Volume 11 Issue 3 2019

Engineering Management in Production and Services (EMPAS)

ISSN (online) 2543-912X ISSN 2543-6597

Ekonomia i Zarządzanie
Economics and Management

Engineering Management in Production and Services

Volume 11 Issue 3 2019

Bialystok University of Technology

International Society for Manufacturing, Service and Management Engineering

ISSN 2543-6597

Bialystok University of Technology
Faculty of Engineering Management

sciendo

ISMSME
International Society for Manufacturing, Service and Management Engineering

Engineering Management in Production and Services

Volume 11 • Issue 3 • 2019

www.empas.pb.edu.pl

Frequency

ECONOMICS AND MANAGEMENT
is published quarterly since 1998

As of the beginning of 2017 the journal
is published under a new name:
ENGINEERING MANAGEMENT
IN PRODUCTION AND SERVICES

Copyrights ©

Bialystok University of Technology
All rights reserved / Bialystok 2019

Publisher

Bialystok University of Technology
Wiejska 45A, 15-351 Bialystok, Poland

The International Society
for Manufacturing Service
and Management Engeneering (ISMSME)

Submission

Papers for submission should be prepared according to the *Authors Instructions* available at www.empas.pb.edu.pl

All papers should be submitted through the electronic submission system

Editor-in-Chief

Joanna Ejdys
Bialystok University of Technology
Faculty of Engineering Management
Wiejska 45A, 15-351 Bialystok, Poland
Phone: (+4885) 746 9802
Fax: (+4885) 663 1988
e-mail: j.ejdys@pb.edu.pl

Indexation

Journal is indexed in SCOPUS, EBSCO Business Source Ultimate (Complete), Norwegian Register for Scientific Journals, Series and Publishers, Index Copernicus, ERIH PLUS, Google Scholar, Central European Journal of Social Sciences and Humanities, Research Papers in Economics (RePEc), BazTech and BazEkon databases

Deputy Editors-in-Chief

Łukasz Nazarko
e-mail: l.nazarko@pb.edu.pl

Katarzyna A. Kuźmicz
e-mail: k.kuzmicz@pb.edu.pl

Editorial Office Secretary

Danuta Szpilko
Bialystok University of Technology
Faculty of Engineering Management
Wiejska 45A, 15-351 Bialystok, Poland
Phone: (+4885) 746 9880
Fax: (+4885) 663 1988
e-mail: d.szpilko@pb.edu.pl

Editorial Office

Bialystok University of Technology
Wiejska 45A, 15-351 Bialystok, Poland
Phone: (+4885) 746 9825
Fax: (+4885) 663 1988
www.empas.pb.edu.pl

Technical Editors

Krzysztof Stepaniuk
e-mail: k.stepaniuk@pb.edu.pl

Tomasz Trochimczuk
e-mail: t.trochimczuk@pb.edu.pl

Editorial Review Board

Editors

Production Engineering
Katarzyna Halicka
Bialystok University of Technology, Poland
Kriengsak Panuwatwanich
Thammasat University, Thailand
Griffith University, Australia

Service Engineering
Wiesław Urban
Bialystok University of Technology, Poland
Hao Wang
Zhejiang University
Ningbo Institute of Technology, China

Engineering Management
Alicja Gudanowska
Bialystok University of Technology, Poland
Jurgita Antuchevičienė
Vilnius Gediminas Technical University, Lithuania

Logistics Management
Katarzyna Kuźmicz
Bialystok University of Technology, Poland
Erwin Pesch
Universität Siegen, Germany

Technology Management
Andrzej Magruk
Bialystok University of Technology, Poland
Zdzisław Klim
Bombardier, USA

Technology Assessment
Łukasz Nazarko
Bialystok University of Technology, Poland
Jelena Stankevičienė
Vilnius Gediminas Technical University, Lithuania

Strategic Foresight
Anna Kononiuk
Bialystok University of Technology, Poland
Elina Hiltunen
What´s Next Consulting Oy, Finland

Industrial Marketing
Dariusz Siemieniako
Bialystok University of Technology, Poland
Gregor Pfajfar
University of Ljubljana, Slovenia

Statistical Editor
Justyna Kozłowska
Bialystok University of Technology, Poland

Linguistic Editor
Jūratė Griškėnaitė

International Advisory Board

Head

Joanicjusz Nazarko
Bialystok University of Technology, Poland

Members

Gianita Bleoju
Dunarea de Jos University of Galati, Romania
Joanna Cygler
Warsaw School of Economics, Poland
Casimir Dadak
Hollins University, Virginia, USA
Emiliya Dimova
Trakia University – Stara Zagora, Bulgaria
Józef Gawlik
Cracow University of Technology, Poland
Romualdas Ginevičius
Vilnius Gediminas Technical University, Lithuania
Bojan Lalić
University of Novi Sad, Serbia
César Larrea
Universidad de Las Américas, Ecuador
Juan Jose Garcia Machado
University of Huelva, Spain
Alojzy Nowak
Warsaw University, Poland
Miloslav Novotný
Brno University of Technology, Czech Republic
Volodymyr Onyshchenko
Poltava National Technical Yuri Kondratyuk University, Ukraine
Magdalena Osińska
Nicolaus Copernicus University, Toruń, Poland
Aleksander Panasiuk
Jagiellonian University in Kraków, Poland
Magdalena Pichlak
Silesian University of Technology, Poland
Rafael Popper
VTT Technical Research Centre of Finland, Finland
Alexander Sichinava
Georgian Technical University, Georgia
Włodzimierz Sroka
WSB University, Poland
Stefan Trzcieliński
Poznan University of Technology, Poland
Leonas Ustinovičius
Vilnius Gediminas Technical University, Lithuania
Andrzej Wasiak
Bialystok University of Technology, Poland
Anna Wasiluk
Bialystok University of Technology, Poland
Samuel Yen-Liang Yin
National Taiwan University, Taiwan
Beijing University, Beijing, China
Kazimierz Zaraś
Université du Québec en Abitibi-Témiscamingue, Canada
Russian Academy of Sciences, St. Petersburg, Russia
Edmundas Kazimieras Zavadskas
Vilnius Gediminas Technical University, Lithuania
Hongyan Zhang
The University of Toledo, USA

Ministry of Science
and Higher Education
Republic of Poland

Publishing of four issues of the "Engineering Management in Production and Services" journal in English – tasks financed in the framework of the contract no. 710/P-DUN/2019 by the Ministry of Science and Higher Education from the funds earmarked for the public understanding of science initiatives.

Table of contents

SPECIAL SECTION

Dariusz Siemieniako
New perspectives on B2B marketing – connecting marketing and technology 7

Katarzyna Nosalska, Grzegorz Mazurek
Marketing principles for Industry 4.0 — a conceptual framework 9

Lukasz Nazarko, Borisas Melnikas
Operationalising Responsible Research and Innovation – tools for enterprises 21

Mateusz Kot, Grzegorz Leszczyński
Development of intelligent agents through collaborative innovation 29

Elena Aleksandrova, Victoria Vinogradova, Galina Tokunova
Integration of digital technologies in the field of construction in the Russian Federation 38

Anna Dewalska–Opitek, Maciej Mitręga
"Appreciate me and I will be your good soldier". The exploration of antecedents to consumer citizenship 48

Viktoria Khrystoforova, Dariusz Siemeniako
Internet-based consumer co-creation experience of the new product development process 60

SPECIAL SECTION

Włodzimierz Sroka, Natanya Meyer
Reengineering the way to do business: perspectives from standpoints of innovation, production and performance 69

Renáta Pakšiová, Kornélia Lovciová
Managerial reporting by food production companies in Slovakia in 2017 71

Katarzyna Walecka-Jankowska, Joanna Zimmer
Open innovation in the context of organisational strategy 86

Katarzyna Tworek, Anna Sałamacha
CRM influence on organisational performance — the moderating role of IT reliability 96

Andrea Sujová, Ľubica Simanová, Katarína Marcineková
Reengineering of production processes and its impact on the financial situation and business performance of the company 106

Artur Swierczek
Examining the link between the governance mechanisms and supply chain performance — an empirical study within the triadic context 117

SPECIAL SECTION

New perspectives on B2B marketing – connecting marketing and technology

Editorial – Dariusz Siemieniako

GUEST EDITOR:

Dariusz Siemieniako

Bialystok University of Technology, Poland
e-mail: d.siemieniako@pb.edu.pl

DOI: 10.2478/emj-2019-0027

Rapid changes in the contemporary business world impact on the understanding of the theory and practice of a company and its relationships with customers. Cognitive computing and Big Data Analytics have opened up new options for marketing solutions that allow for the integration of Internet technology into the business, industry sector and decision-making process. The rapid development of the Internet of Things (IoT), as well as artificial intelligence (AI) and machine learning solutions implemented by companies, facilitate increasingly more adequate and value-creating machine to machine (M2M) interactions. All of these changes in technology translate into opportunities for marketers. The theory and practice of B2B marketing require to carefully consider the influence of technology on value creation, including innovations. More research efforts are required into value creation and communication in the world of IoT, AI and M2M interactions with regard to relationships between customers and sellers. It can be helpful to analyse industry-specific contexts as well as contexts of the emerging vs developed markets.

This special section aims is to present a wide spectrum of new perspectives on B2B marketing with a special focus on the connection between marketing and technology. The focus here has been chosen to encourage new and critical views. This special section showcases papers that offer innovative insights into issues surrounding mostly B2B marketing and technology, which advance our understanding of the contemporary B2B marketing fuelled by technological changes in a modern business world. Most of the papers within this special section are related to the International Conference on Collaborative Innovation Development — CID Conference, which took place on June 10–11, 2019, at the Faculty of Engineering Management of Bialystok University of Technology.

This special section opens with a timely paper Marketing principles for Industry 4,0 — a conceptual framework by Katarzyna Nosalska and Grzegorz Mazurek. The paper advances the understanding of the Industry 4.0 phenomenon in the context of changes taking place in the area of marketing in general and in industrial markets in particular. The second paper Operationalising Responsible Research and Innovation – Tools for Enterprises by Lukasz Nazarko and Borisas Melnikas explores Responsible Research and Innovation (RRI) as a novel approach to governing science and innovation. This paper proposes a range of approaches that help operationalise RRI, such as AHP, weighted indicators, maturity models and Data Envelopment Analysis. Artificial intelligence and business relationships are the focus of the paper Development of Intelligent Agents through Collaborative Innovation by Mateusz Kot and Grzegorz Leszczynski. The authors present research-based evidence on the scope of collaboration between users of Business Virtual Assistants (BVAs) and providers in the process of BVA development, which is influenced by user interpretation through sensemaking. The paper Integration of digital technologies in the sphere of construction in Russian Federation by Elena Aleksandrova, Victoria Vinogradova, Galina Tokunova focuses on changes in collaboration innovations in business relationships applicable to the Russian construction sector in the period of digitalisation. The following two articles deal with consumer motivations of value co-creation. The study by Anna Dewalska-Opitek and Maciej Mitręga entitled "Appreciate me and I will be your good soldier". The exploration of antecedents to consumer citizenship provides tentative evidence for some extrinsic and intrinsic motivation behind consumer inclination to engage in customer citizenship behaviour (CCB) and co-creating with brands they prefer. The research also showcases the multidimensionality of CCB. The paper Internet-based consumer co-creation experience of the new product development process by Viktoria Khrystoforova and Dariusz Siemeniako shows the interest of consumers in being involved in the online co-creation of new product development. The study indicates that the lack of required knowledge results in hesitance to participate among some consumers.

I thank the reviewers for the valuable time given to offer helpful and constructive comments. Special gratitude goes to the editorial team: Prof. Joanicjusz Nazarko, Assoc. Prof. Joanna Ejdys and Dr. Danuta Szpilko for providing a platform for six papers, which will hopefully facilitate a further debate on links between B2B marketing and technology.

The final paper Examining the link between the governance mechanisms and supply chain performance — an empirical study within the triadic context focuses on the importance of governance in the supply chain process. The study showed that the triadic supply chains significantly differentiate in terms of the modes of governance. In addition, findings also indicated that the triadic supply chains that follow the network governance mode consider their performance to be significantly higher in comparison to the supply chains that do not run this type of governance mechanism. It is important to highlight that the mechanism of governance is inseparable from a certain dyadic relationship established between two actors in the broader structure of supply chains. The study also showed that incorporating a clan as a social mechanism of governance together with good market environment and hierarchy results in increasing the relational benefits and overall performance for both dyads in the triadic supply chains.

The articles in this special section of Engineering Management in Production and Services provide valuable new insights into analysed topics. We believe that this issue contributes to the development of theory and provides relevant insight for scholars, policymakers and practitioners.

sciendo

ISMSME International Society for Manufacturing, Service and Management Engineering

received: 1 May 2019
accepted: 15 September 2019

pages: 71-85

Managerial reporting by food production companies in Slovakia in 2017

Renáta Pakšiová, Kornélia Lovciová

ABSTRACT

Corporate reporting on non-financial information has been currently gaining much more interest compared to the past. Most food enterprises believe that performing responsibly and showing an interest in society and the environment will produce a profit and benefit them as well as society. Such cases, in which enterprises report on non-financial information, were the subject of this research. The study aims to discover the managerial reporting of 2017 on the social and environmental effects of food companies in Slovakia to better understand problems in this regard. 2017 was the first year when enterprises were required to draft annual reports containing non-financial information following the amendment to the Slovak law that resulted from the European Union requirements. Across the world, reporting on non-financial information is regulated by voluntary guidelines. The paper presents conclusions of a content analysis of annual food business reports in the Slovak Republic in the context of G4 (GRI) directives from social and environmental points of view as key elements in social responsibility reporting. Individual social and environmental aspects of the research are disclosed by an enterprise if the information in its annual report conforms to defined G4 activities (GRI). All the food enterprises operating in Slovakia that compiled annual reports for 2017 were included in the research. Therefore, 142 annual reports with economic activities in 26 subclasses in the food industry sector were selected. The results present a current and comprehensive (full) reporting overview of this industry in Slovakia and reveal several shortcomings in executive reporting. The analysis of the environmental information in the annual reports shows that food enterprises reporting on environmental protection mainly focus on waste, product services, wastewater, materials and energy, evidenced by information about ongoing monitoring of the environmental impacts of production. In the social category, the G4 (GRI) directive defines four main aspects: (i) labour relations and the environment, (ii) human rights, (iii) society and (iv) liability for products.

KEY WORDS

disclosure, food enterprises, Slovakia, non-financial information, CSR reporting

DOI: 10.2478/emj-2019-0022

Corresponding author:

Renáta Pakšiová

University of Economics in Bratislava, Slovakia
e-mail: renata.paksiova@euba.sk

Kornélia Lovciová

University of Economics in Bratislava, Slovakia
e-mail: lovciova@gmail.com

Introduction

In the Slovak Republic, the food industry is closely linked to primary agricultural production and, therefore, holds an important position in the economy. It has a significant impact on employment and health of the population as well as the development of individual areas and regions of Slovakia. Nevima and Kiszová (2013) reached similar conclusions concerning the Czech Republic. The Food Industry Development Concept 2014–2020 of the Slovak Republic considers the food industry a strategic branch that ensures the country's food sovereignty having the further developmental potential to the level of 80% by 2020. The Concept aims to meet the following strategic objectives (The Food Industry Development Concept, 2014):

- Improve the food sovereignty to 80% of the current consumption of the Slovak population;
- Strengthen the position of the Slovak food industry on the market;
- Increase the food industry's competitiveness.

In April 2018, the Food Chamber of Slovakia (FChS) indicated the declining trend in all indicators of the food industry, which was a consequence of the onset of low-cost trade systems and restrictions in Slovakia. Large stores significantly contributed to the decline in the proportion of domestic food on the domestic market. In other words, Slovak food has been pushed out of the market by cheaper imported food (Teraz.sk, 2018).

The food industry plays an important role in the Slovak Republic; however, it is characterised by an insufficient and low degree of food security (Kollár, 2015; Vaqué, 2017). The plan to combine the development of the food industry with the concept of corporate social responsibility (CSR) is a suitable tool for meeting the strategic objectives of food enterprises that are associated with those of the government. Nowadays, the interest of the public in the information related to the food industry is on the rise. Annual reports, which are the basic source of information on business activities, are regulated by the Accounting Act in Slovakia. The obligation to compile an annual report concerns companies that are required to audit the financial statements by an external auditor and the Accounting Act also sets out the basic requirements for the content of the annual report. However, it does not specify the exact information to be included or its structure, especially in the field of CSR. In terms of sustainability reporting, particularly CSR, the EU member states follow the current key legal act, which in is Directive 2013/34/EU of the European Parliament and of the Council on the annual financial statements, consolidated financial statements and related reports of certain types of enterprises, amending Directive 2006/43/EC and 83/349/EEC as amended. More detailed reporting in the field of CSR was prescribed by Directive 2014/95EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large enterprises and groups. Member states of the EU can choose a way to apply the requirements for enterprises. They have more possibilities to report non-financial information (CSR information): to compile it as a part of a managerial report (this option is available in Slovakia, where an Annual Report is a fusion of financial and non-financial information), to compile a standalone sustainability report, or to compile several reports containing different types of information.

Information about business activities published in annual reports is only important when it can be used by people to make decisions. Different than reporting financial information, there is no uniform approach to reporting non-financial information, which makes itis difficult to compare. Annual reports contain information that varies in scope, is placed in different locations, has numerous wordings and interpretations. Consequently, it becomes questionable whether businesses are reporting anything at all. The current CSR reporting issues are also relevant to industrial sectors.

Authors of several major publications have been investigating CSR reporting in several countries and industries (e.g. Gray et al., 1995; KPMG, 2017; Habek, 2017; Horvath et al., 2017a; Horvath et al., 2017b; Wagner et al., 2018; Tetrevova, 2018); however, no comparable research for the food industry in terms of extended annual reporting requirements in the Slovak Republic has been published yet.

Despite efforts to reconcile and compare non-financial information in the Member States of the European Union, for example, by issuing a Guide to Disclosure of Non-Financial Information (the methodology for disclosure of non-financial information), obstacles arise from differences in legislation, terminology or information presentation (Guidelines on non-financial reporting, 2017).

Given the above-mentioned facts and importance of the food industry, research was concentrated on determining the scope of reporting on key aspects of social and environmental issues for the accounting period 2017, in which the requirements for reporting on non-financial information in accordance with the transposed EU directives in Slovak legislation were stipulated for the first time.

The study aimed to discover the managerial reporting in 2017 on the social and environmental effects of food enterprises in Slovakia to better understand problems in this regard. 2017 was the first year when enterprises were required to draft annual reports containing non-financial information following the amendment to the Slovak law that resulted from the European Union requirements. Across the world, reporting on non-financial information is regulated by voluntary guidelines. The paper presents conclusions of an analysis of Slovak annual food-business reports in the context of G4 (GRI) directives in social and environmental fields as key elements of social responsibility reporting and the use of the most refined reporting guide to aid such task.

The paper offers a literature review focusing on the theoretical background of food enterprise specificities, corporate social responsibility and their reporting behaviour from theoretical and practical points of view. The practical research into the content of annual reports focused on the conditions in Slovakia, and the results were structured according to the main aspects of social and environmental categories presented in the G4 (GRI) directives. The discussion section compares the results to those obtained by authors in other contemporary researches. The conclusions section identifies the most important weaknesses in and directions for improving executive reporting on non-financial information and information about the social and environmental activities of enterprises.

1. Literature review

Globalisation, accompanied by rapid technological changes, has given rise to a completely new business environment. Under these new circumstances, the development of a modern company is determined not only by the effective use of resources and the application of appropriate strategies but also by taking into account the concept of corporate social responsibility (Sroka and Szántó, 2018). In other words, if a company wishes to be perceived as a reliable partner in business, it should implement elements of this concept (Stonkute, Vveinhardt and Sroka, 2018). Terms "sustainability" and "permanent sustainable development" date back to the 1970s. Originally, they were used in the sense that the uncontrolled growth of anything (population, production, consumption, pollution, etc.) is not sustainable when resources are limited (Petera and Wagner, 2015). Sustainable development has famously been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Zhang, Morse and Kambhampati, 2018 or Turečková et al., 2018). In the last decade, an increasing number of companies have been involved in the preparation and disclosure of sustainability reports, which include information on economic, social and environmental dimensions as the major measures of the corporate sustainability quality the so-called "triple bottom line" (Elkington, 1998). Sustainable development is a broader category than CSR. The CSR concept is an implementation of sustainable development at the enterprise level. CSR is considered important for the existence of companies in numerous countries and regions (Lőrinczy and Sroka, 2015).

Since the enforcement of obligations to publish reports on corporate social responsibility (CSR) in the European Union in 2018, an increasing number of companies have introduced the CSR policy into their everyday business practices, and as a result, started disclosing the related information in CSR reports or within annual reports (Strouhal et al., 2015). Corporate social responsibility has become significant in contemporary theory as well as professional practice (Grmelová and Zahradníková, 2019).

The commitment to act responsibly for sustainable development of the society is mandatory for companies that aim to create a strong corporate image as the society becomes more and more concerned about ethical, social (Mallin, 2004) and environmental (Krause, 2015) challenges. In most countries, CSR reporting is voluntary; therefore, companies choose various means to disclose CSR-related information, either in the form of standalone CSR reports or within annual financial reports (Strouhal et al., 2015). As business sustainability is a highly complex issue, mainly containing non-financial data, reporting is not easy, so, several initiatives provide frameworks for sustainability reporting (Budinská, 2016).

In many countries, politicians wish to proliferate the number of new firms and improve their performance by improving sustainable activities (Solesvik, 2019). Depending on a country, different frameworks and standards can be used, such as UN Global Compact Principles, OECD Guidelines for Multinational Enterprises, GRI guideline, ISO 26000, AA1000 and SA8000 (Aureli, 2017). The GRI Sustainability Reporting Guidelines (Guidelines) offer Reporting Principles, Standard Disclosures and an Implementation Manual for the preparation of sustainability reports by organisations, regardless of their size, sector or location (G4 (GRI) Sustainability reporting guidelines, 2016). The main benefit of the directive is a list of quantitative and qualitative performance indicators, through which the company describes its socially responsible performance (Chomová, 2009).

At present, many standards regulate CSR. This diversity is mainly supported by increased interest and the inconsistency in the theoretical anchoring of the CSR concept. Studying the literature, however, most frequently results in a conclusion that usually, the basic division, according to Leipziger (2010), is