chart, the strong expression of dissatisfaction with data consolidation and interconnection of systems by managers is worth mentioning. The measured value of agreement with the statement '*I would welcome a wider data connection of individual IS with subsequent presentation of results*' averaged 3.9. In contrast, the average measured value for specialists was 3.4. The statistical significance of the difference has been verified by the Mann-Whitney test on two independent samples:

Mann-Whitney (Wilcoxon) W-test to compare medians. The W value equates to 479.5 and the *P*-value = 0.0204921. Since the *P*-value is less than 0.05, there is a statistically significant difference between the medians at the 95.0% confidence level.

Thus, the results show that although managers have or should have more power to introduce new tools to facilitate the decision-making process, they are the ones who would welcome more support. Another series of questions sought to reveal the obstacles that employees must face in introducing new tools. The histogram in Figure 3 shows the most indicated difficulties by both managers and specialists. They could mark off any number of obstacles. On average, members of both groups selected about 2 of them.



Source: Own

Fig. 3: *Indication of obstacles by managers and specialists (relative frequency)*

In this group of questions, the discrepancy of opinion was most pronounced. While specialists most often point out the overload of individual employees within project teams, managers, on the other hand, lack enough qualified staff and further mention technical limitations and system restrictions. Disagreements can be partially explained by common different perceptions of work effort made and the required commitment from the manager's point of view. On the other hand, a clear warning from ordinary workers about their overload cannot

be neglected, and more than a third also point out excessive bureaucracy (35%) and even more negatively perceive system barriers (37%), where agreement was found within both groups (managers 41%). Almost a third additionally cite ‘reluctance to changes’ as a major obstacle, which is a crucial warning for top management in the current complex, rapidly changing business environment.

5 Limitations

The research contains several limitations. First, the selection of respondents made on a voluntary basis could not ensure the required representativeness. However, the results may indicate certain contexts of behavior, which can then be verified in further research. The questionnaire was also structured with an emphasis on comprehensibility in order to reach the widest possible range of respondents. It limited the possibilities of wider data analysis. In the next phase of the research, it is planned to address a specific group of employees dedicated to the implementation of new methods, and to examine the factors and reasons influencing the use of these methods in greater detail.

Conclusion

This article was intended to present the structure of the decision-making process, classification of the most common tools supporting the continuality of the process, and finally to find the rate of use of decision-making methods in selected companies.

The most frequently used methods have been arranged into six categories based on phases defined in a decision-making process structure available in appropriate literature. The division of these tools varies across authors. Most of them only deal with one of the categories of these methods and rather prefer a detailed insight into the issues of each specific method. A similar introduction of decision-making methods comparable to the presented article has been divided into 5 sections. It likewise begins with a description of the decision-making process. In the next section, the importance of making a distinction between the cases as to whether we have a single criterion or multiple criteria and between a finite or infinite number of feasible alternatives is highlighted. On the contrary, particular methods are only categorized in three groups as follows: Multi-attribute decision making methods, Group decision making, and Sensitivity analysis [15].

The main goal of the article was to present the utilization rate of decision-making methods in Czech companies. The analysis based on the results obtained from a questionnaire represents the main contribution of this article. In general, the outcomes show that time plays a crucial role in the decision-making process.

The research showed the involvement of five different groups of methods in business decision-making (intuition and previous experiences, consultation with colleagues, data analysis (historical), multi-criteria decision-making methods, consultation with experts outside of the company) with an emphasis on new methods using data analysis and business intelligence principles. The use of this type of tool also revealed the most common obstacles related to its implementation from both the manager and the specialist´s sides. Specialists highlighted overloading of project teams most whereas managers emphasized technical limitations and system restrictions with the same high frequency.

Primarily all respondents, regardless their work position, would currently appreciate the wider connection of available data. However, they commonly rely on their own experience and advice from colleagues. They therefore choose the fastest decision option. Comparable research to the presented study was conducted in 2017 [16]. The cited article particularly discusses the attitude of selected small and medium-sized enterprises towards business

intelligence systems. A total of 96 subjects were included in the analysis, and the results from a questionnaire survey revealed that business intelligence systems are not too widespread or familiar among the selected group of small- and medium-sized enterprises. The research also showed that most companies do not even need to implement more sophisticated software tools, because the analyses they perform fully suit the management. Both research papers showed the satisfaction of companies that have already used BI tools. They confirmed better access to information, better decision-making and, thereby, a competitive advantage compared to others.

On the other hand, enterprises face enormous pressures and are continuously striving for innovative and effective material management methods. Upcoming research can explore why companies do not frequently use new decision-making methods, particularly business intelligence principles that can signify an important market advantage. Future research can set up a model to show these organizations how to incorporate business intelligence methods to improve decision-making processes.

Acknowledgements

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VYHODNOCENÍ VYUŽITÍ NOVÝCH ROZHODOVACÍCH METOD VE VYBRANÝCH SPOLEČNOSTECH

Stoupající tlak na rozhodování ve všech sférách lidského života se řadí mezi základní fenomény současné doby. Nejen ve firmách je tento jev způsoben zvyšujícími se nároky kladenými na celou společnost a potažmo na jednotlivé pracovníky. Článek v první části předkládá přehled doposud známých a užívaných nástrojů, které pracovníkům usnadňují jednu ze základních, dnes již nejen manažerských, funkcí – rozhodování. Na základě dostupné literatury dospěje předložená rešerše k představení vlastního návrhu možného rozřazení nejužívanějších rozhodovacích metod. Samotné zmapování jednotlivých nástrojů by však nebylo kompletní, pokud by využití těchto metod nebylo ověřeno v praxi. Hlavním cílem tohoto článku je zanalyzovat aplikaci několika základních metod rozhodování ve vybraných podnicích s důrazem na nově využívané nástroje, jako je datová analýza a principy business intelligence.

BEWERTUNG DER ANWENDUNG NEUER ENTSCHEIDUNGSMETHODEN IN AUSGEWÄHLTEN UNTERNEHMEN

Der wachsende Druck, in allen Bereichen des menschlichen Lebens Entscheidungen zu treffen, ist eines der Grundphänomene von heute. Dieses Phänomen wird nicht nur in Unternehmen durch steigende Anforderungen an das gesamte Unternehmen und damit an einzelne Mitarbeiter verursacht. Der folgende Artikel gibt im ersten Teil einen Überblick über bisher bekannte und verwendete Instrumente, die den Mitarbeitern eine der grundlegenden Funktionen erleichtern, die heute nicht nur Führungskräfte betrifft, nämlich die Entscheidungsfindung. Basierend auf der verfügbaren Literatur gelangt die vorliegende Recherche zu einem eigenen Vorschlag für eine mögliche Einteilung der am häufigsten verwendeten Entscheidungsfindungsmethoden. Die Erfassung der einzelnen Instrumente allein wäre jedoch nicht vollständig, wenn die Verwendung dieser Methoden in der Praxis nicht verifiziert wäre. Das Hauptziel dieses Artikels besteht darin, die Anwendung einiger grundlegender Entscheidungsfindungsmethoden in ausgewählten Unternehmen zu analysieren, wobei der Schwerpunkt auf neu verwendete Instrumente wie Datenanalyse und Business Intelligence-Prinzipien liegt.

OCENA STOSOWANIA NOWYCH METOD PODEJMOWANIA DECYZJI W WYBRANYCH SPÓŁKACH

Rosnący nacisk na podejmowanie decyzji we wszystkich sferach ludzkiego życia to jeden z głównych fenomenów dzisiejszych czasów. Nie tylko w firmach zjawisko to jest spowodowane rosnącymi wymaganiami stawianymi całemu przedsiębiorstwu, a w konsekwencji także poszczególnym pracownikom. Niniejszy artykuł w pierwszej części przybliża dotąd poznane i używane narzędzia, które ułatwiają pracownikom realizację jednej z podstawowych, dziś już nie tylko, menedżerskich funkcji – podejmowanie decyzji. Na podstawie dostępnej literatury w dalszej części niniejszego opracowania przedstawiona została własna propozycja możliwej klasyfikacji najczęściej używanych metod podejmowania decyzji. Sam przegląd poszczególnych narzędzi nie byłby jednak kompletny bez sprawdzenia zastosowania tych metod w praktyce. Głównym przedmiotem niniejszego artykułu jest analiza zastosowania kilku podstawowych metod podejmowania decyzji w wybranych przedsiębiorstwach ze szczególnym uwzględnieniem stosowania nowych narzędzi, takich jak analiza danych i zasady business intelligence.

APPLICATION OF ARMA AND GARCH MODELS ON TIME SERIES OF KOMERČNÍ BANKA STOCKS

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Abstract

One of the main goals of entities in the securities market is to buy stocks cheaply at the right time (buy undervalued stocks) and also to sell stocks expensively at the right time (sell overvalued stocks).

It is typical for undervalued stocks to be traded at a low price at some point due to their fundamental characteristics. In the future, undervalued stocks can be expected to rise in price, which can bring a capital gain to an investor who bought at a low price. Undervalued stocks are therefore recommended for purchase.

An important prerequisite is therefore the accurate timing of buy and sell signals. The problem, however, is that no one knows exactly when the right time will come, because the market price of stocks is affected by many factors that have an impact on fluctuations in the market value of stocks. For this reason, volatility modeling is coming to the forefront of the interests of many financial analysts and investors.

Keywords

ARMA model; GARCH model; Stocks; Volatility; Komerční banka.

Introduction

The so-called Mathematical modeling provides methods by which phenomena and activities that take place in a person's daily life can be studied. Thus, mathematical modeling makes it very easy to display complex questions or problems through mathematical equations or functions. One of the areas where mathematical models can be used very well is the area of finance, in which the financial market has a key position. Based on supply and demand, there is a movement of money and capital between different entities. The main platform for these financial transactions is stock exchanges, where the main attractions include stocks of large companies.

However, the problem with these transactions is a high degree of uncertainty, as stock volatility is largely unpredictable. Reasons include, for example, measures or regulations of governments in a given country, market expectations, financial or other crises, or the political situation in a given country. For this reason, prediction or modeling of stock volatility comes to the forefront of the interests of many investors, economists, speculators or financial analysts.

1 Research Subject

The aim of this article is to analyze the behavior of Komerční banka stocks within a given time interval using the application of methods and analyzes. This behavioral analysis will be

performed based on the residue distribution calculated from the GARCH model, which will be estimated from the data. The work will analyze both the expected changes that follow the normal distribution, but mainly unexpected changes – the so-called heavy tails.

The article uses as a data source the time series of Komerční banka stocks in the period from January 2018 to February 2019. For the analysis itself, the statistical software R was used as a tool.

2 Research Process

First of all, the source data must be treated so that there is no non-stationarity and inhomogeneity in the data. The so-called autocorrelation also occurs as an undesirable phenomenon in the case of time series. Failure to respect the autocorrelation of residues results in skewed estimates of unknown parameters, which also affects other characteristics. If autocorrelation occurs in the time series, then the residues are not independent. The time series therefore need to be cleaned so that the resulting *p*-values are not skewed. Therefore, time series will be logarithmized first, which will remove their multiplicative character (multiplicative changes of time series will be converted to additive changes). Then the method of the so-called 1st order difference (differentiation of source data) will be applied, which will remove the non-stationarity of this data. To verify that the given values are independent, the so-called autocorrelation function (independence verification) and partial autocorrelation function (independence verification when removing the influence of the third quantity) will be used. The autocorrelation function (ACF) is a suitable imaging tool for detecting visible patterns in data. The ACF value then indicates at different time intervals (Lag) whether there is any form of automatic correlation in the data.

Next, the GARCH model (with parameters *p*, *q*) will be used, which is a model for examining time series volatility. Using the GARCH model, heteroskedasticity will be removed from the data. At this point, the already adjusted data show the characteristics of white noise, which means that all influences are removed – so we obtain independent, equally distributed (same variance) of the random variable. In addition to the above assumptions (homogeneous, stationary series and non-correlation of logarithmic returns), the third assumption of volatility models, which is the normality of logarithmic returns, must be observed. Histogram display can be used to verify the normality of residues.

3 Literary Research and Formulas

3.1 Time Series Issues

The time series represents the so-called numerical variable, the values of which are largely dependent on the time in which these values were obtained. It is basically a sequence of chronologically arranged observations. The time points at which the data were obtained are usually equally distant from each other [5].

Description through descriptive statistics can provide a sufficient idea of the properties of time series as a single data unit but does not provide information about its time evolution [5].

Time series can be classified on the basis of various aspects [5]:

- according to the nature of the data, the values of which form a time series,
- interval time series - the data depends on the length of the interval that is monitored,
- instantaneous time series - data refer to a specific moment,
- according to the periodicity with which the data are monitored,
- time series of annual data,

- short-term time series,
- by type of data monitored,
- time series of absolute indicators,
- time series of derived characteristics – e.g. cumulative time series.

Time series are the result of observations made at discrete time points. Some of them are then discreet in their nature (as an example, time series of total production of a certain agricultural crop for individual years), others need to be "discretized" first. Thus, time series can be created by discretization of values of a continuously changing quantity (e.g. a series of values of amplitude of a signal at given time points), accumulation of values of monitored quantity for a given time period (daily precipitation totals in meteorology) or by averaging values of considered quantity in given time interval (average daily temperatures) [4].

If there is a choice, then it is recommended to choose a compromise solution. The high density of observation time points allows the characteristics of the time series to be well captured, but calculation difficulties can occur. The choice of equidistant intervals between adjacent observations should be a matter of course. As part of the analysis of economic time series, problems associated with the calendar may occur (different lengths of calendar months, different number of working days per month, moving holidays). In such cases, a so-called "standard month" of 30 days or a standard number of working days per month is usually introduced, or the observed data are accumulated. The length of a time series is defined as the total number of observations in the time series, not as the time span between the first and last observations [4].

3.2 Time Series Autocorrelation

A key assumption underlying the linear regression model (LRM) commonly used in applied econometric studies is a sufficient limitation of a phenomenon called autocorrelation [6].

An important feature of time series is their (potential) serial correlation. Therefore, a thorough analysis and visualization of these correlations is needed. The autocorrelation between two random variables X_t and X_ (t + k) can be described as follows [2]:

$$Cor(X_{t+k}, X_t) = \frac{Cov(X_{t+k}, X_t)}{\sqrt{Var(X_{t+k})}Var(X_t)} \quad (1)$$

Since moments are required for stationary data to be constant over time, autocorrelation can be written for these values as a function of delay [2]:

$$\rho(k) = Cor(X_{t+k}, X_t) \quad (2)$$

The most common autocorrelation test in the regression model is the borderline Durbin - Watson test, which is used to test the independence of residues in the normal regression model. The test finds application when the data are obtained sequentially, and the values of the dependent variable form a time series [3].

Durbin - Watson test is calculated as [2]:

$$\widetilde{D} = \frac{\sum_{t=2}^{n}(r_t - r_{t-1})^2}{\sum_{t=1}^{n} {r_t}^2} \quad (3)$$

3.3 Model AR-1

The autoregressive model of a time series is based on the assumption that any value in a time series depends on the previous value of that series. The autoregressive model AR (*p*) of order *p* can be defined as follows [1]:

$$y_t = b_1 y_{t-1} + b_2 y_{t-2} + \cdots + b_p y_{t-p} + \in_t \quad (4)$$

Where
$b_1, b_2, \ldots, b_p$ are the coefficients within the autoregressive process,
$\in_t$ is the so-called white noise (current value), and
y_t is the new series value calculated based on the previous values.

3.4 MA Moving Sum Model

The process MA (*q*) – (Moving Average) - of order q can be written as follows [1]:

$$y_t = \in_t + w_1 \in_{t-1} + w_2 \in_{t-2} + \cdots + w_q \in_{t-q} \quad (5)$$

Where
w are the parameters of the model,
$\in_t$ is white noise.

3.5 ARMA Model

By combining the already mentioned processes AR (*p*) and MA (*q*), a mixed process in the form of ARMA (*p*, *q*) can be obtained [1].

The condition of stationarity of the ARMA process coincides with the condition of stationarity of the AR process (*p*) and the condition of process invertibility is the same as the condition of process invertibility MA (*q*). The mean value of the ARMA process is also zero (as in the previous AR and MA processes) and its autocorrelation function satisfies a similar system of difference equations as in the AR process. Several alternative options can be selected for writing the ARMA process in the form of a difference equation, a linear process or in an invertible form. For each AR model of order *p*, an equivalent MA model with a sufficient number *q* of the interference element can be found. Economic or business time series can be modeled using a relatively small number of p and q elements within the AR, MA or ARMA model. The aim is to find or determine the smallest number of *p* and *q* elements needed for satisfactory time series prediction [1].

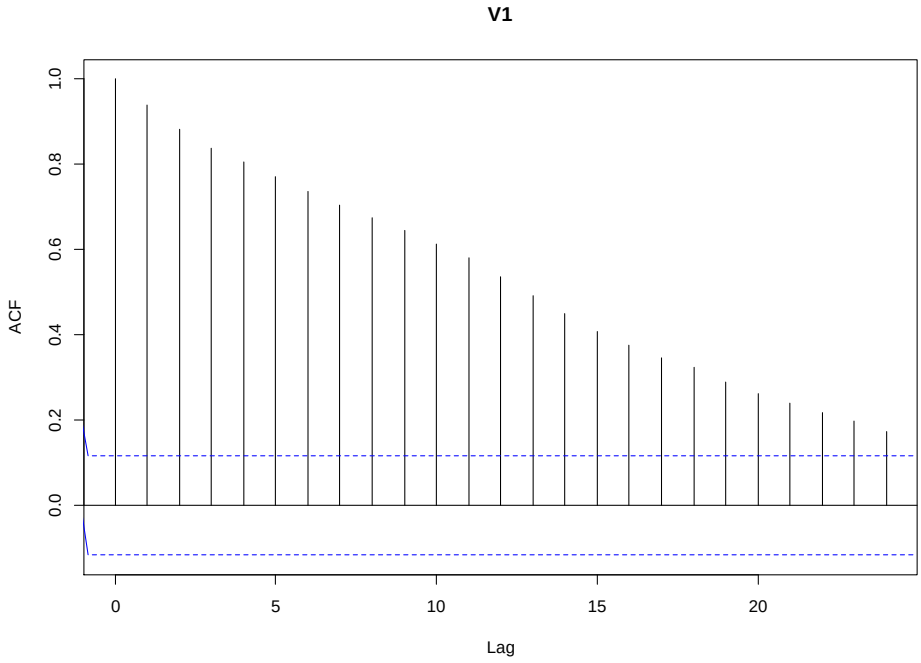
4 Practical Research

The models will be applied to the time series of Komerční banka stocks. This is a series with the length of 285 observations. This is the daily development of stocks with the exception of weekends and holidays from January 2018 to February 2019. The development of stocks in this period is shown in Figure 1.

Source: Own

Fig. 1: *Daily development of Komerční banka stocks*

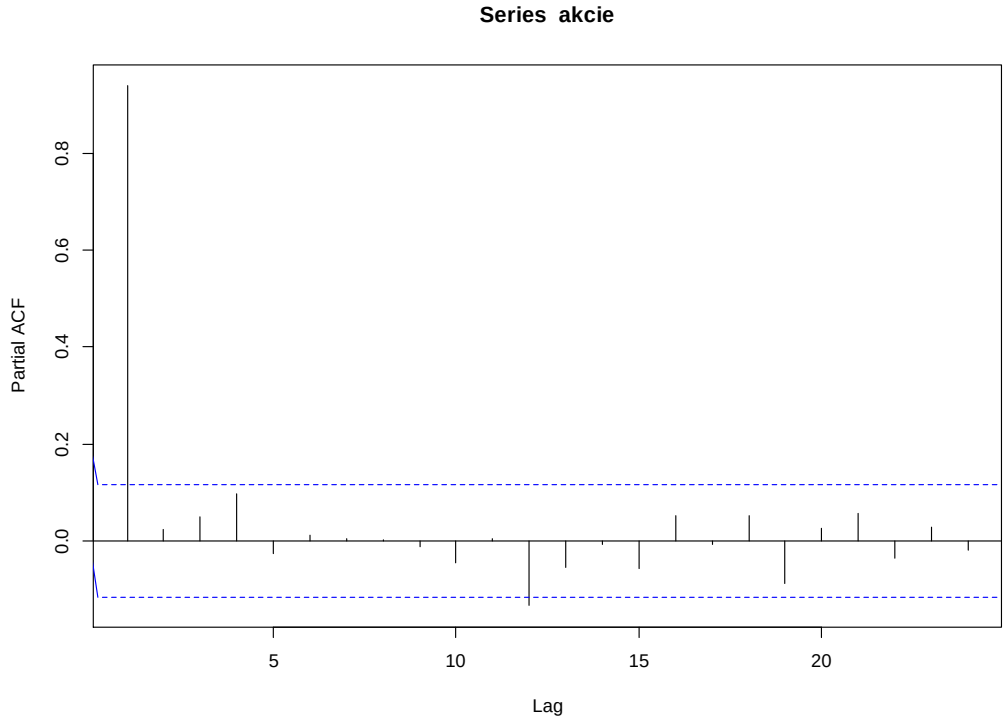
At first glance, it is clear, that the series is inhomogeneous and non-stationary. For verification, the so-called autocorrelation function is used by default, which can be seen in Figure 2, and the partial autocorrelation function shown in Figure 3. But first, the time series must be inserted into the software R and commands for autocorrelation (verification of stationarity) and partial autocorrelation function (verification of the influence of the third quantity) must be used.



Source: Own

Fig. 2: *Autocorrelation function (ACF) of Komerční banka stocks*

The autocorrelation function (ACF) is a suitable imaging tool for detecting visible patterns in data. The ACF value at different time intervals (Lag) indicates whether there is any form of automatic correlation in the data. In Figure 2 you can see clearly visible patterns between the data. In other words, a clear violation of the presumption of independence can be noticed.



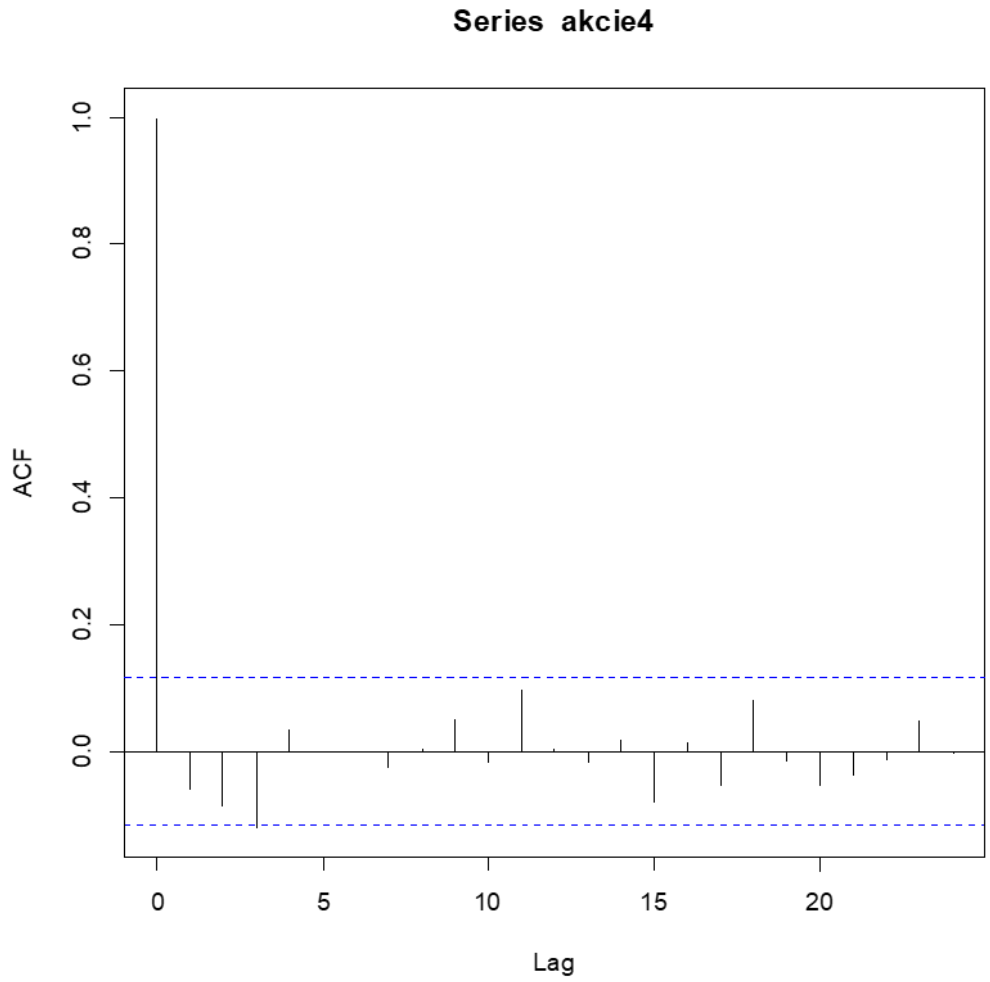
Source: Own

Fig. 3: *Partial autocorrelation function (PACF) of Komerční banka stocks*

The autocorrelation function gradually decreases and the first PACF value is close to 1, which indicates that the series is not stationary.

In order to apply the models, a number of KB stocks need to be transformed. Thus, it will be necessary to logarithm the data, which will remove their inhomogeneity, and subsequently it will be necessary to make a difference, which will remove their non-stationarity.

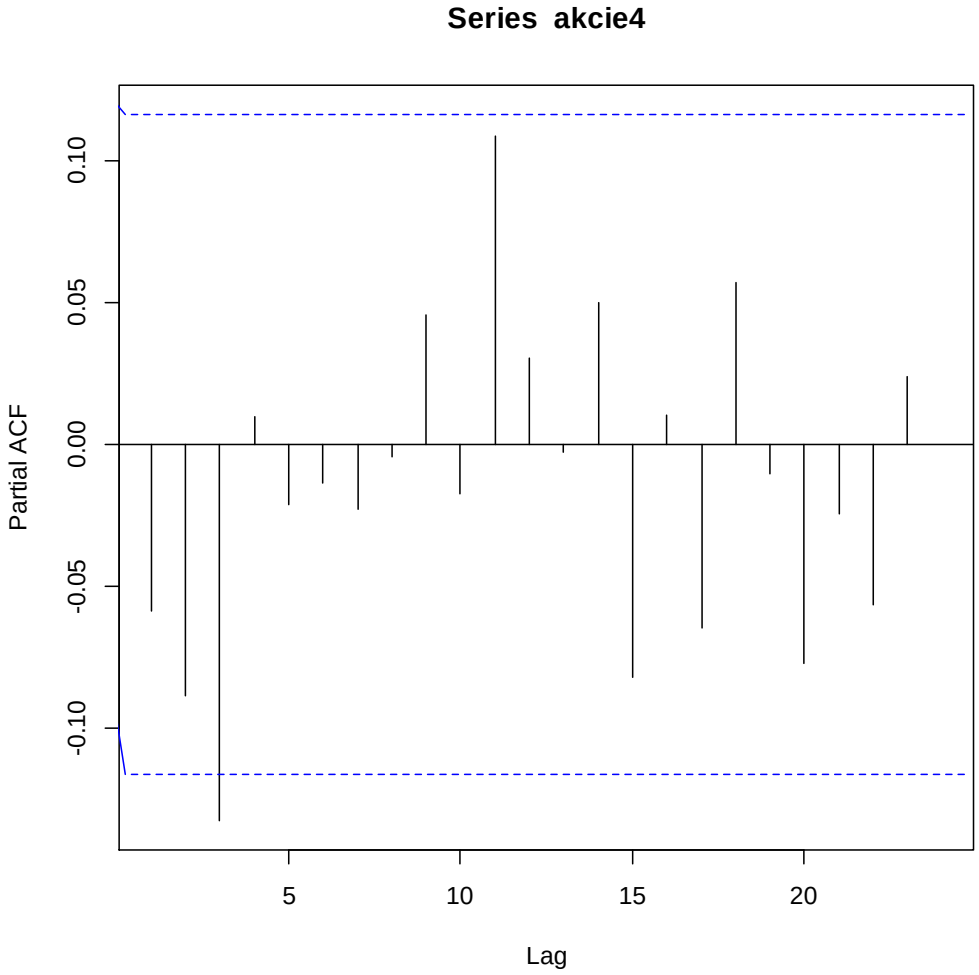
After using commands for logarithm the data and making a difference, it is now possible to identify the model by estimating the autocorrelation and partial autocorrelation functions, which are shown in Figures 4 and 5. It can be deduced that this is indeed a stationary series, because ACF values no longer gradually decrease but move in a certain interval.



Source: Own

Fig. 4: *ACF stationary series of Komerční banka stocks*

The dashed line in the correlogram determines the truncation points (confidence interval). Values between zero and this limit are considered insignificant, i.e. zero. Thus, it is clear, that the series does not contain any MA process because the ACF values are zero.



Source: Own

Fig. 5: *PACF stationary series of Komerční banka stocks*

The partial autocorrelation function helps determine the order of the AR process. However, the monitored series also does not include this process, because all PACF values are insignificant. Correlations could not be demonstrated in this time series, so the whole series is considered white noise. The GARCH model will therefore be used for modeling.

4.1 Estimation of Volatility Models on the Time Series of Komerční Banka Stocks

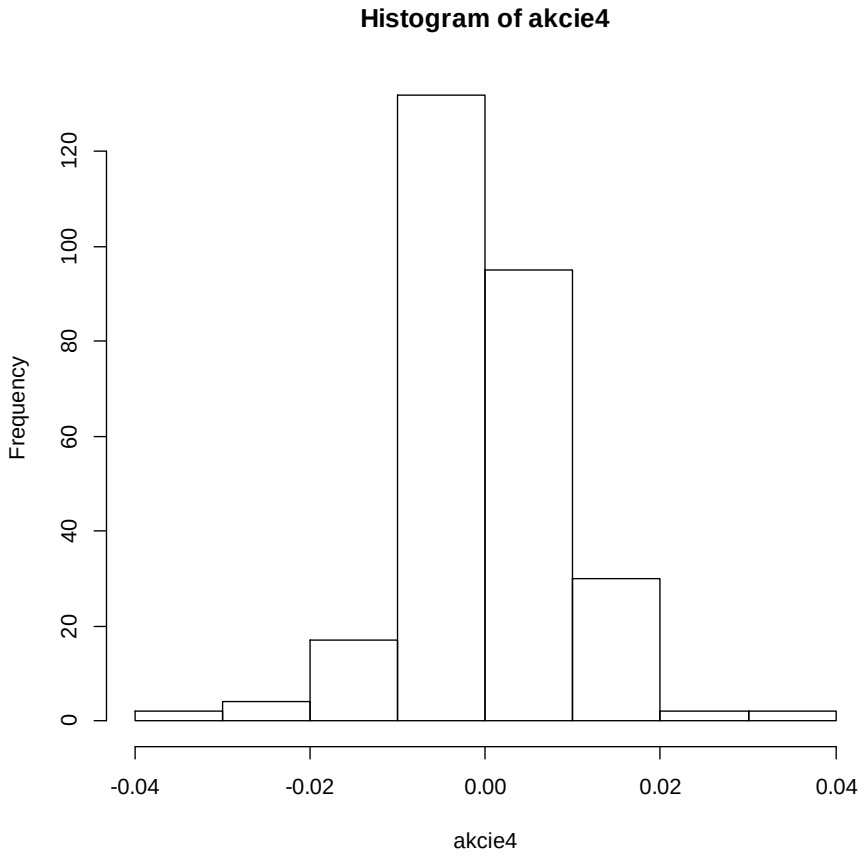
Now the volatility model will be applied to the same time series of KB stocks. The GARCH model (p, q) will be used. However, before the GARCH model is applied, the basic assumptions for modeling the volatility of a given series must be verified. A significance level of 0.05 is considered for all tests below.

The given time series must again be transformed into a stationary series by means of logarithmization and subsequently difference. Figures 4 and 5 are proof of the stationary series. Furthermore, the non-correlation of logarithmic returns is determined, for example using the ACF and PACF functions. As already shown above, the given time series does not contain a correlation of random variables.

The third basic assumption of volatility models is the normality of logarithmic returns. The Jarque-Ber test can be used to verify normality. For JB test, the null hypothesis is followed, for which the normality of the distribution of logarithmic returns is assumed, as well as the

alternative hypothesis, which states that logarithmic returns do not have a normal distribution. The *p*-value is very low (2.2e-16 in Figure 7), which is less than the significance level of 0.05, so the normality of logarithmic returns must be rejected.

A histogram was also used as confirmation. The fact that the logarithmic yields do not have a normal distribution is shown in Figure 6, which shows a histogram of the actual distribution of the logarithms of the series yields. Logarithmic returns have a sharper distribution, which is typical for financial series.



Source: Own

Fig. 6: *Histogram*

Although the Jarque-Ber test did not show the existence of a normal distribution in the data, this time series can be used in the volatility model. The GARCH (1, 1) model will be applied to the time series, which is the most used model for examining time series volatility. The results from the R studio are shown below in Figure 7.

```
> summary(arch.y)

Call:
garch(x = y, order = c(1, 1))

Model:
GARCH(1,1)

Residuals:
    Min      1Q  Median      3Q     Max
-4.2741 -0.5311 -0.0111  0.5278  4.6664

Coefficient(s):
    Estimate  Std. Error  t value Pr(>|t|)
a0 3.564e-05   2.527e-05    1.411    0.158
a1 9.140e-02   6.998e-02    1.306    0.192
b1 4.876e-01   3.488e-01    1.398    0.162

Diagnostic Tests:
        Jarque Bera Test

data:  Residuals
X-squared = 118.47, df = 2, p-value < 2.2e-16


        Box-Ljung test

data:  Squared.Residuals
X-squared = 0.47471, df = 1, p-value = 0.4908
```

Source: Own

Fig. 7: *GARCH function (1,1)*

A more important parameter in the model is the parameter b1, so the resulting model GARCH (1, 1) has the form:

$$\rho_t{}^2 = 0{,}00003564 + 0{,}0914 e_{t-1}{}^2 + 0{,}487 \rho_{t-1}{}^2 \qquad (6)$$

However, the *Pr* value is greater than the significance level of 0.05. For this reason, it is white noise. It can therefore be stated that the market values of Komerční banka stocks in the period under review are not affected by the impact of new information but are also not affected by past variance values. However, if this were not the case, based on the parameters of this function, it can be stated that the impact of new information ($e_{t-1}{}^2$) is not as important within this time series as past values of variance ($0{,}4876 \rho_{t-1}{}^2$) and the modeling of market values of stocks should be based on past values, as this is the most significant factor influencing this time series.

The GARCH (0, 1) model can also be applied to the time series, which is also a frequently used model in the study of time series volatility. The results from the R studio are shown in Figure 8.

```
> summary(arch.y)

Call:
garch(x = y, order = c(0, 1))

Model:
GARCH(0,1)

Residuals:
     Min       1Q   Median       3Q      Max
-4.02586 -0.52718 -0.01033  0.52449  4.37558

Coefficient(s):
    Estimate  Std. Error  t value Pr(>|t|)
a0 8.248e-05   5.314e-06   15.522   <2e-16 ***
a1 2.118e-02   6.142e-02    0.345     0.73
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Diagnostic Tests:
        Jarque Bera Test

data:  Residuals
X-squared = 89.696, df = 2, p-value < 2.2e-16


        Box-Ljung test

data:  Squared.Residuals
X-squared = 0.026868, df = 1, p-value = 0.8698
```

Source: Own

Fig. 8: *GARCH function (0,1)*

A more important parameter in the model is the parameter *a1*, the resulting model GARCH (0,1) has the form:

$$\rho_t{}^2 = 0{,}00008{,}248 + 0{,}02118 e_{t-1}{}^2 \qquad (7)$$

The value of the indicator *Pr* is less than the significance level 0.05 only in the case of parameter *a0*. Therefore, it can be stated again that the impact of the new information is not significant in the model, therefore it is a white noise and the market values of Komerční banka stocks in the monitored period are not affected by the new information.

Conclusion

The aim of the article was to apply the ARMA and GARCH model to the time series of Komerční banka stocks using the analysis in the R software and to find out the behavior of these stocks. The most commonly used form of autocorrelation is the first-order AR (1) autoregression, which was also used.

Based on the GARCH (1, 1) and GARCH (0, 1) models, it was found that the examined time series of market values of Komerční banka stocks showed signs of white noise. The market values of Komerční banka stocks in the period under review are therefore not affected by the impact of new information but are also not affected by past variance values.

The issue of time series of stocks is a very specific topic, because what may apply in one market may not apply in another market, or even what applies to the market values of stocks of one company may not show the same results for another company.

The resulting values are also affected by the observed period, when in a certain period the results may be completely different from other periods. If the time series of market values of Komerční banka stocks did not show white noise values, it could be said that the impact of new information is not as important within the examined time series as past values of variance and stock value modeling should be based on past values, as it is the most important factor influencing the market value of stocks.

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APLIKACE ARMA A GARCH MODELŮ NA ČASOVÉ ŘADĚ AKCIÍ KOMERČNÍ BANKY

Jedním z hlavních cílů subjektů na trhu cenných papírů je ve správný okamžik akcie levně nakoupit (nakoupit podhodnocené akcie) a rovněž ve správný okamžik akcie draze prodat (prodat nadhodnocené akcie).
Pro podhodnocené akcie je typické, že se v určitém okamžiku, vzhledem ke svým fundamentálním charakteristikám, obchodují za nízký kurz. Do budoucna lze u podhodnocených akcií předpokládat růst jejich ceny, což může investorovi, který nakoupil při nízkém kurzu, přinést kapitálový zisk. Podhodnocené akcie jsou tedy doporučovány k nákupu.
Důležitým předpokladem je tedy přesné načasování nákupních a prodejních signálů. Problém však je, že nikdo přesně neví, kdy nastane ten správný okamžik, protože tržní cena akcií je ovlivněna mnoha faktory, které mají dopad na kolísání tržních hodnot akcií. Z tohoto důvodu se modelování volatility dostává do popředí zájmu mnoha finančních analytiků a investorů.

ANWENDUNG VON ARMA UND GARCH MODELLEN AUF DIE ZEITREIHE DER AKTIEN VON KOMERČNÍ BANKA

Eines der Hauptziele von Unternehmen auf dem Wertpapiermarkt ist es, Aktien zum richtigen Zeitpunkt billig zu kaufen (unterbewertete Aktien zu kaufen) und Aktien zum richtigen Zeitpunkt teuer zu verkaufen (überbewertete Aktien zu verkaufen).
Es ist typisch, dass unterbewertete Aktien aufgrund ihrer fundamentalen Eigenschaften irgendwann zu einem niedrigen Preis gehandelt werden. In Zukunft ist mit einem Preisanstieg bei unterbewerteten Aktien zu rechnen, was einem Anleger, der zu einem niedrigen Preis gekauft hat, einen Kapitalgewinn bringen kann. Unterbewertete Aktien werden daher zum Kauf empfohlen.
Eine wichtige Voraussetzung ist daher das genaue Timing der Kauf- und Verkaufssignale. Das Problem ist jedoch, dass niemand genau weiß, wann der richtige Zeitpunkt kommt, da der Marktpreis von Aktien von vielen Faktoren beeinflusst wird, die sich auf Schwankungen des Marktwerts von Aktien auswirken. Aus diesem Grund tritt die Volatilitätsmodellierung in den Vordergrund der Interessen vieler Finanzanalysten und Investoren.

ZASTOSOWANIE MODELI ARMA I GARCH NA SZEREGU CZASOWYM AKCJI BANKU KOMERČNÍ BANKA

Jednym z głównych celów podmiotów działających na rynku papierów wartościowych jest tani zakup akcji we właściwym czasie (zakup akcji niedowartościowanych), a także sprzedaż akcji we właściwym czasie (sprzedaż akcji przewartościowanych).
Niedowartościowane akcje charakteryzują się tym, że w pewnym momencie obrót nimi ze względu na ich fundamentalne cechy odbywa się po niskim kursie. W przypadku akcji niedowartościowanych można się w przyszłości spodziewać wzrostu ich ceny, co może inwestorowi, który kupił po niskiej cenie, zapewnić zysk kapitałowy. Zakup niedowartościowanych akcji jest więc zalecany.
Ważną przesłanką jest zatem dobre trafienie terminu zleceń kupna i sprzedaży. Problem polega jednak na tym, że nikt nie wie dokładnie, kiedy nadejdzie ten właściwy moment, ponieważ na cenę rynkową akcji wpływa wiele czynników, które mają wpływ na wahania wartości rynkowej akcji. Dlatego też modelowanie wahań kursów leży w centrum zainteresowania wielu analityków finansowych i inwestorów.

READINESS OF SMALL AND MEDIUM ENTERPRISES FOR MARKETING AUTOMATION

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Abstract

As the technological progress of online shopping and advertising advances with increased speed, marketing automation has been gaining more attention from both practitioners and academics. However, despite the growing popularity of this new marketing approach, there are many restrictions when it comes to its implementation by small and medium enterprises (SMEs). Due to the high requirements regarding the collection of customer data and advanced knowledge necessary to set up and operate marketing automation systems, many enterprises are not able to fully grasp the potential marketing technologies offer. This article describes the mechanisms of marketing automation, provides the state-of-art research overview and analyses current level of readiness of Czech SMEs to implement digital marketing tools and the obstacles that prevent them to do so.

Keywords

Marketing automation; E-commerce; Digital economics; Customer data; Personalization.

Introduction

The term marketing automation was first used by Professor John D.C. Little [1] at a lecture at the University of California, Berkeley. Little described marketing automation as a support for automatic marketing decisions in the Internet environment. With the help of data that users leave behind when using the Internet, he wanted to improve the entire user experience of purchasing products in the online environment, and thus increase their satisfaction with the service and loyalty to the company or product. Moreover, Little believed that this approach was to enable the creation of automated processes to improve their productivity, easier decision-making and greater return on marketing investment. However, the beginnings of marketing automation can be traced back to the past. Already at the end of the 1990s, database developers, in cooperation with marketers, tried to automatically segment customer databases into smaller units based on available data [2]. Later, these efforts evolved into an entire CRM systems industry including marketing automation [3]. On the other hand, other authors see marketing automation as an intersection of several areas, which, in addition to CRM, include database marketing, interactive marketing, emarketing and direct marketing [4] [5]. According to Sweezey [2], marketing automation means a process using a centralized platform for tracking existing and potential customers, including a set of automated and personalized marketing activities with the ability to monitor and evaluate the effectiveness of all marketing channels. Heimbach, Kostyra, & Hinz believe that the core of marketing automation is the automatic adaptation and personalization of all outputs based on the marketing mix [5].

Important parts of modern automation are lead nurturing and lead scoring. The term lead nurturing describes a process in which automated campaigns are used to communicate with

potential customers and turn them into loyal customers. Each marketing automation platform includes a module in which these campaigns are created. Lead scoring is the process by which users within marketing automation software are automatically segmented by assigning points based on their actions performed [6]. For example, if the customer visits a marketer-defined web page with an offer for a particular product, the system will increase his value by adding ten points based on this action. Then the customer subscribes to the company newsletter using a web form. For this action, the system will increase his value by adding twenty points, because this conversion has a bigger value than just visiting the website. After some time, however, he unsubscribes from the newsletter and the system reduces its rating by 50 points because the customer performed a negative action. In reaction to the scoring, the marketing automation systems are able to trigger automated campaigns tailored as the response to the customer's actions.

Scientific literature describes five basic components of the marketing automation framework. The first component is the input data collected from previous interactions with the users. The second component is represented by real-time decision rules that evaluate user actions based on available data and implement response strategies. User interface of such systems represents the third component. Through this interface, the marketers are able to create and edit the automation rules. The fourth component provides feedback and performance information while the fifth element of the system is used for strategic planning. Modern marketing automation systems use both historical and user-generated data in real time. While the human factor is still very important, especially when it comes to creativity, the automated decision-making and recommendation of relevant offers created through machine learning are increasingly used [7].

Data is a critical part of marketing automation and all related processes are closely linked to their quantity and quality. Nowadays, companies collect large amounts of customer generated data. For most part, the data is obtained from the digital environment, such as visits to websites, downloads of mobile applications or interactions on social networks. However, it can also be data obtained from the real world, such as store visits, purchases, etc. The great importance of data in marketing is characterized by the concept of data driven marketing, or data-driven marketing [7] [8].

Software is the core of the entire automation process that is responsible for performing automated rules created by the marketers. Thanks to the user interface, rules can be created and managed even by users without technical knowledge or knowledge of programming languages. Through the interface, users can create reports providing information about the success or failure of marketing campaigns, making it easier for them to evaluate and decide which automation rules should be modified or suspended. Automation software generally includes a functionality for creating personalized content that guides the marketer through the process of creating new rules or campaigns while recommending them what channel or communication medium to use to reach the customer.

The software may also take care of the automatic personalization of the message based on the set rules. Personalization can modify the message both by structure, for example by coloring it in the customer's favorite color, and by changing the content itself. The message may contain, for example, products that are more likely to be of interest to the customer. When personalizing content, the input data is particularly important. The more the company knows about the customer, the better content it is able to offer to the customer [7] [8] [9].

Since marketing advertising systems and platforms are shifting toward easier, user-oriented interfaces that provide guidance even for beginners, marketing automation has become accessible even for companies and individuals with basic knowledge about marketing.

However, despite the accessibility, it appears that companies are rather reluctant toward these new tools and technologies. In this article, we analyze how companies perceive marketing automation, what their current knowledge about this phenomenon is and what the obstacles that disable them from using this new marketing approach are.

1 Research Objectives

The aim of this article is to investigate the readiness of small and medium-sized companies (SMEs) for the implementation of marketing automation tools that are nowadays accessible. For the research purposes, we define marketing automation (MA) as a set of technologies, rules, software solutions and online platforms that are used to improve the marketing processes through automated, personalized and data-based actions. In accordance with the definition used by Mero et al. [11], organizational structures and processes are also included in the research concept. The academic literature distinguishes two main trends in MA. While some companies invest in developing their own software [11], other prefer buying software solutions that are available on the market [11] [12]. However, there is one area of MA that is significantly neglected by the academic literature. Advertising systems such as Facebook and Google Ads also use machine learning and automated rules for delivering online campaigns. Therefore, these platforms should be included as well since they have significant protentional for SMEs to easily automate their marketing activities.

Tab. 1: *Difference between causal reasoning and effectual reasoning*

Causation	**Effectuation**
Predictive view of the future	Taking actions for the uncertain future based on data and predictions available.
Goal-based action	Making decisions based on available means and resources (means-based action).
Productivity view	Focusing on the cost of the new innovations and process changes (affordability view).
Protective attitude	Emphasizing partnerships and cooperative strategies (cooperative attitude).
Avoidance of potential threats	Looking for new opportunities.

Source: Own based on [11]

The research presented in this article draws from causal and effectual reasoning and the theory of organizational adoption of technologies. Academics [13] argue that companies do not necessarily always decide based rational, causal, models but rather tend to pursue business opportunities. According to Perry, Chandler & Markova [14], managers start with a potential idea they want to reach a then they look for resources for its implementation. This initial motivation is referred to as effectuation in the academic literature. Generally, the effectual reasoning consists of the following five behavioral traits (Table 1).

Some authors believe that effectual reasoning may be only a temporal strategy that is more characteristic for new companies in their early stages of development and they subsequently shift toward causal reasoning [15]. However, research shows that both approaches may be interrelated [14].

In addition to these reasonings, scholars also use technology acceptance theory to describe the company's inclination to technological innovation. Due to the technological development, business models are being reinvented, as well as products and services [16]. Mero et al. [10] distinguish 7 basic technology acceptance models based on current academic literature that include the original model by Davis (TAM) [17], its extensions presented by Venkatesh &

Davis (TAM2) [18] and Venkatesh & Bala (TAM3) [19]. Moreover, the authors include also the theory of planned behavior, the unified theory of acceptance and use of technology [20] and its extension [21]. While these models apply to individuals, diffusion of innovations model [22] technology organization environment model [23] were designed specifically to describe the behavior of companies. All of these models present the main factors and motivators that influence the behavior of enterprises when it comes to technological advancement and innovations.

Despite the slight differences in relationship modelling in the studies above, all of the models have in common the following three contexts: technological context, organizational context, environmental context. As summarized by Oliveira & Martins [24], technological context refers to technology readiness and technology integration. Organizational context includes company's size, expected benefits and obstacles, improved products, services or internal processes. Finally, the environmental context includes internet penetration and competitive pressure (Table 2).

Tab. 2: *Factors influencing new technology adoption by enterprises*

Context	**Factor**
Technological context	Technology readiness
	Technology integration
Organizational context	Company's size
	Expected benefits
	Expected obstacles
	Improved products, services, processes
Environmental context	Internet penetration
	Competitive pressure

Source: Own based on [24]

Based on the literature review of previous research on marketing automation and technological adoption, we formulate the following three research questions:

RQ1: *What is the current trend in MA adoption?*

RQ2: *What is the current level of MA adoption by SMEs?*

RQ3: *What is the readiness of SMEs to adopt MA?*

2 Methods and Data Collection

Data collection was carried out in three stages. The first stage consisted in acquiring information about the trend of marketing automation using the available statistics regarding search volumes of the term in Google and the sales in the marketing automation software industry. Secondly, previous surveys on MA adoption from 2012, 2014 and 2017 were reviewed to trace the development of MA implementation over the years. Finally, the third stage built upon the causal, effectual reasoning and technology acceptance models described above. Using the factors from Table 1 and Table 2, questionnaire items were formulated. The items were rated on a 7-point Likert scale.

The survey was carried out electronically and was distributed to small and medium-sized enterprises in the Czech Republic. E-mail addresses of the respondents were obtained from the MagnusWeb database from Bisnode that also guarantees the consent of the companies in the database to participate in research surveys. In addition, the questionnaire required additional consent from the respondents allowing the storage of their anonymized data for academic purposes to comply with the General Data Protection Regulation. A total of 15,000

companies were contacted and e-mailed with an electronic questionnaire via the Mailchimp mailing service. Overall, 612 questionnaires returned completed.

3 State of MA Adoption by SMEs

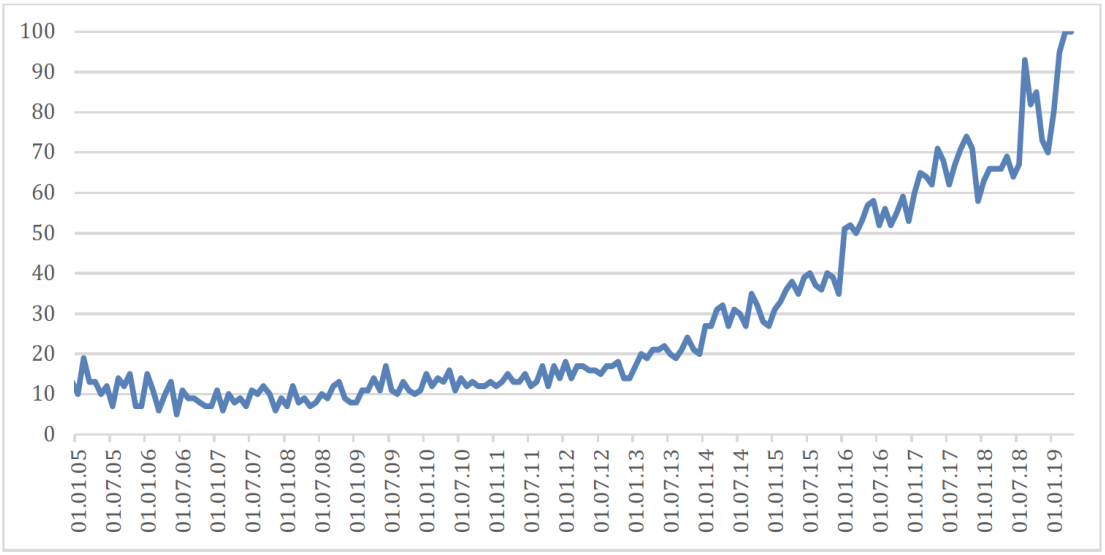
The paragraphs below present the preliminary results from the three research stages. Firstly, we describe the growing interest in the topic of marketing automation, then we review the past surveys and finally, we analyze the results from the online survey which was carried out in 2019 targeting Czech SMEs.

3.1 Growing Interest in Marketing Automation

Although the concept of marketing automation has been known since the beginning of the twenty-first century, it has become more popular in the last decade. Data from Google Trends confirms the growing awareness of this term, which shows the relative volume of searches for the term "marketing automation" over time.

In Figure 1, we can see that until 2013, the term "marketing automation" maintained an approximately stable level of search queries reflecting the current awareness of the companies about this trend. However, since then, the interest in this topic has grown exponentially. We may observe a linear connection between the importance of MA and the growing number of Internet users globally that is directly connected with the increasing amounts of user-generated data. In 2019, more than 51% of the world's population had access to the Internet, compared to more than 81% in developed countries. In developing countries, more than 40% of the population used the Internet. At the same time, ten years ago, only 26% of the world's population had access to the Internet, significantly predominating developed countries compared to developing countries, where the figure was 63% and 17% respectively [25].

As mentioned above, the percentage of people having access to the Internet is also related to how much data is generated on the Internet. More than 3 million GB of data flows through the Internet every minute [25], and this data represents valuable information about the users who generate them. This is the main reason why companies look for new ways to collect and use this data effectively, which marketing automation solutions can help them with. The growing interest in MA is also manifesting in the software industry. Thanks to this increased interest, the entire industry with software for marketing automation is also growing. In 2014, the value of the global market for specialized marketing software was 3.65 billion USD. By 2018, the market had grown to 5.1 billion, and data from Mordor Intelligence predict growth to 14.15 billion USD by 2024. The compound annual growth rate over the last five years has thus reached 6.92%, but it is expected to accelerate and according to the forecast, the market should grow by an average of 18.5% per year. The largest market for the sale of software for marketing automation is the USA with a share of 54% in 2017. Europe was at that time the second largest market with 24% [26].



Source: Own based on [26]

Fig. 1: *Volume of searches of the term marketing automation*

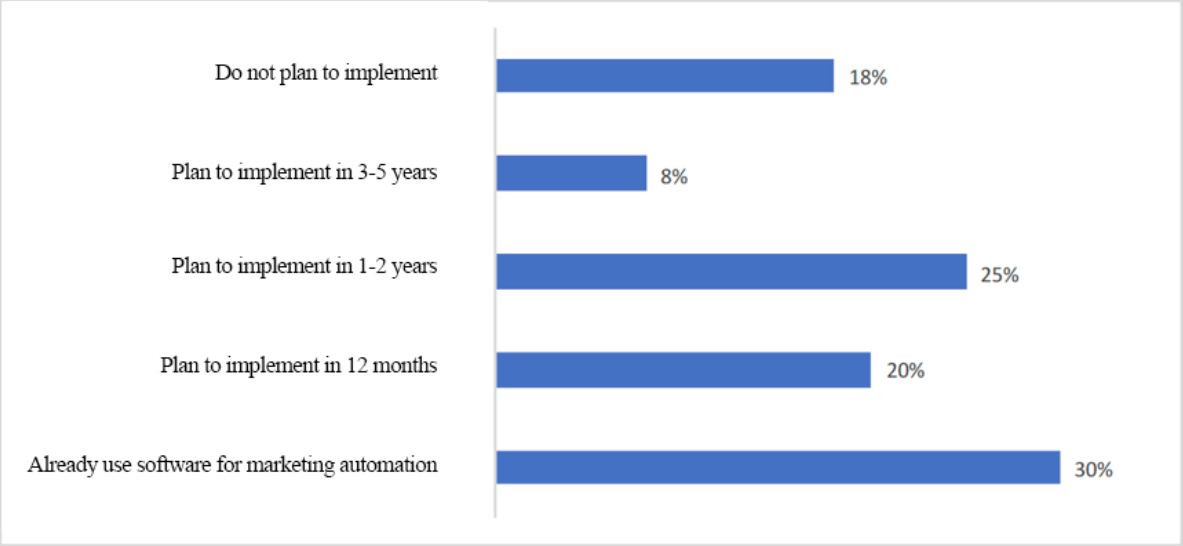
This statistical information confirms the importance of marketing automation and the growing awareness about the tools that facilitate it. The fact that an increasing number of individuals are trying to gain more knowledge in this area suggests that enterprises are trying to seize the opportunity for innovation and gain competitive advantage. It is thus important for companies to keep up with this new trend.

3.2 MA Adoption Rates in 2012, 2014 and 2017

In the last decade, several surveys have been conducted to find out the state of adoption of tools for marketing automation in small and medium-sized enterprises. The market research of the analytical company Techaisle from 2012 showed that the use of software for marketing automation was very low. The survey was conducted across various industries in the US, UK and Germany markets, and only 10% of small companies reported using marketing automation in at least one of the 16 criteria evaluated. For medium-sized companies, the adoption rate reached 28%. Of the entire sample, 36% of companies stated that they plan to deploy marketing automation [27].

Two years later, the analysis of the SMB Group presented more positive results. However, this analysis focused only on small and medium-sized enterprises in the USA, so a direct comparison with previous data is not possible. Of the small businesses, 20% said they had purchased or used a marketing automation software solution in the last two years. Of the medium-sized enterprises, it was only 25%. Another 22% of small and 26% of medium-sized enterprises, respectively, stated that they planned to purchase such a solution and put it into operation in the following twelve months [28].

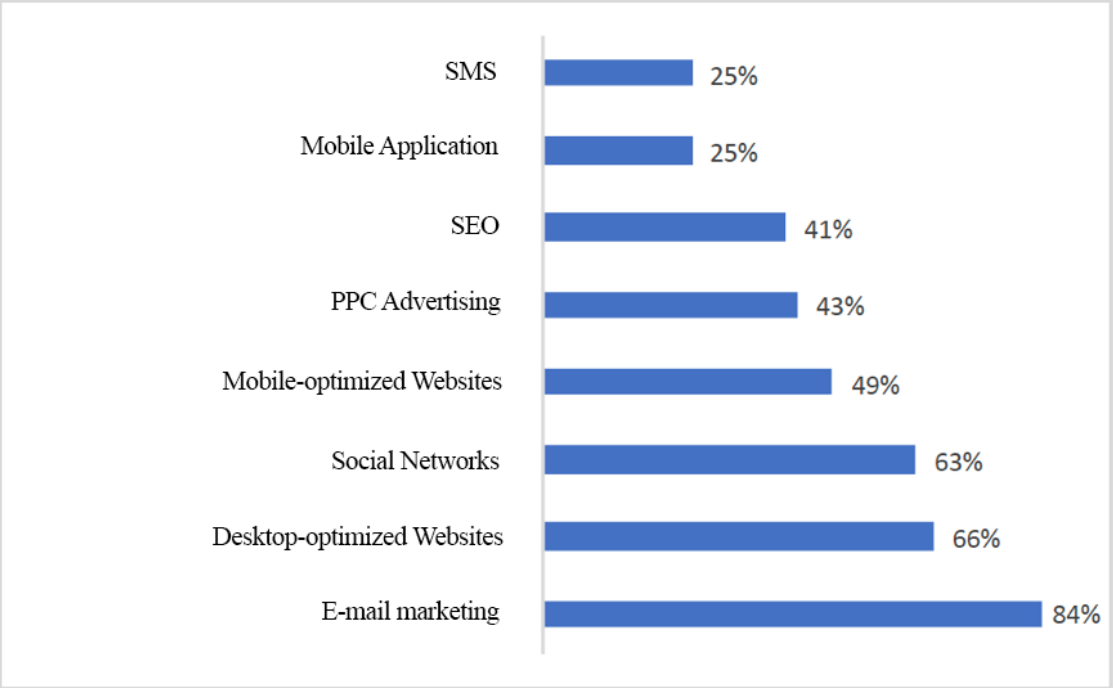
Another survey was organized in 2017 by ActiveCampaign. Over 300 companies participated to this survey that also focused exclusively on small and medium-sized enterprises based in the USA and using some form of online marketing. As shown in Figure 2, the survey data reveal that 30% of SMEs used some form of marketing automation in 2017, while 18% did not plan to use it in the future. Other companies planned to start using marketing automation within one to five years [29].



Source: Own based on [29]

Fig. 2: *Attitudes of USA SMEs toward MA in 2017*

The survey also provided several other important data on the situation of small and medium-sized enterprises. Of those who already use automation, 29% said they use one software solution covering all activities. The second most common response (28%) from companies was that they use several separate solutions, but they are integrated in such a way that they communicate with each other and exchange data. The third large group, comprising 20% of respondents, were companies that used several separate software solutions.



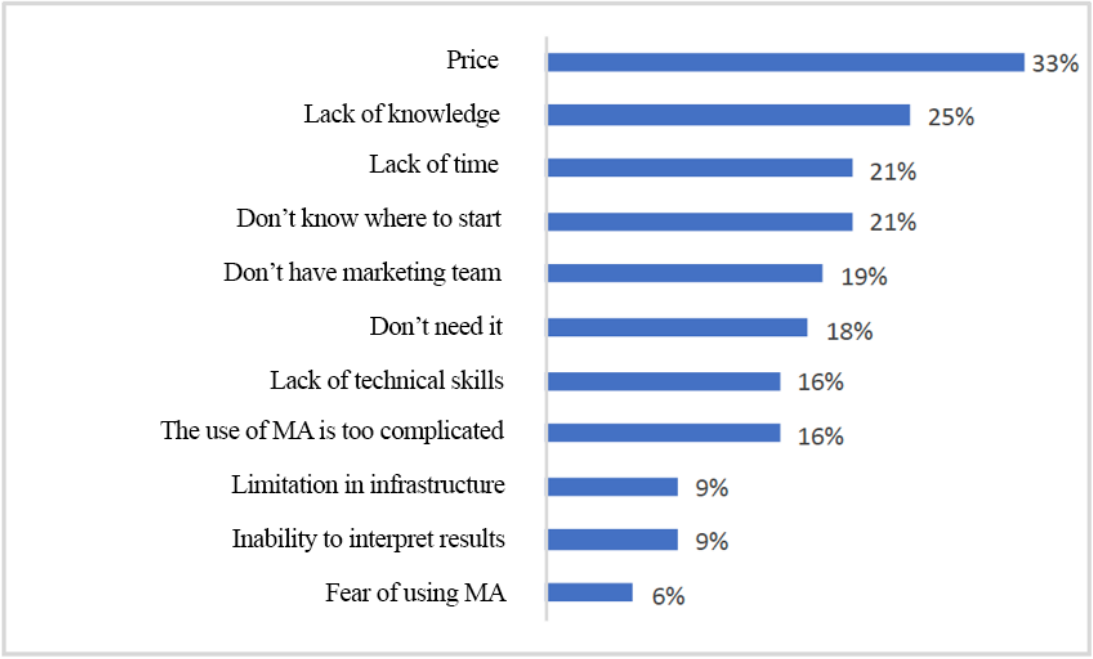
Source: Own based on [29]

Fig. 3: *Usage of online marketing channels by USA SMEs in 2017*

Figure 3 shows the most frequently used channels in marketing automation. By far the most common channel is email, which is used by 84% of companies. Other widely used channels are the company's presentation of the company's website and presence on social networks. On

the contrary, only a quarter of companies use SMS communication or their own mobile application. A close relationship can be observed between the price of a communication channel and its use. Sending an e-mail is free of charge, creation of a website is a one-time investment and you do not pay for publishing regular posts on social networks. In contrast, each SMS is charged and the development of a mobile application can also be costly. It is therefore clear that small and medium-sized enterprises are very sensitive to price or have limited financial resources.

The above-mentioned sensitivity to price is also reflected in another area, which is illustrated in Figure 4. This is the most frequently mentioned obstacle for respondents who have not yet started using marketing automation. The second most common cause is ignorance of marketing automation software, which may be due to a lack of general knowledge of marketing automation, but also to a lack of qualified experts who would be able to help companies implement this software. Other, less frequent options relate mainly to insufficient competencies, capacities and resources, or lack of interest in the use of marketing automation. The inability to integrate with other software is also a rare obstacle for small and medium-sized companies. Large companies are more likely to encounter this problem because they tend to have complex systems that were deployed many years ago and are often obsolete from today's perspective, and their integration with new systems incurs additional costs or does not even allow such integration. Small and medium-sized companies are generally more flexible in this respect, but 9% of respondents still see the possibility of integration as a blocker for the deployment of marketing automation.



Source: Own based on [29]

Fig. 4: *Obstacles preventing implementation of MA*

3.3 MA Adoption Rates in the Czech Republic in 2020

The results for the survey including Czech companies are organized into three groups according to the items from the questionnaire. The first set of questions investigated what MA tools the SMEs are currently using. Second set of questions analyzed the organizational level of knowledge and resources necessary for implementation of MA. Finally, the enterprises

were asked what their plans regarding the implementation of MA were and what obstacle they were facing in this area.

3.3.1 Implementation Rate of MA Tools

The survey results suggest that there is a relationship between the size of the company and the degree of implementation of online marketing tools. The research showed that small businesses use online marketing tools rather infrequently and without a clearly defined strategy. As expected, medium companies use the Internet for communication with customers more frequently. However, it appears that they also tend to use the tools at random. As shown in Table 3 and Table 4, website is a common communication media for 69% of small enterprises (SE) and 85% medium enterprises (ME), although only 44% of SE and 47% ME update the content regularly. In addition, only 5% of SE and 11% of ME have a monthly budget they spent on the website maintenance while 1% of SE and 5% of ME is doing it strategically. Surprisingly, only 14% of SE and 14% of ME communicates with their customers via newsletter. Regarding the basic marketing presentation on social networks, Facebook and Instagram were represented moderately. Facebook is used by 55% of SE and by 79% of ME, while Instagram stays behind with 35% and 60%, respectively.

Tab. 3: *Use of online marketing tools by small enterprises*

Small Enterprises							
Online marketing tool	**Not at all**	**Occasionally**	**Regularly**	**Monthly budget**		**Marketing strategy**	
				Yes	**No**	**Yes**	**No**
Website	31%	25%	44%	5%	95%	1%	99%
Newsletter	86%	12%	2%	0%	100%	0%	100%
Facebook	45%	22%	33%	22%	78%	3%	97%
Instagram	65%	25%	10%	7%	93%	3%	97%
Facebook sponsored posts	78%	11%	11%	11%	79%	1%	99%
Instagram sponsored posts	92%	6%	2%	2%	98%	1%	99%
Facebook Ads manager	98%	2%	0%	1%	99%	1%	99%
Google AdWords	98%	2%	0%	1%	99%	1%	99%
Google Analytics	85%	10%	5%	0%	100%	0%	100%
Remarketing	99%	1%	0%	0%	100%	0%	100%
Marketing automation software	99%	1%	0%	0%	100%	-	-
Marketing agency	83%	15%	2%	2%	98%	-	-

Source: Own

Unfortunately, more advanced online marketing tools that are essential for marketing automation were represented by a very low percentage. Payed advertising on Facebook is implemented by 22% of SE and 34% of ME and payed advertising on Instagram is implemented by 8% of SE and 21% of ME. Moreover, the tools that include MA principles and mechanisms (Facebook Ads Manager, Google AdWords, remarketing etc.) are used by even a lower fraction of SMEs. This level of adoption may be considered as alarming since the results reflect insufficient interest of Czech companies even in basic online marketing instruments.

Tab. 4: *Use of online marketing tools by medium enterprises*

Small Enterprises							
Online marketing tool	**Not at all**	**Occasionally**	**Regularly**	**Monthly budget**		**Marketing strategy**	
				Yes	**No**	**Yes**	**No**
Website	15%	38%	47%	11%	89%	5%	95%
Newsletter	86%	12%	2%	0%	100%	0%	100%
Facebook	21%	31%	48%	29%	71%	6%	94%
Instagram	30%	32%	28%	16%	84%	6%	94%
Facebook sponsored posts	66%	17%	17%	19%	71%	3%	97%
Instagram sponsored posts	79%	12%	9%	8%	92%	3%	97%
Facebook Ads manager	89%	5%	6%	5%	95%	2%	98%
Google AdWords	90%	8%	2%	6%	94%	3%	97%
Google Analytics	79%	16%	5%	0%	100%	0%	100%
Remarketing	93%	6%	1%	1%	99%	0%	100%
Marketing automation software	95%	3%	2%	0%	100%	-	-
Marketing agency	76%	18%	6%	6%	94%	-	-

Source: Own

3.3.2 Organizational Resources

The set of questions related to the organizational resources of a company focused on two main categories: human resources and available knowledge. The results, displayed in Table 5, indicate a rather low level of knowledge about the existence of advanced MA tools. Except the awareness that companies can promote their content via sponsored posts on Facebook and Instagram, the respondents had superficial knowledge. Although the level of knowledge was higher for ME, the difference with SE wasn't that significant.

Tab. 5: *The level of awareness about MA in SMEs*

Question	**Small Enterprises**		**Medium Enterprises**	
	Yes	**No**	**Yes**	**No**
Did you know you can boost your posts on Facebook?	52%	48%	67%	33%
Did you know you can boost your posts on Instagram?	38%	62%	52%	48%
Do you know what Facebook Ads Manager is?	0%	100%	7%	93%
Do you know what remarketing is?	1%	99%	6%	94%
Do you know how Google AdWords work?	1%	99%	3%	97%
Do you know what MA is?	5%	95%	11%	89%
Did you know you can automatically create personalized ads and newsletters?	1%	99%	8%	92%
Do you employ someone with the above-mentioned knowledge?	1%	99%	3%	97%
Do you employ someone who takes care of your social media?	2%	98%	4%	96%
Do you employ someone to take care of your online advertising activities?	0%	100%	1%	99%

Source: Own

Similar negative results were achieved on the level of human resources. Only 2% of SE and 4% of ME employ someone to take care of their social media. However, the employees do not

necessarily have knowledge about advanced tools that facilitate marketing automation. According to our results, 1% of SE and 3% of ME have an employee who is aware of the MA tools offered by advertising platforms.

3.3.3 Attitudes of SMEs Toward MA

Finally, we focused on SMEs attitudes toward MA and their future plans in this area. We thus examined how they perceived the potential benefits of the marketing innovations and whether they were planning to implement them in their current processes. The online survey showed that companies were lacking important information that would help them to better grasp the advantages of MA which reflects in their attitudes. Out of the 612 respondents, 81% of SE and 67% of ME answered that they did not plan to invest in MA in future. Despite showing interest in payed advertising on social networks, advanced tools seem to be of a lesser interest for them. In terms of future MA implementation plans, 92% of SE and 85% of ME do not consider to invest more in marketing activities in the two upcoming years. Interestingly, their prospects change for the five-year term when 24% of SE and 48% of ME consider to expand their marketing activities. On the other hand, the majority of SE (98%) and ME (91%) consider marketing automation as a tool suitable mostly for large companies and e-shops.

Conclusion

Technologies have a significant impact on functioning of the entire society including individuals, households and enterprises. Technological innovations have been changing all industries and pushing them toward automatization of many processes. Marketing is not an exception. In this article, we have examined the current trends in marketing automation adoption while primarily focusing on small and medium enterprises that are characterized by slower innovation behavior than large companies. The first section of the article defined the notion of MA and explained its basic principles. Subsequently, theoretical basis of technology adoption were introduced based on which research directions were proposed. The results from previous surveys and the volume of search queries confirm that marketing automation is a phenomenon that is becoming the center of attention of many companies. However, the readiness of SMEs for more advanced marketing tools is on the lower side. The results from the survey among Czech SMEs indicate that companies struggle to implement even the basic instruments such as sponsored posts on Facebook and Instagram. We have identified critically low awareness of the possibilities of MA offered by user-friendly platforms such Facebook Ads Manager or Google AdWords. In majority, the enterprises do not know about their existence and thus neglect the potential competitive advantage. Alarmingly, SMEs plan to invest only sporadically in marketing in the upcoming five years. The reason for this behavior may be the lack of funds of smaller companies, but also the lack of information about the potential, importance and accessibility of these tools. In order to increase the competitiveness of SMEs in the digital environment, there is a critical need of raising awareness of this topic.

The results described in this article represent a preliminary study of MA adoption behavior of SMEs. Further research will focus on modelling the causal relationships between the factors motivating adoption behavior in MA. Finally, it is important to note that this survey targeted only Czech enterprises and thus is locally specific which means that the behavior of SMEs may differ in other countries due to different economic, political and social conditions.

Acknowledgements

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PŘIPRAVENOST MALÝCH A STŘEDNÍCH PODNIKŮ NA MARKETINGOVOU AUTOMATIZACI

Vzhledem k rychlosti technologického pokroku v online marketingu a reklamě, marketingová automatizace se dostává stále více do popředí jak v aplikační, tak akademické oblasti. Nicméně i přes rostoucí popularitu tohoto nového marketingové přístupu, malé a střední podniky (MSP) narážejí na řadu významných překážek při jeho začleňování do svých podnikatelských procesů. V důsledku vysokých nároků na sběr zákaznických dat a nedostatku znalostí nezbytných k obsluhování systémů a řešení marketingové automatice, mnoho podniků není schopno plně využít potenciál, který marketingové technologie nabízejí. Tento článek popisuje mechanismy fungování automatizačních systémů v marketingu, shrnuje současný výzkum v této oblasti a analyzuje připravenost českých MSP implementovat nástroje digitálního marketingu a překážky, které jim v tom brání.

BEREITSTELLUNG VON KLEINEN UND MITTLEREN UNTERNEHMEN FÜR DIE MARKETING-AUTOMATISIERUNG

Da der technologische Fortschritt des Online-Shoppings und der Online-Werbung immer schneller voranschreitet, hat die Marketingautomatisierung sowohl bei Praktikern als auch bei Wissenschaftlern zunehmend an Bedeutung gewonnen. Trotz der wachsenden Beliebtheit dieses neuen Marketingansatzes gibt es jedoch viele Einschränkungen bei der Umsetzung durch kleine und mittlere Unternehmen (KMU). Aufgrund der hohen Anforderungen an die Erfassung von Kundendaten und des fortgeschrittenen Wissens, das für die Einrichtung und den Betrieb von Marketing-Automatisierungssystemen erforderlich ist, können viele Unternehmen das potenzielle Angebot an Marketingtechnologien nicht vollständig nutzen. Dieser Artikel beschreibt die Mechanismen der Marketingautomatisierung, bietet einen Überblick über die Forschung auf dem neuesten Stand der Technik und analysiert die aktuelle Bereitschaft tschechischer KMU, digitale Marketinginstrumente zu implementieren, sowie die Faktoren, die sie daran hindern.

GOTOWOŚĆ MAŁYCH I ŚREDNICH PRZEDSIĘBIORSTW DO AUTOMATYZACJI MARKETINGU

Wraz z dużym postępem technologicznym w zakresie marketingu i reklamy online, automatyzacja marketingu jest coraz częściej stosowana a także cieszy się rosnącym zainteresowaniem środowisk naukowych. Pomimo rosnącej popularności tego nowego marketingowego podejścia, małe i średnie przedsiębiorstwa (MSP) borykają się z wieloma poważnymi trudnościami związanymi z jego wdrażaniem we własnych procesach biznesowych. Z powodu wysokich wymagań dotyczących gromadzenia danych o klientach oraz braku wiedzy niezbędnej do obsługi systemów i rozwiązań automatyzacji marketingu, wiele przedsiębiorstw nie jest w stanie w pełni wykorzystać potencjału, jaki dają technologie marketingowe. W niniejszym artykule opisano mechanizmy funkcjonowania systemów automatyzacyjnych w marketingu, przedstawiono przegląd najnowszych badań w tym zakresie oraz przeanalizowano poziom gotowości czeskich MSP do wdrażania narzędzi marketingu cyfrowego i przeszkody, które im to uniemożliwiają.

Systematic Literary Research

ON SAFEGUARDING ECONOMIC PERSPECTIVES OF REGIONAL ENTERPRISES IN THE TRINATIONAL NEISSE REGION

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Abstract

This article focuses on the economic development of especially small and medium-sized enterprises in the border triangle of Germany, Czech Republic and Poland. The motive for this article was primarily driven by the politically decided structural changes in the East German coal regions. While preparing this article, the authors found that this groundbreaking transformation resembles the unexpectedly occurring crisis originated by the corona virus in terms of analyzing, structuring measures and management principles. Organizations like economic development institutions located in the municipalities, networks or business initiatives and technology centers like the Bautzen-based Bautzen Innovation Center should play an important part in overcoming both challenges in its role as supporters of the regional economy and – for the innovation centers – host for new businesses.

Keywords

Regional economic structure; Future challenges; Economic perspective; Crisis management; Corona crisis.

Introduction

This article is based on discussions regarding scientific works of Nataly Straßberger as part of the study degree program Enterprise Resource Management led by Albrecht Löhr.

The key question is how planned structural changes as well as the corona crisis influence the economic development of small and medium-sized enterprises. The article illuminates the specific situation of the enterprises based in the triangle regions of Dolnoslaskie in Poland, Liberecky kraj in Czech Republic and especially the Görlitz-Bautzen region in Germany.

The latter main focus is influenced by the business areas of the company that supports Nataly's cooperative degree program at Bautzen University of Cooperative Education. This is Bautzen Innovation Center, which is also responsible for a technology center based in Dresden-Rossendorf.

This article starts with an overview of the regional economic structure in the Görlitz-Bautzen region in Germany called Upper Lusatia and challenges which the companies within this area might have to face in the future. Additionally, the article includes statements on change and crises and how to handle them since the authors also consider the effects of the current corona crisis on regional companies and the question of what these companies could possibly learn from this crisis.

The worked-out assumptions and findings have to be critically evaluated and reshaped. From a simplified point of view, the foresight balance and volumes of economic supply and need have to be modeled, defined and discussed.

1 Preliminary Remarks

1.1 Research Subjects and Objectives

This article focuses on small and medium-sized enterprises in the border triangle Germany, Czech Republic and Poland.

The main objective is to examine the impact of the corona crisis and the structural change on regional companies and to make assumptions about how they can cope with it. This article should especially deliver a contribution on how to act as a company in the given circumstances as well as respond to change in related market settings in general.

1.2 Research Methods

The statements of this article are based on systematic literary research. Various current literature including reference books, journals, publications and news, has been evaluated and appropriate conclusions have been drawn. Additionally, different points of view have been combined and theses have been made, which will need further discussion.

2 Overview of the Regional Economic Structure and Future Challenges

In order to obtain a better overview of the initial situation in Upper Lusatia and challenges even without the effects caused by the corona crisis, the following subchapters outline the economic structure in Upper Lusatia and some general trends and challenges which may affect the companies within this region.

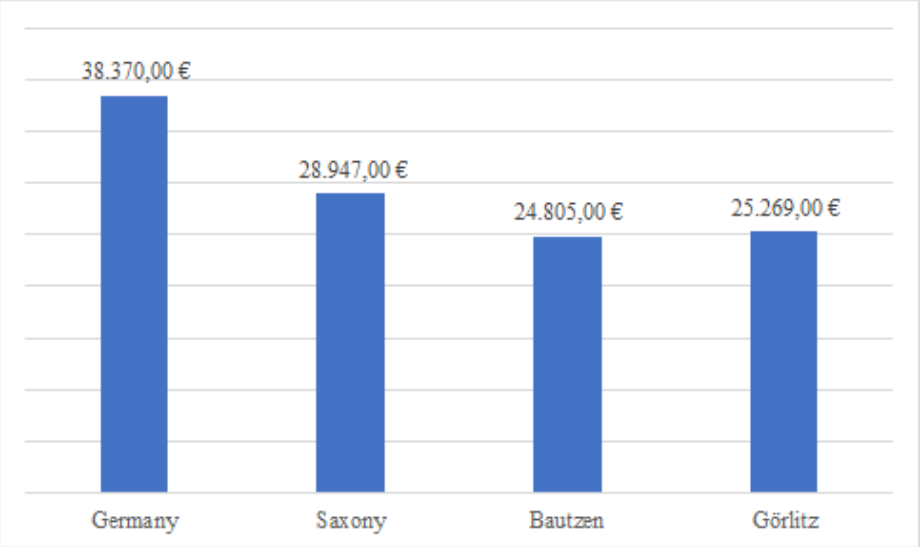
2.1 Economic Region of Upper Lusatia

Upper Lusatia is a region shaped by small and medium-sized companies (SME), so there are hardly any large companies. There is no mono-structure, which means that there are companies operating in various industries as well as services. Moreover, the economic structure is characterized by a mixture of traditional and modern companies.

Almost two thirds of employed people in Upper Lusatia work in the service sector, see [1]. Key industries in the service sector comprise information technology including software development and distribution as well as the tourism and leisure industry.

Regarding manufacturing companies, the most important industry is plant and mechanical engineering. About two thirds of Saxon companies in this industry are based in the districts of Bautzen and Görlitz, see [2]. In addition, textile industry as well as plastics industry are two main industries in Upper Lusatia. Many of the companies of the plastics industry work as automotive suppliers.

However, the region is classified as structurally weak. The main reason for this is the demographic development in Upper Lusatia as described in subchapter 2.2. But also, the added value measured by the gross domestic product (GDP) per capita in the districts of Bautzen and Görlitz is about 35 percent below the German average and about 14 percent below the Saxon average, as the graph in Figure 1 shows.



Source: [3] and [4]

Fig. 1: *GDP per capita in 2016*

Additionally, there is a big difference in the monthly gross salary considering the German median in comparison to the median of the districts of Bautzen and Görlitz, see [5]. That could be a reason why the region is not very attractive for labor migration.

In recent years the unemployment rate of Upper Lusatia has fallen to 5.7 percent in November 2019, see [6]. Nevertheless, it remains above the German average. Current figures already show effects in the unemployment rate of Upper Lusatia due to the corona crisis: In April 2020, the rate had gone up to 6.6 percent in the eastern part of Saxony, while unemployment in Germany had risen to 5.8 percent on average, see [7] and [8].

2.2 Challenges due to Demographic Change

According to forward projections of the Land Statistical Office of the Free State of Saxony, the population of Upper Lusatia will decrease by 7.1 percent in the district of Bautzen and by 10.6 percent in the district of Görlitz by 2030, see [9]. This decrease basically results from two effects – emigration and superannuation of the population.

At the moment it is already impossible to fill all vacancies with skilled workers. This applies especially to eastern and southern parts of Germany including the districts of Bautzen and Görlitz, see [10]. The emigration of young people and the superannuation exacerbate the shortage of skilled workers. That is also the reason why a number of companies think that the demographic change will probably be one of the biggest threats for them. However, due to the consequences of the corona-based crisis, which cannot be predicted in detail, this situation will alter in the future. Serious predictions are not available, which results in a significant uncertainty. However, these demographic circumstances will affect the economy in Upper Lusatia.

With a limited budget and small range, it is particularly hard for SMEs to find suitable young and skilled workers. As a consequence of the personnel shortage, expansion plans are inhibited or, even worse, the continuation of the company is at risk. To summarize, this could result in the economic strength to decline within the regions affected.

Measures have to be taken, so that either young people are encouraged to stay in Upper Lusatia or that they even immigrate to Upper Lusatia. Another solution could be substitutional measures, such as the rationalization of processes, for example through digitalization measures. However, all measures demand strict management decisions and cost money.

2.3 Challenges due to Structural Change

In fact, there has already been a structural change in Upper Lusatia, which began in the 1990s with the reunification of Germany. With the loss of their role as one of the main energy producers in the German Democratic Republic (GDR), numerous power plants and surface mining businesses and their service entities as well as associated companies had to close down. Many of the employees in the lignite-processing sector were laid off. Consequently, the districts of Bautzen and Görlitz had to register a large migration to other areas during that time.

With the decision of the German government to back out of the lignite production by 2038, the remaining lignite companies are about to go out of business. This is going to affect about 12,500 jobs in the whole Lusatian area. However, Upper Lusatia will not be affected as severely as Lower Lusatia. In Upper Lusatia, lignite is structurally significant only in the district of Görlitz, see [11]. These changes in the lignite industry will also affect the neighboring Polish region (PGE Górnictwo i Energetyka Konwencjonalna S.A., Oddział KWB Turów) and indirectly the Czech region regarding the companies that own a significant part of Lusatian lignite mines (Energetický a Průmyslový Holding (EPH) and PPF Investments).

Nevertheless, it is important to prevent further emigration and to maintain economic output in Upper Lusatia, which means that investments to make the region fit for the future are necessary. There are recommendations to invest especially in digitalization, tourism as well as renewable energies and electromobility.

One way to strengthen the economic performance in Upper Lusatia could be the networking of the existing companies. In this way, innovations could be encouraged, and the companies could profit from synergy effects. At this point, there is also a big opportunity to expand cross-border cooperation with Poland and the Czech Republic, which could lead to improved competitiveness on all sides. To summarize, innovation is seen as a key to the successful survival of the structural change, see [11].

2.4 Interim Summary

To summarize, there are various challenges in order to prepare Upper Lusatia for a successful future. However, it is likely that the local companies will not manage these transformations 100 percent on their own. That is the reason for the provision of grants for regions including Upper Lusatia that are affected by the back out of the lignite production.

Additionally, it is one of the main tasks of regional economic development institutions to support local companies – for example with networking events, programs for encouraging innovation, support with management decisions through consulting activities, etc. All these institutions should cooperate to benefit from the strengths of each other and, as a result, to support the region in the best way possible. The key could also lie in improved cross-border cooperation.

3 An Insight into Crisis and its Management

The term “crisis” goes back to the Greek “Krisis” and describes the breach of continuities that provokes a situation demanding (management) decision. Thus, a crisis refers to a turning point under risk, meaning that given decision alternatives are controversial, often ambivalent - see [12, p. 32]. Basically, a crisis is defined as an unexpectedly occurring incident with not foreseeable consequences. In other words, “*a crisis ... is a risk manifested*” (Heath, R. L.

2009, cited in [13]) and leads to the instability of given systems, uncertainty and an urgent need of reacting.

Globalization and international cooperation mean growing complexity. Thus, it is no coincidence that we can see parallels to the VUCA concept that outlines the contextual situations, not only for businesses, but also in current societies, markets and eventually our planet. The acronym VUCA stands for **V**ulnerability, **U**ncertainty, **C**omplexity and **A**mbiguity. This approach is useful for analyzing and understanding worldwide trends as well as regional changes, both occurring unexpectedly as well as in principle foreseeable as a result of given trends or decisions made.

Following this broader view, externally urged changes as principal disruptions of business models can be included in these considerations. Holding on (too long) to a traditionally successful business culminates in a crisis point that demands hard decisions. In the worst case, it may be too late though, so the only way out lies in liquidation. To apply these findings to our regional sight, both the current corona crisis as well as the process of foreseeable decarbonization of the considered region in the next decades can be used as examples.

Unlike hard changes, crises cannot be pre-managed generally. However, organizations ought to be prepared for accepting and diagnosing these abnormal situations and have to switch from daily business management to crisis management fast. These considerations are closely connected to aspects of organizational design, i.e. the mindset regarding planned structural changes are rather hindered or fostered. Management theory agrees widely in the picture of "coming before the situation", meaning simply come into acting instead of (only) re-acting. Once again, this acting happens under risk. Processing this active management can rarely bank on learned, established routines of daily problem solving. Crisis management systems and crisis squads as prepared structures can ease the named actions and lead to better results, see [13].

3.1 Types and Sources of Crises

Crises can basically be classified according to three criteria. The first one is the occurring and persisting of crises as follows:

- abruptly occurrent (as accidents, natural catastrophes)
- latently developing (business models, corona pandemic)
- permanent (climate change)

These types are not strictly distinctive, though representing typical patterns. Nevertheless, they are useful to reduce complexity and facilitate specific, appropriate management responses in complex or confusing situations. To systemize these types, factors like time, dynamic, disposability and communicative processes are available, see [13].

Secondly, crises are distinguished in being caused by internal or external influences. Organizational-environmental factors are, e.g., new competitors, disruptive technologies, market dislocations or shortage of resources triggering growing prices as well as stakeholder influences. Internal causes include management faults, differences amongst shareholders or commitment problems, see [14].

Finally, this article differentiates between strategic and operative challenges. The strategic view focuses on change or loss of strategic competitive advantages, whereas operative challenges refer to short-view problems such as quality faults or a decrease of turnover, see [15].

Hence, the current crisis caused by the COVID-19 virus, commonly called corona crisis, can be classified as latently developing, externally triggered and strategic. It is latently developing, because we must always be aware of the possibility of a comparable pandemic and it's not the first worldwide appearance of a virus of the SARS type. The external character is obvious in terms of a virus being a freak of nature, a mutation. The strategic challenge evolves from the range of the worldwide shock, the unforeseeable sufficient disposability of vaccine and drugs as well as the economic repercussions.

Overall, crises describe unplanned and unintended situations and processes that influence given forecasts and open ambivalent outcome varieties. They may endanger or even rule out the organization's survival. This is caused by threatening main goals, the risk of which is crucial to the existence of the considered subject, see [12, p. 34].

On the other hand, businesses crises can be considered as a natural part of a normal entrepreneurial lifecycle, so crises are simply a natural phenomenon for companies. The key question is less the existence of crises, but how they arise and how they are dealt with, see [16, p. 5].

Summing up, the following aspects describe the concept of crises:

- the threat to existence due to the threat of dominant objectives
- the ambivalence of the initial (metamorphosis or destruction)
- the process character as a time limitation of the crisis process
- the control problem in the sense of a limited influence on survival-critical processes
- the progressive loss of possibilities for actions in the crisis process
- surprises as well as time pressure and stress, see [12, p. 34] and [17, p. 14]

A broad variety of sources traditionally make a distinction between external and internal catalysts for crises. Against the background of globalization, a reshaping of key aspects is discussed. The main question is how and to what extent (international) macroeconomic influences are effectual and cannot be actively managed from the perspective of (internal) operative and strategic management. Strategic foresight and scenario techniques undoubtedly lead to a better understanding. However, the most frequently mentioned internal reasons of crises include faults as well as lapses regarding management and leadership. Secondly, non-existing or dysfunctional controlling contributes to management failures, especially to a lack of ensuring decision-rationality.

3.2 Managing Crises

Usual routines are not applicable for a crisis being a new situation that demands at least a new combination of disposable managing tools or the establishing of completely new ones. This happens under time pressure and unpredictable operational or also reputational risks.

Nevertheless, any crisis provides a unique opportunity from the standpoint of change management: Thoughts, questions and decisions can be covered up relentlessly, which would not have been possible under normal circumstances. And not only covered up, but discussed, changed, re-managed forcefully in order to stabilize or even safeguard the mere existence of a given organization. Tools applied in case of such an incident foster quick de-automatization or liquidation of established reality-patterns and hence the creation and establishment of new procedures, see [15, p. 34].

Successful crisis management in the form of quickly activated (new) structures is only possible or at least more probable if it was part of the corporate strategy and culture before. Thus, functional crisis management grounds on a crisis plan with checklists, concrete measures in case of an emergency and the establishment of a crisis unit. The ideal crisis

managers are generalists who can lead and are people-oriented, decision-making and determined and capable of analyzing situations quickly. It also means that everyday operating managers are not automatically suitable crisis managers, since the mind-set and main skills required are different, see [18].

Another key to overcoming crises is professional crisis communication – internally as well as externally. That is the reason why it has to be considered that this kind of communication differs significantly from the usual one. Hence, rules for crises communication should be part of crises plans. Especially in situations with fierce necessity to shift, all stakeholders are to be informed as a principle; in the best case main stakeholders are integrated.

Especially the understanding of and cooperation with staff members is crucial for overcoming crises. It has to be taken into consideration that change that does not respond to their basic acceptance and feelings is endangered. Firstly, people react to change with uncertainty and other deep-rooted emotions. Here, communication plays a crucial role, but must not be exhausted in information, but serve as a means of exchange and contact, see [19].

These objectives and solving tools could be subsumed as followed, see [20]:

- Crisis management provides restoration of the ability to act
- Operationally, crisis management is led and managed by a crisis squad
- The implementation is divided into problem analysis, situation assessment, decision-making, operational action, control and adaption
- Crisis communication is crucial
- Every company needs a crisis management team
- Crisis management must take care of affected stakeholders
- Informing staff comes first, also to avoid uncertainty or even opposition
- The crisis squad is to be trained in handling stress
- An organizational compliance culture helps to avoid crises

From a general point of view, tools and methods as strategic foresight and scenario techniques facilitate better understanding and clarification of appropriate managerial decisions.

Applied to the current situation, some proposals can be deduced from these points:

If we compare the actions taken in different countries, we could analyze the range of possible reaction on one hand as well as later acting vs. not reacting at all. Additionally, we saw typical details of managing under risk, because no one knew enough details to make classically derived decisions.

Crisis squads had already existed or were established. One of the hardest decisions to be made in most European countries were the harsh limitations of democratic, freedom and even constitutional rights. Then again as a crucial part of communication, many protective shields or direct financial support for businesses were allocated fast. The German government broke the constitutional rule of a balanced budget with Finance Minister Scholz even talking about a “financial bazooka”. A huge part of the society accepted the limitations, which can be interpreted as a result of successful measures and understandable communication as well.

4 The Corona Crisis and its Effects on Regional Companies

The current corona crisis affects almost every industry. However, the effects differ considerably amongst companies. While some are even profiting from the crisis, a large number of companies are fighting for survival. In fact, every business model is being put to the test.

4.1 General Assumptions

One phenomenon that can probably be observed in every company is how fast digitalization processes are advancing. Many companies have improved their internet presence. Additionally, there are companies that have developed new products and services or changed their production – either to help overcoming the crisis or simply to survive.

A huge and fast development that could be witnessed on a global level is the use of video conferencing systems by different providers. Some of them provided free access to the respective platform during the climax of the crisis – of course in expectance of future subscriptions subject to a charge. Additionally, changes in internal IT systems could be detected.

Some companies started the production of highly demanded goods such as face masks, which have quickly become a mass product – also in Europe. Supply chains were rapidly reorganized or derivative products were taken into account as well. In some cases, regional networks gained new importance.

However, companies are under a new kind of risk. In most economies the public is reported to be rather reluctant to spend money for reasons that include a current lack of income and a growing uncertainty regarding future prospects.

In the following, the tourism and leisure industry as well as automotive suppliers will be discussed in more detail as they are important components of the regional economy that is particularly affected.

4.2 Tourism and Leisure Industry

The tourism and leisure industry are probably hit hardest by the crisis – also in Upper Lusatia. On the basis of the general ruling of the Free State of Saxony and a number of federal orders, numerous hotels, restaurants and leisure attractions had to close for weeks, or they had to change their operational business.

According to calculations made by the Marketing-Gesellschaft Oberlausitz-Niederschlesien, there have been losses of more than 70 million euros in the tourism industry in Upper Lusatia so far – due to forced closures and a consequent absence of day-to-day business. About 16,000 employees in tourism and leisure industry are directly affected, the majority of them being on short-time work at the moment, see [21].

Despite the fact that the situation seems to be very dramatic these days, there is a chance for the industry to benefit from the crisis in the long term. Experts assume that holidays in Germany are going to become very attractive in 2020. This could be a big chance to make Upper Lusatia better known as a holiday area and to win a large number of new tourists, who may also return for future holidays.

That is the reason why regional hotels, restaurants and leisure attractions should take advantage of the current situation and expand their internet presence and marketing activities, because many holiday trips are being booked online during the corona crisis. In fact, they can reach new target groups throughout Germany this way.

From this point of view, the corona crisis may accelerate the expansion of the tourism and leisure industry in Germany and also Upper Lusatia in the long-term, which would be a positive contribution to the structural change, because existing potentials will be expanded further.

4.3 Automotive Suppliers

Even without the effects of the corona crisis, the automotive industry faces a lot of challenges, e.g. due to electromobility. But since the outbreak of the coronavirus pandemic, the sales of cars have collapsed massively. In China as one of the biggest markets, sales have nosedived by up to 80 percent at times, see [22]. This leads to big overcapacities in the automotive industry, which affects the automotive suppliers directly in the form of decreasing sales. Hence, companies have secured only few orders and employees are working short time.

On the other hand, technology shifts towards electromobility at the expense of classical combustion engines result in a principal rebuilding of given added value architectures. Effects for component suppliers are e.g. a shortened need for metallic mechanical components. Moreover, higher standardization means growing mass orderings. This poses the question of the extent to which regional SMEs are prepared to meet this changing demand. In addition, the market strength of the big automobile companies may limit the flexibility in reacting for these companies – i.e. they either meet the expectations or they are out of this business. This merely drafted simulation implies several criteria of a crisis.

5 Learnings from the Crisis

Surely, we have to consider and emphasize the importance of crises management as a principle to be better prepared for different kinds of crises. The range spans from a family over every organization up to states and finally the whole world. Challenges are the associated tasks for SMEs against the background of their limited resources. Nevertheless, this finding also results in a kind of new allocation of resources. Many countries, including the EU, plan to store more protective equipment for instance. From a financial point of view, the huge supporting measures ties up billions of Euro in a mid-term perspective. These sums are not available for alternative investments. Measures of economic welfare in a state frame are affected as well as private spending power.

The demand for rethinking business models, the use of agile management tools as agility and flexibility to react to new circumstances may support the future success of every business. For many more traditionally minded organizations this (assumed) necessity implies demanding challenges as well as a given risk. Hence, willingness and skilled ability to reconsider own business models may be basically the crucial criteria for the success and existence of enterprises.

Rethinking global supply chains as one catalyst can push more local cooperation in addition to a global one. This newly balanced structure is often called the concept of glocalization – understood as a dynamic consideration of both local and global aspects. We add the aspect of the special trinational chances in our region.

Also, the members of our ACC network could play a substantial role by engaging in scholarly debates with students and external partners as well as in consulting activities for businesses in our region. Experience from different cases should be structured and shared in a best-practice form. Finally, supporting a public debate on learning from overcoming the current situation can help establish the new mindset.

Thus, the authors invite the public to discuss it, because sticking together within the trinational region could help and advance all parties involved.

Conclusion

In conclusion, the current situation, caused by the spreading of coronavirus as well as the structural change caused by the back out of the lignite production by 2038, can be referred to

as crises. Both imply changes in enterprises concerning organizational structure, business models and therefore management decisions. Both crises are latently developing, caused by external influences and of strategic effect.

Due to the fact that the initial situation in the eastern part of Saxony is not optimal because of the decrease in population and the uncertainty regarding the future of several companies in Upper Lusatia, there are various challenges to be faced both at present and in future.

The authors believe that cooperation and networks at a regional as well as at cross-border level are essential both to overcome the corona crisis and to shape the structural change. Additionally, they assume that some of the regional SMEs will not be able to manage the associated changes completely on their own. That is the reason why the authors recommend the active involvement of the ACC network in consulting activities and exchange of experience in addition to other established economic development institutions.

Furthermore, the authors think that every crisis offers a chance to rethink and renew own products, services, supply chains or even the whole business model, which is also the key to innovation and therefore to success in the long term. It is important to not only react to current developments but also to take bold action and to make decisions as management always means making decision – in times of crises this is even more important.

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O OCHRANĚ EKONOMICKÝCH PERSPEKTIV REGIONÁLNÍCH PODNIKŮ V TROJZEMÍ REGIONU NISA

Tento článek se zaměřuje na ekonomický rozvoj zejména malých a středních podniků v hraničním trojúhelníku Německa, České republiky a Polska. Článek byl motivován především politickými strukturálními změnami ve východoněmeckých uhelných oblastech. Při přípravě tohoto článku autoři zjistili, že tato průlomová transformace se podobá, pokud jde o analýzu, strukturování opatření a zásady řízení, neočekávané krizi způsobené koronavirem. Organizace, jako jsou instituce pro hospodářský rozvoj sídlící v obcích, sítě či obchodní iniciativy i technologická centra, jako je Inovační centrum se sídlem v Bautzenu, by měly hrát důležitou roli při překonávání obou výzev ve své roli podporovatelů regionální ekonomiky a – v případě inovačních center – vytvářet podmínky pro nové podniky.

SICHERUNG WIRTSCHAFTLICHER PERSPEKTIVEN DER REGIONALEN UNTERNEHMEN IN DER TRINATIONALEN NEIßE-REGION

Der Artikel konzentriert sich auf die wirtschaftliche Entwicklung insbesondere der kleinen und mittelständischen Unternehmen im Dreiländereck Deutschland, Polen und Tschechien. Ausgangspunkt für diesen Artikel war vor allem der politisch beschlossene Strukturwandel unter anderem in den ostdeutschen Kohleregionen. Bei der Vorbereitung des Artikels stellten die Autoren fest, dass der damit verbundene tiefgreifende Wandel der unerwartet auftretenden Krise, die durch das Coronavirus ausgelöst wurde, ähnelt. Die Ähnlichkeit betrifft vor allem Analysen, Strukturierungsmaßnahmen und Managementprinzipien. Organisationen wie die Wirtschaftsförderungen der Kommunen, Netzwerke oder Wirtschaftsinitiativen und Technologiezentren wie das Technologie- und Gründerzentrum Bautzen sollten in ihrer Rolle als regionale Wirtschaftsförderer und als Anlaufstelle für neue Unternehmen eine wichtige Rolle bei der Bewältigung beider Herausforderungen spielen.

O OCHRONIE PERSPEKTYW GOSPODARCZYCH PRZEDSIĘBIORSTW REGIONALNYCH DZIAŁAJĄCYCH NA STYKU TRZECH PAŃSTW W EUROREGIONIE NYSA

Niniejszy artykuł poświęcony jest rozwojowi gospodarczemu w szczególności małych i średnich przedsiębiorstw działających na terenie przygranicznego trójkąta Polski, Czech i Niemiec. Napisanie artykułu zainspirowane było przede wszystkim politycznymi zmianami strukturalnymi na wschodnioniemieckich terenach górniczych. Przygotowując niniejsze opracowanie autorzy ustalili, że ta przełomowa transformacja, pod kątem analizy, organizacji działań i zasad zarządzania, podobna jest do nieoczekiwanego kryzysu spowodowanego koronawirusem. Organizacje takie, jak instytucje działające na rzecz rozwoju gospodarczego w gminach, sieci i inicjatywy gospodarcze oraz ośrodki technologiczne takie, jak Centrum Innowacji w Bautzen, powinny odgrywać ważną rolę w podejmowaniu obu wyzwań, pełniąc zadanie podmiotów wspierających gospodarki regionalne a – w przypadku ośrodków innowacji – stwarzających warunki dla powstania nowych przedsiębiorstw.

SUSTAINABLE TOURISM DEVELOPMENT – ANALYSIS OF TOURISM DEVELOPMENT IN KOSOVO

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Abstract

The purpose of this article is to provide a theoretical overview of sustainable tourism as a tourism system that focuses on qualitative development, taking into account the quality of life and prosperity of the population, without causing damage in other aspects.

The theoretical part deals with sustainable tourism and sustainable development. Based on these facts, it turns out that sustainable tourism is a subgroup of sustainable development. Thus, in this article there are given the differences between these two terms and other terms relevant to our research. It also provides an analysis of tourism development in Kosovo, including statistics on how much the tourism sector is financially supported by the Kosovo Government. Finally, a SWOT analysis of the current state of tourism in Kosovo is presented.

Keywords

Tourism; Sustainability; Sustainable tourism; Sustainable development.

Introduction

Economic and technical-technological activities in the contemporary national and international environment have created the conditions for the development of the concept of sustainable development globally.

The trend towards greater economic development leads to the increasing use of natural resources that are threatened with extinction, while new technologies being applied in the industrial, agricultural, construction and transport sectors can greatly endanger air, water and land quality, and cause an increase in the volume of toxic waste and hazardous materials. In this regard, the rapid development of tourism and the pressure exerted by tourist movements on the environment have an impact on a global level. That is why the concept of "sustainable tourism development" or "sustainable tourism" as a new trend in the travel industry is introduced today. Currently, tourists are interested in the so-called "green journey", where one person's stay in one place does not harm the environment of others [1, p. 60].

It is indisputable that tourism is one of the most powerful economic activities and an accelerator of economic development. With its impact on all spheres of economic and social life, tourism is ranked among the top five export industries in the world, in 83% of countries in the world [2]. It is a major source of foreign exchange revenues in 38% of world economies, a complex activity that affects GDP growth, investment and employment rates, a phenomenon that ensures intercultural communication between people, their socio-cultural connection and the development of their knowledge and experiences.

1 Literature Review

1.1 Tourism and Sustainability

The sheer complexity of sustainability issues and sustainable tourism potentially requires a public and private sector response that lies outside the usual jurisdiction of tourism-specific governance. This may be an issue of spatial scale, in that a Government body may have either limited (or even no) jurisdictional authority over a policy problem, or it may be an issue of means with respect to the existence of operational policy processes, technologies and/or institutional arrangements. Perhaps the policy and managerial capacity to respond to issues of sustainable tourism may reflect the political acceptability of any solution (i.e. tax increases, greater regulation, concern over travel lifestyle change). Tourism is undoubtedly a major international industry that is critical to the economic and social well-being of many regions and people. However, it is also a major contributor to global change, hence the central problem of meeting the needs of the present without compromising the needs of future generations [3, p. 7-9].

1.2 The Sustainable Development and the Sustainable Tourism

The idea of adopting the sustainable development concept in the area of tourism appeared in the early '90s, which generated sustainable tourism - an area that quickly gained importance both in academia and research, and in tourism practice/activity/industry. Sustainable tourism dissociates itself as a matter of principle from mass tourism and partially associates to alternative, contemporary tourism forms. In other words, sustainable tourism is primarily the opposite of mass tourism. This is defined as "a positive approach intending to reduce tensions and frictions created by the complexity of interactions between tourism industry, tourist, natural environment and the local communities as host of tourist" [4].

Sustainable development is the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Sustainable tourism is a sub-set of sustainable development. Sustainable tourism is a tourism system that encourages qualitative development, with a focus on quality of life and well-being measures, but does not aggregate quantitative growth to the detriment of natural capital [3, p. 1].

Tourism is a part of human life and an important factor in creating its social status. Tourism has become a means of protecting the environment and at the same time an important source of its destruction. The main international rules on tourism, which also include the main trends in its development, are:

- The relationship between tourism and sustainable development consisting of:
  - The economic importance of tourism,
  - The environmental importance of tourism,
  - Potential effects of tourism,
  - Potential benefits of tourism.
- The international community and the adoption of a new development model;
- Determining the carrying capacities for sustainable tourism [5, p. 280-286].

1.3 Sustainable Tourism Development

Sustainable Tourism Development is relatively new and has gained more significance in last 20 years. It is an adaptive concept emerging from the parent concept of sustainable development and therefore contributing towards the same objectives and principles related to

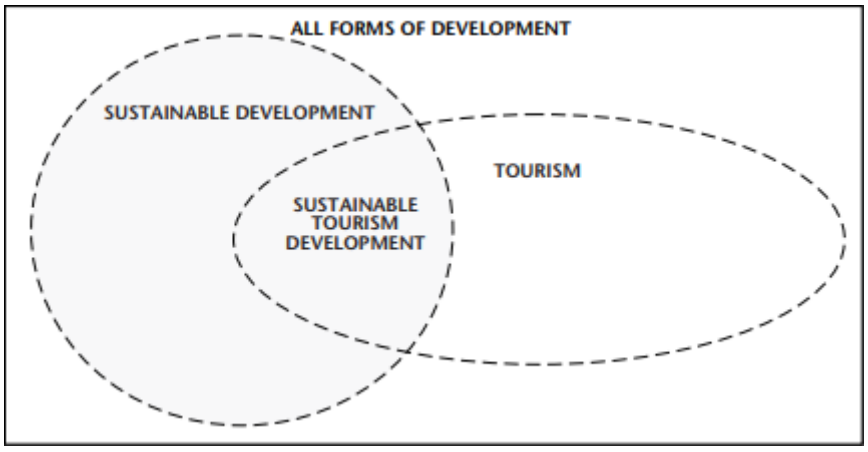
the destination. Sustainable tourism focuses on quality, continuity and balance. Quality through sustainable tourism translates into a valuable experience for visitors in the context of improving quality of life of communities and brings forth the significance of the natural environment. "Sustainable tourism cannot exist without the continuity of the natural resources, culture and customs of host communities". This form of tourism aims to ensure a balance between all stakeholders including the tourism industry, social players, environmental representatives, the Government, the local authority and local communities. In order to ensure continuity of cultural, natural and local community resources, the management strategy has to involve long-term planning and stakeholder engagement. "If we protect the environment in such a way as to bring about in the long run economic misery, we would be defeating the whole purpose of development. If we promote economic wellbeing in the short run, and lead to environmental and social degradation, we will be winning one battle and losing another, with the end result of ending up worse in the long run" [6, p. 7].

1.4 Sustainable Tourism as a Sub-set of Sustainable Development

The study of the appropriate use of the physical environment by humankind serves to chart the history of environmental attitudes and how they are actioned.

Such research can offer profound insights into the manner in which exploitation of the environment occurs, the nature of environmental perceptions, conflicts and behaviours relative to the environment, and the development and analysis of environmental policies. Sustainability is an "essentially contested concept". That is, a concept the use and application of which is inherently a matter of dispute. The reason for this is the degree to which the concept of sustainable development is used to refer to a "balance" or "wise" use in the way in which natural resources are exploited. The appropriateness of such an approach and the very way in which "wise use" is defined will depend on the values and ideologies of various stakeholders.

However, the history of natural resource management suggests that sustainable development, including the sub-concept of sustainable tourism (see Figure 1), is one term among several which has emerged in an attempt to reconcile conflicting value positions with regard to the environment. Furthermore, it is argued that the terminology of "balance" is continuing to evolve, more recently with the notion of the "green economy" and "green economic growth". These concepts have already begun to infiltrate the lexicon of tourism [3, p. 16].



Source: [3]

Fig. 1: *Sustainable tourism as a sub-set of sustainable development*

1.5 Issues in Sustainable Tourism

With its alluring premise of continued development that does not unduly harm a destination's natural and sociocultural environment, the idea of sustainable tourism has emerged as a priority objective of the global tourism sector since the mid-1990s. This is indicated in part by the extent to which it has been officially recognized and internalized by a broad array of international, regional and national organizations both internal and external to tourism. Yet, as attempts have subsequently been made to operationalize the concept in the actual planning and management of tourism businesses and destinations, various attendant issues and challenges have become increasingly apparent.

Issues in sustainable tourism can be summarized in:

- The inherent flexibility of sustainable tourism and the resulting possibility of weak and strong interpretations.
- The degree to which the semantics of sustainable tourism encourage the perpetuation of a possibly unsustainable status quo.
- The complexity of tourism systems, including their fuzzy boundaries, indirect and induced impacts, the influence of external (non-tourism) systems.
- The often unpredictable nature of relationships between cause and effect.
- Comprehensive and minimalist composite models of sustainable tourism.
- The final issue involves sustainable tourism indicators [7, p. 18-19].

2 Methodology

This paper is based on theoretical discussion about the topic in question. Thus, the methodology of this paper is based on literature review, which was summarized from various literary sources related to the issues of tourism, development and sustainability.To illustrate the topic, the research reports and the development of tourism in Kosovo analysis are presented in this article.

3 Analysis of Tourism Development in Kosovo

3.1 Development of the Tourism Sector

Tourism today is one of the largest industries in the world creating more jobs than most other sectors. Countries that are in the early stages of tourism development, such as Kosovo, have the potential to benefit from tourism, especially in reducing poverty and increasing the economic development. For tourism to thrive sustainably, public institutions must provide supportive legislation, an institutional framework conducive to private sector development, and ensure the quality assurance for tourists. This includes proper infrastructure, promotion of tourist potentials, good transport, visa facilitation and appropriate policies to stimulate demand growth.

According to the World Tourism Organization, Europe accounts for 41% of total international tourism admissions, as Southeast Europe is one of the fastest growing regions. In developing countries, tourism ranks sixth as a source of exchange in international trade. Given this, Kosovo may particularly benefit from participating in Balkan tourist tours.

Kosovo's tourism industry is still an emerging industry, at a very early stage of development compared to other Southeast European countries. This is largely due to a lack of investment for many decades, poor private sector tourism offers, a lack of educated staff, poor investor policies, and a lack of coordination between stakeholders and Government agencies. Although the number of tourists and overnight stays in Kosovo has increased significantly over the last

ten years, the number of international visitors within a year is far from the region's average. The largest number of tourists visiting the country is during the summer. This is believed to be mainly due to the diaspora, which has a major impact on the local economy and the tourism sector, in particular [8, p. 6-7].

The legislation in the tourism industry, as in all other sectors, is a fundamental pillar that serves to regulate and monitor the organization and operation of all areas related to tourism activities. Over the years, due to the increasing complexity and competitiveness of this industry, various reforms and updates to tourism legislation have been developed in countries with potential tourism in order to create a healthy and sustainable tourism environment, thus generating economic prosperity for their communities. Without proper legislation and respect for the rule of law, the tourism sector cannot be organized, operated or have any positive economic impact on the community.

The tourism sector is broad and complex, and Kosovo's existing tourism law and regulations are not sufficient and designed to handle such complexity [9, p. 9].

According to the WTTC report, tourism, as of 2018, employs 319 million people. This figure is expected to increase to 421 million by 2029. In Kosovo, according to the report of the Labor Force Survey (2018), the number of employees in the field of tourism is around 28,500 people.

3.2 The Level of Government Support for the Tourism Sector

Tourism in Kosovo is managed and overseen by the Ministry of Trade and Industry, represented by a Division in the Department of Industry. The current administrative level of tourism in Kosovo is under-represented in this ministry, compared to the responsibilities and importance of the tourism sector for development and contribution to the country's economy.

With regard to the Government financial support for tourism, budget lines indicate that over the years the tourism sector has been poorly covered or not mentioned at all. The Government budget allocation for the Ministry of Trade and Industry (responsible for tourism) is very small, given that it has to cover many other areas and sectors within the ministry portfolio. The entire annual budget is spent through the main lines of the ministry, such as capital expenditures, goods and services, subsidies and transfers, wages and salaries, and public services. The tourism sector is not specifically mentioned in the lines where the budget was allocated [9, p. 11].

Tab. 1: *Government budget allocation for the Ministry of Trade and Industry during the period 2012-2017*

Budget allocation of the Government of Kosovo for "MTI" (in Euro)						
Year	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Amount	4,188,780	5,346,217	4,876,369	4,730,877	4,557,200	4,925,977

Source: [10]

Table 1 contains the data on the allocation of the Kosovo Government budget for the Ministry of Trade and Industry during the period 2012-2017.

According to available data, the Kosovo Government spends less than 0.3% of the annual budget for the entire Ministry of Trade and Industry, where tourism is represented by a Division and their budget dedicated to the tourism sector is the lowest in the region [9, p. 11]. Also, we can mention that the budget allocated for MTI for 2018 was 7,333,320 €.

Tab. 2: *Budget allocated to cover the whole spectrum of tourism in Kosovo*

Budget allocated to cover the whole spectrum of tourism in Kosovo (in Euro)							
Year	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Amount	60,000	70,000	70,000	40,000	30,000	30,000	30,000

Source: [9]

Table 2 contains the data on the budget allocated for the whole spectrum of tourism in Kosovo for the period of years 2010-2016. Due to lack of data year 2017 has not been presented.

Division of Tourism (under MTI) and Kosovo Investment and Enterprise Support Agency (KIESA – an agency that promotes and supports investment, exports, tourism, small and medium-sized enterprises (SMEs) and special economic zones, also under MTI) have low financial support (less than 100,000 euros per year) for the development and promotion of this sector [9, p. 11-12].

Tab. 3: *SWOT Analysis of the Current State of Tourism in Kosovo*

Strength	**Weaknesses**
• Strong geographical position in the region and Europe; • Good and unique landscapes (rivers, lakes, parks, mountains, waterfalls, etc.); • Cultural heritage assets; • Special cuisine services; • Multilingualism; • Hospitality; • Uncharted tourist destinations; • Friendly culture; • Reasonable prices; • Wealth in the historical sense and historical countries sense; • It is already included in Western Balkan tourist packages; • Traditional events, festivals, night life; • New airport and highways; • The potential for transit; • The current increase in Government awareness of the tourism sector; • Attractive places and good weather conditions; according to seasons; • With the youngest population in Europe; • Protection and security;	• Poor/average infrastructure (electricity, roads, water supply, sanitation, marking tourist destinations, etc.); • There are no competing tourism laws and regulations available; • Lack of Government support for the tourism sector; • Lack of certified guides; • Poor waste management; • Lack of environmental protection (especially of rivers, deforestation, and waste disposal); • There isn't a National Tourism Agency (NTA)/a National Tourism Organization (NTO) established; • Lack of adequate tourism statistics; • There isn't a strategy for tourism development; • Mismanagement of visitor centers in different municipalities; • Visa regime (especially towards countries with high potential for exporting tourists); • High cost of flights; • Lack of Government subsidies for flights; • VAT for tourists booking from abroad; • Lack of joint bids with other countries in

• Kosovo's small area (fast connection between cities and tourist destinations); • Large diaspora participation in the tourism market in Kosovo; • Flexible and competitive business taxes;	the region; • Lack of municipal support for the tourism sector; • Lack of advertising Kosovo as a tourist destination.
Opportunities	**Threats**
• Attractive due to the post-war period and the peaceful environment (specific to some groups of tourists); • Participation in major trade fairs and shows; • Public relations media plan for transforming Kosovo's image; • Creation of NT/NTO; • Organizing family visits (FAM Trips) for key markets; • Introducing new markets and products; • Business meetings, incentives, business conferences and events; • Heritage protection and promotion by UNESCO; • Development of protected national parks and other tourist assets; • Creation of joint tourist packages with the countries of the region; • Maximizing the use of EU funds for cross-border cooperation for the development of cross-border tourism; • Development of tourist brands; • Attracting foreign investment related to tourism; • Increasing cooperation with international donors, maximizing the use of funds and transfer knowledge to the sector; • Increasing domestic tourism.	• There isn't national tourism strategy; • Very small budget for the tourism sector; • Increasing competition in the region (Western Balkans); • Lack of training/education in the hotel industry; • Lack of development of products and services; • Price competition in the region; • High cost of flights compared to some of the countries in the region (e.g. Macedonia); • Lack of licensing and classification for tourism services and institutions; • Lack of interest and awareness to study courses related to tourism and catering; • Lack of municipal projects available in the tourism sector; • Low interest in using funds allocated by international organizations for tourism projects; • Poor coordination among line ministries; • Fragile political situation that affects the image of Kosovo's media tree; • Lack of Public-Private Partnership (PPP) initiatives; • Kosovo is seen as a transit destination in the region (low number of nights spent); • Undeveloped infrastructure.

Source: [9]

Conclusion

Based on all of the facts stated above we could say that:

- Kosovo as a young country, having little experience in the tourism industry and knowing that there are many challenges in the further development of tourism, must take the step of development and follow the global tourism industry to develop this sector in compliance with international standards.
- The budget allocated by the Kosovo Government for the tourism sector needs to be increased so that this sector can grow faster.
- Knowing that the current situation of tourism development in Kosovo isn't so satisfactory, improvements should be made to tourism legislation in order to comply with tourism laws first, and then to make improvements and reorganizations in policies, procedures and standards on tourism which support the development of the tourism sector.
- Tourist destinations must be protected from pollution because cleanliness of the environment is one of the key elements for these destinations to attract domestic and foreign tourists and visitors.
- We noticed that Kosovo does not have a National Tourism Agency (NTA) / National Tourism Organization (NTO) established. If NTA / OKT were established, they could facilitate the functioning of the tourism sector by providing professional advice and support for the creation of sustainable tourism plans and policies, engaging in marketing and promoting the country and providing a general visionary orientation for the development of the tourism sector.
- Also, in terms of sustainable tourism development and regional competitiveness, Kosovo is currently unable to follow development trends and be competitive.

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UDRŽITELNÝ ROZVOJ CESTOVNÍHO RUCHU – ANALÝZA ROZVOJE CESTOVNÍHO RUCHU V KOSOVU

Článek poskytuje teoretický přehled o udržitelném cestovním ruchu jako o systému cestovního ruchu, který se zaměřuje na kvalitativní rozvoj s ohledem na kvalitu života a prosperitu obyvatelstva, aniž by způsobil škodu v jiných aspektech.
Udržitelný cestovní ruch je podskupinou udržitelného rozvoje. V článku jsou uvedeny rozdíly mezi těmito dvěma termíny a dalšími pojmy relevantními pro náš výzkum. Je analyzován rozvoj cestovního ruchu v Kosovu, včetně statistik o finanční podpoře cestovního ruchu kosovskou vládou. Na závěr je představena SWOT analýza současného stavu cestovního ruchu v Kosovu.

DIE NACHHALTIGE ENTWICKLUNG DER TOURISMUSBRANCHE – EINE ANALYSE DER ENTWICKLUNG DER TOURISMUSBRANCHE IM KOSOVO

Der Artikel gewährt einen theoretischen Überblick über den nachhaltigen Tourismus als System, welches sich auf die kreative Entfaltung unter Berücksichtigung der Lebensqualität und der Prosperität der Einwohnerschaft konzentriert, ohne dabei in anderen Aspekten Schaden zu verursachen.
Der nachhaltige Tourismus ist eine Untergruppe der nachhaltigen Entwicklung. Im Artikel werden die Unterschiede zwischen diesen beiden Termini und weiteren für unsere Untersuchung relevanten Begriffen angeführt. Wir analysieren die Entwicklung des Reiseverkehrs im Kosovo, inklusive der Statistiken über die finanzielle Unterstützung der Tourismusbranche seitens der kosovarischen Regierung. Am Schluss wird eine SWOT-Analyse des gegenwärtigen Zustands der Tourismusbranche im Kosovo vorgestellt.

ZRÓWNOWAŻONY ROZWÓJ TURYSTYKI – ANALIZA ROZWOJU TURYSTYKI W KOSOWIE

Artykuł przedstawia teoretyczne informacje dotyczące zrównoważonej turystyki ujmowanej jako system turystyki, który skupia się na jakościowym rozwoju przy uwzględnieniu jakości życia i dobrobytu ludności bez powodowania szkód w innych dziedzinach.
Zrównoważona turystyka jest podgrupą zrównoważonego rozwoju. W opracowaniu przedstawiono różnice pomiędzy tymi dwoma pojęciami oraz innymi pojęciami związanymi z naszymi badaniami. Analizie poddano rozwój turystyki w Kosowie oraz dane statystyczne dotyczące dofinansowania turystyki przez rząd w Kosowie. Na zakończenie przedstawiono analizę SWOT obecnego stanu turystyki w Kosowie.

Excellent Dissertations

CLUSTER PERFORMANCE MANAGEMENT

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Abstract

The presented article is based on research evaluating the impact of cluster organisations on the financial performance of member entities. The author's doctoral thesis examines whether there is a difference in the financial performance of cluster organisations created through the bottom-up and the top-down approaches, under the conditions existing in the Czech Republic. Both types of clusters that meet the condition of maturity (established before or in 2012) and of a high degree of activity were selected for the research. The financial performance of member business entities was assessed using the following indicators: ROA, ROE, ROS, EVA, EVA/employee and EVA/sales. The aim of the research was to demonstrate whether public support for clusters would be reflected in member entities' better financial performance. The final part of the paper then summarises and discusses the findings.

Keywords

Cluster; Financial performance; Cluster organization; Top-down; Bottom up; Economic value added.

Introduction

In today's global market environment, which is characterised by a high degree of competition, it is important to constantly look for ways to improve the performance and competitiveness of businesses [1]. According to Estélyiová and Koráb [2], one of the consequences of globalisation and technological development is the emergence of inter-organisational partnerships. Inter-organisational partnerships may take a wide range of forms, from unilateral agreements to business networks. Clusters, too, are categorised as a specific form of business networks. As a general concept, a cluster can be understood as the interconnection of businesses and other institutions in a certain geographical area, which benefits those involved and results in a competitive advantage [3]; [2]. Porter [4] defines a cluster as a geographically proximate group of interconnected companies, suppliers, and associated institutions in a particular field as well as companies in related fields that compete and also co-operate with each other. Over the past two decades, technical publications have addressed the issue of clusters, especially in relation to business performance. The doctoral thesis on the topic focuses on one form of inter-organisational partnership, which is considered by experts as a possible tool to support the competitiveness and performance of countries, regions and companies – namely clusters.

The establishment and development of clusters is one of the trends in economic and regional innovation policy. Many experts, such as D'Alise et al. [5], consider clusters as a key source of regional and national competitive advantage. The past two decades witnessed a great wave of interest in the area of clusters on the part of both experts and economic policy makers, and support for clusters became the predominant strategy to support economic development in

most foreign countries. Despite all the advantages that clusters offer, the impact of the cluster concept on member entities' competitiveness and performance is yet to be fully objectively quantified. Given the above, it is therefore necessary to pay increased attention to this issue.

The article examines the impact of business entities' membership in a cluster organisation (institutionalised form of a cluster, i.e. a voluntary grouping of entities within one organisation that has its own identification number) on their financial performance. The basic premise of this article is that the benefits resulting from a business entity's membership in a cluster organisation should, among other things, be reflected in improved financial performance of that entity, which is why the following assumption needs to be verified: Do cluster organisations really have a positive effect on the financial performance of member business entities? The research in the article will focus on delivering qualitative and quantitative evidence for the linkage suggested above.

The article aims to determine whether – under the conditions existing in the Czech Republic – business entities' membership in cluster organisations has a positive effect on the financial performance of those business entities, and whether there are differences in the financial performance of member entities of two types of cluster organisations – organisations established primarily on the initiative of member entities, with no direct public support (bottom-up cluster organisations) and organisations established with support from public budgets (top-down cluster organisations).

1 Research Objective and Methodology

The main objective of the research was to determine whether there were differences in the financial performance of member business entities of COs that had been established through the bottom-up approach and member business entities of COs that had been established through the top-down approach.

Given the considerable diversity of the various cluster organisations in terms of their date of establishment, and also given the availability of financial statements, the research focused on the period 2012–2017. Business data for 2018 are not yet available for a significant portion of business entities in both countries. The research within the article as a whole can be divided into the following 8 steps:

Step 1: Selection of suitable cluster organisations (hereinafter CO). The chosen COs must meet the three conditions listed below, while the last and the fourth condition are only recommended, not mandatory.

1. Only highly active COs are included in the research.
2. Only highly active COs in the maturity phase (i.e. organisations established before or in 2012) are included in the research.
3. It is possible to obtain a list of member entities for the COs.
4. The COs hold the international Cluster Management Excellence label.

Step 2: Defining the research samples and compiling a list of companies to be evaluated. The entire research within the article is based on comparing two research samples. The first research sample comprises the cores of highly active COs that are in the maturity phase, operate in the Czech Republic, and were established through the top-down approach. The second research sample comprises the cores of highly active COs that are in the maturity phase, operate in the Czech Republic, and were established through the bottom-up approach.

Step 3: Compiling a list of subsidies received for CO projects. For both the first and the second research sample, a list subsidies and repayable financial assistance received from the state budget needs to be extracted from CEDR III IS for the period 2004–2017 [6].

Step 4: Determining the number of employees. As the fourth step, data on the number of employees were obtained from the MagnusWeb commercial database for both research samples.

Step 5: Gathering financial statements and extracting data from the financial statements. For the above research samples, the required data from financial statements for 2012–2017 needed to be extracted from the public register.

Step 6: Calculating economic value added. For each of the business entities, the economic value added indicator (hereinafter EVA) was then calculated. The EVA indicator was calculated using the EVA equity method (see formula 1). The CAPM model was used to estimate the cost of equity (r_e).

$$EVA = (ROE - r_e)E \tag{1}$$

The CAPM method was used to estimate the cost of equity (see formula 2). Where r_f is the risk-free rate of return, often taken as the rate of return on treasury bills; β_n is the quantity used to measure the systematic risk of the asset; r_m is the expected rate of return in the market. National stock indices are most often used to determine the expected rate of return in the market r_m [7].

$$r_e = r_f + \beta_n(r_m - r_f) \tag{2}$$

Step 7: Calculating other financial indicators. Furthermore, the following financial performance indicators were calculated in order to be compared between the research samples: return on equity (ROE), return on assets (ROA), return on sales (ROS), EVA per employee and EVA per sales.

Step 8: Comparing the selected characteristics for the different research samples. As the last step of the research, the differences between the values for the above research samples were compared using the non-parametric Wilcoxon-Mann-Whitney W-test.

2 Results and Discussion

As part of the research within the doctoral thesis, two types of COs were compared with each other. In total, these included 22 COs that had been established through the top-down approach and 8 COs established through the bottom-up approach. To compare the differences in member businesses' financial performance in each year, the following indicators were selected: ROA, ROE, ROS, EVA, EVA per employee, and EVA per sales. In order to test the above hypothesis, it was necessary to obtain information on whether all data were normally distributed. The normality of all data samples was tested at a significance level of 5% using the Shapiro-Wilk test, where the null hypothesis assumes that the sample comes from a normally distributed population. Since the Shapiro-Wilk significance test showed that none of the indicators was normally distributed, a non-parametric test was used to verify the hypothesis, namely the Wilcoxon test. The Wilcoxon test, which was used as evidence for the outputs presented in this paper, was performed at a 10% significance level.

Tab. 1: *Wilcoxon W-test and p-values for the ROA, ROE and ROS indicators*

Indicator	**ROA**		**ROE**		**ROS**	
	W	***P*-value**	**W**	***P*-value**	**W**	***P*-value**
2012	11326	0.1963	11697	0.3666	12978	0.6598
2013	12788	0.8097	13305	0.4335	14119	0.1016
2014	12541	0.9862	12961	0.6728	14150	0.0949*
2015	13017	0.6305	13758	0.2082	15044	0.0091**
2016	7037	0.0000**	13428	0.3616	13969	0.1389
2017	12872	0.7422	13758	0.2082	13328	0.4194

** significance level of 5%
* significance level of 10%
Source: Own

Tab. 2: *Wilcoxon W-test and p-values for EVA-based indicators*

Indicator	**EVA**		**EVA/employees**		**EVA/sales**	
	W	***P*-value**	**W**	***P*-value**	**W**	***P*-value**
2012	12375	0.8481	11368	0.2120	11327	0.1967
2013	14329	0.0632*	13040	0.6134	12667	0.9094
2014	13031	0.6201	12455	0.9144	11970	0.5376
2015	13745	0.2132	13577	0.2852	13112	0.5614
2016	13322	0.4231	12443	0.9044	12791	0.8073
2017	14286	0.0699*	13039	0.6141	12931	0.6959

** significance level of 5%
* significance level of 10%
Source: Own

Tables 1 and 2 show that while there are some differences between the financial performance of member businesses of the two CO types, these are not statistically significant with few exceptions. E.g. in 2013 and 2017 the EVA indicator for bottom-up clusters took a more favourable value, albeit still negative. In 2014 return on sales was also more favourable for member companies of bottom-up clusters. Table 2 shows that the result is conclusive not only at a significance level of 10%, but also of 5%. One of the cases was the year 2015 for bottom-up clusters, where member companies' return on sales improved somewhat. However, subsequent trends clearly show that this was merely a one-off fluctuation. Another exception was the year 2016 for bottom-up clusters, where member companies' return on assets declined. However, subsequent trends clearly show that this too was merely a one-off fluctuation. Nonetheless, it was also proven that the financial performance of top-down COs was not significantly better than that of bottom-up COs in any of the other years under review.

Based on the research, it can be concluded that public support that had been invested in the establishment and development of top-down COs in the Czech Republic did not have any significant effect on improving the financial performance of their member business entities. It can thus be assumed that businesses in bottom-up COs were able to catch up with businesses in top-down COs. The efficiency of public support spent on cluster development is thus questionable. However, that does not automatically support the conclusion that clusters as such cannot be a successful tool to promote the competitiveness of businesses. Nonetheless, the research did not confirm that targeted top-down COs have a more significant effect on member businesses' financial performance.

Conclusion

The aim of the research was to determine whether there were differences in the financial performance of member business entities of COs that had been established through the bottom-up approach and member business entities of COs that had been established through the top-down approach.

The values of financial indicators were not confirmed to be statistically significantly higher for member businesses of bottom-up COs than for businesses in top-down COs. For the member businesses of both types of COs, it was thus impossible to prove any statistically significant differences in financial performance. This research did not confirm that top-down COs, i.e. those established with a clear intent, have a more significant effect on financial performance. The research confirmed the scepticism of some authors, such as Bresnahan, Gambardella and Saxenian [8], as to the effectiveness of COs and the possible inefficiency of their public support.

Both the research and the analysis of the COs supported the views of Stejskal and Kovárník [9], who believe that certain COs often form as a grouping of several entities without a high-quality cluster analysis, with their primary objective being to obtain public money. Therefore, some experts, such as Kiese [10], consider the establishment of COs through the public administration mechanism to be worse than the establishment of COs through the private administration mechanism. The question also remains as to what was the real reason why some COs do not use public support. Whether they did not apply for public support at all, or whether their applications were rejected.

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ŘÍZENÍ VÝKONNOSTI KLASTRŮ

Předkládaný článek vychází z výzkumu hodnocení vlivu klastrových organizací na finanční výkonnost členských podnikatelských subjektů. Disertační práce autorky zjišťuje, zda v podmínkách České republiky existuje rozdíl mezi finanční výkonností klastrových organizací vzniklých přístupem bottom-up a top-down. Do výzkumu byly vybrány oba typy klastrů splňující podmínku zralosti (vznik před rokem 2012 včetně) a vysoké aktivity. Finanční výkonnost členských podnikatelských subjektů byla hodnocena pomocí ukazatelů ROA, ROE, ROS, EVA, EVA/zaměstnance a EVA/tržby. Cílem výzkumu bylo prokázat, zda se veřejná podpora klastrů odrazí ve vyšší finanční výkonnosti členských subjektů. V závěrečné části článku jsou poté shrnuty a diskutovány zjištěné výsledky.

CLUSTER-LEISTUNGSMANAGEMENT

Der vorliegende Artikel beruht auf der Untersuchung der Bewertung des Einflusses von Clusterorganisationen auf die finanzielle Leistungskraft der unternehmerischen Mitgliedskörper. Die Dissertationsarbeit des Autors stellt fest, ob in den Bedingungen der Tschechischen Republik ein Unterschied existiert zwischen der finanziellen Leistungskraft von Clusterorganisationen, die durch den Zugriff auf Bottom-up oder Top-down entstanden sind. In der Untersuchung wurden beide Typen ausgewählt. Voraussetzung war, dass sie die Bedingungen der Reife (Entstehung von 2012 einschließlich) und hohe Aktivität erfüllen /ausweisen. Die finanzielle Leistungskraft der unternehmerischen Mitgliedskörper wurde mit Hilfe der Indikatoren/Instruktoren ROA, ROE, ROS, EVA, EVA/Mitarbeiter und EVA/Erträge, bewertet. Das Ziel der Forschung war zu zeigen, ob sich eine öffentliche Unterstützung der Cluster in einer höheren finanziellen Leistungskraft der Mitgliedskörper widerspiegelt. Im abschließenden Teil des Beitrages werden die Ergebnisse zusammengefasst und diskutiert.

ZARZĄDZANIE EFEKTYWNOŚCIĄ KLASTRÓW

Niniejszy artykuł bazuje na badaniach oceny wpływu organizacji klastrowych na efektywność finansową przedsiębiorstw członkowskich. W pracy dysertacyjnej autor badał, czy w warunkach Republiki Czeskiej istnieje różnica pomiędzy efektywnością finansową organizacji klastrowych powstałych w wyniku podejścia bottom-up i top-down. Do badań wybrano oba typy klastrów spełniających warunek dojrzałości (powstanie przed 2012 rokiem włącznie) oraz wysokiej aktywności. Efektywność finansowa przedsiębiorstw członkowskich została oceniona przy pomocy wskaźników ROA, ROE, ROS, EVA, EVA/pracownik i EVA/przychody. Celem przeprowadzonych badań było wskazanie, że pomoc publiczna klastrów wpływa na większą efektywność finansową ich członków. W końcowej części opracowania podsumowano i omówiono stwierdzone wnioski.

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