Knowledge
Economy
Society

INTEGRATED APPROACHES TO SUSTAINABLE MANAGEMENT

Edited by
Janusz Nesterak, Bernard Ziębicki

KRAKOW
UNIVERSITY
OF ECONOMICS

KNOWLEDGE – ECONOMY – SOCIETY

INTEGRATED APPROACHES TO SUSTAINABLE MANAGEMENT

KRAKOW
UNIVERSITY
OF ECONOMICS

KNOWLEDGE – ECONOMY – SOCIETY

INTEGRATED APPROACHES TO SUSTAINABLE MANAGEMENT

Edited by
Janusz Nesterak, Bernard Ziębicki

Kraków 2024

Reviewers
Ivana Bestvina Bukvić, Anna Surowiec

Language editor
Józef Korzycki

Proofreading
Patrycja Dinh Ngoc, Joanna Kalas, Małgorzata Wróbel-Marks

Cover design
Jolanta Królas

ISBN 978-83-7252-902-2 (printed version)
ISBN 978-83-7252-903-9 (ebook pdf)

Krakow University of Economics Press
31-510 Kraków, Rakowicka 27
wydawnictwo.uek.krakow.pl
e-mail: wydaw@uek.krakow.pl

Typesetting, print and binding by
Printing Center, Krakow University of Economics
31-510 Kraków, Rakowicka 27
drukarnia.uek.krakow.pl
e-mail: drukarnia@uek.krakow.pl

First edition
Publisher's sheets 13.7

Table of Contents

Introduction

The modern world faces numerous challenges that demand a holistic and integrated approach to management in various domains of human activity. The complexity of issues such as economic crises, climate change, social inequalities, and the need for technological innovation requires a fresh perspective on management, one that considers both local and global conditions. The need to simultaneously achieve economic, social, and environmental goals drives the development of sustainable practices that not only address current challenges, but also lay solid foundations for the future.

The monograph *Knowledge – Economy – Society. Integrated Approaches to Sustainable Management* is an attempt to analyse and understand these challenges from an interdisciplinary perspective. In a rapidly changing economic and social environment, it is essential to seek solutions that not only respond to crises, but also improve the resilience of organisations, institutions, and individuals to future threats. In this context, an integrated approach means combining different disciplines and analytical tools as well as incorporating diverse perspectives – from crisis management to innovations in finance and labour management, to ensure quality in the modern economy.

Sustainable management is based on several key principles, such as accountability for the consequences of decisions, striving for efficiency in resource use, and openness to collaboration among various sectors and stakeholders. The common denominator here is the idea of synergy, which is the combination of efforts, resources, and competencies to achieve goals that cannot be realised in isolation.

This monograph seeks to explore the topic of sustainable management by analysing the key areas that play a role in building a sustainable, resilient, and ethical operating environment. It aims to answer questions about how to effectively integrate different approaches, what barriers organisations face in implementing sustainable strategies, and what tools can support the transformation toward more integrated management models.

This monograph represents a discourse among academics and practitioners from significant academic centres, addressing escalating and previously unknown challenges related to contemporary economic issues, shaped by the transformation of management strategies in the era of sustainable development. We would like to extend sincere gratitude to the authors of the chapters included in this publication for their efforts in exploring and discussing these issues.

The authors' reflections have been divided into two parts, illustrating partial topics within the scope of the subject matter of the study:

I. Crisis Management and Organisational Behaviour.

II. Labour, Finance, and Quality in Modern Economy.

The first part of the monograph, titled *Crisis Management and Organisational Behaviour*, covers the issue of transforming contemporary organisations in the face of uncertainty, threats, and crises. This section begins with a study emphasising the importance of brand orientation in gaining a competitive advantage. The next chapter presents the significance of Tangible Modern and Serious Games (TMSG) as a factor that stimulates cultural knowledge, cultural economy, and cultural society based on insights from various research studies. The subsequent chapter, based on original research, explores the impact of remote communication during the pandemic on the increased interest in conducting online transactions in the contemporary market. An attempt was made to demonstrate how the restrictions introduced during the pandemic influenced the change in entity behaviour, the acceptance of online transactions and their choice on the B2C market. The following chapter presents reflections focused on illustrating the impact of the Business Analyst (BA) on the business organisation. The essence of this study lies in the presentation of the research methodology, the study design, and the results of the empirical data analysis. In the next chapter, based on original research, the significance and evaluation of resources and competencies in finance were characterised by comparing dairy cooperatives of the Świętokrzyskie Voivodeship with those of the Małopolskie Voivodeship. The following chapter is devoted to deliberations on agile attributes and surviving crises from the perspective of the experiences of Polish enterprises. It discusses the traits of agile employees and presents conclusions and recommendations for companies, emphasising the importance of investing in developing agile employees' competencies as a long-term strategy for adaptation and success. Expanding on organisational behaviour issues, the next chapter delves into the significance of the emotional intelligence construct and its relationship with effective leadership, particularly how emotional intelligence influences employee engagement at work. This section concludes with a study characterising standardisation and adaptation marketing strategies in foreign markets by agricul-

tural machinery manufacturers, analysed through the perspective of export sales managers' opinions.

The second part of the monograph, titled *Labour, Finance, and Quality in Modern Economy*, highlights reflections that address the postulates of sustainable management. The first chapter in this section tackles the issue of mapping the balance between work and private life in EU countries, highlighting specific aspects of diversity in this area and their implications for policy and practice. The following chapter emphasises the role of digitalisation in human resource migration between industries in the Polish labour market, through the lens of occupational shifts towards the IT sector. The next chapter outlines the benefits and limitations of using the Cost Deployment method as a management control tool and provides recommendations for its application in enterprises. In the subsequent chapter, the process of creating quality using a multi-step set of actions called Global 8 disciplines is presented as an element of continuous organisational improvement, which helps reduce variability not only in processes where inconsistency occurs, but primarily in the approach to problem solving. The next chapter presents considerations on the identification and characterisation of difficulties in implementing management control systems based on a case study of a municipal district heating company. In the following chapter, reflections are made on the review and characterisation of the perspectives and specifics of Polish-Serbian scientific collaboration within the framework of EU framework programmes. The next chapter of the monograph offers a broad context of considerations regarding the identification and characterisation of premises for conducting research on theatre in management sciences. This part of the monograph concludes with a chapter that addresses the issue of verifying the effectiveness of discriminant analysis as a tool for predicting corporate bankruptcy.

As scientific editors of this monograph, we would like to sincerely thank all the authors representing academic institutions such as the Academy of Physical Education in Krakow, Andrzej Frycz Modrzewski Krakow University, Bialystok University of Technology, Kazimieras Simonavicius University, Krakow University of Economics, Jan Kochanowski University of Kielce, Josip Juraj Strossmayer University of Osijek, Polytechnic of Porto, School of Education of Polytechnic of Porto, School of Banking and Management in Cracow, University of Agriculture in Krakow, University of Economics in Katowice, University of Applied Sciences in Nowy Targ, Wroclaw University of Science and Technology, and the Reviewers, Professor Ivana Bestvina Bukvić and Professor Anna Surowiec, for their contributions to the creation and substantive shaping of this publication.

Janusz Nesterak, Bernard Ziębicki

PART I

CRISIS MANAGEMENT AND ORGANISATIONAL BEHAVIOUR

Chapter 1

The Overlooked Importance of Brand Orientation in Gaining Competitive Advantage

Bartolomeo Rafael Bialas, Adam Figiel, Janusz Nesterak

1.1. Introduction

The management literature is replete with diverse definitions of competitive advantage. This important business concept, however, still appears to be elusive, vague, and ambiguous. Clayton M. Christensen once famously remarked that "Competitive advantage is a concept that often inspires in strategists a form of idol worship – a desire to imitate the strategies that make the most successful companies successful" (Christensen, 2001, p. 105). It would seem that competitive advantage is inextricably intertwined with organisation performance and profitability. However, it has been observed that a lack of a clear definition of competitive advantage has led to a noticeable schism between scholars and practitioners. Tim O'Shannassy succinctly summarises the nature of this schism when he says that "There has been increasing discussion of and empirical research into competitive advantage in recent years, however understanding of what competitive advantage is and distinguishing this concept from organization performance remains a challenge for the discipline. In recent years there has also been some discussion of the fleeting nature of competitive advantage for firms in a challenging, competitive marketplace but little connection of this discussion to the perceived environmental uncertainty construct (…). The term 'competitive advantage' is another of the strategy *buzzwords* that cause confusion for academics, business executives and consultants (ABCs)" (O'Shannassy, 2008, pp. 168–169). Another voice of concern comes from Hao Ma who claims that "Competitive advantage is perhaps the most widely used term in strategic management, yet it remains poorly defined and operationalized (…). First, competitive advantage does not equate to superior performance. Second, competitive advantage is a relational term. Third, it is context-specific" (Ma, 2000, p. 15).

Despite a lack of consensus about the competitive advantage's academic scaffolding, one thing seems to unite both scholars and practitioners: "Achieving and sustaining a competitive advantage is essential for success and long-term viability" (Kernez, 2024).

1.2. Competitive Advantage and Hypercompetition

There is no doubt that the principal objective for business strategy is to find a viable way of achieving competitive advantage over the other competing organisations in a market. However, the increasingly interconnected and interdepended global economy transforms business competition into aggressive hypercompetition. According to Richard D'Aveni, "business has entered a new era of hypercompetition, shifting dramatically from slow-moving stable oligopolies to an environment characterized by a quick-strike mentality on the part of companies aimed specifically at disrupting the competitive advantage of market leaders" (Rifkin, 1996). Many business organisations around the world are currently undergoing a radical transformation modifying how they create, deliver and capture value to remain relevant. According to the 27th Annual Global CEO Survey conducted in January 2024 by PwC (PricewaterhouseCoopers), organisations are striving to constantly innovate to attract consumers and remain profitable. "Whether they're converting a traditional product to be software-enabled, looking at customer channels and removing intermediaries, or expanding the value chain into other segments, most companies are recognizing the need to transform and innovate" (PwC, 2024). It is well accepted that business has become more competitive. Business executives and consultants are frantically searching for new planning techniques that could invigorate employees, drum up consumer loyalty, and – in the process – establish advantages over competitors.

In today's fast-paced business environment, organisations can only succeed when they stand out from their competitors and offer products or services that resonate with consumers. It has become very challenging to achieve a satisfactory level of differentiation in a crowded market. Organisations are forced to double down on investments in innovation, value creation, business model experimentation, and brand development. Ross Kernez – Director of Search Marketing at HPOne, Mentor at Starta Ventures, and Founder of SEOMeetup – contends that "A competitive advantage is what sets an organization apart from its competitors, allowing it to generate greater sales or margins and retain more customers. This advantage stems from various sources, including cost structure, product offerings, market positioning and customer service" (Kernez, 2024). In other words,

competitive advantage might be conceived of as a unique attribute(s), feature(s), asset(s), or a combination of idiosyncratic capabilities and/or resources that sets an organisation apart from the competition, makes customers choose its offerings over the competing offerings, and gives it an edge in the market. These attributes, features, assets, can include access to natural resources, access to highly trained, experienced, and skilled employees, cost structure, segmentation, first-mover advantage, innovation, strategic location, customer service, operational efficiency, product pricing, product quality, sales and distribution network, patented technologies and innovations, and a plethora of other factors that would make an organisation's offerings unique and superior to those of its rivals (Naatu, 2016, p. 553). This resource-based view of organisations revolves around the recognition, identification, and analysis of resources that collectively are represented by the acronym VRIO (Value, Rareness, Imitability, Organisation). According to Jay B. Barney and Patrick M. Wright, "Firms create value through either decreasing product/service costs or differentiating the product/service in a way that allows the firm to charge a premium price" (Barney & Wright, 1997, pp. 4–5). The fundamental problem with this perspective though, is that any one of these attributes, features, and assets is rarely defensible as a competitive advantage on its own. And even if an organisation is able to appropriate a single attribute, feature or capability, it is even more unfeasible for that advantage to be sustainable over time (Lischer, n.d.).

Following this line of thought, one might suggest that a competitive advantage enables an organisation to occupy a unique – and propitious – position in the market and establish a brand that can become the preferred choice for customers. Luigi Cantone and Alessio Abbate are of the opinion that the essence of competitive advantage lies in a company's ability to create value for its customers that exceeds its cost of creating it (Cantone & Abbate, 2006). Cam Caldwell and Verl Anderson amalgamate the aforementioned definitions and offer one that comprehensively captures the essence of competitive advantage: "Firms achieve a competitive advantage when they produce a product or service that meets customer needs at a lower price, when they offer differentiating features not provided by competitors, or when they meet the needs of customers nor served readily by their competitors. Three keys to competitive advantage are 1) to create a market position that is both unique and valuable, 2) to understand trade-offs associated with *what not to do*, and 3) to create *fit* for company strategies by aligning activities in a way that best accomplishes the chosen strategy. Achieving a distinctive competence enables a firm to perform in a way that is elusive to its competitors" (Caldwell & Anderson, 2017, p. 3).

These varied definitions – although grounded in different schools of thought – share the conviction that competitive advantage enables an organisation to become unique in the eyes of consumers. Following this logic, it can be assumed that every organisation – like every person – should be unique. Even organisations that offer products or services that are virtually identical should invest in establishing an idiosyncratic identity that can ultimately set them apart from their me-too competitors (Allen, 2017). It must be noted, however, that competitive advantage is not "a static platform and must be sustained over a long period to be leveraged. Competitive advantage must be continuously worked on and new angles must either be found or existing ones should be strengthened or revitalized. Sustainable competitive advantage, therefore, is always a 'work--in-progress' agenda for a firm. However, if the process is continuous, when can a firm be said to have a sustained competitive advantage?" (Khan & Panwar, 2019, pp. 215–216). An elegant answer to this question is offered by Jay B. Barney who – in his seminal paper *Firm Resources and Sustained Competitive Advantage* – stated that "A firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy" (Barney, 1991, p. 102). In other words, competitive advantage can be conceptualised in terms of a differential advantage that gives the customers a compelling reason for choosing – and preferring – one brand over other brands. The competitive advantage is what sets an organisation apart – both *from* the rivals and in the *minds* of the consumers. When this advantage cannot be easily duplicated by rivals, it becomes sustainable by erecting barriers to entry for new competitors (Khan & Panwar, 2019, p. 216). Competitive advantage allows an organisation to reap the benefits of superior margins and generate value for the organisation and its shareholders. It acts as a *protective moat* since it cannot be easily duplicated and is exclusive to an organisation.

1.3. Why Brand Is the Ultimate Competitive Advantage

"No matter the industry, product, customer or size, a company's brand is its single most important asset" – says Blair Brady (2020). The proposition that a brand must be treated as the most important corporate asset is currently gaining momentum, but still is viewed by many – scholars and practitioners alike – with skepticism. However, looking at competitive advantage from the customer satisfaction perspective, numerous scholars have observed that our contemporary consumer culture has changed dramatically, and this seismic shift justifies the increasing importance placed by managers on brands. The purchasing act –

posit Liviu Crăciun and Cătălin Mihail Barbu – "has become more than an action to satisfy the basic needs. The consumers search for explanations, motivations, associations of the buying decision with familiar elements in order to achieve the maximum satisfaction. Brands have become more than an element of identification and differentiation: they capture and influence the decision-making process; they create urgency and addiction. Brands sell ideas rather than products. The brand is the magnet that production needs in order to attract consumers" (Crăciun & Barbu, 2014, p. 69). Assets, features, capabilities, and skills that are transformed into building blocks of competitive advantage "can be created from multiple attributes like product quality, technology, innovativeness, reliability, brand image, firm reputation, durability, and customer service. Democratization brought about by technology and process improvements has shortened the life-cycles of products. Products become commoditized faster than in the past (…). Differentiation from competitors can also be achieved through brand positioning and brand image, however, such a differentiation can only be established from the customer's point of view" (Khan & Panwar, 2019, p. 217).

A brand is not just a memorable name, logo, term, sign, symbol, design, or advertising campaign created to identify the goods or services of one seller or group of sellers and differentiate them from those of rivals (Naatu, 2016, p. 551). A brand is how an organisation interacts with the world – internally with its employees, and externally with its customers. The brand strategy is the essence and foundation of the organisation's culture, its raison d'être; it establishes an organisation's values, vision, and strategic intent. Numerous scholars have indicated empirically that brands are "assets constitutive of intellectual capital value, significant drivers and creators of market capitalization, reputation and public integrity" (Naatu, 2016, p. 551). The brand is a constellation of a promise, personality, identity, look, service, memorability, culture, values and beliefs, processes, and tangible attributes that make up the essence of an organisation. The brand should become the very core of all management efforts. Branding – if embraced as a management philosophy – can instantly define what makes a product/service more desirable than similar offerings. According to the Brand Finance Report released by the Institute of Practitioners in Advertising (IPA) in the UK in October 2022, "the top 50 brands in the UK delivered 30% higher returns in 2021, but brands that had a high brand value to equity value ratio had a figure of 80%. The report also indicates that strong brands are a critical strategic asset that deliver value (…) The findings are based on analysis of the Standard and Poors 500 and data from the FTSE 100 benchmarks" (Kay-McClean, 2022). When organisations adopt this asset view of the brand, branding is no longer perceived as a strictly tactical business instrument operated by middle-level managers

(or an outside agency) in order to generate short-term sales. Rather – says David Aaker – "branding should be seen as an overarching business philosophy guiding every decision and every action" (Aaker, n.d.).

There is no doubt that a brand has evolved from marketing tool to management philosophy that can fundamentally shape the future, performance, and profitability of an organisation. Marc Cloosterman asserts that "understanding the financial impact of brands is crucial. By leveraging the full potential of their brands, organizations can drive sustainable revenue growth, enhance shareholder value, cultivate customer loyalty, attract top talent, enhance the license to operate, and assist companies in navigating disruptive market forces with financial resilience" (Cloosterman, 2023). It has also been discovered that strongly branded organisations bounced back quicker from financial crises and retained their profitability (Kay-McClean, 2022).

Numerous scholars from varied disciplines have come to a realisation that intangible assets are rapidly becoming a significant source of value for organisations. Writing for the Wall Street Journal, Vipal Monga observes how RadioShack – pushed into bankruptcy in 2015 – valued its intangibles (brand and customer data) and sold them for $26.2 million. Similarly, a huge percentage of META's worth is connected to its intangibles: The stock market values META Platforms, Inc. (META) at $562.19 billion (6.22.2024). As of June 22, 2024, its assets minus liabilities totaled $159.52 billion. The difference between the two could serve as a proxy for the value of META's vast troves of user data, the algorithms it creates to mine that data, and its brand (Cox, n.d.). In 2023, Coca-Cola's brand was valued at $106.1 billion, an eight percent increase compared to 2022 (Faria, 2024). As a comparison, Coca-Cola's tangible book value for fiscal years ending December 2019 to 2023 averaged $9.092 billion. This clearly shows that tangible assets account for 8% of the brand's market value.

A massive shift has occurred over the last four decades towards intellectual capital, which is now what drives the economy. Three decades ago, as much as 95% of the average corporation's value consisted of tangible assets, according to a report by Thomas Reuters and Interbrand. Today 75% of that average corporation's value is intangible (Brigham, 2010). According to Ocean Tomo – an intellectual property merchant bank – between 1995 and 2015, the share of intangible asset market value increased from 68% to 84%. In 2020, intangible assets commanded 90% of the S&P 500 market value (Ocean Tomo, n.d.). Margaret Molloy – Chief Marketing Officer of strategic branding agency Siegel+Gale – very clearly states that strong brands have a well-documented ability to raise company share price. She points to the fact that consumers' willingness to purchase, recommend, work for, and invest in a company is driven 60% by their perceptions

of the company and only 40% by their perceptions of its products (Molloy, 2020). And according to a survey released jointly by the World Economic Forum and the Fleishman-Hillard public relations firm, three-fifths of chief executives said they believed corporate brand and reputation represented more than 40% of their company's market capitalisation (Brigham, 2010).

Brands – says Tom Roach – "are probably the most powerful and versatile business tool ever invented. And yet there's a growing breed of business leaders who behave as if creating a famous, preferred, distinctive brand is an unnecessary luxury" (Roach, 2020). Research conducted by McKinsey shows that CEOs who prioritise strategic brand management stand to improve their bottom lines. B2C organisations that prioritise strategic brand management are three times more likely to achieve greater than 5% revenue growth, and B2B organisations are more than twice as likely to do so (Kelly, 2023). John Zeigler unabashedly states that "many CEOs do not appreciate the financial significance of getting branding right. In today's economic scenario brand and intangible values cannot be left uncounted as they bear upon the very destiny and survival of a firm (…) Brands create choice, build trust and loyalty, drive a premium price and provide an important source of competitive advantage and the resultant share price" (Zeigler, 2014).

1.4. Conclusion

It is very difficult to build a strong brand in today's hypercompetitive business environment. Chief executives are constantly inhibited by a plethora of substantial pressures and obstacles rendering the brand building process challenging and erratic at best and marginal or nonexistent at worst. Pressure to compete on price, proliferation of competitors, media and market fragmentation, bias towards changing strategies, short-termism, and pressure to invest elsewhere are just examples of factors that prevent CEOs from investing in strategic brand management and brand orientation (Drypen, 2008). As ad man Jeremy Bullmore puts it, "brands are fiendishly complicated, elusive, slippery, half-real, half-virtual things. When CEOs try to think about brands, their brains hurt" (Basis, 2022). Abundant research studies support the case for brand investment. Interbrand's Best Global Brands and Millward Brown's BrandZ ranking support the notion of the competitive lift that brands bestow upon organisations (Molloy, 2020). Businesspeople should consider the brand as a dominant management philosophy rather than marginal tactical tool. Brand orientation – if embraced by the entire organisation – can lead to the establishment of a competitive advantage characterised by longevity and resilience.

References

Aaker, D. (n.d.). *Brands as Assets: The Idea That Transformed Marketing*. PROPHET. Retrieved from: https://prophet.com/2014/07/200-brands-as-assets-the-idea-that-transformed-marketing/ on June 22, 2024.

Allen, M. (2017). *Competitive Advantage: What Makes You Unique?* The Lifescape Coach. Retrieved from: https://www.thelifescapecoach.com/lifescape-coach-blog/competitive-advantage-what-makes-you-unique on June 21, 2024.

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*(1).

Barney, J. B., & Wright, P. M. (1997). *On Becoming A Strategic Partner: The Role of Human Resources in Gaining Competitive Advantage* (Working Paper No. 97-09). CAHRS Center for Advanced Human Resource Studies, Cornell University.

Basis, S. S. (2022). *Brands Aren't Human, So Why Do We Speak of Them as if They Are?* WARC. Retrieved from: https://www.warc.com/newsandopinion/opinion/brands-arent-human-so-why-do-we-speak-of-them-as-if-they-are/en-gb/5883#:~:text=Making%20brands%20human&text=As%20ad%20man%20Jeremy%20Bullmore,can%20be%20beneficial%20for%20brands on June 23, 2024.

Brady, B. (2020). *Your Brand Is Your Greatest Asset*. FORBES. Retrieved from: https://www.forbes.com/councils/forbesagencycouncil/2020/02/24/your-brand-is-your-greatest-asset/ on November 29, 2024.

Brigham, A. F. (2010). *Your Brand Reputational Value Is Irreplaceable. Protect It!* FORBES. Retrieved from: https://www.forbes.com/2010/02/01/brand-reputation-value-leadership-managing-ethisphere.html#:~:text=In%20a%20recent%20survey%20released,of%20their%20company's%20market%20capitalization on June 23, 2024.

Caldwell, C., & Anderson, V. (2017). *Competitive Advantage: Strategies, Management, and Performance*. NOVA Science Publishers, Inc.

Cantone, L., & Abbate, A. (2006). *Creating and Sustaining Competitive Advantage in Dynamic Markets. The Role of Marketing Equity*. EURAM Conference, Oslo, May 17–19. Retrieved from: https://www.researchgate.net/publication/265769616 on June 23, 2024.

Christensen, C. M. (2001). The Past and Future of Competitive Advantage. *MIT Sloan Management Review*, *42*(2).

Cloosterman, M. (2023). *Brands in the Boardroom V: Six Reasons to Prioritize Brand for Financial Success*. BrandingMag. Retrieved from: https://www.brandingmag.com/marc-cloosterman/brands-in-the-boardroom-v-six-reasons-to-prioritize-brand-for-financial-success/ on June 22, 2024.

Cox, O. (n.d.). *Measuring the Value of Intangible Assets. A New Approach*. ANMUT. Retrieved from: https://www.anmut.co.uk/measuring-the-value-of-intangible-assets/ on June 22, 2024.

Crăciun, L., & Barbu, C. M. (2014). The Brand as Strategic Asset of the Organization. *Review of International Comparative Management*, *15*(1).

Drypen. (2008). *Why Is Building Strong Brands so Difficult*. Retrieved from: https://www.drypen.in/branding/why-is-brand-building-difficult.html on June 23, 2024.

Faria, J. (2024). *Coca-Cola's Brand Value from 2006 to 2023*. Statista. Retrieved from: https://www.statista.com/statistics/326065/coca-cola-brand-value/ on June 22, 2024.

Kay-McClean, L. (2022). *Strong Brand Value a 'Critical' Asset, Says IPA Report*. Research Live. Retrieved from: https://www.research-live.com/article/news/strong-brand-value-a-critical-asset-says-ipa-report/id/5104182 on June 22, 2024.

Kelly, C. (2023). *Do CEOs Understand Modern Marketing? 66% of CMOs Say 'No'*. Marketing Dive. Retrieved from: https://www.marketingdive.com/news/cmo-ceo-relationship-issues-mckinsey-report/698156/ on June 23, 2024.

Kernez, R. (2024). *Competitive Advantage: The Key to Business Success*. Forbes. Retrieved from: https://www.forbes.com/sites/forbescommunicationscouncil/2024/02/07/competitive-advantage-the-key-to-business-success/ on June 21, 2024.

Khan, K., & Panwar, T. (2019). Achieving Sustainable Competitive Advantage through Brand Makeover. *The Marketing Review*, *19*(3–4), 213–234. https://doi.org/10.1362/146934719x15774562877700

Lischer, B. (n.d.). *How to Create a Competitive Advantage*. IGNYTE.com. Retrieved from: https://www.ignytebrands.com/competitive-advantage/#:~:text=%E2%80%9CBrand%20building%20delivers%20sustainable%20competitive,over%20those%20of%20their%20competitors.%E2%80%9D on June 22, 2024.

Ma, H. (2000). Competitive Advantage and Firm Performance. *Competitiveness Review*, *10*(2). https://doi.org/10.1108/eb046396

Molloy, M. (2020). *Why Brand Counts*. Siegel+Gale. Retrieved from: https://www.siegelgale.com/brand-value-roi-the-case-for-brand-investment-through-srategic-metrics/ on June 23, 2024.

Naatu, F. (2016). Brand Building for Competitive Advantage in the Ghanaian Jewelry Industry. *International Review of Management and Marketing*, *6*(3).

O'Shannassy, T. (2008). Sustainable Competitive Advantage or Temporary Competitive Advantage: Improving Understanding of an Important Strategy Construct. *Journal of Strategy and Management*, *1*(2).

Ocean Tomo. (n.d.). *Intangible Asset Market Value Study*. Retrieved from: https://oceantomo.com/intangible-asset-market-value-study/ on June 23, 2024.

PwC. (2024). *PwC's 27th Annual Global CEO Survey: US Version*. PWC.com. Retrieved from: https://www.pwc.com/us/en/library/ceo-survey.html on June 21, 2024.

Rifkin, G. (1996). *The Art of Hypercompetition*. Strategy + Business. A PWC Publication. Retrieved from: https://www.strategy-business.com/article/14886 on June 21, 2024.

Roach, T. (2020). *The Brand: The Most Valuable Business Tool Ever Invented*. Retrieved from: https://thetomroach.com/2020/11/12/the-most-valuable-business-tool-ever-invented/ on June 23, 2024.

Zeigler, J. (2014). *Do CEOs Understand the Power of Brands?* LinkedIn. Retrieved from: https://www.linkedin.com/pulse/20140612032029-94137855-do-we-need-to-have-a-class-action-suit-to-get-ceo-thinking-more-about-branding on June 23, 2024.

Chapter 2

The Role of TMSG as Booster for Cultural Knowledge, Cultural Economy and Cultural Society

Maria Inês Pinho, Sérgio Veludo Coelho

2.1. Introduction

Cultural Heritage (CH) encompasses the legacy of physical artefacts and intangible attributes inherited from past generations. Preserving and promoting this heritage is crucial for maintaining cultural identity and educating future generations. Tangible Modern and Serious Games (TMSG), which combine physical interaction with digital gameplay, offer a novel approach to engage the public with CH. These games can enhance learning, motivation, and appreciation of CH by providing immersive and interactive experiences, both physical and digital. This chapter aims to explore how TMSG can be an asset in CH, drawing on insights from various research studies.

TMSG and CH offer interactive and appealing experiences that enhance learning, promote awareness, and facilitate the exploration of heritage sites, both in digital and table top environments. These TMSG leverage advancements in technology, such as virtual and augmented reality, and in this sense create immersive environments that allow users to interact with cultural artefacts and monuments in a meaningful way. But if played in a conventional table board, all the assets offered by digital technologies can be preserved by the game design and rules playsets.

The TMSG are also a very useful method of socialising groups such as students, parents, families or researchers. The gaming activity, whatever their categories, goes far beyond the mere ludic challenge to become a powerful enhancer of group dynamics. By incorporating elements of gameplay, storytelling, and educational content, TMSG can effectively convey the intangible aspects of CH, such as traditions, beliefs, and historical events.

2.2. TMSG as Powerful Tool for Cultural Knowledge, Cultural Economy and Cultural Society

The concept of Cultural Knowledge has been applied to the area of health and nursing (Sharifi, Adib-Hajbaghery & Najafi, 2019). However, anyone who reads this term seems to make more sense for matters linked to Culture or specifically to the Management of CH (Spennemann, 2023).

The process of this type of knowledge goes through the following phases: producing information and, based on that information, producing knowledge and, based on that knowledge, wisdom. In the context of the globalisation of information, memory was the method of knowing; the organisation, processing and retrieval of information was the structure. Currently, the pillars of the new knowledge society are based on productivity and utility and this has transformed knowledge into more than productive information. Using TMSG helps with the transition from one phase to another (Rüth & Netzer, 2020). Likewise, the use of artificial intelligence makes it possible to interpret the values of CH (Spennemann, 2023).

With the integration of the global economy in industrialised countries, the number of citizens coming from diverse cultural backgrounds with different social, cultural and educational attributes and needs has proliferated and with it, the concept of cultural competence, in the sense of the ability to respond to cultural diversity within systems of society. In another way, cultural competence is an umbrella term that involves attitudinal or behavioural concerns at the individual level, as well as policy or procedural concerns at the organisational or system level. Talking about cultural competence implies:

- cultural safety (where there is no discrimination, where cultural providers and cultural audiences are respected and involved in decision-making (Mousazadeh *et al*., 2023),
- intercultural competence (where the individual functions in another culture different than their own (Greene-Moton & Minkler, 2020),
- transcultural culture (related to the differences and similarities of comparative cultural care between cultures, in order to help the citizen, of each country, to achieve and maintain cultural practices of significant quality, respecting the CH of their local heritage) (Chen *et al*., 2023).

Cultural knowledge, then, refers to gaining a solid educational foundation about various cultural groups to better understand customers' different beliefs, values, and behaviours. The necessary knowledge generally involves "dos" and "don'ts" when interacting with audiences from different cultures (Zander, 2007).

With these principles, unintentional cultural offenses can be avoided and public trust can be established (Starr & Wallace, 2011).

Thus, Cultural Knowledge means knowing the cultural characteristics, namely: the history, values, beliefs, behaviours of a cultural or ethnic group and precedes "informed knowledge (cultural awareness)" which is nothing more than being open to the idea of changing cultural attitudes and prepared to think in different directions while making use of their own knowledge and experience (Jasurbek, Irodaxon & Malohatoy, 2023).

Economy and Culture are two concepts that, at first glance, seem to have little connection. In fact, the first is concerned with maximising the return from a productive activity. The second ensures that the democratisation of culture is truly accessible to everyone.

However, several authors have sought to prove that it is possible to speak of a Cultural Economy. Their research helped to understand that this field is dynamic and multidimensional, showing the importance of cultural resources and activities in promoting economic growth, innovation and quality of life.

Among the authors who contributed to this scientific advance, the following stand out:

- Richard Florida: who studied the economic significance of creativity and culture, in addition to exploring how cultural industries and cultural facilities, in general, contribute to economic growth and prosperity in cities and regions (Florida & Adler, 2020),
- David Throsby: who examined the economic value of culture, particularly in terms of the Economy of Arts, CH and Cultural Policies (Throsby, Zednik & Araña, 2021),
- John Hartley: who wrote about the economic dimensions of culture and media, exploring topics such as cultural production, consumption and politics, as well as the role of creativity in economic development (Hartley, 2021),
- Andy Pratt: who contributed to the understanding of creative industries and the cultural economy, offering critical perspectives on the concept of creative economy and its implications for cultural policy and practice (Pratt, 2021),
- Ruth Towse: who deepened the understanding of how economic principles apply to cultural goods and the challenges and opportunities of the cultural and creative sectors (Towse & Hernández, 2020),
- Bruno Frey: who combined economics with other social sciences, namely Psychology, to understand the Cultural phenomenon. His contribution is therefore based on understanding the economic dimensions of culture and the arts (Frey & Briviba, 2023).

In the management of CH, the concept of Cultural Economy refers to the economic aspects of preserving, promoting and using CH assets for sustainable development. And it involves strategies to maximise the economic value of cultural heritage, while ensuring its conservation and protection for future generations. In addition, it covers various activities, including tourism, creative industries, cultural events and products and services related to heritage and emphasises the potential of CH in terms of contributing to local economies, particularly with regard to: creating jobs, attracting investment and improving cultural identity and pride (Borowiecki, Gray & Heilbrun, 2023; Bille, 2024).

It is concluded that the Cultural Economy concerns the intersection of culture and economy, covering the production, distribution, consumption and exchange of goods, services and cultural activities within society. In this sense, it involves economic aspects such as those related to:

- cultural production (at the level of arts and culture industries),
- the means of communication and entertainment,
- heritage and tourism,
- creative industries,
- intellectual property.

It is stated that this concept emphasises the economic value of cultural goods, expressions and practices, as well as their role in promoting economic development, innovation and employment.

The concept of Cultural Society refers to a community or society where cultural values, practices and expressions play a central role in shaping social interactions, institutions and identities (Feischmidt, 2020). In a Cultural Society, culture is not seen simply as a set of traditions or artefacts, but as a dynamic force that influences all aspects of life, including politics, economics, education and everyday behaviour. Cultural societies prioritise the preservation, promotion and celebration of cultural diversity and heritage, while promoting social cohesion, mutual respect and understanding between different groups (Aykaç, 2021; Karayiannides, 2023).

At the level of CH management, the concept of Cultural Society refers to a community or society where CH is deeply valued, actively preserved and meaningfully integrated into various aspects of social life. Following this, CH Management in a Cultural Society involves strategies and practices aimed at involving communities, promoting cultural participation and promoting the sustainable management of heritage resources. It emphasises the importance of recognising diverse cultural identities, traditions and narratives, and empowering communities to take ownership of their heritage (Wollentz, 2020).

Among the authors who address heritage issues in conjunction with community involvement, Smith (2020) stands out. Through her conception of "authorised heritage discourse," she highlights the dominant narratives and power dynamics that shape conservation practices of heritage and the need to challenge them to create more inclusive and culturally responsive approaches.

From another perspective, Isar (2023) explores the role of CH in promoting social cohesion, identity formation and sustainable development. It emphasises the importance of cultural democracy and participatory approaches to CH management, which prioritise the voices and aspirations of diverse communities.

Macdonald (2022), on heritage and museum studies, addresses the relationships between heritage, memory and identity in contemporary societies. Her writings explore how museums and heritage sites can serve as spaces for dialogue, reflection and engagement, fostering connections between past, present and future generations.

As for Harrison, Dias and Kristiansen (2023), they emphasise the need for heritage management approaches that respond to the diverse and often contested meanings of heritage in multicultural societies.

2.3. TMSG and Cultural Knowledge, Cultural Economy and Cultural Society

There is a connection between TMSG and Cultural Knowledge, Cultural Economy and Cultural Society.

In other words, the connection between Cultural Knowledge and TMSG lies in their use as tools to transmit, explore and improve the understanding of cultural knowledge. In this sense, they intersect because they have educational objectives and with a view to cultural knowledge (Ullah *et al.*, 2022). As such, they can be adapted to educate players about specific cultures, helping them understand and appreciate different cultural perspectives and practices.

Furthermore, and according to Kuhail *et al.* (2022), TMSG take advantage of interactive and immersive elements (such as storytelling, role-playing or simulations) to create engaging learning experiences. These elements can be used to present cultural knowledge in a way that is both engaging and informative, that is, for example, players can navigate a virtual environment that mimics a specific cultural environment, they can participate in cultural rituals, or they can solve problems, using culturally specific knowledge

By engaging in TMSG that incorporate cultural knowledge, players can develop greater understanding and sensitivity toward different cultures. This

can promote empathy and reduce cultural prejudices and stereotypes (Olejniczak, Newcomer & Meijer, 2020). Alternatively, games can present scenarios that challenge players to consider cultural perspectives different from their own, promoting cultural awareness and inclusion.

From the perspective of Tzima, Styliaras and Bassounas (2020) TMSG can serve as a means to preserve CH and disseminate it to a wider audience. They can document and simulate traditional practices, histories and stories, ensuring they are passed on to future generations.

This is particularly valuable for cultures that may be at risk of losing their heritage, due to globalisation or other factors. Through TMSG, these cultures can reach a global audience and maintain their traditions in an interactive format.

TMSG development often involves collaboration between game developers, cultural experts, educators, and community members. This collaborative process in itself can be a form of cultural exchange and knowledge sharing.

The TMSG can be used as tools in intercultural training programmes, helping individuals from different backgrounds understand and work together more effectively (Bender & Erle, 2023).

TMSG provide a dynamic and interactive platform to explore and disseminate Cultural Knowledge. They engage players in meaningful experiences that educate, promote cultural sensitivity, preserve CH and facilitate intercultural understanding.

The connection between the concept of Cultural Economy and TMSG lies in the potential of those games to contribute to economic activities related to culture. Therefore, from this perspective, TMSG promote economic development, as they create opportunities for the development and commercialisation of cultural products and services. By monetising cultural content through TMSG, economic value is generated in the cultural sector (Saitua-Iribar, Corral-Lage & Peña-Miguel, 2020).

TMSG can also support cultural tourism by providing immersive experiences that allow players to virtually explore cultural landmarks, traditions and historical sites (Arif *et al.*, 2023).

As in Cultural Knowledge and also in Cultural Economy, TMSG can be used for educational and cultural training purposes. Examples include language learning, the development of intercultural skills and heritage preservation skills (Manshoven & Gillabel, 2021). Institutions and organisations that invest in education and cultural training can use TMSG as tools to improve their programmes, potentially attracting more students and generating revenue.

In the relationship between TMSG and the three concepts, it only remains to address the connection between the concept of Cultural Society and TMSG. This lies in its potential to promote involvement, participation and cultural

expression in society. In another way, TMSG can serve as interactive platforms for cultural exploration, dialogue and community building, thus contributing to the development of vibrant and inclusive cultural societies. More specifically, and according to Fonseca *et al.* (2021), TMSG can promote community involvement, providing opportunities for individuals to participate in cultural activities and events in virtual environments. These games can facilitate connections between individuals from different backgrounds, promoting a sense of belonging and cultural identity in communities.

From the perspective of Pang, Leung and Cheng (2024) TMSG can serve as a means of cultural expression, allowing developers and players to explore and share narratives, traditions and cultural values. Through gameplay, players can experience and interact with different cultural perspectives, promoting empathy, understanding and appreciation of cultural diversity.

Finally, TMSG can raise awareness about the importance of cultural preservation and conservation efforts in society (Capecchi *et al.*, 2023; Pang, Leung & Cheng, 2024).

2.4. Conclusion

The reflection developed in this paper permitted to conclude that TMSG represent a valuable asset in the field of Cultural Heritage, offering innovative ways to engage the public and enhance learning experiences. By leveraging advancements in technology and incorporating interactive and immersive elements, TMSG can effectively communicate cultural content and foster a deeper appreciation of CH. However, ongoing research and development are needed to address existing challenges and fully realise the potential of TMSG in this domain.

The literature review carried out throughout this work allowed understanding the concepts of Cultural Knowledge, Cultural Economy, and Cultural Society linked to CH and the use of TMSG. It can be seen that the technological change currently being experienced presents itself as a complex and multifaceted phenomenon that encompasses the different ways in which culture shapes social life and human experience. This work emphasises the importance of recognising and valuing cultural diversity and creativity in building inclusive and vibrant societies, constituting the TMSG as an instrument to help with the transition.

In fact, TMSG not only facilitate a deeper engagement with CH through interactive storytelling and experiential learning but also foster critical thinking and empathy by placing users in diverse cultural contexts. The tangible nature of these games allows for a more hands-on approach to learn, making abstract cultural concepts more concrete and accessible. Players can immerse themselves in historical events, understand different cultural practices, and appre-

ciate the significance of various cultural artefacts through active participation rather than passive observation. Moreover, TMSG can bridge generational gaps, offering a platform where both the young and the old can explore and appreciate cultural narratives together, thus promoting intergenerational dialogue and learning. These games can be designed to appeal to a wide age range, making CH accessible to younger generations who may prefer interactive digital mediums over traditional methods. This shared experience can help in transmitting cultural knowledge and values from one generation to another, ensuring continuity and relevance in a rapidly changing world.

Concerning Enhancing Community Engagement and Cultural Democracy, this research highlights the importance of community engagement, cultural democracy, and inclusive heritage practices in building resilient and vibrant societies. TMSG can be instrumental in fostering a sense of community by involving local populations in the creation and dissemination of cultural content. Community members can contribute their own stories, artefacts, and traditions, making the games more authentic and representative of their cultural heritage. This participatory approach democratises cultural heritage, allowing diverse voices to be heard and valued.

Moreover, the ability of TMSG to adapt to diverse cultural contexts and their potential to be customised to reflect local heritage and traditions makes them an invaluable tool in promoting cultural sustainability and resilience. Games can be tailored to highlight specific cultural narratives, traditional practices, and local histories, ensuring that these elements are preserved and celebrated. This customisation not only makes the games more relevant to local audiences but also supports the broader goal of cultural preservation in a way that is dynamic and engaging.

Considering future research and as this was an exploratory investigation, it is proposed that a mixed methodology should be implemented in forthcoming studies, which will assess the extent to which signs of articulation between TMSG and the thrust of Cultural Knowledge are visible in this post-pandemic phase. Those revisions should focus on both qualitative and quantitative measures to evaluate the effectiveness of TMSG in enhancing cultural knowledge, fostering community engagement, and promoting cultural sustainability.

References

Arif, Y. M., Putra, D. D., Wardani, D., Nugroho, S. M. S., & Hariadi, M. (2023). Decentralized Recommender System for Ambient Intelligence of Tourism Destinations Serious Game Using Known and Unknown Rating Approach. *Heliyon*, *9*(3), e14267. https://doi.org/10.1016/j.heliyon.2023.e14267

Aykaç, N. Ö. (2021). An Overview on Globalization Discussions through the Concept of Culture. *Culture and Civilization*, *1*(1), 7–17.

Bender, M., & Erle, T. M. (2023). Serious Games for Intercultural Skills: Harnessing Horizontal and Vertical Asymmetries in Expertise and Dversity across the Curriculum. In: S. Bax, G. van der Laan, T. Leesen (Eds), *Breaking Barriers: Innovation through Collaboration* (pp. 67–79). Tilburg University.

Bille, T. (2024). The Values of Cultural Goods and Cultural Capital Externalities: State of the Art and Future Research Prospects. *Journal of Cultural Economics*, *48*, 347–365. https://doi.org/10.1007/S10824-024-09503-3

Borowiecki, K. J., Gray, C. M., & Heilbrun, J. (2023). *The Economics of Art and Culture*. Cambridge University Press.

Capecchi, I., Bernetti, I., Borghini, T., & Caporali, A. (2023). CaldanAugmenty – Augmented Reality and Serious Game App for Urban Cultural Heritage Learning. In: L. T. De Paolis, P. Arpaia, M. Sacco (Eds), *Extended Reality. XR Salento 2023. Lecture Notes in Computer Science, Vol. 14219* (pp. 339–349). Springer.

Chen, S., Zhang, K., Li, X., Ye, H., Lin, K. J., & Law, R. (2023). ChatGPT: Cross-cultural Tourism Research Imperative. *Journal of Economics and Management*, *45*(1), 137–146. https://doi.org/10.22367/jem.2023.45.07

Feischmidt, M. (2020). Memory-politics and Neonationalism: Trianon as Mythomoteur. *Nationalities Papers*, *48*(1), 130–143. https://doi.org/10.1017/nps.2018.72

Florida, R., & Adler, P. (2020). Creative Class and the Creative Economy. In: S. Pritzker, M. Runco (Eds), *Encyclopedia of Creativity* (3rd ed.) (pp. 222–225). Academic Press.

Fonseca, X., Slingerland, G., Lukosch, S., & Brazier, F. (2021). Designing for Meaningful Social Interaction in Digital TMSG. *Entertainment Computing*, *36*, 100385. https://doi.org/10.1016/j.entcom.2020.100385

Frey, B. S., & Briviba, A. (2023). Two Types of Cultural Economics. *International Review of Economics*, *70*(1), 1–9. https://doi.org/10.1007/s12232-022-00410-7

Greene-Moton, E., & Minkler, M. (2020). Cultural Competence or Cultural Humility? Moving beyond the Debate. *Health Promotion Practice*, *21*(1), 142–145. https://doi.org/10.1177/1524839919884912

Harrison, R., Dias, N., & Kristiansen, K. (Eds). (2023). *Critical Heritage Studies and the Futures of Europe*. UCL Press.

Hartley, J. (2021). *Advanced Introduction to Creative Industries*. Edward Elgar Publishing.

Isar, Y. R. (2023). Europe in the World: Towards Global Cultural Citizenship. In: C. Bailey, E. Theodoulou Charalambous, G. Drion (Eds), *Cultural Governance: Current and Future European Perspectives* (pp. 187–202). Routledge.

Jasurbek, E., Irodaxon, E., & Malohatoy, Y. (2023). Cross-cultural Awareness. *Obrazovaniye nauka i innovatsionnyye idei vmire*, *20*(4), 114–118.

Karayiannides, E. (2023). Stuart Hall, Development Theory, and Thatcher's Britain. *Modern Intellectual History*, *20*(4), 1273–1296. https://doi.org/10.1017/S1479244322000555

Kuhail, M. A., ElSayary, A., Farooq, S., & Alghamdi, A. (2022). Exploring Immersive Learning Experiences: A Survey. *Informatics*, *9*(4), 75.

Macdonald, S. (2022). Doing Diversity, Making Differences. *Cultural Heritage Studies*, *13*. https://doi.org/10.14361/9783839464090

Manshoven, S., & Gillabel, J. (2021). Learning through Play: A Serious Game as a Tool to Support Circular Economy Education and Business Model Innovation. *Sustainability*, *13*(23), 13277. https://doi.org/10.3390/su132313277

Mousazadeh, H., Ghorbani, A., Azadi, H., Almani, F. A., Zangiabadi, A., Zhu, K., & Dávid, L. D. (2023). Developing Sustainable Behaviors for Underground Heritage Tourism Management: The Case of Persian Qanats, a UNESCO World Heritage Property. *Land*, *12*(4), 808. https://doi.org/10.3390/land12040808

Olejniczak, K., Newcomer, K. E., & Meijer, S. A. (2020). Advancing Evaluation Practice with TMSG. *American Journal of Evaluation*, *41*(3), 339–366.

Pang, W. Y. J., Leung, B. W., & Cheng, L. (2024). The Motivational Effects and Educational Affordance of TMSG on the Learning of Cantonese Opera Movements. *International Journal of Human–Computer Interaction*, *40*(6), 1455–1464. https://doi.org/10.1080/10447318.2022.2112567

Pratt, A. C. (2021). Creative Hubs: A Critical Evaluation. *City, Culture and Society*, *24*, 100384. https://doi.org/10.1016/j.ccs.2021.100384

Rüth, R., & Netzer, T. (2020). The Key Elements of Cultural Intelligence as a Driver for Digital Leadership Success. *Leadership, Education, Personality: An Interdisciplinary Journal*, *2*(1), 3–8. https://doi.org/10.1365/s42681-019-00005-x

Saitua-Iribar, A., Corral-Lage, J., & Peña-Miguel, N. (2020). Improving Knowledge about the Sustainable Development Goals through a Collaborative Learning Methodology and Serious Game. *Sustainability*, *12*(15), 6169. https://doi.org/10.3390/su12156169

Sharifi, N., Adib-Hajbaghery, M., & Najafi, M. (2019). Cultural Competence in Nursing: A Concept Analysis. *International Journal of Nursing Studies*, *99*, 103386. https://doi.org/10.1016/j.ijnurstu.2019.103386

Smith, L. (2020). Uses of Heritage. In: C. Smith (Ed.), *Encyclopedia of Global Archaeology* (pp. 10969–10974). Springer International Publishing.

Spennemann, D. H. R. (2023). ChatGPT and the Generation of Digitally Born "Knowledge": How Does a Generative AI Language Model Interpret Cultural Heritage Values? *Knowledge*, *3*(3), 480–512. https://doi.org/10.3390/knowledge3030032

Starr, S. S., & Wallace, D. C. (2011). Client Perceptions of Cultural Competence of Community-based Nurses. *Journal of Community Health Nursing*, *28*(2), 57–69. https://doi.org/10.1080/07370016.2011.564057

Throsby, D., Zednik, A., & Araña, J. E. (2021). Public Preferences for Heritage Conservation Strategies: A Choice Modelling Approach. *Journal of Cultural Economics*, *45*, 333–358. https://doi.org/10.1007/s10824-021-09406-7

Towse, R., & Hernández, T. N. (Eds). (2020). *Handbook of Cultural Economics*. Edward Elgar Publishing.

Tzima, S., Styliaras, G., & Bassounas, A. (2020). Revealing Hidden Local Cultural Heritage through a Serious Escape Game in Outdoor Settings. *Information*, *12*(1).

Ullah, M., Amin, S. U., Munsif, M., Yamin, M. M., Safaev, U., Khan, H., Khan, S., & Ullah, H. (2022). Serious Games in Science Education: A Systematic Literature. *Virtual Reality & Intelligent Hardware*, *4*(3), 189–209.

Wollentz, G. (2020). The Cultural Heritage as a Resource in Conflict Resolution – Possibilities and Challenges. *Cadernos do LEPAARQ* (*UFPEL*), *17*(34), 74–90. https://doi.org/10.15210/LEPAARQ.V17I34.19473

Zander, P. E. (2007). Cultural Competence: Analyzing the Construct. *Journal of Theory Construction* & *Testing*, *11*(2), 50–54. https://doi.org/10.1016/j.ijnss.2012.08.22

Chapter 3

The Surge in Online Transaction Interest Following the COVID-19 Pandemic and Trust between Entities in the B2C Sector

Grażyna Plichta

3.1. Introduction

In today's market, most companies utilise various digital devices and systems to enhance their market efficiency. Since the mid-1990s, when the commercial use of the Internet began, many companies have entered the e-commerce market. These companies were aware that having an online presence brings many competitive advantages compared to traditional businesses. The digital revolution and the development of Internet technologies have significantly influenced the successful development of e-commerce. It is worth noting that the development of e-commerce has accelerated significantly due to the restrictions on contact and traditional sales introduced during the COVID-19 exogenous shock. During the pandemic, due to formal guidelines for conducting transactions online, consumers were, to some extent, forced to conduct transactions in this mode. During the exogenous shock, existing companies were suggested to significantly expand their operations to include modern technologies. Various tools for remote communication with customers were made available for use. During this period, wide and adequate access to online transactions for customers' needs meant that this form was not only accepted but also positively evaluated. Consumers who conducted transactions online during this period noticed many advantages of this form. They largely accepted the online mode and got used to it. Since they liked it, they did not want to give it up but continued to use it. This had a significant impact on maintaining and developing this form of business operations after the lifting of pandemic restrictions. The remote form has remained and is widely used in today's market. It can be assumed that the pandemic contributed to the increased interest in conducting online transactions in the B2C

market. Considering the level of activity in the modern market in the remote form, it can be assumed that online transactions will be permanent.

Online transactions involve a lack of direct contact between entities. Consequently, building "virtual" relationships between them at a good level is often a problem. In e-commerce, there is only an "image" of the transaction object and a promise from the offeror that it meets the declared characteristics, which often causes uncertainty and risk. Risk is perceived by consumers to come, for example, from the tools and technologies used, also due to the frequent need to transmit so-called sensitive data over the network. The perceived risk is also significantly related to, among others, the lack of a description of the benefits and potential threats associated with concluding transactions remotely. This may be negatively correlated with the acceptance and willingness to enter into a transaction.

A key factor that determines the perceived level of risk is trust. Trust plays a significant role in decision-making processes related to the purchase of goods and services online. In e-commerce, problems with contact and building relationships between stakeholders are particularly evident at every stage of contact in the B2C sector. Trust is a factor that has a significant impact on building relationships between them. A higher level of trust increases the durability of relationships and reduces uncertainty in relationships in the B2C market. It can be assumed that trust is an essential element in the process of building relationships between entities in e-commerce.

This study examines the impact of the necessity for remote communication during the pandemic on the increased interest in conducting online transactions in the contemporary market. An attempt was made to show how the restrictions introduced during the pandemic influenced the change in the behaviours of entities, the acceptance of online transactions, and their choice in the B2C market. It was assumed that the introduced pandemic restrictions contributed to the increased interest in communication and conducting transactions online even after the pandemic. To thoroughly present the issue, the verification of the adopted assumptions was carried out based on an analysis of available reports, subject literature, and own research (CAWI survey research).

Considering the issues raised and the assumptions adopted, the initial part of the study describes issues regarding the dynamic development of e-commerce during COVID-19 and the interest in online transactions in the B2C market also after the pandemic. Because trust is essential when transactions are carried out remotely, the next part of the study is devoted to trust, a factor necessary to achieve business continuity and e-commerce success. In the final part of the study, presenting the results of my own research, important factors influencing customer interest in online transactions also after the pandemic were indicated.

3.2. Dynamic Growth of E-commerce during the COVID-19 Exogenous Shock and the Interest in Choosing Online Transactions in the B2C Market after the Pandemic

The COVID-19 pandemic, which ranks among the largest epidemiological crises, has had a significant impact not only on the public health crisis but has also shaken the economy. The COVID-19 pandemic is an exogenous shock that always leads to crises at the level of entities and social structures causing a state of imbalance, collapse, fluctuations, disturbances, etc. (Sagan, Plichta & Plichta, 2021). However, it should be noted that it is not only of an economic nature, and therefore requires a more holistic approach (Fasth *et al*., 2022). It should be emphasised that the impact of various shocks, including exogenous shock, on the behaviours and attitudes of entities has a theoretical basis and is confirmed by the results of many studies (Sagan, 2011).

The COVID-19 exogenous shock disrupted long-standing consumer habits, accelerating, postponing, or reversing them. However, it also contributed to the persistence of many practices recommended during the pandemic, such as online shopping. During the pandemic, in accordance with guidelines, purchases were made online, and this form was perceived positively by consumers. This is why interest in e-commerce remained high after the lifting of pandemic restrictions. The impact of market behaviours during the pandemic on the consolidation and development of e-commerce after the pandemic was confirmed, among others, by the results of McKinsey Company research. As part of McKinsey Company research, based on the so-called stickiness test, which identifies factors that determine whether individual market behaviours will be maintained, it was confirmed that, among others, e-commerce will remain at the same level as during the pandemic (Remes *et al*., 2021).

During the pandemic, businesses dynamically entered the digital era. It should be added that the Internet is a milestone in initiating the digitalisation era, which has transferred business aspects to the online world. During the pandemic restrictions, entities were in a way forced to quickly move to digital channels. Those companies that did not do so found themselves in a difficult situation because in the reality of that time, stationary services began to transform into remote services (Szczukocka, 2022). The pandemic in a way created new potential and opportunities for cooperation in e-commerce. During this period, new technologies were used for communication between entities in most sectors. Because the pandemic accelerated the introduction of the latest technologies, it can be said that it significantly contributed to the development of the e-commerce market (Plichta, 2022, p. 44).

At the beginning of the pandemic restrictions, Internet traffic was very dynamic, increasing by 48% from mid-2019 to mid-2020 (Altman & Bastian, 2020, p. 23). The number of people using the internet grew rapidly during this period. According to the *Global Connectivity Report 2022* (ITU, 2022), as many as 466 million people started using the Internet for the first time in 2020 (an increase of 10.3%). By the end of 2021, 4.9 billion people were already using the Internet, which constituted almost 63% of the world's population. According to Ecommerce Europe (2022), during the pandemic, the number of Internet users in the EU exceeded 90% of citizens, of whom 76% made online purchases in 2022. According to the GUS report (GUS, 2022), in Poland in 2022, 92.6% of households had access to broadband Internet. The most regular Internet users were young people, i.e. 16–24 years old (99%). In remote form, they most often looked for information about goods and services.

When it comes to e-commerce in Poland, according to the report of the consulting firm Strategy& (2022) *Perspectives for the Development of the E-commerce Market in Poland 2018–2027*, in 2021 the online sales channel accounted for 13% of total retail sales, and its value was PLN 92 billion. According to forecasts, by 2027 the number of people making online purchases will increase to 3.4 million people. A constant increase in the share of the platform model in online sales is also expected, which in 2027 is to reach 55–60% of the market. According to data provided by the Statista portal (Statista, 2024) by 2027 the total number of users making online purchases will increase to 5.46 billion people. The total value of the e-commerce market will reach USD 9.04 trillion. The pandemic has also highlighted the inequalities in the level of digital skills of customers. Taking into account the data made available in March 2023 by the European Parliament in the publication *Shaping the Digital Transformation: The EU Strategy* (Parlament Europejski, 2023), almost half of EU citizens (42%) did not have basic digital skills. This is a significant problem because in order to make online purchases correctly and be satisfied with e-commerce, digital skills are essential. The large increase in the number of Internet users since the beginning of the pandemic should be equivalent to their skills. When operating online, important are competencies and cognitive abilities, including critical thinking, structuring thoughts and effective communication while adapting to changing circumstances. It is important that the skills go beyond what automated systems and intelligent machines provide.

It should be emphasised that not only the order to use traditional trade during the pandemic influenced the interest in e-commerce after the pandemic. During the pandemic, when remote shopping was suggested, e-consumers experienced the convenience that always plays a significant role in shaping customer

satisfaction and opinions. In general, consumers need convenience when shopping. In today's market, interest in online shopping often stems from giving up crowded brick-and-mortar stores or choosing a preferred shopping time. In this area, digital transformation has supported customers, and therefore, among other things, they are happy to use e-commerce. Taking into account the preferences of e-consumers, among others, the speed of loading the website, the availability of product information, and simple navigation also meet their expectations. E-consumers expect e-commerce platforms to be efficient, effective, and customer-friendly. They often spend time on e-commerce websites and share their experiences, and product information, post their opinions, etc., which influences the behaviours of other consumers (Jalil *et al.*, 2024, p. 5).

Today, the development of e-commerce is largely the result of the widespread use of modern technologies, increasing mobility, and the gradual digitisation of business. The fact is that the COVID-19 pandemic has significantly contributed to the growth of e-commerce, as, among other things, due to the restrictions introduced during this period, the introduction of the latest technologies to the market has been accelerated (Izba Gospodarki Ekonomicznej, 2023). The dynamic development of e-commerce during the pandemic also led to increased competition between companies in the online market. After the pandemic restrictions, consumers no longer have a compulsion but a choice. If they want, they can use e-commerce or make purchases traditionally. In connection with this, for companies operating online, it is more important than ever to focus on attracting customers and ensuring a smooth online shopping experience. It is also very important to build relationships with e-consumers – preferably long-term ones.

3.3. Impact of Trust on Customers' Online Shopping Decision-making Process and Business Continuity of E-commerce – an Outline of the Problem

Mutual trust between the parties to a transaction, e.g., seller and customer, is an important regulator of decisions made in the market. Trust is one of the most important elements of social capital, it occurs in conditions of uncertainty and risk environment and is a key factor in building relationships between entities (Sagan & Plichta, 2016, p. 2). In the case of online shopping, the presence of trust is desirable and important. For the customer to have trust, the company should not take actions that are not in the customer's interest (Plichta & Plichta, 2013). Trust is a necessary factor for business success. It is important in creating sustainable use and business continuity. Trust plays a key role in determining the effectiveness of many relationships in business. Its importance for the successful

adoption of new technologies makes trust also a key prerequisite for e-commerce (Ghuloum, 2024). When entities communicate with each other remotely, trust is particularly important. This is due, among other things, to the significant information asymmetry between entities. When communicating remotely, actions should be taken to convince the other party that they can be trusted. Trust is important in the face of the increasing dynamics of e-commerce and the use of new media by companies to communicate with customers (Plichta, 2021, pp. 161–162). New media enable quick access to information, which undoubtedly supports consumers. In today's market, information tools and their functionalities play an important role, as they enable the rapid exchange of information on any topic. According to SelectLab research, building long-term customer relationships will be done through voice communication and virtual agents used to communicate with customers and collect a large amount of information (Plichta, Sagan & Plichta, 2022, p. 33). However, it should be added that Poles have been consistently distrustful for years, and the low level of trust is a major obstacle to the development of e-commerce. According to a CBOS research report (Czurczak, 2024), as many as 73% of Poles believe that you have to be careful and most people cannot be trusted. Only 24% of Poles believe that most people can be trusted. This is not much, but 5% more than in 2022 (when 19% of respondents held this view) (CBOS, 2024, pp. 1–2).

On the virtual market, trust between e-customers and companies influences the decision-making process of consumers. In general, without the presence of trust in contacts between the parties in e-commerce, it is difficult to build any kind of relationship. Companies offering products on the Internet should plan appropriate customer relationship management processes, including the process of selecting customer, acquiring them, retaining them, and developing relationships with them (Jaciow & Wolny, 2022, p. 122). In e-commerce, the problem on the side of e-customers is often the risk of online purchases. This often results from a lack of trust in the obligations of online sellers. The security measures that online sellers should take to reduce the risk include, among others, security related to controls, authentication systems, and payments. If customers are convinced that the companies are taking appropriate action in this area, they feel more secure and this affects their level of trust (Yusuf *et al.*, 2023, pp. 1–5). Modern technologies have enabled business companies to increase their customer base. Customer concerns about the misuse of personal data and data security can also influence their purchasing decisions. So, to build trust with them, companies should protect the data they collect by applying regulations and privacy policies (Jalil *et al.*, 2024, p. 6). Trust significantly influences the building of positive and lasting relationships between entities. The level of the relationship is sup-

ported by a reliable exchange of information and cooperation full of empathy. The durability of relationships built in the virtual space and through the Internet is not great, and the scale of active relationships does not significantly exceed those created only through physical contact and direct, personal interactions. However, it should be emphasised that this is due to several other factors, such as frequency, the content of information, its quality, reputation, image, communication method (text or video), etc. Trust plays an important role in their construction because it is a factor that allows for transactions and entering into relationships (Plichta & Plichta, 2023, p. 172).

Perceived consumer trust in e-commerce significantly impacts their expectations, attitudes, and decision-making processes. Given the highly competitive e-commerce landscape, maintaining a high level of trust is essential for businesses to attract and retain customers and encourage repeat transactions.

3.4. Factors Influencing Customer Interest in Making Online Transactions after Pandemic Restrictions – Own Research

In today's market, most customers are interested in making purchases and communicating with each other remotely. This is largely the result of experiences resulting from the restrictions and social distancing requirements imposed during the pandemic. During this period, companies quickly adapted to new business models, and consumers adopted new consumption habits that largely suited them. At that time, they recognised that the widely available remote form of transaction has many advantages, including being more convenient, faster, and less expensive. As mentioned earlier, this significantly influenced the dynamic growth of e-commerce and the willingness and interest in remote shopping even after the pandemic restrictions.

The issues discussed in this chapter are part of the research problem of my research carried out as part of the research project entitled: "Determinants and factors influencing the durability of the attitudes of individuals about other stakeholders in conditions of uncertainty and risk resulting from threats caused by an exogenous shock."[1] The data obtained through the conducted research

[1] Project no. 211/20/MSAP within REV 4.0. This project has been financed by the Minister of Education and Science within the "Regional Initiative of Excellence" Programme for 2019–2022. Project no.: 021/RID/2018/19. 578 respondents participated in the research process; type of sample selection: quota sampling by gender, age and education. Research tool built to obtain primary data: questionnaire questions, CAWI. The CAWI survey questionnaire consisted of 22 questions, of which 9 questions included the personal details. The questions in CAWI

made it possible to verify the assumptions underlying the issues addressed in this paper. They confirmed the general assessment of consumers that the remote form is beneficial, and has many advantages, including being more convenient, faster, and less expensive. The largest number of positive indications was the recognition that making transactions remotely is convenient (59.86%) and the expectations of the respondents that after the pandemic it will be possible to use remote transactions and services (62.80%). On the other hand, taking into account the convenience of making purchases remotely, the respondents confirmed that shopping online and dealing with various formal matters requires less physical effort. It was recognised that the remote form is more convenient than the traditional form. In e-commerce, it is not like in the case of traditional shopping, e.g. the need to physically walk around the store, transport purchases, reach sellers and have a direct conversation (70.07% of positive indications). In addition, it was found that shopping online or dealing with official matters takes less time, because e.g. there is no need to travel, there are fewer formalities, and there is no need to print documents. Taking into account the time factor, it was recognised that using the remote form is better because it enables, for example, faster shopping, dealing with matters, or obtaining information (62.11% of positive indications). In addition, the majority of respondents confirmed that making purchases and communicating with employees remotely requires less emotional involvement than personal contact in the traditional form (54.67% of positive indications). On the other hand, when it comes to the costs incurred in remote contact compared to the physical way of making purchases or dealing with official matters, it was also confirmed that the remote form is cheaper. It requires lower costs compared to traditional contacts (Table 3.1).

were adequate to the formulated research problem and reflected the designated objectives of the research. They also made it possible to verify the adopted research hypotheses. A seven-point Likert scale was used to reflect respondents' opinions on the statements in the survey questions. The measurement used enabled, among others, a description of respondents' perceptions and subjective, hidden variables. Scaling the questions in the developed research tool enabled the use of, among others, factor analysis in the data analysis process. The system of intercorrelated variables was transformed into a new system of independent main factors bringing new substantive content. The assessment of the properties of the measurement scales used and the items that constitute them, as well as determining how similar the items included in a given factor are to each other and whether they examine the same theoretical construct, were carried out using the Cronbach's alpha reliability analysis method. Using Cronbach's alpha method in the reliability analysis procedure, it was found that all scales were characterised by high reliability. To extrapolate the research results, the survey was commissioned to be distributed among a representative consumer panel by the international research company TGM Research, also operating in the Polish market.

Table 3.1. Factors determining contacts and making purchases remotely after pandemic restrictions

List of statements	Average	% of positive responses
Online transactions for both shopping and administrative tasks are more cost-effective, leading to lower expenses compared to traditional, in-person interactions	4.48	50.69
Online transactions for both shopping and administrative tasks are less time--consuming, exemplifying the following advantages: elimination of commuting time, reduced formalities, and the absence of document printing requirements. This contrasts with the time expenditure associated with traditional, in-person methods	4.85	62.11
Online transactions for both shopping and administrative tasks demand less physical exertion, exemplifying the following advantages: elimination of the need to navigate physical stores, transport purchases, reach out to employees, and engage in face-to-face interactions. This contrasts with the physical demands associated with traditional, in-person methods	5.11	70.07
Online transactions for both shopping and administrative tasks require less mental energy and effort, exemplifying the following advantages: reduced cognitive load associated with decision-making, comparison shopping, and preparation for in-person interactions. This contrasts with the mental demands associated with traditional, in-person methods	4.62	55.19
Online transactions for both shopping and administrative tasks demand less emotional engagement, exemplifying the following advantages: reduced potential for social anxiety, interpersonal conflict, and emotional distress associated with face-to-face interactions. This contrasts with the emotional demands associated with traditional, in-person methods	4.58	54.67

Source: own work.

In the realm of online transactions, effective communication and relationship building are crucial for fostering trust and enhancing customer engagement. Businesses operating in the e-commerce space should actively engage in social media interactions and utilise these platforms to connect with their customers. As previously discussed, the absence of direct, physical contact in online interactions significantly impacts trust levels and, consequently, relationships. Therefore, entities operating in the hypermedia space must prioritise trust-building strategies, as higher levels of trust lead to stronger and more sustainable relationships. Trust in another party is fostered when they are perceived as honest and reliable. Higher levels of trust enhance relationship durability and reduce uncertainty.

Data gathered from surveys reveal a concerning trend regarding trust levels. Despite the availability of various opinions on trust, most respondents expressed a lack of trust in others. Only 36.68% of participants agreed with the statement "people are generally honest." Over half of the respondents (54.84%) stated that "it is safer not to trust than to trust people." Conversely, the highest percentage of positive responses (73.36%) was associated with the statement "only some people can be relied on." This low level of trust in others is a cause

for concern. However, it is noteworthy that while the survey data indicates a general aversion to trust, the statement "dishonesty usually pays off in life" received the lowest percentage of positive responses (28.03%).

In conclusion, maintaining high levels of trust among entities engaging in remote transactions is essential for building strong relationships in the e-commerce domain. Low levels of trust can hinder effective communication, collaboration, and overall business success. Therefore, fostering trust should be a central focus for businesses operating in the online marketplace.

3.5. Conclusion

The COVID-19 pandemic served as an exogenous shock that significantly accelerated the development of digital technologies, strengthening modern forms of remote communication and e-commerce. E-commerce has emerged as a crucial digital trend that businesses must embrace both now and in the future. Internet technology empowers firms and customers to interact on a global scale. For consumers, e-commerce offers the advantage of seamless interaction and transaction execution without temporal or spatial constraints. It represents the most advantageous form of commerce, particularly when targeting the fully digitalised Generations Y and Z.

As discussed in this work, the pandemic profoundly impacted consumer behaviours, leading to an expansion of online activities and a surge in online shopping. However, trust remains a critical factor in online interactions and transactions. Despite the benefits experienced during the pandemic, trust levels have not increased and remain relatively low. This widespread lack of trust poses a significant challenge to building relationships among online entities. When there is a lack of trust or a low level of trust, it is difficult to build any relationships between the parties. In e-commerce, this is a big problem because in the virtual market, trust is a factor influencing the relationship between e-customers and companies affects consumer decisions. Trust is considered an essential element to achieve business success. Therefore, online companies should regularly take various actions that influence a good level of trust. They should plan appropriate customer relationship management processes, including the process of selecting a customer, acquiring, retaining and developing the relationship with the customer. Companies need to focus on these activities because, as noted in this chapter, the durability of relationships built in virtual space and via the Internet is not high. As modern technologies have enabled companies to expand their customer base, customer concerns about the misuse of their data have increased. In order for customers to feel safe and to build relationships with them, compa-

nies should protect the acquired data by applying regulations, privacy rules and authentication systems.

During the pandemic, most consumers recognised the numerous advantages of remote communication and transaction execution, readily accepting this mode of interaction. The verified benefits of online transactions have led to a continued preference for this method even after the pandemic. This is supported by data from the conducted surveys. In summary, the positive experiences and perceptions of online transactions during the pandemic have significantly contributed to the current market trend where online transactions are the preferred form of commerce for many consumers across generations. This is satisfactory for companies operating online. However, for these companies, it is necessary to attract plenty of customers and to stay in contact with them for as long as possible. This will be possible when e-customers are convinced that, among others, online shopping is safe and e-commerce sites are trustworthy. In the future, companies should focus on ongoing research and obtaining reliable data regarding, among others, the preferences of e-customers from different generations, assessment of the safety of online shopping and important factors that determine the level of trust in e-commerce activities.

References

Altman, S. A., & Bastian, C. R. (2020*). DHL Global Connectedness Index 2020. The State of Globalization in a Distancing World*. Retrieved from: https://www.dhl.com/content/dam/dhl/global/dhl-spotlight/documents/pdf/spotlight-g04-global-connectedness-index-2020.pdf on May 15, 2024.

CBOS. (2024). *Zaufanie społeczne*. Komunikat z badań. Retrieved from: https://cbos.pl/SPISKOM.POL/2024/K_040_24.PDF on May 7, 2024.

Czurczak, A. (2024). *Zdecydowana większość Polaków „nie ufa ludziom"*. Retrieved from: https://wydarzenia.interia.pl/kraj/news-zdecydowana-wiekszosc-polakow-nie-ufa-ludziom,nId,7455008 on May 7, 2024.

Ecommerce Europe. (2022). *European E-commerce.* Retrieved from: https://ecommerce-europe.eu/wpcontent/uploads/2022/06/CMI2022_FullVersion_LIGHT_v2.pdf on May 8, 2024.

Fasth, J., Åkerman, N., Elliot, V., & Hilmersson, M. (2022). Small and Medium-sized Enterprises Response to COVID-19: The Effect of External Openness and Procedural Management. *International Small Business Journal*, 02662426221101528. Retrieved from: https://journals.sagepub.com/doi/10.1177/02662426221101528 on May 10, 2024.

Ghuloum, M. A. A. (2024). Attributes to Construct Trust on E-Commerce: A Qualitative Study. Educational Administration. *Theory and Practice*, *30*(5), 5. https://doi.org/10.53555/kuey.v30i5.3231

GUS. (2022). *Społeczeństwo informacyjne w Polsce w 2022 r.* Retrieved from: https://stat.gov.pl/download/gfx/portalinformacyjny/pl/defaultaktualnosci/5497/2/12/1/spoleczenstwo_informacyjne_ w_polsce_w_2022_r.pdf on May 10, 2024.

ITU. (2022). *Global Connectivity Report 2022*. International Telecommunication Union. Retrieved from: https://www.itu.int/hub/publication/d-ind-global-01-2022/ on May 15, 2024.

Izba Gospodarki Ekonomicznej. (2023). *Dekada polskiego e-commerce.* Raport z badań. Retrieved from: https://eizba.pl/wpcontent/uploads/2023/02/Raport_e-Izby_Dekada_polskiego-e-commerce_2023.pdf on May 10, 2024.

Jaciow, M., & Wolny, R. (2022). *Polski e-konsument. Dekada zmian*. Helion.

Jalil, F., Yang, J., Al-Okaily, M., & Rehman, S. U. (2024). E-commerce for a Sustainable Future: Integrating Trust, Green Supply Chain Management and Online Shopping Satisfaction. *Asia Pacific Journal of Marketing and Logistics*. Advance online publication. https://doi.org/10.1108/APJML-12-2023-1188

Parlament Europejski. (2023). *Kształtowanie transformacji cyfrowej: strategia UE*. Retrieved from: https://www.europarl.europa.eu/news/pl/headlines/society/20210414STO02010/ksztaltowanie-transformacji-cyfrowej-strategia-ue on May 12, 2024.

Plichta, G. (2021). Trust as Factor of E-Commerce Development and Building Relationship in the B2C Sector in the Situation of an Exogenous Shock. In: J. Nesterak, B. Ziębicki (Eds), *Knowledge Economy Society: Business Development in Digital Economy and COVID-19 Crisis* (pp. 155–165). Instytut Nauk Ekonomicznych Polskiej Akademii Nauk.

Plichta, G. (2022). COVID-19 Pandemic and Its Impact on E-Commerce and the Interest in Handling Administrative Matters in the Electronic. In: J. Nesterak, B. Ziębicki (Eds), *Knowledge, Economy, Society: Business Challenges and Transformations in the Digital Age*. Instytut Nauk Ekonomicznych Polskiej Akademii Nauk.

Plichta, J., & Plichta, G. (2013). Znaczenie zaufania w handlu elektronicznym – perspektywa instytucjonalna. *Psychologia Ekonomiczna*, 3.

Plichta, J., & Plichta, G. (2023). Artificial Intelligence as a Factor in Reducing Transaction Costs in the Virtual Space. In: M. Sołtysik, M. Gawłowska, B. Sniezynski, A. Gunia (Eds), *Artificial Intelligence, Management and Trust*. Routledge.

Plichta, J., Sagan, A., & Plichta, G. (2022). *Szoki egzogeniczne a kształtowanie relacji na rynku B2C z perspektywy struktury wartości konsumentów.* Attyka.

Remes, J., Manyika, J., Smit, S., Kohli, S., Fabius, V., Dixon-Fyle, S., & Nakaliuzhnyi, A. (2021). *The Consumer Demand Recovery and Lasting Effects of COVID*-19. Report. McKinsey Global Institute.

Sagan, A. (Ed.). (2011). *Wartość dla klienta w układach rynkowych*. Wydawnictwo Uniwersytetu Ekonomicznego w Krakowie.

Sagan, A., & Plichta, G. (2016). Zaufanie a wartości osobowe konsumentów w świetle logiki dominacji usługowej S-D Logic. *Zeszyty Naukowe Politechniki Śląskiej. Organizacja i Zarządzanie*, 97.

Sagan, A., Plichta, J., & Plichta, G. (2021). The Impact of the COVID-19 Pandemic on Relations in B2C Markets from the Point of View of Selected Buyer Characteristics. In: K. S. Soliman (Ed.), *Proceedings of the 38th International Business Information Man-*

agement Association (IBIMA), *23–24 November 2021*, *Seville*, *Spain*. International Business Information Management Association.

Statista. (2024). *Digital Commerce – Worldwide*. Retrieved from: https://statista.com/outlook/dmo/fintech/digital-payments/digital-commerce/worldwide on June 30, 2024.

Strategy&. (2022). *Perspektywy rozwoju rynku e-commerce w Polsce 2018–2027*. Retrieved from: https://www.pwc.pl/pl/pdf-nf/2022/Raport_Strategyand_Perspektywy_rozwoju_rynku_e-commerce_w_Polsce_2018-2027.pdf on May 16, 2024.

Szczukocka, A. (2022). Wpływ pandemii na rozwój handlu elektronicznego. *Acta Universitatis Lodziensis. Folia Oeconomica*, 2

Yusuf, A., Gaffar, V., Hurriyati, R., & Wibowo, L. A. (2023). E-Trust in E-Commerce: A Systematic Literature Review. In: *Proceedings of the 3rd Borobudur International Symposium on Humanities and Social Science 2021* (*BIS-HSS 2021*). https://doi.org/10.2991/978-2-494069-49-7_105

Chapter 4

The Impact of the Business Analyst on Business Organisations

Marta Krajewska-Beentjes, Ilona Staszewska-Daca,
Krzysztof Borodako, Piotr Sedlak

4.1. Introduction

In today's business world of transformation and optimisation of business operations, the Business Analyst (BA) plays a leading role (Gobov, Kunanets & Oliinyk, 2020), as increasing complexity of business processes and fast paced technological advances have exponentially increased the need for professional BAs (Kosarenko, 2019). Moreover, discipline of business analysis and the role of the BA are not only growing in importance but are at a critical stage in its development (Paul & Cadle, 2020). One of the reasons behind it is that modern BAs are equipped with new skills and are able to address organisational weaknesses by analysing them and recommending workable solutions (Wijetunge, 2021). Nevertheless, the role of the BA remains unheard-of to the general public and obscure to many professionals and organisations despite being one of the most in-demand roles in the past few years (White, 2018).

According to the International Institute of Business Analysis (IIBA®), a BA could be any person who performs business analysis activities within an organisation regardless of whether the job title and business analysis are defined as the practice of enabling change by identifying needs and recommending solutions that deliver value to stakeholders or not (IIBA®, n.d.). The BA plays a critical role in analysing and synthesising information received from a large number of stakeholders in order to deliver solutions that meet their needs (IIBA®, 2015; Wyskwarski, 2020). The BA importance in organisations is proved (Doucek, Maryska & Nedomova, 2013), as on the one hand BA connects the business, design, and IT teams (Shah, 2017) and on the other is indispensable for strategic planning and facilitates cooperation among stakeholders (Vongsavanh & Campbell, 2008; Iberaheem, 2023). However, the nature of the BA role depends upon

whether an individual BA is based within a business or a technology unit within an organisation (Vashist, McKay & Marshall, 2010).

The primary objective of this chapter is to attempt to determine the impact of the BA on the business organisation. The structure of the paper is as follows: after a brief literature review, the research method and design of the study are outlined. This is followed by the key results of the analysis of the empirical data collected from BAs. In the last section, the main findings and research limitations are discussed.

4.2. Research Methodology

4.2.1. Research Approach

The qualitative research methods were employed to examine the role of the BA, gain understanding regarding the challenges BAs face and make predictions about the future of the profession.

The study was based on the premise that a BA is someone who performs business analysis activities, no matter the job title. For research purposes, a "BA group" was constituted out of 16 BA professionals who came from different organisations and performed business analysis activities for the past five years (Table 4.1). A two-stage approach was implemented to gather data from professional BAs.

Table 4.1. Years of experience and job titles held by professionals with BA responsibilities

No.	Identifier	Experience[a]	Other titles
1	BA1	20/10	IT Project Manager, Quality Officer, Process Expert, Software Developer, Software Engineer
2	BA2	6/2	Business Development Manager, Implementation Analyst, New Business Specialist
3	BA3	13/2	Systems Development Coordinator, Senior Customer Service Specialist
4	BA4	16/4	Implementation Specialist, Specialist for IT Support and Business Processes
5	BA5	15/1	Associate Business Information Analyst, Product Management Consultant, Business Intelligence Consultant
6	BA6	11/2	Web Developer
7	BA7	15/3	Project Manager
8	BA8	20/15	Consultant, Project Manager
9	BA9	18/8	Quality Engineer, Product Owner, Project Manager, Programmer
10	BA10	12/6	Technical Product Owner, Lead Business Analyst / Delivery Manager, Senior Business Analyst, IT Business Analyst, Business/Data Analyst, IT Risk Management Consultant
11	BA11	19/8	Systems and Business Analyst, IT Analyst, IT Solution Architect, Systems Administrator

Table 4.1 cnt'd

No.	Identifier	Experience[a]	Other titles
12	BA12	22/4	Product Owner, Enterprise Product Manager, IT Manager, System Engineer
13	BA13	8/1.5	Finance and Accounting Process Specialist, Senior Administrator
14	BA14	18/11	BI Product Owner, Business Solution Architect, Programmer
15	BA15	15/3	Advanced Analytics Manager, Credit Analytics Lead, Senior Risk Analyst
16	BA16	10/2	Analyst/Designer, Database Programmer, Programmer

[a] Total years of work experience / work experience in the BA role.

Source: own work.

4.2.2. Survey

To gain understanding about the BA's professional background and the role they play as BAs within their organisations as well as to determine a direction for the interviews, an online survey was conducted. The survey comprised 14 questions that were rather basic in nature and combined closed-ended, open-ended, multiple choice, and rating scale questions.

4.2.3. Semi-structured Interview

Semi-structured interviews were conducted using a pre-written interview script. The interview questions were formulated to reflect the results of the survey as well as the overall goal of the study. During the interview, follow-up questions were asked to address emerging topics, discuss BA work experience or in reference to answers provided in the survey. In total, 16 online interviews were performed by using MS Teams when the data saturation threshold was reached.

In compliance with the General Data Protection Regulation (GDPR), the Bas' answers were anonymised. Furthermore, to ensure the confidentiality of the findings, each BA received a unique identified from BA1 to BA16.

The video recordings, transcripts and observation notes were collected through the interviews and structured using Excel files and Word documents. No dedicated software was used for data analysis due to the relatively small population of 16 BAs.

4.3. Key Results

4.3.1. Business Analyst Impact on Business

To fully understand the specificity of the BAs role, the authors took into consideration the impact of the BAs on "the business." Specifically, aspects such as the strength of BA's role in the organisation and their impact on decisions

and strategies. The ratings of a direct BA impact on the business (Figure 4.1) were based on the subjective perception of a particular BA. The research showed a dependency between the BA's responsibilities, the projects in which they are involved, and the strength of their position within the company.

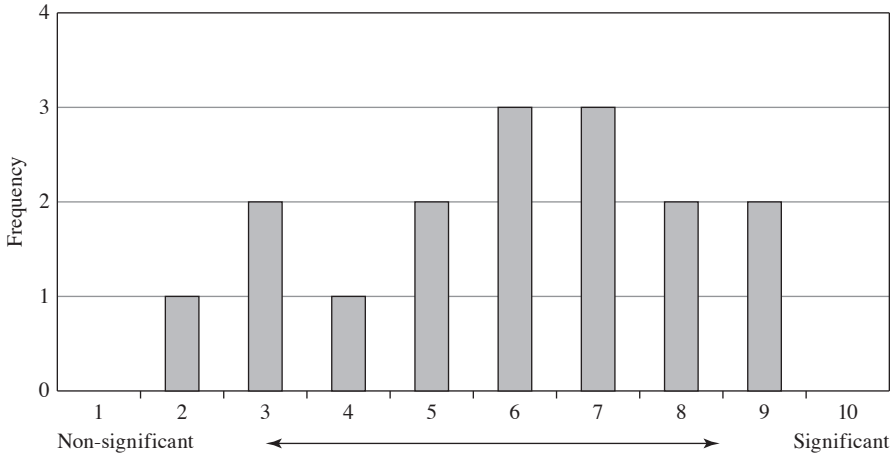

Figure 4.1. Business Analyst impact on business
Source: own elaboration on the basis of pre-screening survey data ($N = 16$).

4.3.2. High Impact on Business

The interviews with BAs who indicated the highest impact on business (impact = 8–10) helped to understand how effectively the organisations can implement BA's work. These organisations are aware that having a BA ensures that higher management and senior-level business stakeholders will make the right decisions, as they recognise that choosing the best available option at the time would need taking into account the BA. BA9 said, "The craftsmanship of the BA, this certain way of thinking translates into designing the best possible solution." The BAs make important decisions on how the product or system will be shaped. BA16 said, "BA brings real value, (…) voice on how the system will look like, how the process will be implemented, so as a BA you can make a change." Another BA who rated his impact on business as very strong, 9 on a scale of 10, justified it in the following way, "I gave it such a high rating because of the work we do as BAs, as we engage with the business users. We define what is going to be built and therefore our output is really strong," BA8 explained. Because of this, it is easier to forecast the long-term effects of any organisation's actions and the potential risks the business may choose to take. BA10 said, "You need to tell the development team what they need to do, and you are there to solve the problems. You need to unblock the team and help them to go faster."

4.3.3. Moderate Impact on Business

By contrast, BAs who rated the strength of their position and impact on the business high or moderate (impact = 5–7), have a scope of duties precisely defined and know exactly what their tasks are. In this case, they do not face a situation in which their role is misunderstood by colleagues. Their opinion is considered when making strategic decisions in the company and they have a direct impact on decisions made by stakeholders situated higher in the company's hierarchy. BAs have a significant impact on products, services and projects. Correspondingly, these BAs are the originators of the new ideas for implementation. Specific and defined responsibilities are an indispensable element of mature organisations in which structure is clearly outlined. In such organisations, the BAs are visible and their accountability is high. Each BA has an appropriate job title and a job description that covers at least the main tasks for which the BA is responsible. The employer knows exactly that having a BA in the team brings tangible results and appreciates BA's work. Other employees take the opinion of BA and this role is taken seriously. According to BA14, "The BA should participate in the implementation of new ideas, new functionalities, new processes (…) in order to be already at the design stage and come up with a certain concept of how we want to implement it. And here is the big role of the BA."

4.3.4. Low Impact on Business

The BAs who assessed their position weakest (impact < 5) were the ones whose scope of duties often overlapped with other roles and whose positions were not clearly defined. Such BAs often said that they felt that their opinion was not taken into account when making important decisions. Rather, they are in a position to carry out specific duties which are often not consulted with them. The BAs stressed that they were perceived as "only Business Analysts," so they do not have much influence on the generally understood "business." BA5 said, "Even though I suggest something or raise something, they might not give you credit, because I'm only a Business Analyst (…) I think I'm really down in the hierarchy. (…) The BAs are rather executors. (…) I still feel that I'm far away from having an impact on a deep level." BA10 said, "I think that sometimes people don't feel the weight of the BA's responsibility. How much responsibility the BA has. And I feel that this is sad because it hurts everybody in the project." BA2, who rated BA impact on business as very low (2 out of 10) explained it in the following way, "The impact of the BA is quite low in my current organisation (…) because of complex processes and the fairly extensive structure path to reach decision-makers." Moreover, BA2 made one more interesting observation, as in her view "in a healthy organisation, the indicator of BA impact should be sig-

nificant. When it is low, I immediately think that something is not quite right internally. Maybe the Business Analyst faces barriers he cannot overcome on his own or the processes are convoluted."

4.3.5. Factors Affecting BAs Impact

Based on the research, multiple factors that potentially could affect BAs impact on the business organisation have been identified and grouped into three categories:

1) proximity of the BA's work to the profit or main interest of a given organisation,

2) strong functional organisational structure,

3) stance of the senior management on the BA role.

BAs having all three elements in their work, have the greatest impact on business (Figure 4.2).

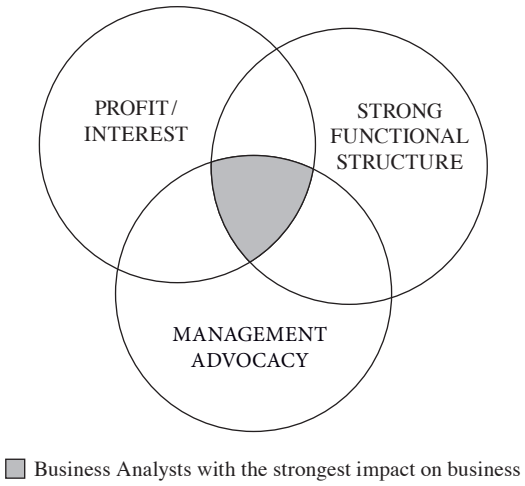

Figure 4.2. Key elements affecting the impact of Business Analyst on business
Source: own elaboration on the basis of interview data ($N = 16$).

Proximity of the BA's Work to the Profit

The research results suggest that there is a direct correlation between the profit of the organisation and the role of the BA. The interviews with BAs revealed that one of the key elements influencing BA's dominant position and business impact is their proximity to the organisation's financial gain and the main interest of the organisation related to its goal or mission. As one of the BA's (BA10) put it, "The further the BA role is from profit the more messed up this role is." BA2 explained, "If you work as a BA on the system that brings

money to the company, then your impact is really high. Let's say that the system breaks down and the clients cannot do anything. It will translate directly into losses and hurt the business." Therefore, BAs who work on the "money making" systems or the ones who have direct contact with the customer are characterised by a strong position in the company. BA16 said, "May not be directly added value for profit but it is one of the variants that can pay off, for example, by choosing our system, and not the competitive one. Yes, so I would say it goes more in this direction." In case of the non-profit organisations (NGOs) or governmental institutions, the BAs who worked there stressed the importance of the optimisation efforts that led to changes in operations and directly translated into internal monetary gains due to cost savings and other efficiencies. As such organisations exist to address a social cause or a political issue, the BAs impact on business is related to the objectives for which the organisation exists. These BAs take decisions on important aspects of implementing new systems, manage the activities of entire teams, and are responsible for the management of the business requirements of various groups of key stakeholders. BA12 said, "The BA impacts not only the project or programme but the organisation as a whole. But generally, I always try to be practical and have as much of a positive impact on the project and also the team as I can." The BAs who work in NGOs considered themselves to be an essential part of the organisation's activities. According to the Senior BA who works in an NGO, the goals of the organisation shape the role of the BA. BA12 said, "The non-profit organisation is completely different from the commercial sector. They work in different markets and have different objectives." The interviewed BAs who work in non-governmental, international organisations can also be characterised by a strong position and therefore a strong influence on the business due to their ties to the most significant and visible projects. They have a strong impact on the decisions made and the direction of key projects. Interestingly, one of the interviewed BAs separated the impact on business into two categories – a general impact on the organisation and the impact on the project or developed product. BA1 justified it as follows "Within the scope of the application, my impact is very big, as I define what the application does. But as a company as a whole, it depends. From the company perspective, if it is not a top, core application then my impact is much smaller but I could still have some influence."

Functional Organisational Structure

The research suggests that organisational design and structure play a role in BA's impact and visibility. The BAs who work in highly structured functional organisations with clear authorities, functions, and responsibilities know what falls within the scope of their role. In such organisations, the BAs need to adhere

to policies, processes, and plans when performing their BA role. Furthermore, it was found that there is a difference in the impact on business between external BAs hired by a business organisation and the BAs already working within the same organisation. BAs who collaborate with external clients have a more specific scope of work. Their time is money, so it must be put to good use. Their work structure is defined, with more specific and precise tasks, but at the same time also adapted to the needs of the client. Possibly, that is why the BAs hired for consultancy could have greater authority compared to internal experts. Interestingly, several people from the BA group pointed out "an Outsider BA" is seen as a better expert and is perceived by employees to be more competent than an internally employed BA. As BA14 put it, "An external BA has more authority, everyone wants to hear what this person has to say, see what he has to offer." This exceptional status makes external BAs feel secure in their position and willing to share even less popular or unconventional opinions. Additionally, external BAs have a good understanding of what and how the client's competitors operate. They use this knowledge and know-how to coach clients, implement changes, and even directly impact the company's strategy. BA14 revealed that an external BA might have a significant influence on the business by telling customers directly "You will do it like this, because XYZ company does it." It is rather difficult for organisations to disagree with such arguments.

Stance of the Senior Management on BA Role

Along with all the factors mentioned above, it also turned out that the strength of a particular BA could be influenced by the grit of their supervisors. The BAs whose line managers had a strong position, were encouraged to act. Moreover, the BAs supervisors rated BA's role in the organisation as valuable and of great significance. Some of the interviewees said that whenever there was a strong BAs team led by the manager or a BAs Team Leader, and this person was promoting the BAs internally, the impact of the BA was greater. BA8 said, "I had a really strong and very methodical Team Leader, (…) a promoter of us – the BAs." When BAs felt supported by management, they became more confident and did not hesitate to express less popular opinions or ask tough questions. As a result, the BA role in such organisations has gained respect and evolved into a high-ranking role. Moreover, their analytical work and opinions are considered by business and technology experts. This clearly demonstrated that in order to have a substantial impact as a BA, there needs to be outspoken advocacy from the middle and senior management. BA8 said, "Promoting, advocating, lobbying for the BA is sort of the role of the BAs Leader." As they need to show that the BA significantly contributes to the organisation's success. BA8 explained, "It is very important that not only your immediate supervisor appreciates your

work, but your senior management needs to really appreciate that as well. These people have a role to play. If your big boss at director level tends to undermine it, and maybe do something else or not involve the BA, then people will do the same." BA8 continued, "Director level should make BAs work more visible. If BA is more visible, BA is also more impactful."

4.4. Conclusion

The study's findings show that BAs had varied degrees of impact on business in different organisations. The research demonstrated that the proximity to the profit of the "money making" organisations influence the BA position and the impact on business. In contrast, for non-profit organisations, the impact of BA on business is related to the purpose for which the organisation exists. In these organisations, the BAs led business process improvement efforts that translated into internal efficiencies and cost savings. We observed a direct correlation between the BAs impact on business and the strength of their position within the organisation and that organisational attitude is a key factor in enabling the use and contribution of Business Analyst (Paul & Tan, 2015).

The BAs who assessed their impact on business as significant were seen as an indispensable and integral part of each team's composition and a guarantee for delivering a project or product that meets customer needs. In contrast, the BAs who perceived their position as a rather weak one, emphasised lack of clarity in the BA's scope of work or the multiple overlaps with other roles, resulting in a low influence on the project work and organisation as a whole. Additionally, our study suggests that BA seniority might be another factor influencing BA's impact on business.

The interviewed Senior BAs were mostly assigned to high-profile, complex projects and had greater responsibilities related to strategic analysis. The research suggests that Senior BAs supported higher management in reaching the best possible results. They were also involved in the business process changes or strategic initiatives, that were distinct from dealing mainly with the IT systems.

In summary, the following connections were observed:

- the more mature and formally structured the organisation, the clearer the BA role to other employees,
- the higher proximity to profit or main interest of the organisation, the greater impact of the BA on business,
- the greater the internal advocacy and support from senior management for the BA role, the greater the visibility and understanding of the BA within the organisation,

- the more recognised the role within the organisation, the greater the value added of the BA.

An impactful BA considers various business possibilities and threats to close the gap between the understanding of the business needs and how technology can provide a solution (Vice, 2022). Moreover, a dedicated BA sets projects up for success by creating value and positive change for the organisation (Brandenburg, 2015).

Some of the limitations of the conducted research are worth noting. The above research is based on one country's data as well as presents the significant simplification of the research framework. This allows it to reflect the main attributes of the Business Analysts in organisations and may lead to additional in-depth research. Rooted in the grounded theory, the authors are also conscious of the constraints caused by the empirical material's single origin. Without a doubt, broadening this material to include industry journals, corporate data, market statistics, and so forth might provide a more complete picture of professional BAs' activities and their impact on business. These limitations could be used to guide future research on the topic of business analysis.

References

Brandenburg, L. (2015). *What Is a Business Analyst?* Retrieved from: https://www.bridging-the-gap.com/business-analyst-role/ on March 24, 2023.

Doucek, P., Maryska, M., & Nedomova, L. (2013). Development of Requirements on the Role Business Analyst. In: S. Wrycza (Ed.), *Information Systems: Development, Learning, Security. SIGSAND/PLAIS 2013. Lecture Notes in Business Information Processing, Vol. 161* (pp. 17–26). Springer.

Gobov, D., Kunanets, N., & Oliinyk, Y. (2020). *Approaches for the Concept "Business Analysis" Definition in IT Projects and Frameworks*. CEUR Workshop Proceedings (9th International Conference "Information Control Systems & Technologies" (ICST 2020), Odessa, Ukraine, September 24–26, 2020).

Iberaheem, M. (2023). The Role of Business Analysis in Strategic Planning: Discuss How Business Analysis Contributes to the Strategic Planning Process in Businesses. *East Asian Journal of Multidisciplinary Research*, *2*(7), 2709–2730.

IIBA®. (n.d.). Home page; a professional association dedicated to supporting business analysis professionals. International Institute of Business Analysis™. Retrieved from: https://www.iiba.org/ on March 24, 2023.

IIBA®. (2015). *A Guide to Business Analysis Body of Knowledge® (BABOK® Guide)* (3rd ed.). International Institute of Business Analysis™.

Kosarenko, Y. (2019). *Business Analyst: A Profession and a Mindset*. Kosarenko.

Paul, D., & Cadle, J. (2020). *Business Analysis* (4th ed.). British Computer Society Learning and Development.

Paul, D., & Tan, Y. L. (2015). *An Investigation of the Role of Business Analysts in IS Development* (ECIS 2015 Completed Research Papers. Paper 142).

Shah, M. (2017). Evolving Role of a Business Analyst. *International Journal of Business and Management*, *1*(2), 7–12.

Vashist, R., McKay, J., & Marshall, P. (2010). *The Roles and Practices of Business Analysts: A Boundary Practice Perspective*. 21st Australasian Conference on Information Systems 2010, Brisbane.

Vice, M. (2022). *Understanding the Impactful Role of Business Analysis in an Organization*. Retrieved from: https://www.iiba.org/business-analysis-blogs/understanding-the-impactful-role-of-business-analysis-in-an-organization/ on March 30, 2023.

Vongsavanh, A., & Campbell, B. (2008). The Roles and Skill Sets of Systems vs Business Analysts. In: *ACIS 2008 Proceedings – 19th Australasian Conference on Information Systems* (pp. 1059–1068).

White, M. F. (2018). *Defining Your Role as a Business Analyst*. Modern Analyst Portal. Retrieved from: https://www.modernanalyst.com/Resources/Articles/tabid/115/ID/5121/Defining-your-role-as-a-Business-Analyst.aspx on March 25, 2023.

Wijetunge, R. (2021). *International Perspective. Trends in Business Analysis in Sri Lanka*. IIBA Sri Lanka. Retrieved from: https://www.iiba.org/business-analysis-blogs/trends-in-business-analysis--2021-and-beyond/ on March 3, 2023.

Wyskwarski, M. (2020). An Attempt to Determine the Scope of Duties of the Business Analyst – Application of Text Mining Analysis. *Scientific Papers of Silesian University of Technology. Organization and Management Series*, 148.

Chapter 5

The Importance and State of Resources and Competencies in the Field of Finance. A Comparison between Dairy Cooperatives from Świętokrzyskie and Małopolskie Voivodeships*

Izabela Konieczna

5.1. Introduction

Financial management involves using emerging opportunities to obtain sources of financing for the company's activities (capital), as well as placing them in assets so that they help achieve the company's strategic goals and maximise the benefits obtained by individual owners (shareholders) of the company (Bień, 2016, p. 14). That can be achieved only when the company has appropriate resources and competencies. It is why resources and competencies in the sphere of finance are absolutely crucial for the proper functioning of the company. Every company should be aware of the possession of significant resources and competencies and should be ready to make changes, sometimes quite big to let the company to survive and to compete in the turbulent environment. Hence, the aim of the research is to analyse the importance and the state of financial resources and competencies of selected dairy cooperatives from Świętokrzyskie and Małopolskie Voivodeships in comparison to their competitors.

To achieve the goal, research questions and hypotheses were formulated.

- RQ1: Are cooperatives aware of the importance and the state of resources and competencies in the field of finance in comparison with competition?
- RQ2: Is there any difference in assessing the importance of indicated resources and competencies in the field of finance between cooperatives from two neighbouring voivodeships, namely Świętokrzyskie and Małopolskie.

* The publication was financed by the Jan Kochanowski University in Kielce.

- RQ3: What is the strategic potential in the field of finance of dairy cooperatives claimed to be in comparison to the competition?
- H1: Cooperatives are aware of the importance and the state of resources and competencies in the field of finance in comparison with competition.
- H2: There is no difference in assessing the importance of indicated resources and competencies in the field of finance between cooperatives from two neighbouring voivodeships, namely Świętokrzyskie and Małopolskie.
- H3: Cooperatives' strategic potential in the field of finance is claimed to be better than that of their competitors.

In order to achieve the goals, answer research questions and respond to the hypotheses, an analysis was carried out based on the results of direct interviews conducted with the help of the questionnaire.

The organisation of this chapter is as follows. In the next section, selected financial resources/competencies are described. In Section 3 are presented research results of the importance and state of resources and competencies in the field of finance of selected dairy cooperatives from Świętokrzyskie and Małopolskie Voivodeships. Section 4 contains a summary and reference to the hypotheses.

5.2. The Issue of Financial Resources/Competencies Management

Effective financial management allows an organisation to make the most of its money to further its mission and is essential to the survival and growth of any business (Sitinjak *et al.*, 2023, pp. 160, 161). To do so, very crucial are the resources and competencies such as (Stankiewicz, 2002, pp. 121–122):

1. Financial potential. It reflects potential investment opportunities and financial indicators such as profitability, liquidity, and solvency. The competitiveness of this type of potential is reflected in the sustainable solvency of the business as well as in having enough working capital thanks to clear calculation, so it can be used reasonably and effectively in business activities (Zherlitsyn *et al.*, 2019, p. 214). The organisational and management approach in this case is based on the following features defining the financial potential of the enterprise: organisation of the use of financial resources; the set of resources and the effectiveness of their management; managing the company's financial capabilities (Zabediuk, 2022, p. 178).

2. The share of technical cost of manufacturing in total cost, the level of total unit costs, the level of fixed unit costs, the level of labour unit costs. One of the ways to obtain optimal profits is to conduct sales activities and reduce costs. Sales play an important role in providing revenue to a company. However,

at the same time, the company incurs costs related to production. The company must calculate them because high production costs will affect sales and profits (Suzan & Nabilah, 2020, p. 169). Therefore, cost management is an important tool for increasing the competitive potential of the company, as management must take into account and collect detailed information on costs incurred, as well as limit unnecessary expenses in order to reduce production costs (Ditkaew, 2018, p. 60). That is why companies need to count the share of technical cost of manufacturing in total cost, the level of total unit costs, the level of fixed unit costs, and the level of labour unit costs. Cost management is very important and management must pay attention to it to obtain accurate cost information that can be used in effective governance, decision-making and internal control to achieve high goals (Ditkaew, 2018, p. 60).

3. Equity financing. This kind of financing means exchanging part of the ownership of a business for a financial investment in the business. Equity financing can be a very attractive option for financing growth when a company is not yet generating positive cash flow from operations (Zickefoose, 2014, p. 1). Equity financing is considered less risky than debt financing because the company does not have to repay shareholders. Investors often focus on the long term and do not expect an immediate return on their investment. Equity financing allows businesses to reinvest operating cash flow into business growth instead of focusing on debt repayment and interest (CFI, n.d.). The ability to retain capital and reinvest it in the business instead of paying it back to lenders on a set schedule allows business owners to invest in infrastructure or intellectual property (Zickefoose, 2014, p. 1).

4. Access to external financing sources. Many businesses do not have enough capital to operate, so they choose to borrow from personal sources such as family and friends, as is the case with small and medium-sized enterprises, or from non-personal sources such as banks and other financial institutions, as is the case with large companies (Omoshagba & Zubairu, 2018, p. 35). Access to debt financing is a means for businesses to obtain capital, in the form of loans, from lending institutions and then commit to repay the debt on time and at a certain interest rate. This form of financing is most commonly used by businesses to obtain investment capital and finance new business projects (Badi & Ishengoma, 2021, p. 245).

5. Possibilities of the debt collection. A company's liquidity depends on its ability to make sales and collect existing debts for goods sold and services provided (Sokołowska & Wiśniewski, 2015, p. 144). The debt collection process is a set of procedures used to recover outstanding debts from debtors (Łada & Wejer-Kudełko, 2018). Collection efficiency plays an important role in determining

liquidity (Sokołowska & Wiśniewski, 2015, p. 144) and, as a consequence, the company's survival on the market and development.

6. Abilities in planning the revenues and costs. A good understanding of the behaviour of costs and revenues is essential for decision-makers to understand the relationship between a company's revenues, costs, and profits (Dabor, Otalor & Erah, 2013, p. 68). Cost data is extremely crucial for planning, command, and control. It is vital to understand recording and calculating systems that are accurate, dependable, and relevant to users' business decision-making, such as price setting, cost-volume-profit analysis, break-even analysis, and so on. It is also related to effectively regulating costs and expenses in order to maximise business profits (Ditkaew, 2018, p. 62).

7. Applied systems of managerial accounting. Management accounting as a management tool for enterprise activity combines almost all management functions: accounting, planning, coordination, control, analysis and decision-making (Shurpenkova & Sarahman, 2021, p. 54). This system monitors the efficiency of internal operational and associated duties, as well as the organisations' performance in a competitive context (Pedroso, Gomes & Yasin, 2020). The process of budgeting and strategic planning is shaped by management accounting. Managers on this basis can set objectives, assign resources, and develop realistic budgets that align with the long-term strategy of the company by examining financial data.

8. The knowledge and abilities of financial and accounting services. The accounting profession in organisations has gained significant importance as it is responsible for proper care and management of finances (Palacio-Fierro *et al.*, 2023, p. 225). One of the tasks of accounting and finance is to provide managers with relevant data that helps them plan and control activities (Dabor, Otalor & Erah, 2013, p. 69). Only appropriate knowledge and skills of accountants and financiers allow obtaining reliable data that is the basis for making management decisions by managers. Financial data compiled by accountants and financiers serves them as a source of information and influences management decisions (Bagieńska, 2016, p. 55).

5.3. The Importance and State of Resources and Competencies in the Field of Finance – the Research Results

The study was conducted among dairy cooperative managers, who were asked to assess the importance and state of their financial resources and competencies in comparison to their competitors. The research was conducted on a sample of 7 out of 17 dairy cooperatives from the Świętokrzyskie and Małopolskie

Voivodeships, representing 41% of the cooperatives in operation during the year of the study. A structured interview questionnaire was employed, with carefully selected questions in terms of number, content, form, and order.

Tables 5.1 and 5.2, as well as Figures 5.1 and 5.2, were created based on the interview results.

Table 5.1. The assessment of the validity of resources/competencies of dairy cooperatives in the field of finance

Resources/competencies of cooperatives in the field of finance	Cooperatives from Świętokrzyskie Voivodeship	Cooperatives from Małopolskie Voivodeship	Mean
Financial potential of the company	5.00	5.00	5.00
The share of technical cost of manufacturing in total cost	4.67	4.50	4.59
The level of total unit costs	4.33	4.00	4.17
The level of fixed unit costs	4.33	3.75	4.04
The level of labour unit costs	3.33	4.00	3.67
The possibility of financing development from equity	4.67	4.00	4.34
Access to external financing sources	4.00	3.50	3.75
Possibilities of debt collection	4.00	4.00	4.00
Abilities in planning revenues and costs	4.00	3.50	3.75
Applied systems of managerial accounting	4.33	4.00	4.17
The knowledge and abilities of financial and accounting services	3.67	4.00	3.84
Mean	4.21	4.02	–

Rating scale: 5 – extremely important, 4 – very important, 3 – quite important, 2 – moderately important, and 1 – completely unimportant.

Source: own work and (Konieczna, 2013, p. 401).

Taking into account the assessment of the validity of resources/competencies of dairy cooperatives in the field of finance (Table 5.1 and Figure 5.1) it is seen that:

- Extremely important for cooperatives from both voivodeships are the financial potential of the company (mean – 5.0) as well as the share of technical cost of manufacturing in total cost. In the case of the second kind of resources, there is a little bit of difference in assessment of cooperatives as the mean of the validity in case of cooperatives from Świętokrzyskie Voivodeship is 4.67 and the mean of cooperatives from Małopolskie Voivodeship is 4.50. For cooperatives from Świętokrzyskie Voivodeship extremely important is also the possibility of financing the development from equity (mean – 4.67) while for cooperatives from Małopolskie Voivodeship it is very important.

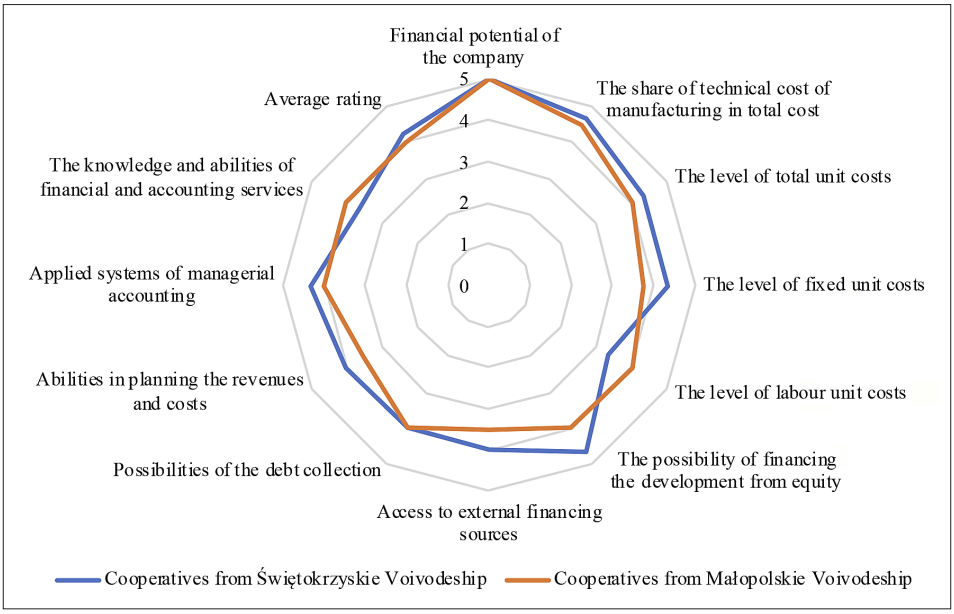

Figure 5.1. The assessment of the validity of resources/competencies of dairy cooperatives in the field of finance

Rating scale: 5 – extremely important, 4 – very important, 3 – quite important, 2 – moderately important, and 1 – completely unimportant.

Source: own work.

- Very important are most of indicated resources and competencies. The level of total unit costs, and applied systems of managerial accounting (mean – 4.17) are assessed higher by cooperatives from Świętokrzyskie Voivodeship. In the case of the level of fixed unit costs (mean – 4.04), access to external financing sources, and abilities in planning the revenues and costs (mean – 3.75) the situation is the same because of the fact that cooperatives from Świętokrzyskie Voivodeship assessed these kinds of resources higher than cooperatives from Małopolskie Voivodeship. Other situation is in case of the knowledge and abilities of financial and accounting service (mean – 3.84) because cooperatives from Małopolskie Voivodeship assess these competencies higher than cooperatives from Świętokrzyskie Voivodeship. Cooperatives form both voivodeships are in agreement about the possibilities of the debt collection. The mean in this case is 4.0.
- The lowest is assessed the level of labour unit costs (mean – 3.67). However, there is a difference in assessment between cooperatives from both voivodeships. For cooperatives from Małopolskie Voivodeship it is very important but for cooperatives from Świętokrzyskie Voivodeship it is quite important.

Table 5.2. The assessment of the state of resources/competencies of dairy cooperatives in the field of finance in comparison to competition

Resources/competencies of cooperatives in the field of finance	Cooperatives from Świętokrzyskie Voivodeship	Cooperatives from Małopolskie Voivodeship
Financial potential of the company	2.00	2.25
The share of technical cost of manufacturing in total cost	2.00	2.25
The level of total unit costs	2.00	2.25
The level of fixed unit costs	2.00	2.25
The level of labour unit costs	2.00	2.00
The possibility of financing development from equity	2.00	2.00
Access to external financing sources	2.00	1.75
Possibilities of debt collection	2.00	2.00
Abilities in planning revenues and costs	2.00	1.75
Applied systems of managerial accounting	2.00	2.00
The knowledge and abilities of financial and accounting services	2.00	2.00
Mean	2.00	2.05

Rating scale: 3 – better, 2 – similar, 1 – worse state of resources/competencies in comparison to competitors.

Source: own work and (Konieczna, 2013, p. 404).

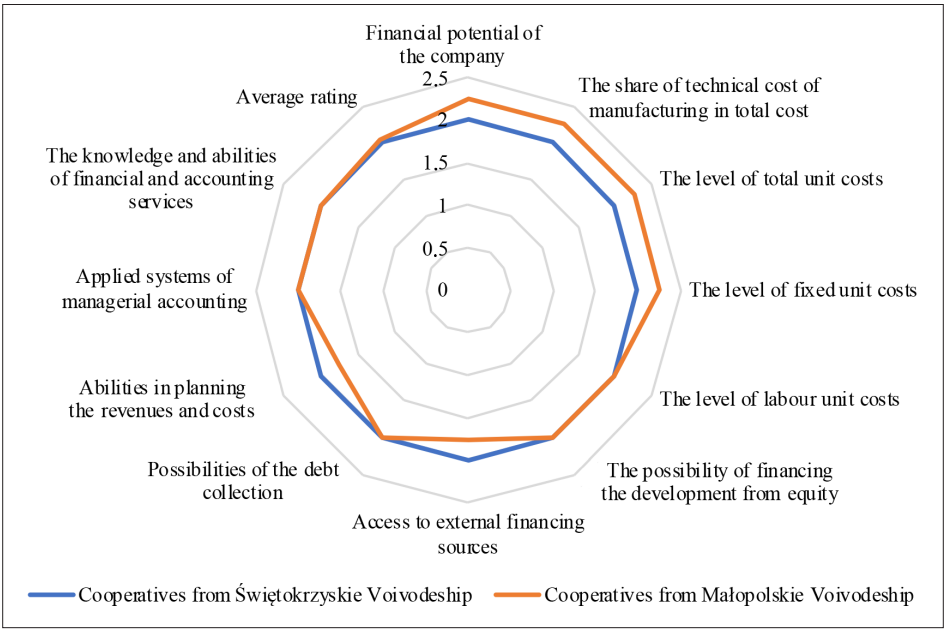

Figure 5.2. The assessment of the state of resources/competencies of dairy cooperatives in the field of finance in comparison to competition

Rating scale: 3 – better, 2 – similar, 1 – worse state of resources/competencies in comparison to competitors.

Source: own work.

While taking into account the assessment of the state of resources/competencies of dairy cooperatives in the field of finance in comparison to competition, namely the strategic potential, it is seen that cooperatives from Świętokrzyskie Voivodeship claim that the state in their case is the same as that of their competitors. In the case of cooperatives from Małopolskie Voivodeship the situation is different. There is a difference in the assessment of the state of resources/competencies. The financial potential of the company, the share of technical cost of manufacturing in total cost, the level of total unit costs, and the level of fixed unit costs are stated to be slightly better than the same for competitors. The level of labour unit costs, the possibility of financing development from equity, possibilities of debt collection, applied systems of managerial accounting, and the knowledge and abilities of financial and accounting services are the same as for the competitors. Slightly worse are: access to external financing sources, and abilities in planning revenues and costs.

5.4. Conclusion

An essential component of operating a business is overseeing the finances of the enterprise. Effective financial management reduces risk, promotes stability and business growth, and enables the efficient use of financial resources and competencies. That is why the companies should be aware of the importance of resources and competencies in the field of finance and should know how the resources and competencies compare to competitors.

Based on the analysis of the research results and taking into account the formulated questions and hypotheses, it is clear that cooperatives are aware of the importance and the state of resources and competencies in the field of finance in comparison with competition. Cooperatives' representatives assessed their entities' resources and competencies and rated each of the indicated answer options showing their importance. This way, hypothesis H1 was confirmed. By contrast to the H1, hypothesis H2 was not confirmed. There is a difference in assessing the importance of indicated resources and competencies in the field of finance between cooperatives from two neighbouring voivodeships, namely Świętokrzyskie and Małopolskie. Research results show that cooperatives from Świętokrzyskie Voivodeship assessed the importance of indicated resources and competencies a little bit higher. The mean in this case is 4.21, unlike in the case of the cooperatives from Małopolskie Voivodeship, where the mean is slightly lower standing at 4.02. Hypothesis H3 was not confirmed either, as the strategic potential of dairy cooperatives in the field of finance was claimed not to be better than that of their competitors. As shown by the research results, the strategic

potential is similar to that of competitors. However, there is a difference in assessment in case of cooperatives from different voivodeships. The cooperatives from Świętokrzyskie Voivodeship assessed all indicated resources and competencies in the field of finance as similar to those of the competition, while cooperatives from Małopolskie Voivodeship assessed some of the resources and competencies to be better than those of their competitors and some to be worse.

Future research recommendations could be made to address the area limitations of this research, such as carrying out a study among cooperatives from other voivodeships to find out if they are aware of the importance and state of resources and competencies in the area of finance.

References

Badi, L., & Ishengoma, E. (2021). Access to Debt Finance and Performance of Small and Medium Enterprises. *Journal of Financial Risk Management*, *10*, 241–259.

Bagieńska, A. (2016). Professional Knowledge and Skills as a Key Factor in the Development of the Outsourcing of Financial and Accounting Services in Poland. *Studia i Materiały Wydziału Zarządzania UW*, *1*(20), 52–64.

Bień, W. (2016). *Zarządzanie finansami przedsiębiorstwa*. Difin.

CFI. (n.d.). *Equity Financing.* Retrieved from: https://corporatefinanceinstitute.com/resources/valuation/equity-financing/ on June 12, 2024.

Dabor, E., Otalor, J., & Erah, D. (2013). The Cost-Volume-Profit Model: A Discuss. *Accounting Frontiers, 4*, 68–80.

Ditkaew, K. (2018). The Effects of Cost Management Quality on the Effectiveness of Internal Control and Reliable Decision-making: Evidence from Thai Industrial Firms. Proceedings of the 10th International RAIS Conference on Social Sciences and Humanities (RAIS 2018). *Advances in Social Science, Education and Humanities Research*, *211*, 60–69.

Konieczna, I. (2013). The Importance of Resources and Competencies in the Field of Finance of Dairy Cooperatives from Świętokrzyskie Voivodeship. In: J. Turyna, J. Rak (Eds), *Finansowe uwarunkowania rozwoju organizacji gospodarczych* (pp. 399–406). Wydawnictwo Naukowe Wydziału Zarządzania Uniwersytetu Warszawskiego.

Łada, M., & Wejer-Kudełko, M. (2018). Success Factors and Barriers to the Effective Debt Collection Process. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 515, 147–156.

Omoshagba, T. P., & Zubairu, U. M. (2018). A Systematic Review of the Field of Debt Financing. *Covenant Journal of Entrepreneurship*, *2*(1), 34–49.

Palacio-Fierro, A., Valle Alvarez, T., Morales-Urrutia, X., & Mantilla Falcón, M. (2023). An Exploration of the Skills and Knowledge of the Accounting Profession. In: A. Mesquita, A. Abreu, J. V. Carvalho, C. Santana, C. H. P. de Mello (Eds), *Perspectives and Trends in Education and Technology* (pp. 225–234). ICITED 2023. *Smart Innovation, Systems and Technologies*, 366. Springer.

Pedroso, E., Gomes, C. F., & Yasin, M. M. (2020). Management Accounting Systems: An Organizational Competitive Performance Perspective. *Benchmarking: An International Journal*, *27*(6), 1843–1874.

Shurpenkova, S., & Sarahman, O. (2021). Management Accounting as an Effective Tool of Management of a Modern Enterprise. *Współczesne Problemy Zarządzania*, *9*(1(18)), 53–58.

Sitinjak, C., Johanna, A., Avinash, B., & Bevoor, B. (2023). Financial Management: A System of Relations for Optimizing Enterprise Finances – a Review. *Journal Markcount Finance, 1*(3), 160–170.

Sokołowska, E., & Wiśniewski, J. (2015). Liquidity Management by Effective Debt Collection: A Statistical Analysis in a Small Industrial Enterprise. *Ekonomika*, *94*(1), 143–156.

Stankiewicz, M. J. (2002). *Konkurencyjność przedsiębiorstwa. Budowanie konkurencyjności przedsiębiorstwa w warunkach globalizacji.* TNOiK Dom Organizatora.

Suzan, L., & Nabilah, R. S. (2020). Effect of Production Costs and Sales on the Company's Net Profit. *Jurnal Akuntansi*, *24*(2), 169–186.

Zabediuk, M. (2022). Formation of Components of the Enterprise's Financial Potential. *Economic Forum*, *1*, 17–182.

Zherlitsyn, D., Ogloblina, V., Levytskyi, S., & Mykhailyk, D. (2019). *Assessment of Financial Potential as a Determinant of Enterprise Development*. Proceedings of the 6th International Conference on Strategies, Models and Technologies of Economic Systems Management (SMTESM 2019).

Zickefoose, S. (2014). *Raising Capital for Your Business? The Advantages and Disadvantages of Equity Financing.* Keiter. Retrieved from: https://keitercpa.com/wp-content/uploads/2014/02/Equity-Financing_Scott_Zickefoose_Article-1_2014.pdf on June 12, 2024.

Chapter 6

Agile Attributes of Employees and Surviving Crisis Situations – Experiences of Polish Enterprises*

Maria Kocot

6.1. Introduction

In today's fast-paced and turbulent business world, organisations face constant challenges that require them to be agile and adapt to rapidly changing conditions. Organisational agility, understood as the ability to quickly adapt to new realities, is becoming a key factor enabling not only the survival but also the development of enterprises. In this context, the agile attributes of employees play an extremely important role, as they are the foundation for building and maintaining agility at the organisational level. This chapter focuses on the analysis of these attributes, drawing on the experiences of Polish enterprises and exploring their impact on the organisation's ability to survive crisis situations, such as the COVID-19 pandemic. Through a series of face-to-face qualitative interviews, this study seeks to understand how individual employee characteristics contribute to organisational agility and, in turn, to more effectively cope with unpredictability and challenges.

In the context of ever-evolving business challenges, it is becoming increasingly clear that the key to success is not only the ability to adapt, but also a proactive approach to the future. The agility and resilience of employees, their adaptability, and their ability to innovate and think creatively, shape the foundations on which organisations can build their competitive advantage. Continuing this thought, this chapter offers an insight into how Polish companies can use these characteristics to strengthen their position in the market, especially in the face of unpredictable events. The analysis is based on a wide spectrum of experience,

* The publication is financed by the University of Economics in Katowice.

emphasising the universality and importance of investing in the development of employee competences as a long-term strategy.

The chapter introduces the topic of organisational agility and its importance for businesses in the context of rapidly changing market conditions. It presents definitions of organisational agility from various literature perspectives, emphasising its key role in crisis management. The characteristics of agile employees are also discussed, including cognitive flexibility, the ability to learn quickly, proactivity, emotional resilience, and the ability to work under uncertainty. The chapter then analyses how these employee attributes impact an organisation's ability to survive crises, such as the COVID-19 pandemic, based on the results of qualitative interviews conducted with representatives from various sectors. Finally, the conclusions and recommendations for companies are presented, highlighting the importance of investing in the development of agile employee competencies as a long-term strategy for adaptation and success.

In the context of research on organisational agility in crisis situations, the agile attributes of employees are crucial. To explore this issue, a series of face-to-face qualitative interviews were conducted with workers from different sectors in Poland in 2023. A total of 103 interviews were conducted to understand how the individual characteristics of employees contribute to an organisation's ability to survive and adapt in challenging times such as the COVID-19 pandemic.

6.2. The Essence of Organisational Agility

In the literature, there are various interpretations of the concept of organisational agility. Some of them emphasise the combination of effective human resource management and the use of modern technologies and production methods as the key to agility (Chen & Siau, 2020; Skyrius & Valentukevičė, 2020). Other definitions emphasise the importance of integrating flexible technologies, knowledge and experience gained through end-to-end quality management and just-in-time on-demand manufacturing (Kt & Sivasubramanian, 2023; Almahamid, Awwad & Adams, 2010).

There are also approaches that emphasise an organisation's ability to quickly adapt to changing market conditions (Bray *et al*., 2019; Cappelli & Tavis, 2018; Chen & Li, 2021), treating agility as the strategic ability to adapt in the face of unexpected market changes. Agility is also understood as an organisation's readiness to respond effectively to dynamic changes and the ability to sustain operations in changing market conditions by developing an effective response mechanism (Narasimhan, Talluri & Mahapatra, 2006).

The concept also includes the ability to modify the operational level in response to increasing customer expectations, defining agility as the ability to manage change in order to survive in the face of a variety of market challenges (McNamee *et al.*, 2010). Organisational agility also means taking advantage of market opportunities effectively and quickly, allowing you to achieve a competitive advantage in a short period of time (Goldman, Nagel & Preiss, 1995; Kidd, 1994; Meredith & Francis, 2000). It is understood as the ability to react rapidly to changes in both the internal and external environment, and to take proactive actions to take advantage of the new opportunities that arise as a result of these changes.

6.3. Agile Employee Attributes

Agile attributes of employees are a key element in building organisational agility. They include a range of competences, attitudes and abilities that allow you to operate effectively in a dynamically changing business environment. These attributes include cognitive flexibility, which enables employees to quickly adapt to new conditions, tasks, and technologies. It is the ability to deal effectively with uncertainty and complexity, which is essential in rapidly changing contexts (Brynjolfsson & McAfee, 2017; Cavusgil, Knight & Riesenberger, 2014).

Another important attribute is the ability to learn and adapt. Employees in agile organisations must be open to continuous learning and development, which allows them to keep their skills and knowledge up to date in response to changing market demands (Gupta, Puranam & Srikanth, 2006). This ability also includes a willingness to experiment, test new ideas and approaches, which fosters innovation and creativity. Communication and collaboration are other key attributes. Organisational agility requires employees to effectively exchange information, both within teams and between different organisational units. Cooperation based on trust and openness fosters quick problem solving and effective project delivery (Danneels & Kleinschmidt, 2001).

Emotional resilience is another important attribute that allows employees to remain calm and effective in stressful situations and to accept constructive criticism. This allows you to maintain a high level of motivation and commitment, even in the face of challenges (Constantinides, 2014). Finally, employee initiative and proactivity in identifying and capitalising on new opportunities are essential for an organisation to respond quickly to market changes (Chakrabarty, 2006; Dhillon & Backhouse, 2001). Employees who are able to see and initiate

change contribute to the creation of an agile organisational culture, which is crucial for achieving competitive advantage (Cullen, Seddon & Willcocks, 2005).

In summary, employee agile attributes such as cognitive flexibility, ability to learn and adapt, communication, collaboration, emotional resilience, and initiative and proactivity are essential for building and maintaining organisational agility. These core competencies enable organisations to successfully navigate uncertainty and use dynamic market changes to their advantage.

6.4. Organisational Agility in Crisis Situations

Organisational agility in crisis situations is a key element in ensuring that companies survive and thrive in unpredictable conditions. Crises such as the COVID-19 pandemic highlight the need to adapt quickly to changing market, social, and economic realities (Duchek, 2020). Organisations with a high level of agility are able to respond more effectively to crises, thus minimising negative effects and taking advantage of newly created opportunities (Cegarra-Navarro *et al.*, 2021).

In the context of crisis situations, organisational agility manifests itself through the ability to quickly restructure internal processes, flexibility in supply chains, and adapt product or service offerings to changed customer needs (Chen & Li, 2021). Adaptability in human resource management, including the retraining of workers and the introduction of flexible working arrangements such as teleworking, is also becoming essential (Nath & Agrawal, 2020).

The example of the COVID-19 pandemic has shown that organisations capable of quickly digitising their operations, implementing advanced online communication tools, and maintaining business continuity through remote work environments have shown greater resilience to disruption (Yoshikuni & Dwivedi, 2024). In addition, agile enterprises are able to effectively manage risk by using proactive strategies and tools to monitor the external environment, which enables them to detect threats faster and respond accordingly (He & Harris, 2020).

As a result, agility in crisis situations not only enables organisations to maintain operations and protect key values, but also fosters the identification and exploitation of new business opportunities that may arise as a result of global perturbations (Schulze & Pinkow, 2020). This underscores the importance of agility as a strategic competitive advantage, enabling not only survival but also long-term growth and success in an uncertain environment.

6.5. Agile Attributes of Employees and Crisis Survival – Analysis of Qualitative Interviews

The methodology employed in the research involved a series of face-to-face qualitative interviews with employees from various sectors across Poland in 2023. A total of 103 interviews were conducted to understand the impact of agile attributes of employees on the organisation's ability to survive and adapt during crises, such as the COVID-19 pandemic. The interviews were transcribed, and the transcripts were analysed using thematic analysis. This method enabled the identification of common themes and patterns in the responses, providing insights into the key attributes contributing to organisational agility. The interviewees represented a wide range of industries, which allowed for a variety of perspectives on organisational agility in crisis situations. The distribution of respondents was as follows: 26% (27 people) from the technology sector, 20% (21 people) from the healthcare industry, 15% (15 people) from the financial sector, 10% (10 people) from education, 10% (10 people) from retail, 10% (10 people) from manufacturing, and the remaining 9% (9 people) were from other industries, including logistics and transportation.

As part of the qualitative interviews, respondents were asked seven key questions to understand how the agile attributes of employees affect the organisation's ability to survive and adapt in crisis situations. These questions addressed the following issues:

1. How does the flexibility of the mind affect your ability to adapt during a crisis?
2. How has rapid learning and adaptation helped you adapt to new working conditions during the pandemic?
3. What proactive actions have you taken to minimise the negative effects of the crisis on your organisation?
4. How has emotional resilience contributed to your effectiveness in challenging circumstances?
5. How has your ability to work under uncertainties influenced your professional activities?
6. How do you think team collaboration and communication affect organisational agility?
7. What personal qualities do you consider to be the most important for increasing organisational agility?

The respondents' answers were as follows:

- 92% of respondents (95 people) said that the flexibility of their minds significantly affected their ability to adapt, allowing them to quickly find new solutions in a crisis situation.
- 87% (90 people) indicated that rapid learning and adaptation were key in effectively adapting to remote work and other changed working conditions.
- 80% of respondents (82 people) have taken proactive measures, such as introducing new security procedures or restructuring teams, to minimise the impact of the crisis.
- 75% (77 people) said that emotional resilience helped them maintain high levels of performance despite pressure and stress.
- 85% (88 people) said that the ability to work under uncertainties was essential to continue operating and make quick decisions.
- 90% (93 people) highlighted the role of team collaboration and communication as the foundation of organisational agility, enabling effective information sharing and collaborative problem-solving.
- Proactivity (95% – 98 people), mental flexibility (92% – 95 people) and emotional resilience (88% – 91 people) were the most important personal traits influencing organisational agility.

Table 6.1. Impact of agile employee attributes on organisational survival and adaptation in crisis situations

Answer	Percentage	Number of people
Flexibility of the mind significantly affects the ability to adapt	92	95
Rapid learning and adaptation are key to effective adaptation	87	90
Proactive measures, such as the introduction of new procedures	80	82
Emotional resilience helps maintain high performance	75	77
Ability to operate under uncertainty is essential	85	88
Team collaboration and communication as the foundation of agility	90	93
The most important personal qualities: – proactivity – flexibility of mind – emotional resilience	 95 92 88	 98 95 91

Source: own work.

The analysis of responses showed that across industries, employees' value similar qualities and skills that enable organisations to respond effectively to crises. These findings highlight the importance of investing in agile competence development, both at the individual and organisational level, which could be key to better weathering future challenges.

6.6. Conclusion

Research conducted on the organisational agility of employees in crisis situations, such as the COVID-19 pandemic, shows that the individual agile attributes of employees are crucial to an organisation's ability to survive and adapt. An analysis of 103 qualitative interviews with representatives of various sectors shows a broad recognition of mental flexibility, rapid learning and adaptation, proactivity, emotional resilience, the ability to work under conditions of uncertainty, as well as a commitment to collaboration and communication within a team to be key factors enabling an effective response to unforeseen challenges.

Mental flexibility has been identified as one of the most important attributes, enabling employees to quickly find new solutions and adapt to changing conditions. Rapid learning and adaptation have also played a significant role in successfully adapting to remote work and other changed working conditions. In addition, proactive measures, such as the introduction of new security procedures or the restructuring of teams, have proven to be key in minimising the negative impact of the crisis on organisations.

Emotional resilience helped employees maintain high levels of performance despite pressure and stress, while the ability to work under uncertainties was essential to continue operating and making quick decisions. Collaboration and communication within the team have been highlighted as the foundation of organisational agility, enabling effective information sharing and collaborative problem-solving.

Among the personal traits most frequently mentioned by respondents that affect organisational agility were proactivity, mental flexibility and emotional resilience. These results highlight the importance of investing in agile competence development at both the individual and organisational levels, which may be key to better surviving future challenges. Overall, this research indicates that developing the attributes of an agile workforce is important for enhancing an organisation's ability to respond effectively to crises and adapt to changing conditions, which contributes to their long-term survival and success.

On the basis of the conducted research on the attributes of employee agility and their impact on surviving crisis situations, several important conclusions can be drawn. The analysis of qualitative interviews shows that mental flexibility, quick learning and adaptation, proactivity, emotional resilience, the ability to work in uncertain conditions, cooperation and communication in a team are key attributes that allow employees and organisations to effectively cope with difficult times. These qualities and skills play an essential role in enabling organisations not only to survive crises, but also to adapt and evolve in changing conditions.

In addition, the results of the study indicate the universality of valuable attributes of agility across sectors, suggesting that investing in the development

of these competencies can benefit organisations regardless of the industry in which they operate. The importance of such investments highlights the need for a strategic approach to human resource management, which should focus on identifying, recruiting and developing individuals with these key attributes. In the long term, organisations that focus on building a culture that supports agility, adaptation, and continuous learning can better handle unpredictability and change, becoming more resilient to future challenges. Such a culture not only promotes the individual competences of employees, but also creates an environment in which cooperation and knowledge sharing become natural elements of the organisation's functioning.

On the basis of the conducted research on the attributes of agile employees in the context of surviving crisis situations, a number of recommendations can be made for companies striving to increase their resilience and adaptability. Above all, organisations should focus on developing agile competencies among their employees, such as flexibility of mind, quick learning, adaptation, proactivity, emotional resilience, and the ability to work under uncertainty. These features proved to be crucial in effectively adapting to changing conditions and enabling the continuation of operations despite uncertainties and crises.

Companies should invest in training and development programmes that support the development of these competencies, promoting a culture of continuous learning and adaptation. Introducing mechanisms to support innovation and creativity, such as brainstorming sessions, creativity workshops, or mentoring programs, can encourage employees to think outside the box and respond quickly to new challenges.

In addition, the importance of team collaboration and communication as the foundations of organisational agility should be emphasised. Companies should strive to build strong, inclusive teams where open communication and collaboration prevail. Facilitating the exchange of information and joint problem solving allows for faster response to crises and more efficient use of the organisation's resources.

Investments in technologies that support remote work and flexible working can also contribute to organisational agility. Having access to the right digital tools and platforms enables employees to work effectively from anywhere, which is especially important in situations where traditional forms of work become impractical.

Finally, companies should place a high value on building the emotional resilience of employees. Organisations can offer psychological support, mental wellbeing programmes, as well as stress management and resilience training, which can help employees cope better with crisis situations.

The conclusions of the study emphasise that investing in the development of agile employee attributes is crucial for building organisational resilience. Companies that focus on supporting the development of these competencies can better weather future challenges while maintaining the ability to innovate and adapt in a rapidly changing environment.

In the context of future research, it will be important to further explore the relationship between the different attributes of agility and the success of an organisation in crisis situations, as well as to identify best practices and strategies in talent management that can support the development of these key competencies. Further research may also focus on understanding how technologies and innovations can support the development of agility attributes among employees and across organisations, which could be key to enhancing their ability to survive and thrive in the future.

References

Almahamid, S., Awwad, A., & Adams, A. (2010). Effects of Organizational Agility and Knowledge Sharing on Competitive Advantage: An Empirical Study in Jordan. *International Journal of Management*, *27*(3), 10–12.

Bray, D. A., Reeves M., Levin, S., Harnoss, J. D., Ueda, D., Kane, G. C., Johnson, J. S., & Gillespie, D. (2019). Adapt and Thrive: How Can Business Leaders Best Understand the Complex Interplay between Companies, Economies, and Societies? *MIT Sloan Management Review*, 4–5, 1–23.

Brynjolfsson, E., & McAfee, A. (2017). The Business of Artificial Intelligence. *Harvard Business Review*, *95*(1), 60–70.

Cappelli, P., & Tavis, A. (2018). HR Goes Agile. *Harvard Business Review*, March–April, 46–52.

Cavusgil, S. T., Knight G., & Riesenberger J. R. (2014). *International Business: The New Realities*. Pearson Education Limited.

Cegarra-Navarro, J. G., Sánchez-García, J. C., Marco-Lajara, B., & García-Pérez, A. (2021). Building Organizational Resilience in the Face of the COVID-19 Pandemic: The Role of Strategic Agility. *Sustainability*, *6*(13).

Chakrabarty, S. (2006). Making Sense of the Sourcing and Shoring Maze: Various Outsourcing and Offshoring Alternatives. In: H. S. Kehal, V. P. Singh (Eds), *Outsourcing and Offshoring in the 21st Century: A Socio-Economic Perspective.* Idea Group Publishing.

Chen, X., & Siau, K. (2020). Business Analytics/Business Intelligence and IT Infrastructure: Impact on Organizational Agility. *Journal of Organizational and End User Computing.* https://doi.org/10.4018/joeuc.2020100107

Chen, Y., & Li, X. (2021). The Role of Organizational Agility in Managing the COVID-19 Pandemic: A Case Study of Two Chinese Hospitals. *International Journal of Environmental Research and Public Health*, *18*(1), 70. https://doi.org/10.3390/ijerph18010070

Constantinides, E. (2014). Foundations of Social Media Marketing. *Procedia – Social and Behavioral Sciences*, *148*, 40–57. https://doi.org/10.1016/j.sbspro.2014.07.016

Cullen, S., Seddon, P., & Willcocks, L. (2005). Managing Outsourcing: The Life Cycle Imperative. *MIS Quarterly Executive*, *4*(1), 1–12.

Danneels, E., & Kleinschmidt, E. J. (2001). Product Innovativeness from the Firm's Perspective: Its Dimensions and Their Relation with Project Selection and Performance. *Journal of Product Innovation Management*, *18*(6), 357–373.

Dhillon, G., & Backhouse, J. (2001). Information System Security Management in the New Millennium. *Communications of the ACM*, *44*(4), 125–128.

Duchek, S. (2020). Organizational Resilience: A Capability-based Conceptualization. *Business Research*, *13*(1), 215–246. https://doi.org/10.1007/s40685-019-0085-7

Goldman, S. L., Nagel, R. N., & Preiss, K. (1995). *Agile Competitors and Virtual Organizations: Strategies for Enriching the Customer.* Van Nostrand Reinhold, 34–42.

Gupta, S., Puranam, P., & Srikanth, K. (2006). *Services Sourcing in the Banking and Financial Services Industries. Exploding Myths and Describing Emerging Best Practice.* London Business School and Capco Institute.

He, H., & Harris, L. (2020). The Impact of Covid-19 Pandemic on Corporate Social Responsibility and Marketing Philosophy. *Journal of Business Research*, *116*, 176–182. https://doi.org/1016/j.jbusres.2020.05.030

Kidd, P. T. (1994). *Agile Manufacturing: Forging New Frontiers.* Addison-Wesley, 2–14.

Kt, M. A., & Sivasubramanian, C. (2023). *Workforce Agility: A Review on Agility Drivers and Organizational Practices.* Researchers' Forum, Department of Commerce. University of Kerala, Karyavattom. https://doi.org/10.59640/cbr.v14i2.1-8

McNamee, R. C., Schoch, N., Oelschlaeger, P., & Huskey, L. (2010). Collaboration Continuum: Cultural and Technological Enablers of Knowledge Exchange. *Research-Technology Management*, *53*(6), 54–57.

Meredith, S., & Francis, D. (2000). Journey Towards Agility: The Agile Wheel Explored. *The TQM Magazine*, *12*(2), 137–143. https://doi.org/10.1108/09544780010318398

Narasimhan, R., Talluri, S., & Mahapatra, S. K. (2006). Multiproduct, Multicriteria Model for Supplier Selection with Product Life-cycle Considerations. *Decision Sciences*, *37*(4), 577–603.

Nath, V., & Agrawal, R. (2020). Agility and Lean Practices as Antecedents of Supply Chain Social Sustainability. *International Journal of Operations* & *Production Management*, *40*(10).

Schulze, J. H., & Pinkow, F. (2020). Leadership for Organisational Adaptability: How Enabling Leaders Create Adaptive Space. *Administrative Sciences*, *10*(3), 37. https://doi.org/10.3390/admsci10030037

Skyrius, R., & Valentukevičė, J. (2020). Business Intelligence Agility, Informing Agility and Organizational Agility: Research Agenda. *Informatics*, *90*(47). https://doi.org/10.15388/im.2020.90.47

Yoshikuni, A. C., & Dwivedi, R. (2024). Effects of Knowledge Management Processes by Strategic Management Accounting on Organizational Ambidexterity: Mediation of Operational Processes Under Environmental Dynamism. *Global Journal of Flexible Systems Management*, *25*(3), 513–532. https://doi.org/10.1007/s40171-024-00398-9

Chapter 7

Emotional Intelligence of Managers as a Determinant of Interpersonal Relationship Formation in Organisations

Marian Bursztyn

7.1. Introduction

Over recent years, humanity has become increasingly aware of the key role played by emotional components in the formation of interpersonal relationships and the building of organisational culture. Today's constant changes in the organisation of work reflect the constant socio-economic changes, technological developments, competitiveness and the unprecedented innovation process. There is no doubt that the fast-paced developmental changes in the economy require new competences from employees. These changes affect not only rank-and-file employees, but above all managers, who, due to the nature of their duties, decide on the success or failure of a company.

The key factor influencing the building of relationships and actions taken by managers is emotional intelligence. High emotional intelligence enables managers to correctly identify and control their emotions. These situations lead to factors that result in employee engagement and affect job satisfaction. Emotional intelligence enables managers to better cope with everyday stressful situations. It allows them to be more resilient and flexible in relation to the various phenomena occurring in the organisation.

The main intention of the topic is to try to better understand the meaning of the construct of emotional intelligence, as well as its relationship with effective leadership, which includes searching for an answer to the issue of the impact of emotional intelligence on employee engagement at work.

Given the area adopted, it should be noted that the analysis presented is by no means definitive and requires further exploration in this area.

The chapter attempts to define the concept of emotional intelligence, taking into account the basic aspects of its structure, and also makes an attempt to identify the key areas for the development of managers' competencies that have

an impact on the involvement of employees through building the right interpersonal relationships. This is followed by a discussion of the determinants that form the basis for shaping interpersonal relations in an organisation, and which result from the interrelationship between the emotional intelligence of managers and employees. In conclusion, the author presents results that should contribute to the discussion on the use of emotional intelligence as a determinant of interpersonal relationship formation in organisations.

Due to a lack of literature treating in a synthetic and expressive manner, and thus unifying the issue adopted in the title, the author reviewed individual segments of literature, which from the point of view of the presented subject matter constituted the core of considerations. The criteria adopted for the selection of literature, which covered individual detailed levels related to the broad spectrum of emotional intelligence, the use of emotions in building interpersonal relations and also building commitment in the organisation, allowed for the synthesisation of the discussed subject matter.

7.2. The Essence of Emotional Intelligence

Emotional intelligence (Salovey & Mayer, 1990, pp. 185–211) is one fundamental determinant of the quality of a person's social functioning. Individuals characterised by high emotional intelligence perform better in building interpersonal interactions, correctly read the emotional states of others, better understand emotions and skilfully recognise the emotional message of the interlocutor. Emotional intelligence makes it possible to regulate one's own emotions in everyday social situations. As a result, it becomes helpful in the effective performance of accepted social roles, both in personal and professional life. It enables the use of emotional processes in the proper construction of interpersonal interactions based on rational thought and emotional processes (Ledzińska, 2000; Mayer, Salovey & Caruso, 2000).

The defined concept of emotional intelligence is considered as the ability to deal with people in an integral and intelligent way and the ability to enter into intrapersonal relationships with them (Majeed *et al.*, 2017) as "the ability to perceive, evaluate and express emotions accurately; the ability to access and/or generate feelings when they facilitate thinking; the ability to understand emotions and emotional knowledge; the ability to regulate emotions, motivate oneself, empathise and cope with relationships" (Mayer, Salovey & Caruso, 2004, p. 201).

The idea of the accepted concept now referred to as the construct of emotional intelligence was disseminated following the published work *Emotional Intelligence* by Daniel Goleman (1995) in which the author showed that qualities

such as empathy, caring, the ability to control unpleasant feelings, as well as staying optimistic and establishing and maintaining good relationships with other people are important in building relationships, especially in the context of work (Goleman, 2011, p. 241). This approach enabled Goleman to define the term "emotional intelligence" as "the ability to recognise our own feelings and the feelings of others in order to motivate ourselves and manage emotions well within ourselves and in our relationships" (Goleman, 2011, p. 73). He emphasises that it becomes a necessary condition to have and to be able to have knowledge about emotions, which can be used to understand the internal and social world and thus allow for appropriate decision-making. A similar position is presented by Bar-On (2000), who emphasised the adaptive function of emotional intelligence. In contrast, Bradberry and Greaves (2005) point out that emotional intelligence is the "missing element" in the conceptualisation of the complete person, whose immanent elements are personality and intelligence.

Emotional intelligence helps a person understand how to navigate social and professional environments. The model of emotional intelligence proposed by Mayer and Salovey (1999) was drawn up as a specific package of individual skills needed to process emotional information for adaptation in building interpersonal relationships. It should be emphasised that these abilities are emotional in nature. On this basis, four levels of ability have been identified, ranging from the most developmentally simple to the more complex.

The first level, which includes the perception, evaluation and ability to express emotions, relates to the ability to identify emotions both in oneself and in others, to express them in a way that is appropriate to the situation, and to be able to distinguish between sincere and insincere behaviour and between appropriate and inappropriate emotional messages.

The next level is the ability to emotionally support thinking, which allows you to use emotions to direct attention to what is important and consequently provides emotional support for memory and judgment of reality. This area also includes the ability to use mood to adopt a variety of viewpoints (from optimism to pessimism) and the ability to support emotional states in the process of effective problem solving.

The third level is the use of knowledge based on the resulting emotions, understood as the correct naming of emotions and their understanding through their sensible interpretation in the social context (the appearance of sadness due to loss), as well as understanding complex emotions and predicting probable emotional sequences.

The final fourth level is the conscious regulation of emotions. This level covers a wide range of various feelings, both pleasant and unpleasant, as well as

those that take into account or ignore the received emotions, guided by the assessment of their usefulness in everyday functioning. It is also the conscious ability to control one's emotions and the emotions of other people, as well as the ability to control emotions, i.e. the ability to mute or strengthen emotions (negative or positive), taking into account the information these emotions carry (Maruszewski & Ścigała, 1998; Mayer & Salovey, 1999; Mayer, Salovey & Caruso, 2004).

Emotional intelligence should be understood as a comprehensive set of personality traits that favour proper adaptation to social and task situations. In this respect, Bar-On (2000) points out that emotional intelligence enables a person to cope effectively with the demands coming from the environment. He distinguished the following components: intrapersonal, which include emotional self-awareness, assertiveness, self-respect, self-fulfillment and independence; interpersonal understood as empathy, the ability to establish and maintain satisfactory interpersonal relationships, as well as social responsibility; adaptive regarding problem-solving skills and adaptive flexibility in interpersonal relationships; ability to cope with stress – stress tolerance and impulse control; and general emotional state associated with a general sense of happiness and optimism.

Matczak and Knopp (2013), on the other hand, draw attention to the difference in the understanding of the conceptual scope of "emotional capacity" and "emotional competence." They point out that abilities define the causality of cognitive processes, whereas competences are expressed in already mastered skills manifested in everyday functioning. The position presented in this way is consistent with that of Goleman, who distinguished the previously accepted concepts into "emotional intelligence" and "emotional competencies." He considers the former to be "the potential capacity to learn practical skills," while he sees the latter as indicating "how much of this potential capacity has been turned into skills" (Goleman, 2011, p. 76). Treating emotional intelligence as a set of competencies, it is necessary to highlight within it such skills that, from the manager's point of view, belong to the important ones in building interpersonal interaction, namely: goal orientation, emotional self-awareness and self-control, adaptability, an optimistic approach to life, the ability to be a leader, the ability to influence others or the ability to resolve conflicts and cooperate with others.

An understanding of emotional intelligence as a sense of self-efficacy is proposed by Petrides and Furnham (2000, 2001, 2003), who believe that an individual makes a subjective assessment of the competences they possess, regardless of the actual level they represent. In this case, the mere belief that one possesses emotional intelligence is sufficient justification for emotional self-efficacy. In this approach, emotional intelligence is defined as a system of behavioural dispositions and a position on having such skills that allow for the identifica-

tion, processing and, consequently, use of information generated by emotions (Wytykowska & Petrides, 2007).

Among the components mentioned so far, the main elements of emotional intelligence include the ability to read one's own feelings and the awareness of having them when they arise and when they appear in acts of self-awareness. This self-awareness enables an individual to grasp the particular nuances of the emotions that arise, as well as their complex and potential impact on our actions and the functioning of other people (Stein, 2011).

This disposition should also be understood as the ability to build emotional dynamics on both an inter- and intrapersonal level (Perkowska-Klejman, 2019). Consequently, self-awareness is the key to self-control and freedom of action, which leads to the emergence of a new quality of behaviour towards others, which, in the case of managers, seems to be a desirable disposition. In contrast, a lack of these skills can lead to failures and difficulties in building interpersonal relationships (Ekman & Davidson, 2012, p. 231).

Emotions, which are a fundamental component of human life, are important in the plane of emotional intelligence. Emotions can determine an individual's physical and mental states when interacting with others. Emotions should be considered in terms of behaviour and their impact on human cognitive processes such as attention, perception, thinking or memory (Jarymowicz & Imbir, 2011). Emotions, by their very nature, arise as an automatic response determined by the situation at hand and, conversely, a specific behaviour is the cause of an adequate emotion. There is no doubt that emotions arise on the basis of interpersonal relationships and they have an evolutionary function as they allow humans to adapt to environmental circumstances (Plutchik, 1991).

It should be noted that the ability to regulate, monitor and control emotions allows you to make conscious choices regarding your response to an event or behaviour. Emotions motivate an individual to take a particular action, which, in their own appropriate way, leave an indelible mark on the individual's experience and thus determine his or her behaviour, conduct and perception of the resulting relationships (Lewis, 2005, pp. 780–797). In this context, Salovey, Mayer and Caruso (2002) believe that emotions can influence the construction of appropriate interpersonal interactions in terms of appropriate response to situations related to the occurrence of stressful situations, modification of negative thoughts, the way of reacting and processing acquired information, and allow the acquisition of skills that allow the differentiation of both emotions and behaviour, and thus allow for changes in behaviour appropriate to interpersonal relationships. The range of emotional regulation thus acquired enables the manager in the organisation to make the right choices about the manner and nature of his

or her responses to situations. In contrast, a misperception of emotions can lead to an impediment to the process of building appropriate relationships (Goleman, 2011, p. 96).

7.3. Emotional Intelligence as a Key Determinant of Managerial Competence

Marked by socio-economic changes, modern times in which technological processes in organisations are evolving dynamically generate a demand for employees equipped with new sets of soft competences.

There are different definitions of competences, but they share certain common characteristics, which, according to Lubbadeh (2020), include both "knowledge" – understood as the possession of information, "knowledge" in as the way of performing a task (procedure) and "knowledge" understood as "attitude." All these components are interrelated, leading to an appropriate response to changing situations. According to Leban and Zulauf (2004), modern managers are increasingly aware that the organisation is a reflection of their actions, because a technically proficient professional with a high coefficient of emotional intelligence is a person who perceives conflicts more easily and quickly than others and is able to identify an effective solution to ensure better communication and empathy with his or her employees, to handle new and unexpected situations in an appropriate way.

Managerial competences generally focus on the behavioural and functional levels, combining into one level of a multidimensional – holistic – approach. Kazak (2017) notes that the behavioural level focuses on cognitive attributes, which include self-awareness, self-regulation and a wide range of social skills that can be developed, while the functional level emphasises the formal implementation of the task, i.e. the technical skills necessary to getting the job done. It should be emphasised that the manager, being the leader of the team, has the competence to build rules and implement norms of interpersonal cooperation, as well as define cooperation in order to ensure appropriate team building.

It is worth remembering that, in addition to the above-mentioned competences, technical managerial competences, expressed in terms of the knowledge possessed and the skills directly related to the work performed, as well as social competences in terms of the ability to transfer knowledge, or leadership and teamwork skills, become important. With regard to the issue of managerial competences understood as "abilities and skills," Kiełtyka (2016) emphasises that in this area the following should be distinguished: perceptual abilities (e.g. openness to new experiences, creative imagination), organisational

skills (e.g. the ability to motivate, adapt the actions of colleagues to take specific actions to achieve a common goal), intellectual abilities (e.g. independence in decision-making, ability to respond to unpredictable situations), motivational skills (e.g. ability to encourage feedback from others, conscious use of leadership skills), decision-making skills (e.g. taking responsibility for the course of events, decisiveness in choosing and making decisions) and intuitive abilities (e.g. psychological intuition, high awareness of own potential).

The above-mentioned abilities, called emotional competences, despite their autonomous nature, are inherently related to the mixed models of "emotional intelligence" presented by Goleman and Boyatzis (2013) or Bar-On (2010). In terms of emotional competence referring to managers' abilities and stemming from emotional intelligence, attention should be drawn to the models of emotional competence presented by Saarni (1999) and Bisquerra Alzina (2009).

Saarni (1999) defined emotional competence as an articulated set of abilities and skills that an individual needs in order to function well in a changing environment. The acquisition of these abilities is aimed at an individual's ability to adapt appropriately to changing environmental conditions, as well as to increase self-confidence. In order to build her model, the author adopted three co-existing theories with emotions as their focal point. Thus, she pointed to:

- a relational model of emotion based on Lazarus' (2000) theory, which identifies emotion as the foundation of human motivational development,
- the functionalist model of emotion, understood as a process of building relationships between the individual and the environment,
- the social-constructivist model of emotion, emphasising emotion as the cause of the individual's emergence of experience through social, developmental and cognitive contexts.

Adopting this assumption, Saarni (1999) built a model of emotional competence, listing eight basic competences: emotional self-awareness, which enables the recognition of a range of emotional experiences, appropriate for different levels of human emotional maturity; the ability to recognise and understand other people's emotions by recognising the emotions that arise in others; the ability to express emotions by skillfully linking expressed emotions with social roles; empathetic attitude towards others, which manifests itself in the ability to recognise and understand other people's emotions; the ability to accurately distinguish subjective emotions from the external emotional expressions of others; ability to adaptively solve unfavourable and stressful situations; awareness of the need for emotional communication presented in the authentic expression of one's emotions and the ability to achieve emotional self-efficacy, which is expressed by emotional balance between personal, social and cultural life.

A similar reference to the presented issues is illustrated by the theoretical model of Bisquerra Alzina (2009). He indicates that competences constitute a whole set of knowledge, skills and attitudes that are necessary to become aware, understand, express and regulate emotional phenomena. This leads to comprehensive preparation and proper performance of managerial professional functions. The assumptions made in this way include: emotional awareness, which should be defined as the ability to read one's own emotions; emotion regulation as the ability to properly regulate and use emerging emotions; emotional autonomy, which should be defined and understood as a set of features related to the ability to consciously manage one's emotions, and social competences allowing to enter into and maintain appropriate relationships with other people.

The models of emotional competence expressed in the above models indicate that managers, in building interpersonal relationships, need both types of intelligence at the same time, both general intelligence and emotional intelligence, as high general intelligence or emotional skills alone are not enough.

All the elements discussed above are of great importance in creating the right interpersonal relationships, which undoubtedly has an impact on the created structure of personal and emotional relationships in the organisation.

7.4. Emotional Intelligence of Managers – a Determinant of Relationship Formation in Organisations

Emotional intelligence is usually seen as an individual competence, but organisations mainly work on the basis of teams, so focusing on this aspect is as important as on the individual. Managers play a key role in team functioning (Druskat & Wolff, 2001). It seems that emotional intelligence is closely related to many indicators of work effectiveness in an organisation, such as: increased economic profitability of the company, increased economic status of the organisation, appropriate interpersonal relationships and attitudes of employees, including managers, affecting the functioning of the organisation.

Therefore, the issue of linking the "emotional intelligence" of managers and the involvement of employees in the organisation becomes an important element of the functioning of the work organisation.

High competitiveness is becoming an important challenge for a modern organisation, therefore the appropriate involvement of managerial staff seems to be justified. In this case, managers play a significant role in the employee engagement process, so leadership development seems to be an element that benefits the development of the organisation. The organisation can support managers in developing their soft skills, which can ultimately translate into employee engagement

and overall wellbeing as well as the economic performance of the company. In this case, a manager's emotional intelligence becomes an important factor that has to do with increasing individual employee engagement at work. Therefore, Mahon, Taylor and Boyatzis (2014) believe that an emotionally intelligent manager acts as a facilitator that enhances employee engagement.

For this reason, an extremely important task in the field of organisational management is the improvement and development of interpersonal skills related to the "emotional intelligence" of managers. Benčiková (2013) suggests that managers have a noticeable impact on the efficiency, quality and overall success of every organisation through more creative management systems that are based on knowledge and experience acquired in everyday work. The manager, therefore, has a leadership role that is crucial to the effectiveness of employees and, consequently, to the productivity of the entire organisation.

A manager needs to know how to inspire and ignite the passion of employees so that they are committed to their activities and can realise their full potential throughout their career. A manager must learn how to become an inspirational leader who ignites the passion of employees and create a healthy, happy and fully engaged work environment. With such leadership, employees at all levels will feel obliged not only to improve their professional potential, but also to maintain it throughout their careers, as they will feel that not only their hard work is appreciated, but also their true belonging to the team.

It should be noted that due to the volatility of the economic environment, a manager should operate to the highest possible degree with leadership styles, choosing the right one for the situation.

A manager's leadership plays a key role in the development of an organisation. He is responsible for helping members or work teams of the organisation meet everyday challenges and work positively towards the organisational goal. In order to show the essence of leadership, it is necessary to synthetically recall the understanding of this issue. The phenomenon of organisational leadership has long been of interest to organisational researchers.

Blanchard (2019) defines leadership as an individual predisposition of an individual who has the ability to influence other people through appropriate action, both on a personal and professional level, aimed at achieving a desired goal. Blanchard (2019) believes that leadership is rooted in humility, starts within us, is effective and benefits everyone and leads to the conclusion that the hardest thing to do is to lead oneself. Kanste (2011) believes that the most difficult people to lead are the managers (leaders) themselves, as it seems necessary for a manager to understand that continuous collaboration with other team members is necessary for success. The author emphasises that it is also the ability to inspire trust

and influence people to take a specific action. It is important to emphasise that leadership involves two key levels, one of which is the tendency of subordinates to perceive how their leaders make the right decisions to achieve their personal needs and desires, and the other involves the manager's ability to emotionally engage employees in the performance of tasks that need to be done.

However, it seems that, when discussing leadership styles, it is necessary to refer to the concept proposed by Goleman (2011) as, in proposing them, he has in mind the theory of emotional intelligence he presented, in which he indicated that an effective manager will seamlessly choose from among the proposed leadership styles to achieve positive results. Furthermore, the author believes that an emotionally intelligent manager will apply a synthesis of the leadership styles outlined below in response to the needs of the environment:

Prescriptive (*coercive*) *style* – in this style the leader demands immediate, autocratic compliance. The style most often has a negative impact on remuneration systems and building the right relationships in the organisation. Exceptions to the use of this style are situations that require an unambiguous defined course of action, e.g. in times of crisis, when clear direction is needed.

The authoritative (*influential*) *style*, whose effectiveness is not based on "authority," but is concerned with influencing, that is, motivating individuals while explaining how their work fits into the overall functioning of the organisation. Although this style appears to be the most effective in a variety of situations it can be perceived by some as apodictic, imposing certain solutions by requiring the establishment of a relationship of trust with the manager.

The affiliative (*unifying*) *style* centres around people, their values and emotions, rather than in the tasks and goals adopted by the organisation. The manager builds strong emotional bonds between people in the team. This style has a clear impact on interpersonal communication, as people who like each other are more likely to talk to each other and are willing to cooperate. The affiliative manager naturally builds rapport and socialises with his or her direct reports, including in private. This style is particularly effective when building relationships and enhancing team harmony.

The democratic style of team management promotes freedom of action and implies the joint involvement of the whole team in decision-making processes. This process takes place in an atmosphere of respect. In the democratic approach, the manager acts as a facilitator whose job is to involve his or her employees in decision-making.

The prescriptive style is geared towards high quality task performance, while setting benchmarks and direction described as "follow me." In this convention, the manager sets high performance expectations for employees. Managing a team

in this way is recommended for well-motivated, highly competent employees who only need guidance in their activities.

The coaching style focuses more on the personal development of the manager than on tasks that are related to the work environment. In this case, leaders play a supporting role in identifying their strengths and weaknesses, which are then linked to the personal aspirations of employees. As a result, an agreement is often made that defines the roles as well as the responsibilities of each participant in the coaching relationship.

With the above in mind, it is fair to say that the most effective manager is one who can move from one style to another in a skilful and effortless manner, using the right kind of communication and motivation, which are essential factors in meeting the needs of employees in different situations. "Good style" leadership means using the right style at the right time.

Based on the above breakdown of leadership styles presented by Goleman (2011), authors Goleman, Boyatzis and McKee (2013) emphasise that four styles are responsible for resonance in an organisation while maintaining a high quality of work: visionary, coaching, affiliative and democratic, while the other two, herder style and dictator style, should be used with due and utmost caution. In this overview, we find the styles already characterised and specified above. Thus, the visionary style corresponds to the prescriptive style, the coaching style to the coaching style, the affiliative style to the unifying style, the democratic style to the democratic style, the "herder" style to the normative style and the "dictator" style – to the prescriptive.

Drucker (2016) believes that care should be taken to build the right organisational culture and create a good organisational climate, conducive to increasing managerial effectiveness on the basis of two parameters: efficiency ("doing things the right way") and effectiveness ("doing the right things"). At the same time, the author believes that managerial effectiveness is a certain habit that can be developed in the form of certain competences and cannot be linked to a certain innate predisposition or a certain personality type.

Thus, "an effective manager derives productivity from human strength, which is a real opportunity for success for him and the managed organisation" (Lubbadeh, 2020, p. 41). Effective emotionally intelligent managers are able, with the help of the emotional intelligence developed in themselves and other people, to cope brilliantly with a variety of situations, especially with toxic work environments, problematic superiors and subordinate managers and difficult employees.

Effective leaders (managers) use at least four styles of interacting with employees in their daily work: these styles include: authoritarian style, democratic style, skilful and correct influencing, and building leadership strategies as an aid

to developing an employee's individual potential (coaching). The key to choosing a particular style is to be flexible and willing to adapt to the organisation's environment. It is important to remember that it is in the hands of the manager to choose the right leadership style for the situation. The importance of a manager's personal characteristics and attributes is believed to significantly influence an individual's behaviour in the workplace (Handa & Gulati, 2014). The personality traits manifested are generally consistent and influence the response of individuals therefore the emotional connotation of commitment, which includes employees' feelings and beliefs about their relationship to their work, becomes an important element. These elements stimulate them to voluntarily engage in behaviours aimed at achieving the desired organisational outcomes, emphasising the emotional fulfilment the employee experiences as a result of their commitment to their work.

Shuck and Wollard (2010) believe that the emotional system and positive feelings of employees including managers affect their work and level of commitment, and are expressed by the positive "state" of the employee (attentiveness, alertness, enthusiasm, determination, active). He points to an individual's ability to control their emerging emotions, and these elements are contained within the construct of emotional intelligence. Lakshmi and Rao (2018), on the other hand, argue that in every facet of life, both personal and professional, a manager being an employee of an organisation, the construct of "emotional intelligence" plays a key role. This is because proper management of employees' emerging emotions can definitely lead to an increase in their commitment to the organisation. Furthermore, it can lead to the acquisition of higher competencies of employees in terms of their individual and team success. As a result, proper emotion management will contribute to effective work engagement.

Schaufeli *et al.* (2002, p. 74) depict the problem of engagement as "a positive, satisfying work-related state of mind characterised by vigour, dedication and preoccupation." In this respect, "vigour" as the employee's full commitment is associated with a sufficiently high level of psychological well-being during work, allowing for overcoming everyday difficulties resulting from work (Schaufeli *et al.*, 2002). An important element is dedication to the completed task, which brings the employee a sense of importance, enthusiasm and further inspiration for the work undertaken (Schaufeli *et al.*, 2002). However, the basic feature of "absorption" is the full concentration and involvement of employees in the work performed (Schaufeli *et al.*, 2002). Kahn (1990) defines this issue similarly, based on the theory developed by Rich, LePine and Crawford (2010), which draws attention to the level of work engagement from the physical, cognitive and emotional point of view. It is worth mentioning that in the available literature

on commitment, Macey and Schneider (2008) make a distinction, assuming the issue of commitment as an individual feature, state and behaviour of a person.

In accordance with the presented theory, Schutte *et al.* (2000) define the issue of work engagement as an important state of attachment to the organisation in which employees are both involved in the process of work and are fully aware of their effectiveness. When defining commitment, the authors believe that it is an element of a satisfying emotional state related to work, taking into account both the above-mentioned vigor and commitment to work. In this way, engagement is not just a temporary state, but should be viewed as a more permanent affective-cognitive state. Therefore, managers need to know which practices work and what they should focus on in order to motivate their employees and retain them in the organisation. In such an adopted strategy, employees are not only aware of their role in the organisation, but also demonstrate greater commitment, characterised by increased productivity and creativity, and, consequently, are more willing to take on specific professional roles.

The importance of managers' emotional intelligence in terms of employee work engagement should be explained through Lazarus' (2000) theory of emotions, which becomes useful in predicting the emotions of individuals in the workplace. The theory presented by the author tries to explain its three aspects: the first one concerns the cognitive level, which refers to the individual knowledge of the individual and his/her assessment of what is happening in the work environment, the second level is related to the aspect of building emotional relationships between the individual and its surroundings, taking place in constantly changing situations, while the third and last level results from the motivational skills of individual employees. At the same time, it is suggested that the motivation of an individual is influenced by his or her professional environment resulting from individual emotional experience (Lazarus, 2000). As a consequence, the individual employee involvement assumed in this way allows for the assumption that people who are able to manage emotions and, at the same time, are supported by self-motivation, properly regulate the emergence of emotions, thus experiencing greater commitment in the organisation (Barreiro & Treglown, 2020). In other words, the way an employee explains and interprets his or her emotions, how he or she uses self-management in the process of dealing with his or her own emotions, and how he or she responds to the emotions of others makes the resulting process easier to acquire the experience of proper involvement in the organisation (Barreiro & Treglown, 2020).

Based on the above considerations, it should be noted that, based on the theories presented, the individual development of emotions, and therefore

the ability to manage and regulate them, may lead to positive experiences related to employees' involvement in the organisation.

This means that an individual's ability to respond positively to his or her emotions enables and leads to significantly greater commitment to the organisation. It follows that the reason why the "emotional intelligence" construct can lead to increased work engagement is embedded in the "emotions" component, which causes actions to support and maintain professional commitment through the acquisition of emotional experience, which is the ability to deal with one's own emotions and emotions of co-workers, becoming the basis for the source and motivation to achieve intended professional tasks (Green *et al.*, 2017).

Managers' skills resulting from the construct of "emotional intelligence" are useful in the daily work of a team leader, aimed at achieving appropriate results, and resulting directly from interaction with an employee. Such situations include skilful conflict management, appropriate organisational changes that take into account the individual characteristics of employees, as well as other skills in order to achieve a positive emotional climate in the organisation. In conclusion, it is worth noting that by developing emotional intelligence, you can skilfully regulate your emotions and the emotions of other people, especially in difficult situations related to building manager-employee relationships. In the light of the above considerations, it can be assumed that there are well-established grounds for believing that there is undoubtedly a relationship between the skills of developing emotional intelligence and the involvement of employees in the organisation.

7.5. Conclusion

Emotional intelligence can be considered an important determinant characterising manager from the point of view of relationship building in organisations (Mahon, Taylor & Boyatzis, 2014; Barreiro & Treglown, 2020). The attempt to identify the relationship between the emotional intelligence of managers and the formation of relationships in the organisation became a key element of the issue undertaken, which encompassed a multifaceted approach embracing emotional intelligence, emotion management, leadership and leadership styles. The analysis conducted helps to emphasise that emotional intelligence can be developed as a skill, and that organisations should invest in development programmes for managers, developing their leadership skills including the ability to assess and regulate their own emotions and the emotions of others, and use this information to guide during their performance (Mayer, Salovey & Caruso, 2004).

It is worth emphasising that the construct of emotional intelligence can be developed as a skill. Therefore, organisations should invest in development

programmes in this area, aimed at executives – managers and other members of the organisation. In the case of managers, it becomes important to develop their leadership skills, including the ability to assess and regulate their own emotions as well as the emotions of others, and to skilfully use the emotional information flowing to guide their team in their actions (Salovey & Mayer, 1990). In such an aspect, it makes sense to focus efforts on the implementation of emotional intelligence training that will lead to a positive impact on the organisation's created interpersonal relationships. In addition, an important element seems to be to provide managers with increased support with mentoring programmes that allow them to develop their skills in building and sustaining relationships not only in the supervisor-subordinate context, but also at the level of colleagues themselves. These support systems reinforce the employee's perception of the manager as a professional, which increases the impact on individual employees' commitment to the organisation. Managers should therefore build not only individual relationships with subordinates, but also relationships with and between the entire team of employees. It is worth noting that emotional intelligence is a very useful tool that can be used to build a properly functioning work organisation.

In the conclusion of this paper, it is worth outlining the limitations of the study conducted. Any research analysis of this kind has its limitations, and this study is no exception. The analysis of the theoretical publications carried out indicates the cross-sectional nature of the work leading to the identification of only relevant links between the problems discussed, rather than the identification of a cause-and-effect relationship. The limitations in conducting an analysis of the presented subject matter were primarily due to the scarcity of literature demonstrating a link between the construct of emotional intelligence of managers as an element that shapes interpersonal relationships in organisations. On the other hand, there is a wide range of literature, as well as empirical research, which treats the particular issues undertaken in a separate manner with few connections that are only complementary to the main topic. For this reason, the author made an attempt to pick out from the wide literature only the scope that would enable the smooth linking of the individual levels presented.

Despite the limitations indicated, it is worth proposing recommendations for future research that can lead to a decisive deepening and understanding of the adopted issue. Given these limitations, it is worth noting the need for an in-depth analysis of the theoretical publications, and there is a need for research that includes the importance of managers' emotional intelligence in building interactions in the organisation. According to the recommendations found in the analysed literature, research should be carried out at group and organisational levels and the relationship between these levels taking into account

the construct of emotional intelligence should be identified. Multilevel research can contribute to identifying not only the links but also the dependencies that exist between the different planes. These elements will allow for a better understanding of the issue undertaken.

References

Bar-On, R. (2000). Emotional and Social Intelligence: Insights from the Emotional Quotient Inventory. In: R. Bar-On, J. D. A. Parker (Eds), *The Handbook of Emotional Intelligence* (pp. 363–388). Jossey-Bass.

Bar-On, R. (2010). Emotional Intelligence: an Integral Part of Positive Psychology. *South African Journal of Psychology*, *40*(1).

Barreiro, C. A., & Treglown, L. (2020). What Makes an Engaged Employee? A Facet-level Approach to Trait Emotional Intelligence as a Predictor of Employee Engagement. *Personality and Individual Differences*, *159*, 1–8.

Benčiková, D. (2013). Cultural Intelligence – Fiction or Reality. *Management, Science and Education. Slovak Scientific Journal*, *2*(2), 5–9.

Bisquerra Alzina, R. (2009). *Psicopedagogía de las emociones*. Síntesis, 61–82.

Blanchard, K. (2019). *Um Nível Superior de Liderança*. CAE.

Bradberry, T., & Greaves, J. (2005). *The Emotional Intelligence Quick Book: Everything You Need to Know to Put Your EQ to Work*. Simon & Schuster.

Drucker, P. (2016). *Menedżer skuteczny*. MT Biznes.

Druskat, V. U., & Wolff, S. B. (2001). Building the Emotional Intelligence of Groups. *Harvard Business Review*, March.

Ekman, P., & Davidson, R. J. (Eds). (2012). *Natura emocji: podstawowe zagadnienia* (2nd ed.). GWP.

Goleman, D. (1995). *Emotional Intelligence*. Bantam Books.

Goleman, D. (2011). *Inteligencja emocjonalna w praktyce*. Media Rodzina.

Goleman, D., & Boyatzis, R. (2013). *Emotional and Social Competency Inventory*. Hay Group.

Goleman, D., Boyatzis, R., & McKee, A. (2013). *Naturalne przywództwo. Odkrywanie mocy inteligencji emocjonalnej*. Jacek Santorski – Wydawnictwa Biznesowe.

Green, P. I., Jr., Finkel, E. J., Fitzsimons, G. M., & Gino, F. (2017). The Energizing Nature of Work Engagement: Toward a New Need-based Theory of Work Motivation. *Research in Organizational Behavior*, *37*, 1–18.

Handa, M., & Gulati, A. (2014). Employee Engagement: Does Individual Personality Matter. *Journal of Management Research*, *14*(1), 57–67.

Jarymowicz, M., & Imbir, K. (2011). O dynamice emocji wzbudzanych automatycznie bądź refleksyjnie. In: D. Doliński, W. Błaszczak (Eds), *Dynamika emocji. Teoria i praktyka*. PWN.

Kahn, W. A. (1990). Psychological Conditions of Personal Engagement and Disengagement at Work. *The Academy of Management Journal*, *33*(4), 692–724.

Kanste, O. (2011). Work Engagement, Work Commitment and Their Association with Well-being in Health Care. *Scandinavian Journal of Caring Sciences*, *25*(4), 754–761.

Kazak, M. (2017). Kompetencje menedżerskie we współczesnej organizacji. *Journal of Modern Management Process*, *2*(1), 89–99.

Kiełtyka, L. (2016). Rola menedżera we współczesnych organizacjach. *Przegląd Organizacji*, 8(919).

Lakshmi, K. N., & Rao, K. S. S. (2018). A Study on Role of Emotional Intelligence on Employee Performance. *International Journal of Civil Engineering and Technology* (*IJCIET*), *9*(3), 440–448.

Lazarus, R. S. (2000). Cognitive-Motivational-Relational Theory of Emotion. In: Y. L. Hanin (Ed.), *Emotions in Sport* (pp. 39–63). Human Kinetics.

Leban, W., & Zulauf, C. (2004). Linking Emotional Intelligence Abilities and Leadership Styles. *Leadership & Organization Development Journal*, *25*(7), 554–564.

Ledzińska, M. (2000). O niektórych próbach łączenia inteligencji i osobowości. *Psychologia Wychowawcza*, *43*, 1–10.

Lewis, M. (2005). Emocje samoświadomościowe: zażenowanie, duma, wstyd, poczucie winy. In: M. Lewis, J. M. Haviland-Jones (Eds), *Psychologia emocji* (pp. 780–797). Gdańskie Wydawnictwo Psychologiczne.

Lubbadeh, T. (2020). Emotional Intelligence and Leadership – the Dark and Bright Sides. *Modern Management Review*, *25*(27), 39–50.

Macey, W. H., & Schneider, B. (2008). The Meaning of Employee Engagement. *Industrial and Organizational Psychology*, *1*(1), 3–33.

Mahon, E. G., Taylor, S. N., & Boyatzis, R. E. (2014). Antecedents of Organizational Engagement: Exploring Vision, Mood and Perceived Organizational Support with Emotional Intelligence as a Moderator. *Frontiers in Psychology*, *5*.

Majeed, N., Ramaya, T., Mustamil, N., Nazri, M., & Jamshed, S. (2017). Transformational Leadership and Organizational Citizenship Behavior: Modeling Emotional Intelligence as Mediator. *Management and Marketing. Challenges for the Knowledge Society*, *12*(4), 571–590.

Maruszewski, T., & Ścigała, E. (1998). *Emocje – aleksytymia – poznanie*. Wydawnictwo Fundacji Humaniora.

Matczak, A., & Knopp, K. A. (2013). *Znaczenie inteligencji emocjonalnej w funkcjonowaniu człowieka*. Liberi Libri.

Mayer, J. D., & Salovey, P. (1999). Czym jest inteligencja emocjonalna? In: P. Salovey, D. J. Sluyter (Eds), *Rozwój emocjonalny a inteligencja emocjonalna: Problemy edukacyjne* (pp. 29–69). Dom Wydawniczy Rebis.

Mayer, J. D., Salovey, P., & Caruso, D. R. (2000). Emotional Intelligence as Zeitgeist, as Personality, and a Mental Ability. In: R. Bar-On, J. D. A. Parker (Eds), *The Handbook of Emotional Intelligence* (pp. 92–117). Jossey-Bass.

Mayer, J. D., Salovey, P., & Caruso, D. R. (2004). Emotional Intelligence: Theory, Findings, and Implications. *Psychological Inquiry*, *15*(3), 197–215.

Perkowska-Klejman, A. (2019). *Poszukiwanie refleksyjności w edukacji. Studium teoretyczno-empiryczne*. Wydawnictwo Akademii Pedagogiki Specjalnej.

Petrides, K. V., & Furnham, A. (2000). On the Dimensional Structure of Emotional Intelligence. *Personality and Individual Differences*, *29*(2), 313–320.

Petrides, K. V., & Furnham, A. (2001). Trait Emotional Intelligence: Psychometric Investigation with Reference to Established Trait Taxonomies. *European Journal of Psychology*, *15*(6), 425–448.

Petrides, K. V., & Furnham, A. (2003). Trait Emotional Intelligence: Behavioural Validation in Two Studies of Emotion Recognition and Reactivity to Mood Induction. *European Journal of Personality*, *17*(1), 39–57.

Plutchik, R. (1991). Emotions and Evolution. In: K. T. Strongman (Ed.), *International Review of Studies on Emotion*, *Vol. 1* (pp. 37–58). Wiley.

Rich, B. L., LePine, J. A., & Crawford, E. R. (2010). Job Engagement: Antecedents and Effects of Job Performance. *Academy of Management Journal*, *53*(3), 617–635.

Saarni, C. (1999). *The Development of Emotional Competence*. Guilford Press.

Salovey, P., & Mayer, J. D. (1990). Emotional Intelligence. *Imagination, Cognition, and Personality*, *9*(3).

Salovey, P., Mayer, J. D., & Caruso, D. (2002). Pozytywna psychologia inteligencji emocjonalnej. In: J. Czapiński (Ed.), *Psychologia pozytywna* (pp. 380–463). Wydawnictwo Naukowe PWN.

Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The Measurement of Engagement and Burnout: A Two Sample Confirmatory Factor Analytic Approach. *Journal of Happiness Studies*, *3*, 71–92.

Schutte, N., Toppinen, S., Kalimo, R., & Schaufeli, W. B. (2000). The Factorial Validity of the Maslach Burnout Inventory-General Survey (MBI-GS) across Occupational Groups and Nations. *Journal of Occupational and Organizational Psychology*, *73*(1), 53–66.

Shuck, B., & Wollard, K. (2010). Employee Engagement and HRD: A Seminal Review of the Foundations. *Human Resource Development Review*, *9*(1), 89–110.

Stein, S. J. (2011). *The Complete EQ-I 2.0 Model (Technical Manual)*. Multi-Health Systems, Toronto.

Wytykowska, A., & Petrides, K. V. (2007). Inteligencja emocjonalna jako dyspozycja. Polska adaptacja skali do badania inteligencji emocjonalnej jako cechy: TEIQue Petridesa i Furnhama. *Psychologia, Edukacja i Społeczeństwo*, *4*(1), 97–110.

Chapter 8

Marketing Strategies for Standardisation and Adaptation to Foreign Markets of Agricultural Machines Manufacturers as Perceived by Export Sales Managers

Sandra Snarska, Urszula Kobylińska

8.1. Introduction

The company operation in foreign markets is related to its internationalisation. The internationalisation of companies is a complex process, so it is difficult to find a single, universal definition of this concept in the literature (Budzyńska-Biernat, 2015). Turnbull defines internationalisation as the physical emergence of a company beyond the borders of its home market (Turnbull, 1987). Johanson and Vahlne define it as the process of increasing international exposure and adapting a company's strategic activities to the specifics of the international environment (Johanson & Vahlne, 1977). According to Dunning, on the other hand, internationalisation is a model of a company's foreign investment in which it exploits its advantages (Dunning, 1981).

Referring to Polish authors, reference should be made to Rymarczyk, who most broadly defined the process of internationalisation as any type of economic activity undertaken by a company outside the country (Rymarczyk, 2004). K. Fonfara emphasises that the concept of internationalisation of enterprises is based on the assumption that a company's activities on the home market differ from its activities on foreign markets. At the same time, the author points out that the foreign environment is characterised by differences with respect to the local environment and, therefore, any foreign company operations should be treated differently (Fonfara, 2012).

The background to internationalisation processes, but at the same time their premise and consequence, is globalisation processes. National markets are giving way to an expanding global market for three main reasons. The first is technology development, which has made it possible to significantly reduce

the transport price and telecommunication services, allowing companies to minimise production costs by moving part of their production activities abroad. Second, globalisation is supported by the international trade liberalisation, where the reduction of tariffs contributes to increased trade and investment. Third, continuous change and development provide additional incentives for global integration (Horská, 2014).

Globalisation reflects the companies tendency to buy, sell and distribute products and services in most countries and regions of the world. Internationalisation means doing business in many countries, but is often limited to a certain area, such as Europe (Hollensen, 2011).

Globalisation and internationalisation create opportunities for access to new markets, technologies and technological processes, new organisational and management knowledge, customer preferences. Consequently, they lead to the internationalisation of production, distribution and marketing. A company can conduct its marketing activities on the local market or on an international scale with foreign markets. However, the peculiarities and complexities of foreign markets are different from the domestic market, hence the need to implement distinct activities referred to as international marketing (Doole, Lowe & Kenyon, 2019).

Since the 1960s, a classification of marketing tools according to McCarthy's (1964) 4P concept has prevailed, assuming that satisfying customers' needs is done by providing them with a coherent offer consisting of product, price, distribution and promotion (Dorożyńska, Kłysik-Uryszek & Kuna-Marszałek, 2021).

An enterprise intending to enter international markets faces the challenge of answering the strategic questions of whether to introduce a standardised offer on foreign markets or the same as on the local market or adapted to the needs of a given market in terms of selected or all marketing-mix elements. In practice, only an insignificant number of enterprises strive for full standardisation or adaptation of marketing-mix tools, the majority use mixed strategies (Dorożyńska, Kłysik-Uryszek & Kuna-Marszałek, 2021). Choosing the right relationship between standardisation and adaptation is a challenge for today's managers (Hollensen, 2020). Global standardisation can enhance a product's brand image, while strategy adaptation can satisfy customer needs and increase exports (Khodakarami & Zakaria, 2018).

Following on from the above considerations, the aim of the paper is to investigate how Polish agricultural machines manufacturers expand into new foreign markets and thus determine the foreign marketing strategy they use for internationalisation. In order to achieve the aim of the paper, the authors conducted semi-structured interviews among managers responsible for sales in foreign markets of Polish agricultural machines manufacturing companies.

8.2. Adaptation and Standardisation Strategy in International Marketing – Bibliometric Analysis

The literature review process is a key tool for analysing knowledge for a specific study. The literature review purpose is to enable the researcher to both map and evaluate the existing theoretical area and to clarify the research problem (Tranfield, Denyer & Smart, 2003). The systematic literature review in this paper uses bibliographic data on the topic of adaptation and standardisation strategies in international marketing and was divided into four main steps. The first step was to search the literature for analysis. The next step involved the selection of publications found in the database by introducing selected search filters. The third and fourth stages were devoted to bibliometric analysis, primary analysis elements and citation analysis. Baseline data for the study were collected from the Web of Science and Scopus databases on 4 January 2024. A search was performed for scientific publications that included the phrases "international marketing" and "standardisation" or "adaptation" in their title, abstract or keywords. The review covered the period 2009–2023 and related to the area of Business, Management and Accounting. The total number of documents found for the two phrases in the Web of Science and Scopus databases was 3,709. The detailed criteria and results of the publication review for the Web of Science and Scopus databases are presented in Table 8.1.

Table 8.1. Criteria and results for filtering publications in Web of Science and Scopus databases

Phrase	Criteria filtering	Scopus	Web of Science
"International marketing" and "standardisation" or "adaptation"	title, abstract	8	72
	keywords	37	128
	articles published in journals	116	423
"International marketing"	title, abstract	247	156
	keywords	711	408
	articles published in journals	1,247	156

Source: authors' own work.

The first stage of the bibliometric analysis was to assess changes in researchers' interest in the adaptation and standardisation strategies in international marketing issue.

Figure 8.1 shows the number of publications dedicated to the topic of marketing adaptation and standardisation strategies and international marketing in general from 2009 to 2023 in the Scopus database. The number of publications dedicated to international marketing (1,247) far outweighs the number of publications on adaptation and standardisation strategies (116).

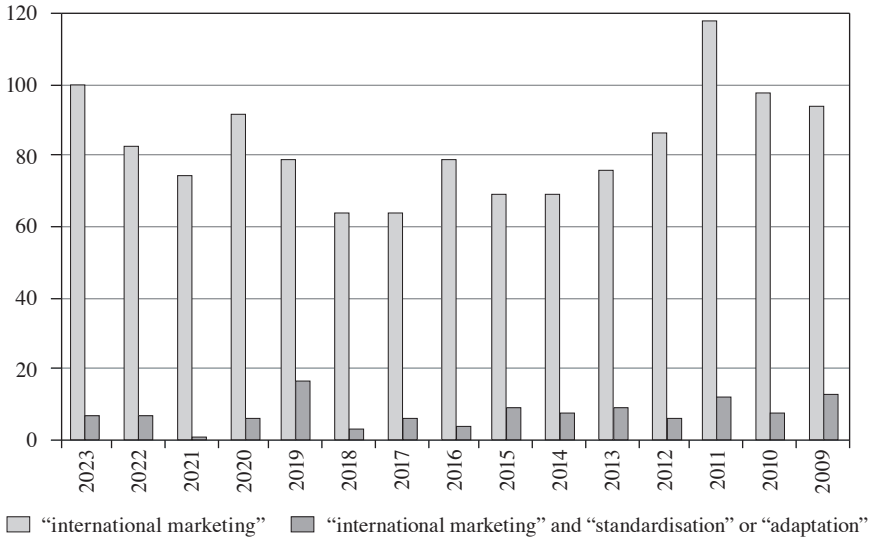

Figure 8.1. Number of publications on the topic of marketing adaptation, standardisation strategies and international marketing from 2009 to 2023 in the Scopus database
Source: authors' own work.

The first article in the Scopus database dealing with the topic of adaptation strategies "International Marketing Presentations: Some Options" by P. J. Hovell and P. G. P. Walters appeared in 1972 in the *European Journal of Marketing*. The article outlines the advantages and disadvantages of standardised approaches to international marketing.

For the Web of Science database, the first publication, "Patterns of Marketing Adaptation in International Business: A Study of American Business Firms Operating in India" by M. P. Kacker, appeared in 1972 in *Management International Review*. The publication addresses the adaptation strategies of American businesses in the Indian market.

The next stage of the bibliometric research involves citation analysis (Table 8.2), which illustrates the impact scale of the selected scientific publication. The Scopus database identified the 10 most-cited articles on adaptation and standardisation strategies in international marketing terms. Studies from this area were cited a total of 1,113 times. The most frequently cited publication in the database, with 160 citations, is the article by M. Hultman, M. J. Robson and C. S. Katsikeas, titled "Export Product Strategy Fit and Performance: An Empirical Investigation," published in the *Journal of International Marketing* in 2009. On the other hand, in the Web of Science database, the most cited publication is an article by K. E. Meyer, S. Estrin, S. K. Bhaumik, and M. W. Peng titled "The Importance of the Export of a Product to the Market. Institutions, Resources

and Entry Strategies in Emerging Economies" published in *Strategic Management Journal* in 2009 with a total of 1,151 citations.

Table 8.2. Ranking of articles with the highest citations number in the Scopus database

No.	Authors	Title	Journal	Year	Number of citations (% share)
1	Hultman, M., Robson, M. J., & Katsikeas, C. S.	"Export Product Strategy Fit and Performance: An Empirical Investigation"	*Journal of International Marketing*, *17*(4), 1–23	2009	160 (5%)
2	Schmid, S., & Kotulla, T.	"50 Years of Research on International Standardization and Adaptation – from a Systematic Literature Analysis to a Theoretical Framework"	*International Business Review*, *20*(5), 491–507	2011	134 (4%)
3	Paul, J.	"Marketing in Emerging Markets: a Review, Theoretical Synthesis and Extension"	*International Journal of Emerging Markets*, *15*(3), 446–468	2020	126 (4%)
4	Vrontis, D., Thrassou, A., & Lamprianou, I.	"International Marketing Adaptation versus Standardisation of Multinational Companies"	*International Marketing Review*, *26*(4), 477–500	2009	116 (4%)
5	Navarro, A., Losada, F., Ruzo, E., & Díez, J. A.	"Implications of Perceived Competitive Advantages, Adaptation of Marketing Tactics and Export Commitment on Export Performance"	*Journal of World Business*, *45*(1), 49–58	2010	112 (3%)
6	Schilke, O., Reimann, M., & Thomas, J. S.	"When Does International Marketing Standardization Matter to Firm Performance?"	*Journal of International Marketing*, *17*(4), 24–46	2009	110 (3%)
7	Donthu, N., Kumar, S., Pattnaik, D., & Lim, W. M.	"A Bibliometric Retrospection of Marketing from the Lens of Psychology: Insights from Psychology & Marketing"	*Psychology and Marketing*, *38*(5), 834–865	2021	94 (3%)
8	Steenkamp, J.-B. E. M., & Geyskens, I.	"Manufacturer and Retailer Strategies to Impact Store Brand Share: Global Integration, Local Adaptation, and Worldwide Learning"	*Marketing Science*, *33*(1), 6–26	2014	94 (3%)
9	Hallbäck, J., & Gabrielsson, P.	"Entrepreneurial Marketing Strategies during the Growth of International New Ventures Originating in Small and Open Economies"	*International Business Review*, *22*(6), 1008–1020	2013	85 (3%)
10	Olejnik, E., & Swoboda, B.	"SMEs' Internationalisation Patterns: Descriptives, Dynamics and Determinants"	*International Marketing Review*, *29*(5), 466–495	2012	82 (3%)

Source: authors' own work.

Most studies have focused on indicating companies' attitudes toward the use of standardisation/adaptation strategies and examining the reasons influencing their selection criteria (Vrontis, Thrassou & Lamprianou, 2009; Navarro *et al.*, 2009; Olejnik & Swoboda, 2012; Hallbäck & Gabrielsson, 2013). The following

authors' studies: (Schilke, Reimann & Thomas, 2009; Hultman *et al*., 2009) verified the benefits obtained with standardised strategies with those that can be achieved with adaptation strategies. Among the most frequently cited publications was a systematic literature review of international standardisation/marketing adaptation strategies (Schmid & Kotulla, 2011).

The next step of the bibliometric analysis was to verify the number of citations in relation to the country of authors' origin publishing articles on adaptation and standardisation strategies in terms of international marketing in the Scopus database. Table 8.3 shows the countries of origin of the authors publishing most frequently in the Scopus database, together with the number of citations, publications and the number of citations per publication.

Table 8.3. Country of origin of the most frequently published authors in the Scopus database

No.	Country	Citations	Publications	Citations per publication
1	USA	990	40	24.7
2	UK	859	26	33
3	Germany	390	15	26
4	Spain	317	12	26.4
5	France	127	11	11.5
6	Italy	106	11	9.6
7	Australia	198	10	19.8
8	India	313	9	34.7
9	Israel	157	9	17.4
10	Finland	176	8	22

Source: authors' own work.

As can be seen, the largest number of authors publishing on the issues analysed comes from the USA. This can be explained by the fact that this country plays a key role as a business and technology centre in the world. Companies from the USA often have a global reach and are interested in strategies of adaptation and standardisation in order to compete effectively in international markets. In addition, there is a huge market in the USA with great cultural diversity. Companies operating in this market are often interested in expanding into international markets and are looking for strategies that will allow them to adapt effectively to different cultures while maintaining some standardisation of their marketing efforts.

8.3. Research Methodology and Research Sample

The realisation of the research goal, i.e. investigation of how Polish agricultural machines manufacturers expand into new foreign markets and thus determining the foreign marketing strategy they use for internationalisation, required the use of an appropriate research methodology. The authors chose the semi-structured interview as a research method because its basic feature is the possibility of posing any questions and deepening certain themes (Miński, 2018). The interview is one of the most popular obtaining information methods. According to Kvale, an interview is a specific conversation form, during which knowledge is created in the course of interaction between the interviewer and the respondent (Kvale, 2010).

The advantage of this method is to ensure that all areas of interest to the researcher are explored. The interview scenario may change during the course of the study as new connections and reflections result in the researcher. Open-ended questions presuppose a focus on certain topics rather than the rigidity of the interview structure. On the other hand, disadvantages can include the occurrence of any disruptions in the interview involving a topic change, which can affect the final result (Maison, 2022).

A total of ten interviews were conducted, involving foreign sales managers in the export sales departments of agricultural machines manufacturing companies in Poland. Interviews were conducted in the second quarter of 2022.

The questions were designed in such a way that the empirical material collected through them would allow the following research questions to be answered: Q1. How do Polish agricultural machines manufacturers expand into new foreign markets? and Q2. What foreign marketing strategies do they use for expansion?

The interviews were recorded, transcribed and analysed in a manner typical of information collected using a qualitative method. Analysis included structuring the data collected during the study and interpreting it.

Kvale advises a short briefing before the interview, i.e. introducing the respondent to the interview situation (Kvale, 2010), so the first step was to provide information about the interview purpose, the interview transcript and to clarify any ambiguities. At the initial stage of the interview, respondents were asked about the employment level in the company, the average length of service in the position, the number of foreign markets served by country and the exports structure in the company's total sales.

Among the surveyed enterprises, their structure was as follows – 3 large enterprises, 6 medium-sized enterprises and 1 small enterprise. Table 8.4 shows the research population characteristics. The average length of service of the respondents as foreign sales manager was 7 years. On average, managers were responsible for the sales development in nearly 15 foreign markets. For all

large companies and three of the medium-sized group, the markets are divided by geographical regions, with individual managers responsible for sales in groups of geographically similar markets. The amount level of foreign sales in the company's total sales in the case of large and 4 medium-sized companies ranged from 60 to 70%, while in another 2 medium-sized and 1 small company it was 40–50%.

Table 8.4. Research population

Responder	Position	Gender	Length of service	Number of markets served
Respondent 1	Export sales manager	M	12	< 15
Respondent 2		M	8	< 5
Respondent 3		M	6	> 15
Respondent 4		M	17	< 15
Respondent 5		M	5	< 10
Respondent 6		M	2	< 5
Respondent 7		M	5	< 5
Respondent 8		M	6	< 5
Respondent 9		M	4	< 10
Respondent 10		M	8	< 10

Source: authors' own work.

The dominant internationalisation form of agricultural machines manufacturing companies in Poland is export. This means that the surveyed companies have opted for a low risk of doing business in a foreign market, partially transferring it to a distributor, with the concomitant lower costs of such activity. Only one of the surveyed companies engages in a more advanced international activity form – three foreign subsidiaries.

8.4. Findings

The first question concerned the factors determining the choice of target markets. The specificity of the answers was dictated by the enterprise's size. For the representatives of large enterprises, the key factors were – the demand for a given product and the competitors presence on a given market, while for the representatives of small and medium-sized enterprises these were – geographical proximity and the agriculture specificity in a given country, as confirmed by the words of one manager responsible for sales in a medium-sized enterprise:

> The specificity of agriculture should be similar to that in Poland, so as not to modify the products too much [R6].

When asked about the process of entering a new foreign market from a company perspective, sales managers were happy to share details. For all companies it was similar. Excerpt from a foreign sales manager at a large company:

> Usually the first contact is at an industry trade fair in Poland or in other countries where we are already active, then the customer is asked to take a closer look at the offer and determine the sales potential. Sometimes only a narrow products group is attractive, sometimes the entire range. We often encourage the potential distributor to sell the first machines at a very attractive price. As we are confident in our products, we know that they will stand up to the work. The first working machines create the best advertisement. It is important to select the first machines to be "put on the market" so that they prove themselves in the specific market conditions. If a machine does not perform, such news will spread very quickly in the local farming community [R1].

> We are often referred by a dealer or farmer for a distributor from another country, in which case we usually manage to make new contacts [R8].

The marketing-mix strategy development and implementation is another important stage of a company's operating strategy in foreign markets. However, the strategy preparation should be preceded by marketing research of selected foreign markets. When asked about marketing research prior to entering a new foreign market, participants in the interviews mostly answered that they do not conduct such research. Only the representatives of two large companies answered in the affirmative, indicating that they conduct research, but only for a selected markets part using their own resources in specialised marketing departments.

It can be concluded that the product policy of Polish agricultural machines producers corresponds to standardisation and undertaking adaptations in individual cases, i.e. adjusting the offer to the selected market segment requirements. The answers obtained show that all producers make modifications to the products offered, but only in specific cases, as indicated by one of the representatives:

> Modifications relate to technical parameters and functionality when there is a high demand for selected machine models in specific markets. An example would be agricultural machines designed for working in high mountain areas [R5].

However, smaller producers, representing small and medium-sized enterprises, are less likely to put modified products into serial production, as they rather try to make these only on an exceptional basis.

In product branding policy terms, the abandonment of their own original brand becomes apparent. Three out of ten of the companies analysed produce agricultural machinery which is then sold on foreign markets under the brand name of another manufacturer, well known in the chosen country; moreover, companies are open to this type of cooperation between other manufacturers. Excerpt from a statement by one sales representative of a large manufacturer:

> As a new company in an difficult exotic market, we are able to work with a well-known leading manufacturer and offer products under its brand name already known to customers [R1].

In terms of pricing policy, all managers were in agreement – the price level is adapted to the markets specifics. Citing the words of one manager, the pricing strategy assumes export prices at a different level than those in the home market:

> Prices are not determined by the selected foreign markets specifics, but only by the costs associated with logistics and distribution of agricultural machines and pricing at a relatively lower level than western competitors [R10].

The distribution policy of Polish agricultural machines manufacturers abroad involves the use of their foreign distribution channels. Only one of the surveyed companies in the large group has its own distribution channel – two foreign companies. All Polish manufacturers prefer selective distribution with independent intermediaries, so-called exclusive importers and dealers, a fact explained by a sales representative:

> Dealers are able to assume the risks and costs of selling products in foreign markets [R4].

Managers cited the following as deciding factors when choosing a distributor for expansion into foreign markets: sales risk, sales costs, distributor reach, market knowledge and effectiveness in reaching end customers.

The forms of promotion used in the agricultural machines market are not spectacular, the limited number of buyers means that direct marketing instruments are much more important, while the role of mass media tools is less important – as Niewiadomski's (2012) research has already shown. The following were indicated as the promotional tools most frequently used in foreign markets: trade fairs, advertising brochures and catalogues, social media, Internet advertising, press advertising, machines demonstrations in the field and open days at the company or factory tours. The choice in most cases was dictated by the market and buyer group specifics, observation of competitors' activities, to quote the words of the salesman responsible for sales in a medium-sized company:

> On the previously verified effectiveness of activities in a given market [R9].

Promotional activities are partly tailored to the individual markets specifics, but through the significant share of the brand distributor in the market in question. As one manager specified:

> Marketing activities are the responsibility of dealers who know the market in a given area [R3].

Figure 8.2 shows a diagram of 4P marketing mix of the international strategy of the companies surveyed.

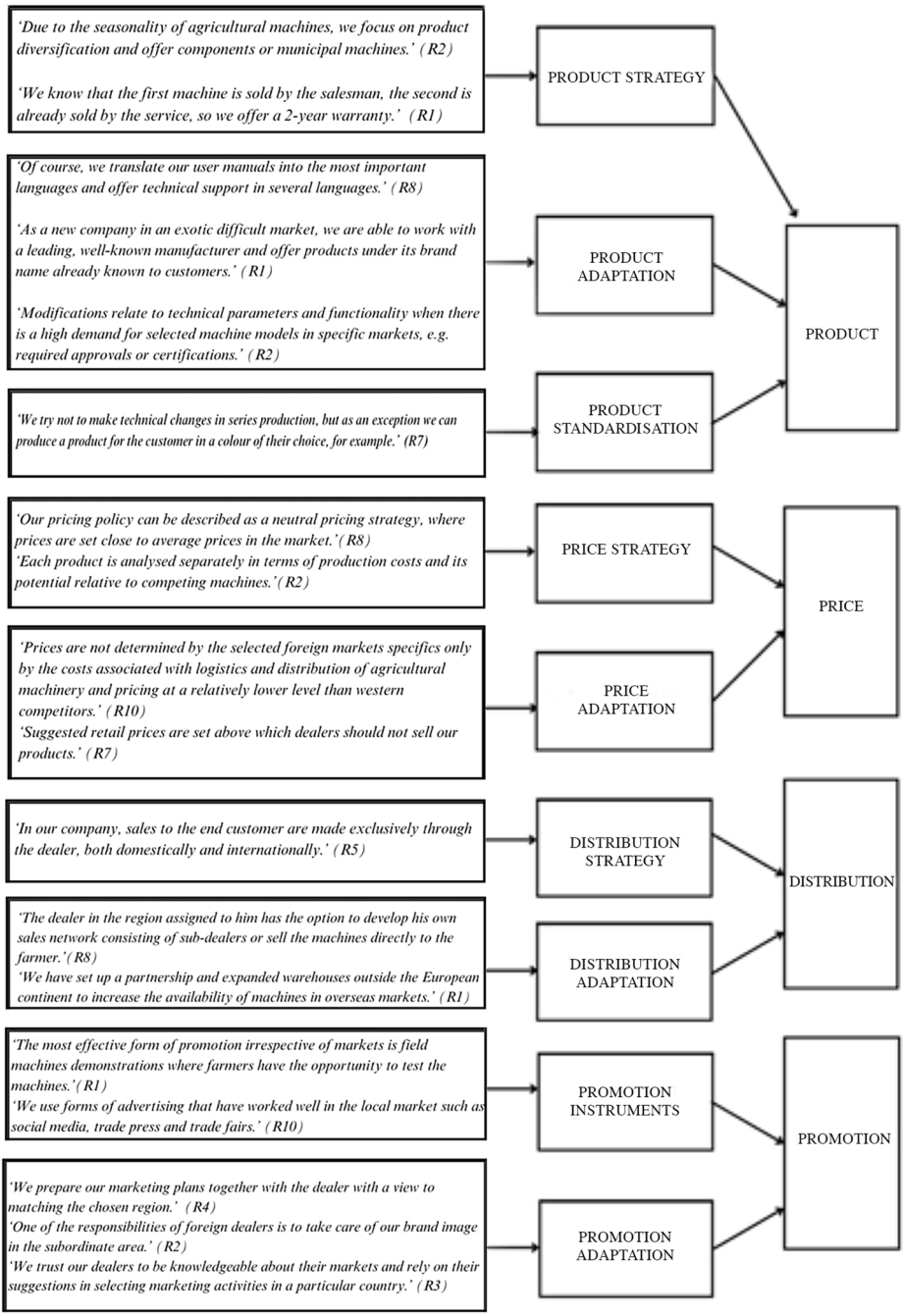

Figure 8.2. 4P marketing-mix strategy diagram of the companies surveyed
Source: authors' own work.

8.5. Conclusion

Summarising the research results, it can be concluded that in the agricultural machines manufacturing industry, the company size has a significant impact on the decision behind the choice of target markets. For large companies, product demand and the competitors presence on a market are key factors, while for small and medium-sized companies factors such as geographic proximity and the agriculture specifics are more important. Entering new foreign markets usually begins with the first contacts at trade fairs in Poland or other countries where the company is already active. It is important to familiarise the customer with the offer and to identify sales potential. Companies often encourage potential distributors through attractive prices for the first machines of whose quality and good performance they are certain.

The development and implementation of a marketing-mix strategy is an important stage of an enterprise's operations in foreign markets. It should be noted, however, that most surveyed companies do not carry out marketing research before entering a new foreign market. Only the representatives of some large companies indicated that such research is carried out, but only for selected markets and with the help of internal resources in specialised marketing departments. It can also be noted that larger companies are more inclined to adapt by introducing modifications to serial production, while smaller producers are less likely to do so, making sure that these are only pro-dynamic exceptions. Pricing policy is adapted to the specifics of individual foreign markets, where export prices are usually lower than on the home market, taking into account costs related to logistics and distribution. In terms of product branding policy, some producers have abandoned their own brands in favour of well-known local brands in order to better penetrate foreign markets, which can be an effective strategy for entering new markets.

The forms and promotion tools used in the agricultural machines market are very different from those used in the fast-moving goods market. The limited number of buyers means that instruments of direct marketing, such as fairs, industry events or machines demonstrations, are much more important. The export predominance over other forms decisively influences the low internationalisation degree of the companies surveyed. It can be assumed that as their knowledge of foreign markets develops, the internationalisation level of their business activities will increase. Some limitations of the study can be identified. The qualitative nature and small research sample, only on the Polish market, could potentially limit the results generalisability. Future research could investigate foreign marketing strategies used in other industrial production sectors within the EU.

References

Adamczyk, J., & Witek, L. (2008). *Marketing międzynarodowy*. Oficyna Wydawnicza Politechniki Rzeszowskiej.

Budzyńska-Biernat, A. (2015). Orientacja międzynarodowa przedsiębiorstwa w kontekście strategii marketingowej na przykładzie przedsiębiorstw sektora żywnościowego z Wielkopolski. *Zeszyty Naukowe Uniwersytetu Szczecińskiego. Problemy Zarządzania, Finansów i Marketingu*, *2*(41), 191–202.

Doole, I., Lowe, R., & Kenyon, A. (2019). *International Marketing Strategy: Analysis, Development and Implementation* (8th ed.). Cengage Learning.

Dorożyńska, A., Kłysik-Uryszek, A., & Kuna-Marszałek, A. (2021). *Organizacyjne i marketingowe aspekty internacjonalizacji przedsiębiorstw*. Wydawnictwo Uniwersytetu Łódzkiego.

Duliniec, E. (2007). *Marketing międzynarodowy*. PWE.

Dunning, J. H. (1981). *International Production and the Multinational Enterprise*. George Allen and Unwin.

Fonfara, K. (Ed.). (2012). *Zachowanie przedsiębiorstwa w procesie internacjonalizacji. Podejście sieciowe*. PWE.

Hallbäck, J., & Gabrielsson, P. (2013). Entrepreneurial Marketing Strategies during the Growth of International New Ventures Originating in Small and Open Economies. *International Business Review*, *22*(6), 1008–1020.

Hollensen, S. (2011). *Global Marketing. A Decision-oriented Approach* (5th ed.). Financial Times Prentice Hall.

Hollensen, S. (2020). *Global Marketing.* Pearson.

Horská, E. (2014). *International Marketing: Within and Beyond Visegrad Borders*. Wydawnictwo Episteme.

Hovell, P. J., & Walters, P. G. P. (1972). International Marketing Presentations: Some Options. *European Journal of Marketing*, *6*(2).

Hultman, M., Robson, M. J., & Katsikeas, C. S. (2009). Export Product Strategy Fit and Performance: An Empirical Investigation. *Journal of International Marketing*, *17*(4).

Johanson, J., & Vahlne, J.-E. (1977). The Internationalization Process of the Firm – A Model of Knowledge Development and Increasing Foreign Market Commitments. *Journal of International Business Studies*, *8*(1), 23–32.

Kacker, M. P. (1972). Patterns of Marketing Adaptation in International Business: A Study of American Business Firms Operating in India. *Management International Review*, *12*(4/5).

Karasiewicz, W. (2013). *Marketingowe strategie internacjonalizacji polskich przedsiębiorstw: podejście holistyczne*. Wolters Kluwer SA.

Keegan, W. J., & Green, M. C. (2000). *Global Marketing*. Prentice-Hall.

Khodakarami, P., & Zakaria, Z. (2018). Inward Export Performance and Export Marketing Strategy in Service Industry: Review and a Conceptual Framework. *World Applied Sciences Journal*, *35*(11), 2486–2493.

Kvale, S. (2010). *Prowadzenie wywiadów*. Wydawnictwo Naukowe PWN.

Maison, D. (2022). *Jakościowe metody badań społecznych. Podejście aplikacyjne*. Wydawnictwo Naukowe PWN.

Meyer, K. E., Estrin, S., Bhaumik, S. K., & Peng, M. W. (2009). Institutions, Resources and Entry Strategies in Emerging Economies. *Strategic Management Journal*, *30*(1), 61–80.

Miński, R. (2018). Wywiad pogłębiony jako technika badawcza. Możliwości wykorzystania IDI w badaniach ewaluacyjnych. *Przegląd Socjologii Jakościowej*, *13*(3), 30–51.

McCarthy, E. J. (1964). *Basic Marketing: A Managerial Approach*. R. D. Irwin.

Navarro, A., Losada, F., Ruzo, E., & Díez, J. A. (2010). Implications of Perceived Competitive Advantages, Adaptation of Marketing Tactics and Export Commitment on Export Performance. *Journal of World Business*, *45*(1), 49–58.

Niewiadomski, P. (2012). Jakość czy cena? Czynniki determinujące decyzje zakupu produktu na rynku maszyn rolniczych. Część I. Rozważania systematyzujące. *Journal of Research and Applications in Agricultural Engineering*, *57*(2), 125–129.

Olejnik, E., & Swoboda, B. (2012). SMEs' Internationalisation Patterns: Descriptives, Dynamics and Determinants. *International Marketing Review*, *29*(5), 466–495.

Pietrasieński, P. (2005). *Międzynarodowe strategie marketingowe*. PWE.

Robertson, R. (1994). Globalisation or Glocalisation? *The Journal of International Communication*, *1*(1), 33–52.

Rymarczyk, J. (2004). *Internacjonalizacja i globalizacja przedsiębiorstwa*. PWE.

Rymarczyk, J. (2012). *Biznes międzynarodowy*. PWE.

Schilke, O., Reimann, M., & Thomas, J. S. (2009). When Does International Marketing Standardization Matter to Firm Performance? *Journal of International Marketing*, *17*(4), 24–46.

Schmid, S., & Kotulla, T. (2010). 50 Years of Research on International Standardization and Adaptation – from a Systematic Literature Analysis to a Theoretical Framework. *International Business Review*, *20*(5), 491–507.

Sobczak, E. (2006). Procesy globalizacji a marketing międzynarodowy. *Marketing i Rynek*, 10, 2–7.

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review. *British Journal of Management*, *14*(3), 207–222. https://doi.org/10.1111/1467-8551.00375

Turnbull, P. W. (1987). A Challenge to the Stages Theory of the Internationalization Process. In: P. J. Rosson, S. D. Reid (Eds), *Managing Export Entry and Expansion. Concepts and Practice* (pp. 21–40). Praeger.

Vahlne, J.-E., & Johanson, J. (2012). New Technology, New Business Environments and New Internationalization Processes? In: V. Havila, M. Forsgren, H. Håkansson (Eds), *Critical Perspectives on Internationalization* (pp. 209–228). Pergamon.

Vrontis, D., Thrassou, A., & Lamprianou, I. (2009). International Marketing Adaptation versus Standardisation of Multinational Companies. *International Marketing Review*, *26*(4/5), 477–500.

PART II

LABOUR, FINANCE AND QUALITY IN MODERN ECONOMY

Chapter 9

Mapping the Balance: Diversity of Work-Life Balance in EU Countries

Katarzyna Piecuch, Michał Niewiadomski

9.1. Introduction

Contemporary trends such as an ageing society, technological transformation, and the globalisation of labour markets emphasise the significance of reconciling professional and personal life. Work-life balance (WLB) solutions increasingly influence European labour markets, determining human resources' competitiveness, inclusion, and diversity levels. These solutions benefit entrepreneurs and individuals but differ across EU countries in terms of assessing their effects. The study aims to identify these variations and group EU countries according to the quality of WLB system assessments from the employees' perspective. This comparison enabled the recognition of similarities and contrasts in how effectively employees in different countries reconcile their professional and personal lives.

The evaluation of WLB efficiency examines the impact of occupational demands on the quality of personal life and the extent to which personal obligations determine the work domain (Staines, 1980). Job responsibilities may interfere with individual private environments at various levels, often by depleting physical and mental capabilities necessary for domestic responsibilities or caregiving. Conversely, personal life dynamics, such as family concerns, can reduce employees' levels of concentration and attention at work. This backdrop creates tensions that lead to work-life conflict (Greenhaus & Beutell, 1985), which assumes that achieving fulfilment or satisfaction in one domain necessitates compromises in another. Such conflicts result in many adverse outcomes, including physical and emotional exhaustion and, ultimately – job burnout (Bannai & Tamakoshi, 2014). These negative consequences decrease work quality and efficiency, affecting companies' economic performance (Elizebeth Thomas, George & Joshua, 2024; Murugan & Dharshini, 2023; Timms, Brough & Graham, 2012).

In contrast, companies that implement strategies to improve the WLB of their employees report lower absenteeism rates, reduced employee turnover and increased commitment and loyalty (Kurniasari & Dewi, 2023; Secret, 2006).

Another important criterion for evaluating work-life balance is time management, which refers to how effectively an individual can allocate time between personal and professional life (Strzemińska & Bednarski, 2014). A review of more than 60 studies by Albertsen (Albertsen *et al*., 2008) found that nearly all examined studies confirm the negative impact of extended working hours on WLB. The flexibility of time and the ability to freely decide how to divide it between work and personal commitments are also necessary to successfully reconcile work and personal duties (Timms *et al*., 2015).

Consequently, balancing professional and private life is one of the EU's fundamental goals and policies. Efforts to enhance working conditions and strengthen the labour force are also closely linked to the Sustainable Development Goals (SDEs), particularly SDG 8 (quality of work and economic development). However, despite the consistent actions of the European Commission, EU member states display considerable differences in how their working population perceives their WLB (Eurofound, 2023).

The current body of research on work-life balance (WLB) often focuses on specific industries, sectors (Aufa *et al*., 2023; Murugan & Dharshini, 2023), or countries (Fagnani & Letablier, 2004; Romeo, Yepes-Baldó & Berger, 2014; Vilhelmson & Thulin, 2016) making it challenging to understand WLB on an international level. Multinational studies can offer valuable insights for policy development by highlighting effective policies in diverse contexts. One common approach in multinational studies involves grouping and comparing methods. For instance, a typology was developed by comparing family policies across 28 OECD countries, categorising them into five groups based on their welfare regimes (Thévenon, 2011).

Other comparative studies delve into the cultural aspects of WLB, such as gender roles and household status (Clarke, Koch & Hill, 2004; Uberti & Douarin, 2023) indicating a distinction between Mediterranean countries (e.g., Italy and Greece) and Nordic countries (e.g., Iceland and Sweden). These findings align with the study that indexed EU countries in terms of WLB systems (Fernandez-Crehuet, Gimenez-Nadal & Reyes Recio, 2016). The National Work--Life Balance Index encompasses five assessment categories: time, work, family, health, and politics. The index authors concluded that Northern and Central European countries, such as Denmark, the Netherlands, Finland, and Sweden, had a higher National Work-Life Balance Index value when compared to Southern and Western European countries, such as Spain, Greece, Portugal, Latvia, and Bulgaria. Such multinational studies hold the potential to shape policy-making

by highlighting the effectiveness of certain WLB strategies in specific cultural and regional contexts.

This study aimed to bridge a research gap in international comparisons by identifying current differences among EU countries in the quality of employees' assessment of the WLB system. The comparison revealed both similarities and contrasts in how specific national circumstances influence the effectiveness of WLB regulations and solutions.

The chapter is structured into several key sections. The methodology section details the use of the Czekanowski diagram method to analyse secondary data from the European Working Conditions Telephone Survey (EWCTS). Results are then presented, showing eight distinct groups of EU countries based on WLB experiences and the factors affecting them. The conclusions and discussion section interprets the results and their implications for policy and practice.

9.2. Methodology

To assess the EU member states' WLB concept, we employed the Czekanowski diagram method. This method, originally from anthropology science (Soltysiak & Jaskulski, 1999), which has been extended to other scientific fields (Bartoszek & Luo, 2023; Grabiński, 2017; Mowczan, 2017; Oleniacz, 2021) is a graphical representation of the similarities and differences between sets of data. It allows for comparing multiple variables and identifying patterns or trends in the data set. The method replaces selected distance measures with graphic symbols or, in this study, with colours, which allows for the possibility of observing similarities and differences in the data set.

In our study, estimating the distances between objects (analysed countries) was preceded by the standardisation of data within individual variables, which led to the unification of the studied features. The distance between the objects was determined by the urban distance (Manhattan, City Block) (Malkauthekar, 2013), according to the formula:

$$d_{il} = \sum_{j=1}^{m} \left| z_{ij} - z_{lj} \right| \qquad (i = 1, 2, \ldots, n;\ j = 1, 2, \ldots, m), \tag{1}$$

where:

d_{il} – represents the distance between object i and l,

z_{ij} – signifies the standardised value of variable xj for the i-th object,

z_{lj} – signifies the standardised value of variable xj for the l-th object.

Applying the above transformation, we obtained a matrix of distances between objects (countries). Interpreting such an asymmetric matrix is complicated. Therefore, symbols or colours are assigned to individual values within

the accepted distance intervals (as in this study). This results in a symmetrical, unordered diagram, a fundamental problem at the creation stage.

Ordering the diagrams can be achieved using different algorithms, such as the ordering algorithm, the genetic algorithm, and the UMCzek (Soltysiak & Jaskulski, 1999). This study selected the ordering algorithm due to its ability to deliver efficient results with limited observations. This algorithm transforms the diagrams to minimise the value of the optimisation function (Strojny & Niewiadomski, 2023).

9.3. Results

In order to analyse the WLB phenomenon, we include all member states of the European Union (EU27). The secondary data for this analysis was obtained from the European Working Conditions Telephone Survey (Eurofound, 2023), conducted by the European Foundation for the Improvement of Living and Working Conditions in 2021 (Eurofound, 2023). We specifically selected variables from the original survey related to the WLB aspect. These variables encompassed questions regarding the intersection of personal and professional spheres (spillover and conflict theory – questions 3, 4 and 5), control over time and its flexibility (questions 1, 2 and 7), and the consequences of work-life conflict (question 6).

Each question had different response options. These are presented in Table 9.1.

Table 9.1. Questions used to research the WLB EU employee's experience

No.	Question	Response option
1	How do your working hours align with your family or social commitments outside work?	Not well at all
		Not very well
		Well
		Very well
2	Would you say that for you arranging to take an hour or two off during your usual working hours to deal with your personal or family matters is…?	Very difficult
		Fairly difficult
		Fairly easy
		Very easy
3	How often in the last 12 months have you felt too tired after work to do some of the household jobs which need to be done?	Always
		Often
		Sometimes
		Rarely
		Never

Table 9.1 cnt'd

No.	Question	Response option
4	How often in the last 12 months have you found it difficult to concentrate on your job because of family responsibilities?	Never
		Rarely
		Sometimes
		Often
		Always
5	How often in the last 12 months have you worried about work when you were not working?	Always
		Often
		Sometimes
		Rarely
		Never
6	Do you suffer from emotional or/and physical exhaustion?	Physical exhaustion
		Physical and emotional burnout
		No burnout
		Emotional exhaustion
7	Do you work more than 48 hours per week?	Less than 48 hours per week
		48 hours or more

Source: own work based on Eurofund (2023).

The data obtained were analysed using the MaCzek programme, which created a distance matrix between objects. The program then assigned symbols to each class corresponding to their distance. However, to present the data more clearly, the study authors deliberately converted these symbols into coloured rectangles (Table 9.2).

Table 9.2. Classification of symbols and class intervals with the determination of the level of similarity between observations

Symbol	Class compartments
■	0–16.725 (high level of similarity)
■	16.725–25.289 (medium similarity level)
■	25.289–37.043 (low level of similarity)
■	37.043–67.378 (negligible similarity)
Blank	≥ 67.378 (no similarity)

Source: own calculation, MaCzek programme.

The matrix was sorted using a simple automatic algorithm. Countries with similar variables describing WLB were grouped along the main diagonal. The chapter's authors then individually coloured the sorted distance matrix in Excel (Figure 9.1).

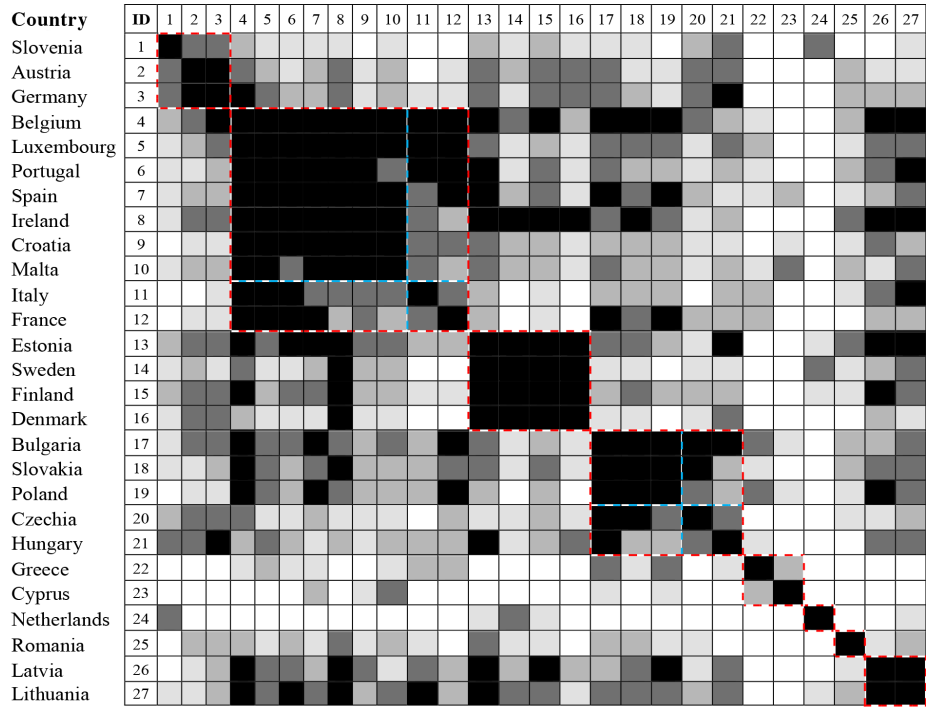

Figure 9.1. Grouping countries by variables describing the WLB phenomenon presented in the ordered Czekanowski diagram for data from 2021

Source: own work.

The diagram presents clusters of similar symbols, representing typological sets indicating the most and least diverse objects. Based on this, eight main groups were identified and marked with a red dotted line in the diagram. Additionally, two extra sets were identified for two groups, marked with a blue dotted line. The mean values of the individual variables for the resulting groups and subgroups are presented in Table 9.3.

The first group comprises Slovenia, Austria, and Germany. These countries have the lowest reported workload, with about 88% working less than 48 hours (variable V3). They also have the rarest occurrence of working hours interfering with personal duties and causing excessive fatigue that affects family life. Only about 7% of people in this group (V2) reported a problem with the flexibility of working hours. Additionally, people in these countries rarely worry about work when not working, translating to a relatively low risk of burnout, with approximately 8.8% (V7) of individuals experiencing emotional and physical exhaustion combined.

Table 9.3. Mean values of variables for groups identified by the Czekanowski diagraphic method

Group/ response option	V1: In general, how do your working hours fit in with your family or social commitments outside work?				V2: Would you say that for you arranging to take an hour or two off during your usual working hours to deal with your personal or family matter is?				V3: Do you work more than 48 hours per week?	
	not well at all	not very well	well	very well	very difficult	fairly difficult	fairly easy	very easy	less than 48 hours per week	48 hours or more
Group 1	2.94	10.62	44.54	41.90	7.20	10.69	37.10	45.01	88.01	11.99
Group 2, subgroup 1	5.66	15.39	46.92	32.03	9.89	12.48	41.34	36.30	82.30	17.70
Group 2, subgroup 2	5.75	12.40	42.35	39.49	10.33	12.80	39.35	37.52	84.28	15.72
Group 3	4.39	14.80	42.69	38.13	9.57	12.64	43.25	34.54	80.27	19.73
Group 4, subgroup 1	3.46	12.75	50.27	33.52	7.70	12.29	41.54	38.47	81.14	18.86
Group 4, subgroup 2	3.50	11.90	42.89	41.70	11.68	11.25	36.89	40.18	81.84	18.16
Group 5	5.79	15.72	46.22	32.27	17.99	17.54	43.33	21.13	81.76	18.24
Group 6	4.57	12.48	42.88	40.07	7.61	13.05	30.75	48.60	84.13	15.87
Group 7	6.36	14.72	46.62	32.31	8.49	16.03	43.43	32.05	82.43	17.57
Group 8	5.85	16.18	54.98	22.99	7.15	11.43	48.55	32.87	81.44	18.56
Group/ response option	V4: How often in the last 12 months have you felt too tired after work to do some of the household jobs which need to be done?					V5: How often in the last 12 months have you found it difficult to concentrate on job because of family responsibilities?				
	always	often	some-times	rarely	never	never	rarely	some-times	often	always
Group 1	2.33	17.75	32.58	30.00	17.34	36.85	37.27	18.53	5.75	1.61
Group 2, subgroup 1	5.99	20.75	31.21	24.94	17.11	36.24	32.56	22.71	6.86	1.63
Group 2, subgroup 2	8.18	19.49	36.56	23.12	12.65	27.62	37.34	26.73	5.87	2.45
Group 3	4.61	21.98	33.33	24.88	15.20	36.78	35.10	19.99	6.80	1.33
Group 4, subgroup 1	4.69	14.57	33.16	25.49	22.09	39.92	30.18	20.86	6.07	2.97
Group 4, subgroup 2	4.58	16.81	32.45	27.04	19.12	31.98	36.39	22.81	7.09	1.72
Group 5	3.84	23.62	29.24	27.73	15.57	33.57	35.10	20.88	8.30	2.14
Group 6	11.02	18.70	33.43	20.22	16.63	33.96	26.70	26.80	7.72	4.82
Group 7	4.65	15.20	37.39	22.92	19.84	36.20	32.76	25.47	3.52	2.05
Group 8	4.99	19.83	38.98	21.28	14.93	33.14	28.99	28.42	7.12	2.32

Table 9.3 cnt'd

Group/ response option	V6: How often in the last 12 months have you worried about work when you were not working?					V7: Do you suffer from emotional or/and physical exhaustion?			
	always	often	some-times	rarely	never	physical exhaustion	physical and emotional burnout	no burnout	emotional exhaustion
Group 1	2.81	14.58	26.49	28.60	27.52	18.82	8.79	66.44	5.96
Group 2, subgroup 1	8.98	20.99	24.95	20.55	24.53	22.27	14.73	57.51	5.50
Group 2, subgroup 2	11.20	18.19	27.89	22.16	20.55	19.66	12.40	62.76	5.17
Group 3	6.84	19.56	24.42	24.59	24.59	20.13	13.78	59.77	6.32
Group 4, subgroup 1	8.79	11.75	26.15	22.50	30.81	15.61	8.92	72.03	3.45
Group 4, subgroup 2	9.06	18.98	22.85	22.02	27.09	24.19	12.34	59.84	3.63
Group 5	6.54	23.36	22.62	22.74	24.74	20.84	16.20	56.94	6.02
Group 6	11.99	19.63	25.97	17.48	24.92	20.26	14.03	58.98	6.73
Group 7	13.86	22.19	34.75	14.47	14.74	23.99	9.18	63.05	3.78
Group 8	7.62	20.76	30.72	19.94	20.96	22.41	11.52	62.17	3.89

Source: own work.

The second group consisted of two subgroups: 1) Belgium, Luxembourg, Portugal, Spain, Ireland, Croatia, Malta, 2) Italy, and France. These countries demonstrated a higher workload, with about 18% of subgroup 1 and 16% of subgroup 2 working more than 48 hours per week. A slight decrease in the percentage of people working less than 48 hours led to a noticeable increase in work-life conflict and significantly impacted respondents' fatigue levels. The "always" components within the V4 variable were about 6% for subgroup 1 and about 8% for subgroup 2, respectively. At the same time, respondents from this subgroup were the least likely to say (about 13%, V4) that they never feel tired after work.

The third group included Estonia, Sweden, Finland, and Denmark. These countries have the highest (approximately 20%, V3) proportion of individuals reporting working more than 48 hours per week. These countries also have the lowest percentage of people (about 1.3%, V5) reporting problems concentrating on work due to personal workloads. Around 25% (V6) are rarely bothered by worrying about working outside. However, about 22% (V4) feel tired after work frequently, and 6.3% admit to experiencing emotional exhaustion (V7).

The fourth group consisted of two subgroups: 1) Bulgaria, Slovakia, Poland, 2) Czechia, and Hungary, and the adjustment of working hours to non-work duties was rated relatively well (V1). However, there is less flexibility in leav-

ing work for personal matters than other groups (V2). The percentage of people working more than 48 hours per week is high (18% in both subgroups in V3), but it does not lead to frequent fatigue after work. Subgroup 1 countries are most likely to have no problems concentrating at work due to family responsibilities and report the lowest percentage of burnout symptoms (V6). They are also characterised by the lowest percentage of people reporting symptoms of burnout or physical and emotional exhaustion (V7).

In *the fifth group*, which comprises Cyprus and Greece, respondents rated their ability to align working hours with personal responsibilities at an average level (V1). However, 18% of them, the highest among all groups, reported facing high or very high difficulty in obtaining permission to take a break during working hours for personal matters. Additionally, this group had the highest percentage (23%) of individuals who constantly felt fatigued after work (V4), followed by the lowest percentage of people who did not declare professional burnout (V6).

In *the sixth group*, the Netherlands was the only country represented. The survey revealed that it was easiest for employees in the Netherlands to take time off work for personal reasons, with about 49% of respondents indicating it was "very easy" (V2). However, the Netherlands also had the highest percentage of people feeling tired after work (around 11% for V4) and experiencing difficulty concentrating on work due to non-work demands (V6). These findings could explain why approximately 6.7% of respondents from the Netherlands reported feeling emotionally exhausted, which is the highest average share among all the groups.

The seventh group was Romania. This country had the highest percentage of respondents (around 6.3%) struggling to balance work and personal responsibilities (V1). Additionally, they are the most worried about their jobs when not working, with approximately 14% reporting this concern (V6). Physical exhaustion and a high risk of burnout are also relatively common in this group.

In *the eighth group*, including Lithuania and Latvia, about 55% of respondents rated their WLB as good, while approximately 16% rated it as not very good (V1). Respondents from these countries reported being able to take time off work for personal matters as reasonably good (V2), but about 19% worked more than 48 hours a week (V3). Additionally, around 40% of respondents sometimes feel too tired to do housework after work, and about 28% find it challenging to concentrate on work due to personal responsibilities (in both variables, it is the highest number of all surveyed groups).

9.4. Conclusion

The categorisation of countries has been instrumental in advancing our understanding of the factors influencing WLB in Europe. Our analysis showed significant variation among countries, indicating that the same factors impact WLB differently. From the grouping analysis, the following conclusions were drawn.

Less overtime work improves WLB. The characteristics of group 1 support studies that indicate a positive correlation between long working hours and weaker WLB (Hsu *et al*., 2019). Reducing overtime leads to a more efficient personal life and a lower risk of burnout or lack of concentration on work. These results align with previous studies demonstrating that improved WLB is linked to reduced levels of burnout (Tomar & Singh, 2024). Findings are also supported by the conclusion of group 2, where only a slight increase in the number of people working more than 48 leads to more frequent fatigue after work, which makes it challenging to perform non-work duties. The tilting of the balance towards work may be related to the cultural emphasis on work and strong labour market regulations. This is confirmed by research by Matilla-Santander, who notes that despite solid labour market regulations (e.g. overtime), little effort is made to facilitate WLB in these countries.

Long working hours are conducive to high concentration at work. Group 3 coincides with Thévenon's classification. In our research, the Nordic countries have been enlarged to include Estonia, which is in line with the direction of development of this country, bringing it closer to the level of this group (Laar, 2008). In contrast to group 1, there is the most significant problem with long working hours, but at the same time, the lowest problem is concentration on work due to personal burdens. This can be explained by the well-developed care systems in these countries, which effectively relieve people who work overtime from non-work-related responsibilities (Pylkkanen & Smith, 2021).

The assessment of WLB is not solely determined by working hours and flexibility. In countries where people work longer hours (groups 3 and 4), there is usually less tension in the work sphere, and concentration on work remains high. The situation of group 4 may be linked to cultural conditions resulting from the communist regime, leading to a lack of gender equality in household chores and a solid social acceptance of long working hours. In contrast, the situation of group 3 may be associated with a well-established care and support system for families, which helps employees effectively detach from family or personal duties. This conclusion is supported by a study, which revealed that highly developed countries view overtime as time taken away from family or personal matters, while in countries with a lower level of economic development, overtime

work can be viewed as beneficial for the family due to increased profits, reducing the tension associated with the risk of job loss (Spector *et al*., 2004).

The flexibility in work schedules can support WLB, but it can also lead to emotional exhaustion. Cyprus and Greece have high instances of individuals finding it challenging to take time off work for personal reasons and always feeling fatigued after work. The low scores in Greece are consistent with findings from other studies (Fernandez-Crehuet, Gimenez-Nadal & Reyes Recio, 2016; Piasna & Spiegelaere, 2021). The Netherlands provides an example of a country with high work flexibility but also experiences reduced work focus, post-work fatigue, and emotional exhaustion (Spreitzer, Cameron & Garrett, 2017). Therefore, offering too much flexibility in working hours may not always solve WLB issues. One possible reason for the high emotional exhaustion despite flexible work schedules is the pressure to be available anytime and anywhere. Research has shown that while flexible work schedules can have benefits, they may not necessarily improve concentration at work or reduce the effects of post-work fatigue and emotional exhaustion (Bencsik & Juhasz, 2023; Nagar & Rana, 2024). This may be linked to the misuse of employee availability after work and the lack of skilful time management in a remote or hybrid environment. Effective WLB systems should alleviate professional stress, offer flexibility in work schedules, and empower employees with greater autonomy over their work.

A low WLB rating may be more influenced by worrying about work than personal life. Romanian respondents rated their ability to reconcile low, indicating that they worry less often about personal responsibilities at work but more often about work when they are not working. This suggests that insufficient labour regulation may contribute to WLB disruption more than social and family regulation deficits. Fear of losing a job is more critical in assessing WLB than fear of the personal sphere. This underscores the need for policies that address job security and work-related stress to improve WLB.

Our research offers a new perspective on country groupings in the context of work-life balance (WLB). We found that Eastern European countries within Thévenon's (2011) welfare model show significant diversity in relation to WLB and its connection to the labour market (Piecuch, 2017). Our results also indicate a positive relationship between strict working time policies in certain countries and better WLB (Germany, Austria). However, countries with extended working hours and poor enforcement of working time rules present a contrasting scenario (Matilla-Santander *et al*., 2019). This emphasises the importance of balancing workplace flexibility to avoid emotional exhaustion.

The conclusions of the analysis point to the complexity of the WLB phenomenon, highlighting that not only the number of working hours but also social support, flexibility and cultural aspects play a crucial role in shaping the experience of work and private life. The observed differences suggest that

while EU legislation is uniform, country-specific measures may be more effective in moderating conditions for a high WLB score.

One of the limitations of the study is the use of secondary data from the European Working Conditions Telephone Survey, which might not capture all nuanced cultural and social factors influencing work-life balance in different EU countries. The Czekanowski diagram method, while effective for comparing multiple variables, can result in some minor complications when interpreting asymmetric matrices of distance between objects. Future research should continue to analyse differences between countries, focusing on understanding how different policies affect WLB. An important research direction would also be to investigate how cultural determinants in individual countries influence the perception and implementation of WLB, which may lead to a deeper understanding of the mechanisms that determine differences between countries. Finally, further research is proposed on the effectiveness of various policy interventions to improve WLB, analysing their impact on reducing post-work fatigue and improving the overall well-being of workers.

References

Albertsen, K., Rafnsdóttir, G. L., Grimsmo, A., Tómasson, K., & Kauppinen, K. (2008). Workhours and Worklife Balance. *Scandinavian Journal of Work, Environment and Health* (*Supplements*), *5*, 14–21.

Aufa, F. T., Istiqomah, F. A., Fadillah, N., & Ferdian, F. (2023). The Increasing of Employee Retention in the Hotel Industry: Diagnosing the Effect of Work-life Balance. *Jurnal Pariwisata Nusantara (JUWITA)*, *2*(2), 95–102. https://doi.org/10.20414/juwita.v2i2.7286

Bannai, A., & Tamakoshi, A. (2014). The Association between Long Working Hours and Health: A Systematic Review of Epidemiological Evidence. *Scandinavian Journal of Work, Environment and Health*, *40*(1), 5–18. https://doi.org/10.5271/sjweh.3388

Bartoszek, K., & Luo, Y. (2023). Identifying Clusters in Czekanowski's Diagram. *Mathematica Applicanda*, *51*(2), 183–198. https://doi.org/10.14708/ma.v51i2.7259

Bencsik, A., & Juhasz, T. (2023). Impact of Technostress on Work-life Balance. *Human Technology*, *19*(1), 41–61. https://doi.org/10.14254/1795-6889.2023.19-1.4

Clarke, M. C., Koch, L. C., & Hill, E. J. (2004). The Work-family Interface: Differentiating Balance and Fit. *Family and Consumer Sciences Research Journal*, *33*(2), 121–140. https://doi.org/10.1177/1077727X04269610

Elizebeth Thomas, S., George, J., & Joshua, A. J. (2024). Work-life Balance Practices: Drivers of Job Engagement and Mitigators of Turnover Intention. *Research Review. International Journal of Multidisciplinary*, *9*(3), 178–190. https://doi.org/10.31305/rrijm.2024.v09.n03.019

Eurofound. (2023). *European Working Conditions Survey* (dataset). https://www.eurofound.europa.eu/en/data-catalogue/european-working-conditions-survey

Fagnani, J., & Letablier, M.-T. (2004). Work and Family Life Balance: The Impact of the 35-Hour laws in France. *Work, Employment and Society*, *18*(3), 551–572. https://doi.org/10.1177/0950017004045550

Fernandez-Crehuet, J. M., Gimenez-Nadal, J. I., & Reyes Recio, L. E. (2016). The National Work–Life Balance Index©: The European Case. *Social Indicators Research*, *128*(1), 341–359. https://doi.org/10.1007/s11205-015-1034-2

Grabiński, T. (2017). Uproszczona metoda delimitacji wektorowej. *Zeszyty Naukowe Uniwersytetu Ekonomicznego w Krakowie*, 5(965). https://doi.org/10.15678/ZNUEK.2017.0965.0505

Greenhaus, J. H., & Beutell, N. J. (1985). Sources of Conflict between Work and Family Roles. *The Academy of Management Review*, *10*(1), 76–88. https://www.jstor.org/stable/258214

Hsu, Y.-Y., Bai, C.-H., Yang, C.-M., Huang, Y.-C., Lin, T.-T., & Lin, C.-H. (2019). Long Hours' Effects on Work-Life Balance and Satisfaction. *BioMed Research International*, *2019*, 1–8. https://doi.org/10.1155/2019/5046934

Kurniasari, C. A., & Dewi, Y. E. P. (2023). The Effect of Work-life Balance and Quality of Work Life on Employee Performance with Gender as a Moderating Variable. *Jurnal Pamator: Jurnal Ilmiah Universitas Trunojoyo*, *16*(2), 231–246. https://doi.org/10.21107/pamator.v16i2.19637

Laar, M. (2008). Leading a Successful Transition: The Estonian Miracle. *European View*, *7*(1), 67–74. https://doi.org/10.1007/s12290-008-0024-z

Malkauthekar, M. (2013). *Analysis of Euclidean Distance and Manhattan Distance Measure in Face Recognition*. https://doi.org/10.1049/cp.2013.2636

Matilla-Santander, N., Lidón-Moyano, C., González-Marrón, A., Bunch, K., Martín-Sánchez, J. C., & Martínez-Sánchez, J. M. (2019). Attitudes toward Working Conditions: Are European Union Workers Satisfied with Their Working Hours and Work-life Balance? *Gaceta Sanitaria*, *33*(2), 162–168. https://doi.org/10.1016/j.gaceta.2017.10.006

Mowczan, D. (2017). *Zróżnicowanie kapitału ludzkiego w Polsce w ujęciu regionalnym – analiza z wykorzystaniem metod wielowymiarowej analizy porównawczej*. Wydawnictwo Uniwersytetu Rzeszowskiego. http://repozytorium.ur.edu.pl/handle/item/3007

Murugan, G. B., & Dharshini, M. P. (2023). Analysis on Impact of Work Life Balance towards Job Retention on ITES Sector (IT Enabled Service Sector). *International Journal of Engineering and Management Research*, *13*(3). https://doi.org/10.31033/ijemr.13.3.5

Nagar, K., & Rana, S. (2024). Harmony in the Digital Realm: Exploring Techno-inclusion and Techno-privacy as Catalysts for Work Life Balance amidst Technostress. *Northern Economic Review*, *15*(1).

Oleniacz, G. (2021). Czekanowski's Diagram and Spatial Data Cluster Analysis for Planning Sustainable Development of Rural Areas. *Sustainability*, *13*(20). https://doi.org/10.3390/su132011404

Piasna, A., & Spiegelaere, S. D. (2021). Working Time Reduction, Work-life Balance and Gender Equality. *Dynamiques Régionales*, 10.

Piecuch, J. (2017). *Regiony Grecji, Hiszpanii, Irlandii i Portugalii w dobie kryzysu: z perspektywy zmian struktury produkcji i zatrudnienia*. Difin.

Pylkkanen, E., & Smith, N. (2021). The Impact of Family-friendly Policies in Denmark and Sweden on Mothers' Career Interruptions Due to Childbirth. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.522282

Romeo, M., Yepes-Baldó, M., & Berger, R. (2014). The Spanish and Latin American Contribution to the Study of Worklife Balance: Keys for Intervention. *Papeles del Psicólogo*, *35*(1), 48–58.

Secret, M. (2006). Integrating Paid Work and Family Work: A Qualitative Study of Parenting in the Workplace Childcare Experiences. *Community, Work & Family*, *9*(4), 407–427. https://doi.org/10.1080/13668800600925027

Soltysiak, A., & Jaskulski, P. (1999). Czekanowski's Diagram. A Method of Multidimensional Clustering. In: *New Techniques for Old Times. CAA 98. Computer Applications and Quantitative Methods in Archaeology. Proceedings of the 26th Conference* (pp. 175–183). Barcelona.

Spector, P. E., Cooper, C. L., Poelmans, S., Allen, T. D., O'Driscoll, M., Sanchez, J. I., Siu, O. L., Dewe, P., Hart, P., & Lu, L. (2004). A Cross-national Comparative Study of Work-family Stressors, Working Hours, and Well-being: China and Latin America versus the Anglo World. *Personnel Psychology*, *57*(1), 119–142.

Spreitzer, G. M., Cameron, L., & Garrett, L. (2017). Alternative Work Arrangements: Two Images of the New World of Work. *Annual Review of Organizational Psychology and Organizational Behavior*, *4*, 473–499. https://doi.org/10.1146/annurev-orgpsych-032516-113332

Staines, G. (1980). Spillover versus Compensation: A Review of the Literature on the Relationship between Work and Nonwork. *Human Relations*, *33*(2), 111–129.

Strojny, J., & Niewiadomski, M. (2023). Uwarunkowania rozwoju społeczno-gospodarczego środkowoeuropejskich regionów peryferyjnych UE. *Rozwój Regionalny i Polityka Regionalna*, *14*(63). https://doi.org/10.14746/rrpr.2023.63.07

Strzemińska, H., & Bednarski, M. (Eds). (2014). *Working Time: Trends and Prospects in the New Economy*. Instytut Pracy i Spraw Socjalnych.

Thévenon, O. (2011). Family Policies in OECD Countries: A Comparative Analysis. *Population and Development Review*, *37*(1), 57–87. https://doi.org/10.1111/j.1728-4457.2011.00390.x

Timms, C., Brough, P., & Graham, D. (2012). Burnt-out but Engaged: The Co-existence of Psychological Burnout and Engagement. *Journal of Educational Administration*, *50*(3), 327–345. https://doi.org/10.1108/09578231211223338

Timms, C., Brough, P., O'Driscoll, M., Kalliath, T., Siu, O. L., Sit, C., & Lo, D. (2015). Flexible Work Arrangements, Work Engagement, Turnover Intentions and Psychological Health. *Asia Pacific Journal of Human Resources*, *53*(1), 83–103. https://doi.org/10.1111/1744-7941.12030

Tomar, A., & Singh, D. A. P. (2024). Unraveling the Burnout-Work-Life Balance Nexus: A Secondary Data Analysis. *International Journal of Indian Psychology*, *12*(1). https://doi.org/10.25215/1201.136

Uberti, L. J., & Douarin, E. (2023). The Feminisation U, Cultural Norms, and the Plough. *Journal of Population Economics*, *36*(1), 5–35. https://doi.org/10.1007/s00148-022-00890-5

Vilhelmson, B., & Thulin, E. (2016). Who and Where Are the Flexible Workers? Exploring the Current Diffusion of Telework in Sweden. *New Technology, Work and Employment*, *31*(1), 77–96. https://doi.org/10.1111/ntwe.12060

Chapter 10

The Role of Digitisation in the Migration of Human Resources between Industries on the Polish Labour Market

Dominik Pawelec

10.1. Introduction

Nowadays, we have been dealing with an increasing importance of digitalisation and the demand for IT skills. IT companies are no longer looking for people with technical education only, but also specialists like project managers, analysts or user interface designers who have digital competences (Departament Rynku Pracy, 2021).

In 2022, the Polish Economic Institute conducted research which showed that 42% of vacancies for specialist positions were identified as difficult to fill in the IT sector. Moreover, 64% of surveyed companies employed less IT specialists than planned, and 20% had to refuse to implement a project very often due to the lack of a sufficient number of specialists (Polski Instytut Ekonomiczny, 2022). Staff shortages in the Polish IT sector amount to up to approximately 25,000 positions. If Poland could be compared to the European Union, there is a shortage of nearly 147,000 positions (Kotelba, 2022). According to the CompTIA report *IT Industry Outlook 2024*, one of the main goals and challenges of the IT sector in 2024 will be the recruitment of qualified employees with specialised knowledge and skills, as well as their retention in companies (CompTIA, 2023). Specialists are needed in many IT areas, such as: data analysis, programming, testing and project management (Coders Lab, n.d. – a). Many services are based on data processing which is crucial in industries like technology companies, business, finance, medicine and entertainment.

Changing the employment sector to find a job in IT is becoming more and more popular, and there are more and more reasons for making such a decision (Wojciechowska, 2018). According to the report compiled in 2022, over 60% of Poles would like to change the industry in which they currently work and

move to the IT sector (Klimowicz, 2023). The growing popularity of such a trend is a challenge for the entire economic sector of Poland and affects all industries.

The purpose of this article is to analyse the phenomenon of people changing their profession towards the IT sector, as well as to identify motivations, obstacles and ways to achieve the goal of changing a profession towards the IT industry.

10.2. Research Methodology

To achieve the adopted purpose of the analysis, the following research questions were asked:

- What are the reasons for employees changing their careers towards IT?
- What are the ways and obstacles in the process of changing the industry to IT?
- What impact does the migration of human capital to the IT industry have on other industries?

To obtain answers to these questions, the ARC Rynek i Opinia company used the results of research commissioned by the Enter the Code website, which surveyed a group of 1,025 professionally active people aged 25–37, who have a secondary or higher education, in May 2022 (Klimowicz, 2023). Research was also carried to indicate the motivation to continue the professional path in the IT industry. This survey was conducted among people aged 25–50 in a group of 1,200 people from July to November 2022. All people participating in the research were Polish. The respondents were asked to indicate the motivation for changing their career to the IT industry from the following options: salary, possibility of remote work, flexible working hours, new challenges, transparency of the development path, access to the latest technologies, employee benefits, other. The respondents could indicate more than one answer.

The research was conducted using methods typical of qualitative research. The subject of the research was a phenomenon occurring among an increasing number of professionally active Poles. The issue of professional change towards IT was considered in terms of both subjective and socio-cultural conditions.

10.3. Reasons for the Increased Process of Migration of Human Capital to the IT Industry

In almost every manufacturing company, the process of replacing employees with technology is visible. Innovative production lines and intelligent robots effectively replace the work of human hands. For employees who are afraid of changes, this is an anxiety-inducing process. The research of Future of Skills Employment in 2030, conducted by the Nesta foundation, reveals that (Bakshi, 2017):

- 10% of people currently perform a profession for which demand will increase,
- 70% of people have a profession whose way of doing it will change (but will still exist),
- 20% of employees have jobs that will be completely replaced by robots.

Analysing the data of the conducted research, it can be concluded that employees concern about maintaining their jobs are legitimate. The impact of IT on the environment will be increasing: this is a trend with a strong economic and social basis, because the number of people engaged in this industry is growing dynamically. According to Eurostat data, during the years 2012–2021, employment in the IT industry in the European Union increased from approximately 5.5 million up to 8.8 million (Figure 10.1).

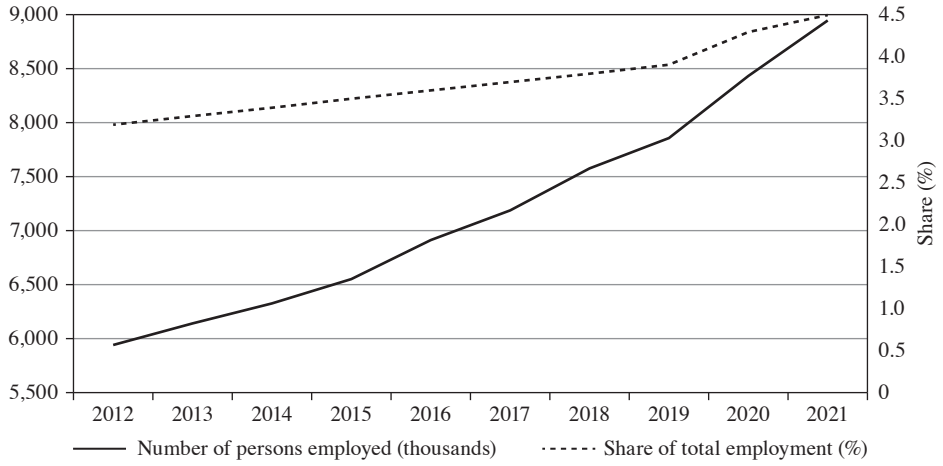

Figure 10.1. IT employment in EU in 2012–2021
Source: (Eurostat, 2022).

The World Economic Forum predicts that in 2030 the IT industry will develop many new professions, which may include: algorithm bias auditor, data detective and cyber calamity forecaster (World Economic Forum, 2021).

The IT business will create a new social class in which more and more people will participate. To highlight the motivation for the change among society, an online survey was conducted (Figure 10.2). People participating in the research were asked to indicate the reasons why they would like to change their profession. The survey was conducted among 1,200 people aged 25–50 with various levels of education.

The most common reason of migration between industries is the perspective of higher earnings. According to the Central Statistical Office (data from

October 2023), earnings related to digitalisation or telecommunications are on average about 65% higher than in other sectors. Table 10.1 reflects the average monthly gross salary in individual sectors in Poland in 2023.

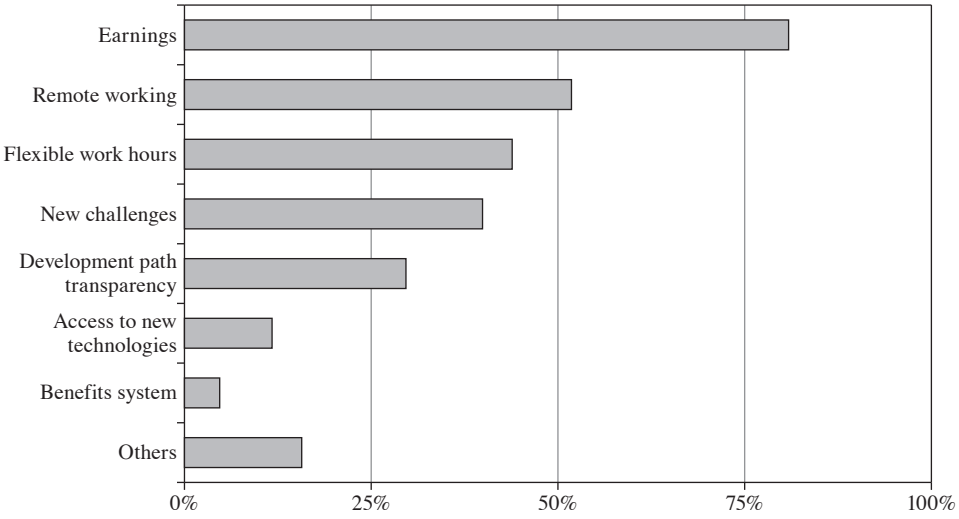

Figure 10.2. Motivations to move into IT
Source: own work based on (Klimowicz, 2023).

Table 10.1. Average monthly gross salary in October 2023 (PLN)

Enterprise sector	Average monthly gross salary (PLN)
Average earnings	7,544.98
Agriculture, forestry, hunting and fishing	11,296.82
Mining	13,910.71
Industrial processing	7,059.91
Generation and supply of electricity, gas and hot water	10,175.17
Water supply: sewage and waste management	6,513.61
Construction	7,250.34
Trade	6,820.18
Transport	7,668.61
Accommodation and gastronomy	5,384.21
Information and Communication	12,463.47
Real estate market services	7,333.25
Professional, scientific and technical activities	10,051.42
Administration	5,758.89
Culture, entertainment and recreation	6,838.46
Other service activities	5,739.61

Source: (Wynagrodzenia.pl, n.d.).

The data presented in Table 10.1 allows us conclude that earnings in the Information and Communication Industry are in the second place (after the mining industry) and in some cases the average salary in this industry is more than twice as high as in other sectors of the economy.

According to the IT Salary Report, a new person working as a junior programmer in Poland in 2021 earned on average PLN 6,355 on an employment contract or PLN 7,204 providing business to business (B2B) services. A programmer with slightly more experience (mid) could count on a salary of PLN 11,240 (employment contract) and PLN 13,694 (B2B). However, a senior developer (senior) earned on average PLN 16,133 (employment contract) and PLN 18,717 (B2B).

Another point considered when changing industries is work flexibility (Grafton, 2022). Employers in the IT industry provide wide opportunities to choose the form of employment (employment contract, mandate contract or B2B) as well as the start and end times of work. Over 80% of employees in the sector related to the production of software products declare their willingness to work flexible hours, which means that the employee can start work at a convenient time within the hours set by the employer (Optim Human, n.d.). The possibility to choose the working mode (stationary or remote) is also an important condition. According to the Future Business Institute report, in the era of the COVID-19 pandemic, but also in the post-pandemic times, many employers offer remote work, which does not require presence in the office, or hybrid work – partly in the office, partly remotely (Polski Instytut Ekonomiczny, n.d.).

Employees are interested in new challenges related to both the change of profession and the industry. Science and access to constantly improved technologies mean an opportunity for development in many fields and on many levels of digitalisation. Transparency of the development path and specific requirements for the employee, as well as employee benefits, are also important motivators (Pazio, 2022).

10.4. The Most Popular Methods of Moving into the IT Sector

The methods that are being used during the process of transition into the IT sector depend on the functions that a particular person is going to perform in the organisation. Figure 10.3 reflects the most popular professions in the IT industry according to a survey conducted for the Enter the Code website (Klimowicz, 2023).

The most frequently chosen professions are those that require the ability to create automatic tests, data analysis, programming, graphics or project management (Figure 10.3).

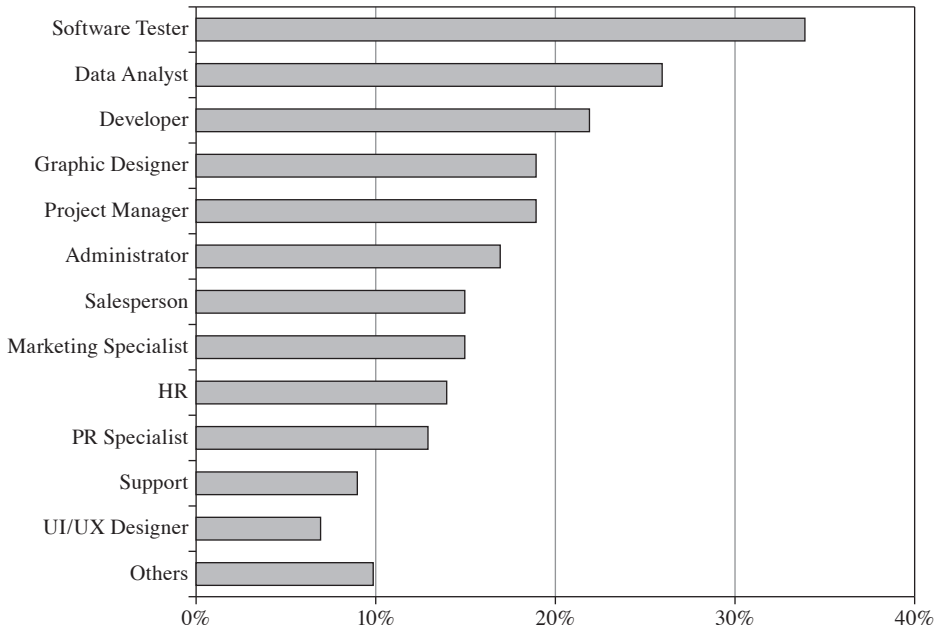

Figure 10.3. Most often chosen IT professions
Source: (Klimowicz, 2023).

The market trend indicates that people with programming skills are much more needed and usually they have a higher chance for the better-paid positions. Also, when it comes to work flexibility or new challenges, these are the options that best suit the thesis (Kodilla, 2017).

The most common method of learning issues related to the above-mentioned professions are free courses available on the popular streaming platforms or gaining knowledge from free blogs or websites created by professionals (Coders Lab., n.d. – b). Another way for people who want to change their career to IT is to participate in paid courses – bootcamps) or workshops (Onwelo, 2023). Completion of such an event is usually associated with a certificate. Companies sponsoring a given training often offer the opportunity to join the recruitment process in their company after completing the classes. The price discrepancy between courses is huge and depends on the level of advancement, duration and person who conducts them. For example, an online Java developing course for a beginner costs PLN 150, while an 8-week testing course, online in the form of group meetings or stationery, preparing a person to work as an automatic tester in Java costs PLN 10,000 ending with an ISTQB (International Software Testing Qualifications Board) certificate exam (Inprogress, n.d.).

10.5. The Impact of Migration between Industries on the IT Industry and Other Sectors of the Economy

The IT industry is a very attractive option of change for employees from other sectors. The phenomenon of migration between industries has been reflected in the research prepared by the Enter the Code website, in which 1,025 respondents took part. 623 people showed a willingness to change their profession. Table 10.2 reflects these areas of the economy from which migration into the IT sector is the most common (Klimowicz, 2023).

Table 10.2. Areas of economy and percentage quantity of respondents who show a willingness to change their profession into IT

Specification	Percent
Administration	14
Wholesale and retail trade	11
Industrial processing	9
Construction	9
Other service activities	8
Transport, shipping, logistics	7
Education	6
Health care and social assistance	4
Scientific and technical activities	4
Culture and entertainment	4
Uniformed services	3
Hotel services, gastronomy	3
Energy of industry	2
Agriculture	1
Mining	1
Mechanics	1
Real estate market services	1
Others	10

Source: (Klimowicz, 2023).

Among the specialisations in which respondents would like to change industries, the highest places were taken by administration (14%), wholesale and retail trade (11%), industrial processing (9%) and construction (9%).

According to data from the international recruitment company Randstadt, although nearly 90% of candidates of the IT sector are university graduates, only 54% have completed studies in fields such as computer science or automation and robotics (Dziennik Gazeta Prawna, 2019). The smallest percentage of people who are trying to change their profession to the IT industry are graduates of medical

schools, artists, and manual workers, such as cleaners, because these are professions not threatened by the development of technology and artificial intelligence (zrobotyzowany.pl, 2023).

The entry threshold to the IT industry is being set higher and higher. The requirements for beginners are changing and growing. To join the digitisation sector, required are not only programming skills, but also, for example, the administration of operating systems or computer networks (Coders Lab., n.d. – c). The labour market generates fewer offers for employees without experience than in previous years. According to the research conducted by Team Connect, 15% of recruiters pay more attention to experience rather than to education (Team Connect, n.d.). It is estimated that 77% of inexperienced employees in 2021 had problems to find a job in their profession. According to *Rekruter* magazine, in 2021, only about 9% of all offers were for people inexperienced in the IT industry (Magazyn Rekruter, 2023).

The growing popularity of profession change among people migrating into the IT sector also generates staff shortages at the place of their previous employment. The report *Profession Barometer* indicates that the largest deficit of specialists in 2022 in Poland was in the construction, education, TSL (transport, shipping, logistics), administration and production industries (Antończak-Świder, 2022). These are the industries from which employees would most like to work in IT (Table 10.2). Migration between the above-mentioned industries generates staff shortages in the sectors from which employees decide to change.

Undoubtedly, remote work, which is one of the main motivators to change profession, can be identified with the most job offers on the IT market, which leads to many social and economic changes described in the report "Aspects of remote work from the perspective of the employee, employer and the economy," impacting mainly on cities with high population. This type of solution is usually introduced in the IT and Telecommunications Sector (PARP, 2021).

Digitalisation and the requirements for specialists in the above fields affect universities and the education system in Poland. Computer science was the most often chosen field of study in 2022 (studia.pl, 2024). Currently, according to otouczelnie.pl website, studies connected with IT are being offered by 67 public universities and 34 private universities in full-time, part-time and online education (otouczelnie.pl, n.d.). Studies last 3–3.5 years (first level) or 1.5 to 2 years (second level) and end with a diploma of bachelor's/engineer's or master's degree.

10.6. Conclusion

Most forecasts say that the Polish IT market will become saturated by 2030 (Zielona Linia, n.d.). However, this is an extremely optimistic forecast, assuming that the huge employment gap will be filled within a decade if the demand for Polish programmers does not increase several times by then.

Upcoming demographic decline may have an impact on fewer IT graduates in the future. These forecasts do not take into account the phenomenon of the inflow of human capital from other industries, which can be continued in the future. There is a good chance that the shortage of IT specialists will never be reduced to zero. The perspective of work in an industry that is characterised by the same features in every country in the world, and universal skills, the knowledge of which can be used in many companies, mean that the migration trend will intensify (Olbert, 2017).

The popularity of career change to IT is an upward trend. There are many motivations for such a decision. These include finances, work style, new challenges as well as working with the latest technologies. There are many ways to achieve this goal, including: participation in free courses, paid training, access to literature or obtaining a degree in computer science or a related field. The migration trend carries consequences for other industries and the IT industry itself, affecting the recruitment process among people ready to work in digitalisation, as well as causing significant changes in the current economic system of cities and whole regions, and it also generates staff shortages in other industries whose employees find employment in IT.

IT migration challenges and how to overcome them might be the subject of an upcoming study because forecasts of migration popularity say that every year more people will decide to change their career path and it is difficult to indicate the end of such a process or at least its slowdown.

Human resources policy makers need to monitor the labour market by continuing to research IT employment and the challenges it faces. These include specialisation in IT itself, threats to employment in other industries, the need to adapt the education market to changing employment conditions. The article points out that experience is increasingly important when applying for IT jobs, with employers paying more attention to skills than education. It should also be noted that it is not only hard skills that are necessary. Increasingly, employers are paying attention to the need for soft skills, such as project management, analytics or user interface designing.

Future research should include not only changes in the labour market, but also the adaptation of education to changing conditions and the need for specialists. In the IT sector itself, there are many specialisations, therefore the labour market should be shaped in such a way that employees are trained according to

future demand. Another area of research is the development of online or micro-credentials courses leading to certificates, as tools supporting lifelong learning. This is an important addition to education, since 90% of employees are in jobs that will either disappear or be replaced by robots in the future.

References

Antończak-Świder, A. B. (2022). *Barometr Zawodów*. Retrieved from: https://barometrzawodow.pl/forecast-card-zip/2022/report_pl/raport_ogolnopolski_2022.pdf on February 2, 2024.

Bakshi, H. (2017). *Nesta. The Future of Skills: Employment in 2030*. Retrieved from: https://www.nesta.org.uk/report/the-future-of-skills-employment-in-2030 on February 2, 2024.

Coders Lab. (n.d., a). *Analityk danych zawodem przyszłości.* Retrieved from: https://coderslab.pl/pl/blog/analityk-danych-zawodem-przyszlosci on February 2, 2024.

Coders Lab. (n.d., b). *Jak zostać programistą. Przewodnik dla początkujących*. Retrieved from: https://coderslab.pl/pl/blog/jak-zostac-programista-przewodnik-dla-poczatkujacych on February 2, 2024.

Coders Lab. (n.d., c). *Start w branży IT – od czego zacząć?* Retrieved from: https://coderslab.pl/pl/blog/start-w-branzy-it-od-czego-zaczac on February 2, 2024.

CompTIA. (2023). *IT Industry Outlook 2024*. Retrieved from: https://connect.comptia.org/content/research/it-industry-trends-analysis-2022 on February 2, 2024.

Departament Rynku Pracy. (2021). *Rola kompetencji cyfrowych dla przyszłości zawodowej osób młodych. Praca dla młodych*. Retrieved from: https://dlamlodych.praca.gov.pl/-/15583894-rola-kompetencji-cyfrowych-dla-przyszlosci-zawodowej-osob-mlodych on February 2, 2024.

Dziennik Gazeta Prawna. (2019). *W branży IT dyplom jest niepotrzebny: Połowa specjalistów nie ma wykształcenia technicznego*. Retrieved from: https://serwisy.gazetaprawna.pl/praca-i-kariera/artykuly/1411933,wyksztalcenie-w-branzy-it.html on February 2, 2024.

Eurostat. (2022). *ICT Specialists Workforce Continued to Grow in 2021*. Retrieved from: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220505-1 on April 25, 2024.

Grafton. (2022). *Information Technology Salary & Market Guide 2022*. Grafton Gi Group Holding. Retrieved from: https://www.grafton.hu/en/munkaadok/survey-zone/information-technology-salary-market-guide-2022 on February 2, 2024.

Inprogress. (n.d.). *ISTQB® Certified tester – test manager – poziom zaawansowany*. Retrieved from: https://inprogress.pl/szkolenia/inzynieria-oprogramowania/istqb/istqb-certified-tester-test-manager-poziom-zaawansowany on February 2, 2024.

Klimowicz, E. (2023). *Zmiana pracy 2022 – raport. Enter the Code*. Retrieved from: https://enterthecode.pl/badania/zmiana-pracy-2022 on February 2, 2024.

Kodilla. (2017). *Czego pracodawcy nie oczekują od programisty?* Retrieved from: https://kodilla.com/pl/blog/czego-pracodawcy-nie-oczekuja-od-programisty on March 20, 2024.

Kotelba, M. (2022). *Rynek IT kontra talent gap. Czy niedobory kadr będą na stałe?* Retrieved from: https://nofluffjobs.com/insights/rynek-it-polska-swiat-czego-brakuje on February 2, 2024.

Magazyn Rekruter. (2023). *Kryzys w branży IT: Dlaczego juniorzy mają trudności ze znalezieniem pracy?* Retrieved from: https://www.magazynrekruter.pl/kryzys-w-branzy-it-dlaczego-juniorzy-maja-trudnosci-ze-znalezieniem-pracy on February 2, 2024.

Olbert, M. (2017). *Rola migracji zarobkowych wykwalifikowanych specjalistów IT*. Uniwersytet Ekonomiczny we Wrocławiu.

Onwelo. (2023). *Przebranżowienie się na IT. Czy nadal warto rzucić wszystko i stać się programistą?* Retrieved from: https://blog.onwelo.pl/przebranzowienie-sie-na-it-czy-nadal-warto-rzucic-wszystko-i-stac-sie-programista on March 20, 2024.

Optim Human. (n.d.). *Kauczukowy dzień w firmie – o tym co kryje się za firanką elastycznego czasu pracy*. Retrieved from: https://www.optimhuman.com/elastyczny-czas-pracy on March 20, 2024.

Otouczelnie.pl. (n.d.). *The List of Universities which Offer IT Studies in Poland*. Retrieved from: https://www.otouczelnie.pl/artykul/866/Informatyka#uczelnie on February 2, 2024.

Pazio, I. (2022). *Kompendium HR 2022*. pracuj.pl. Retrieved from: https://wyzwaniahr.pracuj.pl/wp-content/uploads/2022/09/kompendium-hr-2022.pdf.pdf on March 20, 2024.

PARP. (2021). *Aspekty pracy zdalnej z perspektywy pracownika, pracodawcy i gospodarki. Raport*. Praca zbiorowa. Polska Agencja Rozwoju Przedsiębiorczości. Retrieved from: https://www.parp.gov.pl/component/publications/publication/aspekty-pracy-zdalnej-z-perspektywy-pracownika-pracodawcy-i-gospodarki on April 25, 2024.

Polski Instytut Ekonomiczny. (n.d.). *Raport Future Business Institute*. Retrieved from: https://archiwum.pte.pl/pliki/2/36/Future_Business_Institute.pdf on March 20, 2024.

Polski Instytut Ekonomiczny. (2022). *Na polskim rynku pracy brakuje blisko 150 tys. specjalistów IT*. Retrieved from: https://pie.net.pl/na-polskim-rynku-pracy-brakuje-blisko-150-tys-specjalistow-it on February 2, 2024.

Studia.pl. (2024). *Najpopularniejsze kierunki studiów w 2024 roku – ranking*. Retrieved from: https://studia.pl/najpopularniejsze-kierunki-studiow-ranking on February 2, 2024.

Team Connect. (n.d.). *Jak zdobyć pracę w branży IT: Czy doświadczenie jest kluczem do sukcesu?* Retrieved from: https://teamconnect.pl/jak-zdobyc-prace-w-branzy-it-czy-doswiadczenie-jest-kluczem-do-sukcesu on February 2, 2024.

Wojciechowska, Z. (2018). Źródła i rodzaje zmian zawodowych w biografiach młodych dorosłych. *Rocznik Andragogiczny*, *25*, 249–266.

World Economic Forum. (2021). *Top 10 Jobs of the Future – For 2030 and Beyond*. Retrieved from: https://www.weforum.org/agenda/2021/05/jobs-of-the-future-year-2030 on February 2, 2024.

Wynagrodzenia.pl. (n.d.). *Wynagrodzenia w Polsce według danych GUS*. Retrieved from: https://wynagrodzenia.pl/gus on April 25, 2024.

Zielona Linia (n.d.). *Boom na programistów potrwa do 2023 roku – prognoza ekspertów*. Retrieved from: https://zielonalinia.gov.pl/-/boom-na-programistow-potrwa-do-2030-roku-prognoza-ekspertow on March 22, 2024.

Zrobotyzowany.pl. (2023). *Jakie zawody nie są zagrożone przez AI?* Retrieved from: https://zrobotyzowany.pl/informacje/newsy/5016/jakie-zawody-nie-sa-zagrozone-przez-ai on February 2, 2024.

Chapter 11

Benefits and Limitations of Using the Cost Deployment Method as a Management Controlling Tool

Janusz Nesterak, Angelika Wodecka-Hyjek, Ewa Bąchor

11.1. Introduction

Integrated management is a complex decision-making process that takes place in interrelated functions and phases. Management controlling can be considered a management concept that is a cross-functional tool, supporting the precise setting of goals to be achieved by the company. It is also the collection, analysis and processing of key data necessary for decision-making, as well as the control and analysis of the company's performance. All this through the prism of analysing the processes taking place and the level of achievement of objectives arising from the adopted strategy. The area of finance and controlling has become an engine of improvement, helping management in the decision-making process. In manufacturing companies, this is all made the more difficult because many companies do not have enough information to make decisions based on reliable and objective data.

Cost Deployment can be the right tool to understand the economic value of waste and losses generated in the production process and the expenditures needed to reduce them. The Cost Deployment method also provides the ability to prioritise and select the appropriate, most optimal tool to help select and implement plant improvement projects. This occurs based on a loss-benefit analysis, where as a result of calculation we obtain the rate of return on the expenditures. However, the Cost Deployment method, while it can be an enabling tool used in World Class Manufacturing companies, requires an appropriate implementation methodology. It is also necessary to have an appropriate time horizon of data bases so that Cost Deployment can truly be an enterprise management support tool, providing reliable data and fully utilised in the decision-making process. The purpose of this paper is to show the benefits and limitations of using the Cost Deployment method as a management controlling tool. In this perspective,

the study includes showing the Cost Deployment and management controlling, the benefits and limitations of Cost Deployment, and recommendations for their use. Cost Deployment, its benefits and limitations, is described through the prism as a basic pillar of the cost analysis method and the support it might provide to management controlling. In fact, this chapter's goal is to look for an answer to the question of whether Cost Deployment provides sufficient benefits to be as a support to management controlling.

In most cases Cost Deployment, being part of the technical pillars of WCM, is seen as a tool for efficient operational decisions rather a tool for controlling itself. So far there were few analysis conducted to see Cost Deployment as a controlling tool, none as a management controlling tool. In most research papers and literature, Cost Deployment is shown as one of the tools to be used to achieve operational KPI's (Key Performance Indicators). Cost Deployment, introduces a strong link between precisely defined areas for improvement and the results of obtained through WCM pillars, which is measured by appropriate KPIs (Massone, 2007). The chapter firstly presents assumptions of the Cost Deployment method and management controlling. Subsequently, the benefits and limitations of using the Cost Deployment method as a management-controlling tool are presented, followed by conclusions and future areas of research.

11.2. Pillars of Dependence – Cost Deployment Method and Management Controlling

11.2.1. General Remarks

Considering the benefits and limitations of using the Cost Deployment method for management controlling purposes, it is necessary first of all to briefly explain what the Cost Deployment method and management controlling are. As presented, these are two pillars, inextricably linked. The Cost Deployment method allows you to collect and appropriately capture data from the production system and analyse them in terms of objectives and how to apply them to implement the adopted business strategy, translated by management controlling into processes and activities. Process controlling, or management controlling, is oriented towards improving the parameters related to the efficiency of processes and, consequently, the whole enterprise. Controlling understood in this way includes cost aspects, but not in the sense of cost accounting, but the search for so-called economic benefits – yields due to changes in the structure and courses of processes (Nesterak, Jabłoński & Kowalski, 2020). In fact, according to one of very few analysis of Cost Deployment as a cost analysis method, performed by Chiarini and Vagnoni (2015) based on Fiat's WCM methodology, seems to be

a "grand strategy" focused on cost savings where quality must be reached with no trade-off with other strategies. A particular system called "cost deployment" measures waste and losses on processes. The performance measurement system is structured and fosters day-by-day management as well as computer-based management (Chiarini & Vagnoni, 2015).

11.2.2. Cost Deployment Method

Cost Deployment is a method that clips traditional cost accounting between lean accounting and management controlling. It is a response to traditional cost accounting systems supporting the operations of many companies that have not met the needs of organisations having to cope with a dynamic and ever-changing environment economy characterised by ever-shorter product life cycles and hyper competition (Horngren, Datar & Foster, 2002). Cost Deployment is a method of analysing costs incurred during the production process. Striving to reduce production costs is one way to achieve a competitive advantage. By incurring low production costs, an enterprise can be more flexible in shaping its pricing policy, and thus have a greater influence on generated margins and, as a result, potential profits. The main objective of the Cost Depolyment method is to analyse the cost of production directed at indicating and identifying the losses arising in the production process. Essentially, the most important differentiating element of the Cost Deployment analysis method is the indication of the cause-effect relationship of the resulting losses in the production process and their quantification. Mere knowledge of the structure of incurred costs or the ability to determine the value of TKW is not sufficient for efficient and effective management of production costs, as well as is not the basis for the introduction of purely controlling activities and, in particular, management controlling. Implementation of technological processes can be supported by the analytical knowledge obtained via analysis. Therefore, controlling has a much broader scope of influence, as it affects both the course of core and auxiliary processes taking place in a company (Nesterak, 2015). In the world of lean management – the world of lean – any process or task that does not add any value from the customer's point of view is wasteful. The analysis considers processes, activities, actions through the lens of those that add no value. A special case is the specific management accounting methods used to measure one of the most important groups of external stakeholders – customers (Łada, 2011). In the process of Cost Deployment analysis, a distinction is generally made between value-added activities – that is those for which the customer is willing to pay and activities that are redundant, do not add value and can be eliminated immediately – these constitute obvious waste,

and activities that do not add value, but are performed because of ongoing processes – this is classified as – hidden waste.

Examples of activities belonging to the previously mentioned three groups are shown in Figure 11.1.

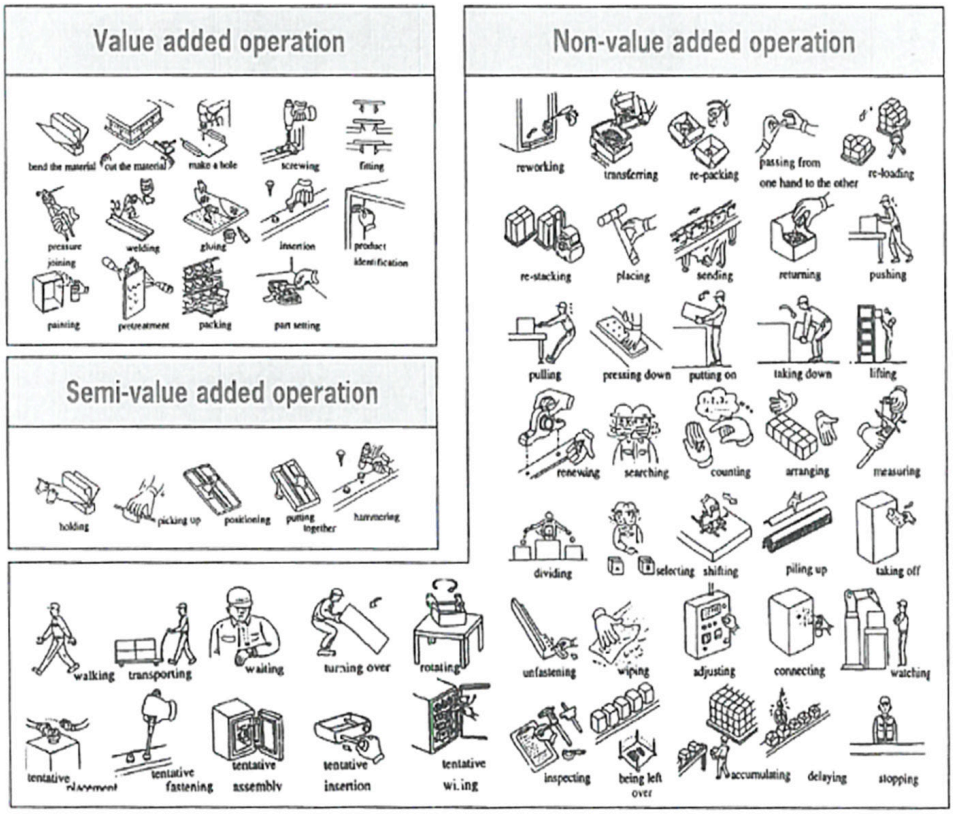

Figure 11.1. Types and examples of classification of operations performed in the production process

Source: materials of the "Cost Deployment" project of the household appliance company, 2016.

Within the framework of Cost Deployment dice analysis, a very important aspect is also increasing the involvement of the controller in both operational and technological aspects. The controller works closely with organisation entities at different levels of management levels – from the chief executive to the level of operational management, and the analytical knowledge obtained from the analysis of data is primarily used to optimise the implementation of technological processes taking place in the enterprise. Exactly such indications and characteristics are pointed out in the study "Management Controlling. Design and Implementation" – the first work defining management controlling (Nesterak, 2015).

Particularity of data analysis using the Cost Deployment method, is the ability to identify the cause (source) of the resulting losses. This method makes it possible not only to identify the source of the arising loss and quantify it, but also to appropriately select the most technically effective and economically efficient method of elimination, preventing, or at the same time, reducing the probability of the occurrence of this loss in the future (Nesterak, Wodecka-Hyjek & Bąchor, 2023). The use of Cost Deployment makes decision-making processes more efficient and consistent with strategic assumptions. In addition, good decision support methods facilitate learning, understanding and communication of problems and solutions within the organisation. While managers can and should use Cost Deployment to support and enhance the rationality of decisions, they should always take additional consideration of soft issues related to the human factor and the work environment. For example, health, safety and environmental (HSE) issues typically cannot be addressed solely through cost-benefit assessments, although there are undoubtedly areas of waste within these processes as well.

11.2.3. Management Controlling

Both levels: operational and strategic are involved in management of the processes occurring in the enterprise. The controlling of occurring processes is interdisciplinary in nature and covers the full spectrum of controlling enterprise performance. This feature of process controlling coincides with the tools offered by the newest type of controlling distinguished according to the criterion of the scope of competence, namely, management controlling (Nesterak, Wodecka-Hyjek & Bąchor, 2023). In order for controlling to carry the term "management controlling," it is necessary to define controlling as a way to improve the management of an organisation (Nesterak, 2015). In the literature, one can also find a definition of controlling as a holistic view of management. According to Marciniak, one can then speak of a controlling way of management (Marciniak, 2004). With this approach, one can even talk about controlling as a management concept and not as one of the tools related to management. Controlling is pragmatic in nature, i.e. strongly oriented towards practical use in the activities of enterprises. This is due to the possibility of its application in a variety of approaches and variations. Often practice provides more solutions than theory (Weber, 2001). Such seems to be the Cost Deployment method, based on practice and analysis of actually occurring interactions and events in the production process, manifested by costs incurred within the production process. The analytical knowledge gained is primarily used to optimise the course of the implementation of technological processes occurring in each functional area of the organisation (Nesterak, 2015), which is the common goal of both management controlling

and the Cost Deployment method of analysis. P. Horváth defines controlling as a management subsystem that deals with the formation and coordination of planning, control and information supply processes aimed at controlling the entire system from the point of view of the set goals (Horváth, 2006). Such opportunities are provided by the use of a cost analysis method such as Cost Deployment. Management controlling affects both the course of basic and auxiliary processes occurring in the enterprise, therefore it has a much broader scope of influence. Management controlling is carried out not only by employees of economic divisions, but primarily by employees of technical divisions, who, with their decisions, have the greatest impact on the economic and financial performance of the organisation (Nesterak, 2013). The main tasks of controlling are planning, control and direction. A reliable reporting system allows for more accurate controls during the business year (Nesterak, Jabłoński & Kowalski, 2020). For the purpose of achieving high organisational efficiency, it is necessary to look for effective ways of monitoring processes both in the area of assumed process flows and making necessary changes in them. Management controlling based on process analysis can serve this purpose (Nesterak, Jabłoński & Kowalski, 2020). Using the Cost Deployment method, a company has the opportunity to find ways to achieve high organisational efficiency by effectively monitoring processes.

11.3. Benefits of Using the Cost Deployment Method as a Management Controlling Tool

The primary benefit of implementing the Cost Deployment analysis method is a transparent root cause analysis for each type of wastage arising in the production process. A key success factor in accurate cost deployment (mapping) is exhaustive data collection, the basis of which is the database that serves for all analyses (Giovando, Crovini & Venturini, 2017) . The ability to identify the source of losses is important because their elimination leads to the permanent elimination of downstream arising losses.

More effective and conscious control of cost items related to the production process enables the study of cost factors, cost-generating processes and losses. Control of processes and appropriate analysis of data allow effective and precise actions not only from the point of view of knowledge of the sources of losses, but also due to the provision of information on the relationship between waste, losses and their reduction. Reduction is understood as the most effective selection of tools for the problem. Appropriate selection not only from the point of view of qualitative efficiency, but also due to the expenditures that the enterprise is forced to incur in order to implement the tool effectively and maximise the obtained

results. It is therefore necessary to be aware of the essence of the costs incurred and knowledge of the factors determining their value as well as the knowledge of the relationship with the risk incurred, in order to gain possibility of improving competitiveness and the possibility of shaping them (Nowak, 2017).

The Cost Deployment method also allows us to classify repair projects in terms of waste and loss reduction based on cost-benefit analysis. Cost Deployment's cost analysis component includes a preparation stage. The Impact--Cost-Easiness (ICE) analysis method allows *a priori* analysis of potential situations, resulting in information on which decisions and actions should be taken and which should be abandoned. The cost-benefit analysis sums up the potential and expected benefits as a result of the situation or actions that would be taken and implemented. Actions that are proposed because of this analysis must be evaluated and selected according three factors: impact, cost and ease of implementation. This is called ICE matrix. The ICE matrix allows the establishment of an indicator that shows in a very clear way to what extent it is possible to reduce a given loss/waste. The impact factor determines the value of the identified loss, the cost factor and the ease-of-implementation index for the proposed improvements determine respectively the value of the cost of implementing improvement activities for the identified loss and the combination of their implementation captured in the values of time and resources required to carry them out. Assigning each of these factors weights in the range of 1–5 allows objective quantification of the relationship of impact, cost and ease of implementation. The ICE indicator can thus take values in the range of 1–125, where the higher its value, the higher the probability of the effectiveness of the corrective measures introduced. Above all, it gives clear guidance as to which tools will prove to be the most effective ones. Before starting projects, it is necessary to decide which of the proposed projects is the most appropriate in the data for implementation at this time. Thanks to such a solution, the company gains another advantage, which is the ability to create a cost reduction programme that will actually meet the requirements of SMART.

The Cost Deployment method, which requires continuity and repetition in data collection and comparison between analysis periods, implies at the same time stability and usability of reports in terms of form. It is not possible to make significant changes in the format of the collected data and its analysis. This would deprive the company and the team of analysts – controllers of the possibility of comparing data between periods, which in turn would lead to the impossibility of using the tools and solutions provided by the Cost Deployment method. Full involvement of the control area, which is forced to pay more attention to all departments (and pillars) involved in a world-class production programme, is essential.

The Cost Deployment method gives continuous control over improvement projects carried out at the plant and better calculation of savings. This is due to the comparability of data between comparative periods.

Cost Deployment, thanks to the analysis of the effects that the use of individual tools can give, allows for conscious and purposeful selection of the most appropriate tool; instead of using generally available tools, the company can tailor controlling tools and processes to its specific operational and strategic needs.

11.4. Limitations of Using the Cost Deployment Method as a Management Controlling Tool

Implementation of the Cost Deployment method is not only time – and labour-intensive, but above all requires the involvement of the entire staff of the company. From the highest levels of management to the operators operating at the various positions located directly on the production line. Management commitment at the highest levels is an obvious determinant of success in any strategic effort. It is the responsibility of management to properly motivate employees and solidify their commitment so that they ultimately reach the end of the employee engagement chain. This cycle is illustrated in Figure 11.2.

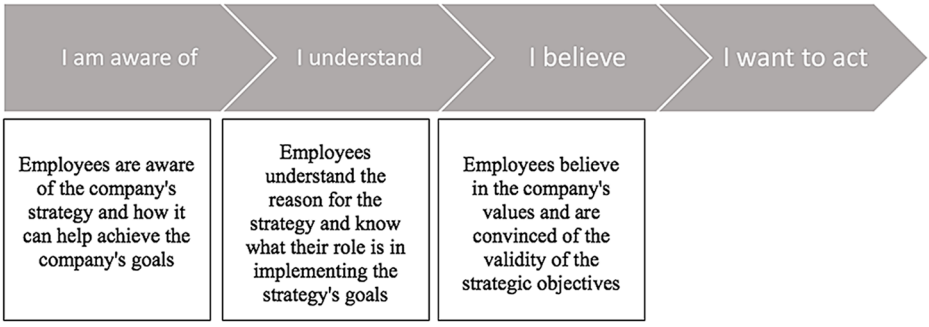

Figure 11.2. Chain of employee engagement in WCM culture
Source: own elaboration based on SITECH implementation material.

Management involvement seems to be an obvious aspect, nevertheless, in many companies top management's delegating of tasks seems to eliminate the factor of personal involvement and motivation of employees. The differentiating element here is the level of involvement of top management and even showing this involvement by participating in the presentation of the results of the semestral or annual analysis, as well as emphasising the importance of using the Cost Deployment method as the most effective tool for cost analysis in the company WCM. Cost Deployment allows defining improvement programmes that have

an impact in reducing losses, everything that can be classified as wastes or non-value added in a systematic way. It also ensures collaboration between units of production and function of Administration and Control (Silva *et al.*, 2013).

Application of the Cost Deployment method requires continuous data collection and ongoing analysis. Due to the time-consuming and labour-intensive nature of this, only organisations that are aware and learning allow and support this continuous process. Many companies allow the organisation to engage in the act of abandoning regular as well as cyclical data collection, resulting in general demotivation and lack of commitment to ensuring the quality of the data acquired. The application of the Cost Deployment method is a time-consuming activity – data collection and analysis must be based on a certain minimum time period, which is a minimum of four semesters. In this aspect, the application of the Cost Deployment method as well as management-based controlling requires financial expenditures, which for many companies are the main obstacle to its implementation. Besides, both the implementation of a controlling system based on Cost Deployment analysis and its effects are stretched over time.

Another limitation, unfortunately, is that the model and all reporting details are not immediately up-to-date, e.g., current recognition of any changes in the product portfolio, sales network or company structure. With the Cost Deployment method, data is updated semesterly. Updating the data means updating the effects and benefits of implementing tools and solutions as a result of decisions made based on the previous Cost Deployment session. Just making the decision to implement the most effective solutions and use the appropriate tools (based on the ICE ranking), does not equate to immediate results. The longer the Cost Deployment method is applied, the longer you have to wait for results. After "collecting" the so-called "quick wins" in the first and second rounds of analysis, it is time to apply solutions that are not immediate, but those with an average payback period. Ordinarily, we are talking here about a period of about 1–2 years.

Another constraint and even challenge for an organisation may be the need to build a customised IT system. The problem can arise from both financial and operational considerations. When implementing a new IT system, or expanding an existing one, a common collateral effect is the need for organisational changes, and these generally encounter resistance among team members and organisations. It is also not insignificant that many companies have access to particular areas of data, access to which is dispersed in different information systems that are not always compatible with each other. Therefore, the need to process huge amounts of data forces the purchase of new, often very expensive equipment, which involves both huge financial outlays and organisational problems associated with new implementations.

11.5. Conclusion

Implementing a new solution or method in companies inherently faces barriers while bringing benefits to the company. A cost analysis method, such as Cost Deployment, provides benefits in itself and enables one to look at the production process through the prism of generated losses while identifying feasible solutions and tools that, at a given stage, potentially guarantee the highest payback from the expenses incurred. Posing that with the possibility of support that this method gives in the field of management, control and streamlining the processes taking place, it seems that the benefits are far more significant than the limitations and difficulties that an organisation will have to face when using a cost analysis method such as Cost Deployment. Strategic decisions of the organisation must be based on real data, not intuition or assumptions. Such an opportunity is provided to the organisation by the use of the Cost Deployment method as an element of the analysis of processes and centres of responsibility. Thus, this method enables the realisation of the function, which is management controlling. Most frequently named benefits and limitations are shown in Table 11.1.

Table 11.1. Most commonly cited benefits and limitations of WCM

Aspect	Benefit	Limitation
Transparent root cause analysis for each type of waste occurring in the production process	×	
Adequately collected data – in initial stage of analysis		×
Adequately collected data – later stage of analysis	×	
Ability to indicate the source of losses	×	
Stability and usability of reports in terms of form	×	
Time consuming process		×
Continuous data collection and analysis	×	×
Investment consuming process		×
Appropriate IT system		×

Source: own elaboration based on literature review and own observation during Cost Deployment implementation in manufacturing companies.

It appears to be a linear connection between Cost Deployment and management controlling, where Cost Deployment is understood as an analysis method. Development and changes taking place in the production process imply the Cost Deployment method to evolve with them, and allow providing precise information about the allocation of costs, almost immediately and effectively reducing the production costs incurred by the organisation (Giovando, Crovini & Venturini, 2020). Traditional cost accounting, Lean Accounting and management control-

ling are cost analysis methods that are combined in Cost Deployment. Traditional cost accounting systems supports the operation of many companies that have not yet met the needs to deal with a dynamic and constantly changing environment, characterised by increasingly shorter product life cycles and hyper competition (Horngren, Datar & Foster, 2002). Therefore, further analysis and research will be directed to see Cost Deployment as a cost analysis method itself rater than an operational or technical efficient tool for lean tools implementation.

References

Chiarini, A., & Vagnoni, E. (2015). World-class Manufacturing by Fiat. Comparison with Toyota Production System from a Strategic Management, Management Accounting, Operations Management and Performance Measurement Dimension. *International Journal of Production Research*, *53*(2), 590–606.

Giovando, G., Crovini, C., & Venturini, S. (2017). Cost Deployment Implementation: A Case Study. In: D. Vrontis, Y. Weber, E. Tsoukatos (Eds), *Global and National Business Theories and Practice: Bridging the Past with the Future* (pp. 652–664). 10th Annual Conference of the EuroMed Academy of Business. EuroMed Press.

Giovando, G., Crovini, C., & Venturini, S. (2020). Evolutions in Manufacturing Cost Deployment. *Global Business and Economics Review*, *22*(1/2), 41–52.

Horngren, C. T., Datar, S. M., & Foster, G. (2002). *Management and Cost Accounting*. Pearson, Prentice Hall Institute.

Horváth, P. (2006). *Controlling*. Verlag Franz Vahlen.

Łada, M. (2011). Obraz relacji z klientami we współczesnych metodach rachunkowości zarządczej. *Zeszyty Teoretyczne Rachunkowości*, *64*(120), 67–82.

Marciniak, S. (2004). *Controlling. Filozofia, projektowanie*. Difin.

Massone, L. (2007). *Fiat Group Automobiles Production System: Manual do WCM, World Class Manufacturing: Towards Excellence Class Safety, Quality, Productivity and Delivery*. Fiat (Brazil).

Nesterak, J. (2013). Ewolucja controllingu w Polsce i na świecie. *Zeszyty Naukowe Uniwersytetu Ekonomicznego w Krakowie*, 905, 37–54.

Nesterak, J. (2015). *Controlling zarządczy. Projektowanie i wdrażanie*. Oficyna a Wolters Kluwer business.

Nesterak, J., Jabłoński, M., & Kowalski, M. (2020). *Controlling procesów w praktyce przedsiębiorstw działających w Polsce*. Wydawnictwo Uniwersytetu Ekonomicznego w Krakowie.

Nesterak, J., Wodecka-Hyjek, A., & Bąchor, E. (2023). Cost Deployment in the Optimization of Production Processes in the Enterprise. In: J. Nesterak, B. Ziębicki (Eds), *Knowledge – Economy – Society, Increasing Business Performance in the Digital Era* (pp. 244–258). Institute of Economics Polish Academy of Sciences.

Nowak, E. (2017). Costs as an Economic Category Exposed to Risk. In: E. Nowak, M. Kowalewski (Eds), *Global Challenges of Management Control and Reporting* (pp. 195–202). Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu.

Silva, L. C. S., Kovaleski, J. L., Gaia, S., Garcia, M., & de Andrade Júnior, P. P. (2013). Cost Deployment Tool for Technological Innovation of World Class Manufacturing. *Journal of Transportation Technologies*, *3*, 17–23.

Weber, J. (2001). *Wprowadzenie do controllingu*. Oficyna Controllingu Profit.

Chapter 12

The Process of Creating Quality Using a Multi-stage Set of Global 8 Disciplines Activities

Adam Popek

12.1. Introduction

G8D is a detailed action plan. It supports production organisations in the automotive industry in a systematic, orderly and consistent way of solving quality problems. This method has actually become a widely used standard in the automotive industry. G8D is also an element of continuous improvement of the organisation, which helps to reduce variability not only in processes where inconsistency occurs, but above all in the approach to solving problems (Bertagnolli, 2022).

Research problem: industry enterprises always look for solutions aimed at optimising the production system, quality and quantity of production.

Research questions:

1. What determines the way of production in industry zone?
2. What changes can be involved in production system to optimise it?
3. Does G8D method significantly improve the condition and production of a chosen enterprise?

Many fields use the 8D method, and it yields significant and satisfying results. The tools involved in the entire process are described in manuals and materials used by quality assurance specialists. The key benefits of implementing the 8D method include the ability to find the root cause, develop a corrective action plan, and implement it. They are clearly visible not only in financial reports, but also in the way we work every day (Rambaud, 2011; Visser, 2017).

The main goal of the chapter is to present a quality management system and describe the process of eliminating nonconformities based on the G8D method. An example is a company in the automotive industry.

12.2. Literature Review

In Ford Motor Company used to show, approach and resolve problems, employed by professionals. The disciplines are:

- D0: Preparation and Urgent Emergency Actions: The diagnostic stage is the beginning, and this is where the 8D function starts. The cause needs to be found, identified, and a corrective plan developed. First, corrective actions are taken in response to the current situation;
- D1: Use a Team: In D0, the source of the problem turns out to be too complicated and extensive for one person to implement corrective actions in the shortest possible time. Therefore, it is impossible to work using only one pair of hands. Assembling an effective and skilled team is essential for the success of the G8D problem-solving efforts;
- D2: Describe the Problem: Describing the problem is the process of "diving into" the problem and gaining a more detailed understanding of it. At this stage of the problem-solving process, it is important to provide all possible information about the problem, learn its origins, and determine the exact nature of the problem;
- D3: Develop Interim Containment Plan: ICA, as it claims, is temporary. The Global 8D process allows understanding the problem and enabling a fuller comprehension of it;
- D4: Determine and Verify Root Causes and Escape Points: At this stage of the G8D problem-solving process, temporary containment action (ICA) should be taken, thereby gaining some valuable time to focus on solving the problem. It is also important to review the team composition to ensure that all relevant skills and experience are available to take the next step and challenge in the problem-solving process;
- D5: Verification of Permanent Changes (PC) That Will Bring a Solution: After determining the root causes of the problem and the starting point, the process of identifying and selecting the most appropriate permanent corrective action begins;
- D6: Define and Implement Corrective Actions: After determining and verifying the best PCA for the root cause and the starting point, the next step is to implement the PCA;
- D7: Prevent Recurrence of Problems/System Issues: Astute problem solvers know that whenever a problem arises, there is usually a procedure that allowed it. This can be called "the root cause of the root cause";
- D8: Congratulations to the Employees for a Job Well Done: At this stage, it is necessary to verify whether the report generated using the 8D method

has been sent to all parties and whether the implemented changes have been thoroughly described along with their justification. All changes are feasible and appropriate to the current condition of the enterprise. Other examples show the need of introduce systems of evaluation of the quality of production or production systems and the way of its improvement. The example of Semantic Interoperable Smart Manufacturing is a perfect way of showing how it can be useful at different parts of the production process, analysing many items in a same time and integrating it all in a model of economic and effective production process (Adamczyk, Szejka & Canciglieri, 2020). A different example involves an artificial neural network which can create the expected result model by analysing even thousands of components. It makes the final product much more fitted to consumer expectations, including financial possibilities and borders (Ahiaga-Dagbui & Smith, 2014). Also an automotive example such as the Lean Management System based on Toyota Manufacture demonstrates that eliminating waste in the production process can significantly improve the quality and quantity of production, especially if big stores contain different stages of production (Bertagnolli, 2022). Another part of discussion involves safety. It is much more important than speed and quantity of production, however not everyone thinks about it at first. Also, it can improve income stats of manufacturing. Some studies have shown that the ISO 9001 standard predicts changes in organisational outcomes, including profit. Moreover, this is the first research conducted on such a large scale, taking into account variables such as employment, wages, health, and safety concerning the use of the ISO 9001 standard. Nearly 1,000 companies from California participated in the analysis. Among the organisations that decided to implement the ISO 9001 standard, a significantly lower mortality rate was noted compared to the control group. Additionally, organisations with the adopted ISO standard recorded higher growth rates in sales, employment, average wages, and average annual earnings. The incidence of injuries slightly decreased, although treatment costs remained unchanged (Levine & Toffel, 2010). Nowadays, the main role is played by Artificial Intelligence (AI). It is definitely a new, huge tool in analysing current processes and proposing problem solutions based on more economical ways of production (Nargargoje *et al.*, 2023).

12.3. Research Methods

12.3.1. Problem-solving Concept

The problem-solving concept concerns quality problem solving, for example unwelcome situations in which inconsistency with requirements appeared and is carried out in a certain way, with the use of methods and tools elaborated by the experienced people in quality managing over the years. There are three basic types of the approach to problem solving used by these organisations (Bertagnolli, 2022):

- preventive – it assumes finding a solution before inconsistencies appear during the designing the product phase while using advanced quality tools,
- proactive – on the basis of the existing data, with the use of so called 7 quality tools, the aim is constant improvements in an organisation,
- reactionary – in order to answer to an inconsistency which appears, the aim is to protect the client.

The general scheme of the problem-solving process is shown in Figure 12.1.

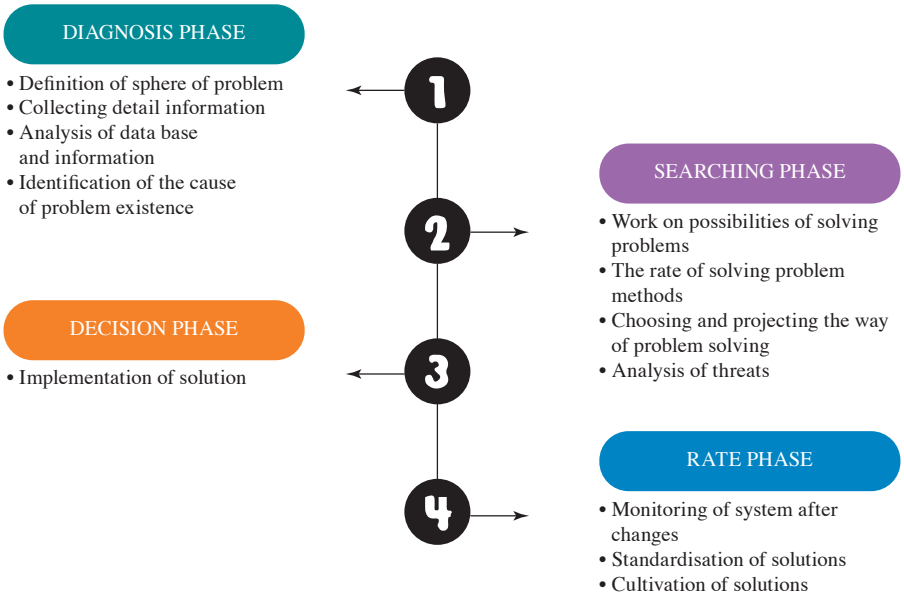

Figure 12.1. The stages of quality problems solving

Source: own work based on (Ahiaga-Dagbui & Smith, 2014; Adamczyk, Szejka & Canciglieri, 2020).

The stages of diagnosis and searching are equivalent to the PLAN step, while the decision-making stage corresponds to the DO step. As for the assessment stage, the presented model shows that the requirements are met by the CHECK

(monitoring the system after changes have been made) and ACT (standardising solutions and improving the system) stages.

12.3.2. Does the Global and Disciplinary Method (G8D) Ensure More Efficient Production?

The ISO 9000 series standards recommend, and the ISO/TS 16949 specification outright requires, that organisations use an orderly (systematic) methodology in the process of eliminating inconsistencies (PN-EN ISO 9000:2015, ISO/TS 16949:2009). One such method, widely known and used in the automotive industry, is G8D. The detailed goals of actions in accordance with G8D are (Ahiaga-Dagbui & Smith, 2014; Adamczyk, Szejka & Canciglieri, 2020; Nagargoje *et al.*, 2023):

- supervision and isolation of all suspected products,
- identification of the source of the problem,
- implementation of effective corrective actions to prevent similar problems in the future,
- demonstrating that the implementation of corrective and preventive actions is continuous.

As already mentioned, the procedures in this method have stages, as shown in Figure 12.2.

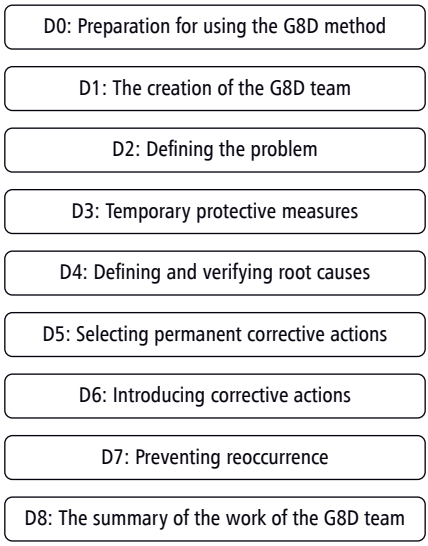

Figure 12.2. The G8D method: the stages of actions
Source: own work based on (Adamczyk, Szejka & Canciglieri, 2020; Nagargoje *et al.*, 2023).

The stages are marked with symbols from D0 to D8. It can be clearly seen that the entire G8D process consists of two main parts that group certain stages.

One part, which includes stages D1, D2, and D4, is analytical in nature. It involves defining the problem and its causes. The other part (D3, D5, D6, D7) involves fixing the problem.

In the inconsistency elimination methods, several dozen elements, from a big choice of tools in quality management, are used.

Below are presented tools and techniques of quality management, which have been elaborated in order to be used in the process of inconsistency elimination – either at a stratification problem stage or during reasons identification (Levine & Toffel, 2010): Brainstorming technique, Ishikawa diagram, Pareto diagram, 5-WHY technique, "Is/Is Not" technique, 5W2H technique, ABCD tools, FMEA (Failure Mode and Effect Analysis) and Poka-yoke techniques.

12.4. Results

In this paper, the methodology was shown on the basis of experience of a selected industry and applied management systems. The aim is to present what kind of factors are most important and even critical to the production process.

The sample enterprise is part of an international production group, which produces subcomponents for companies in the automotive and household appliances trade. Concentration on these two parts of production gives varieties in sell market, however it requires control and good organisation of the sector of workers. The Polish company specialises in designing and producing components intended for the two above mentioned trades. The company has the certificates for the following introduced management systems: ISO 9001, ISO/TS 16949, ISO 14001, and the certificate which allows it to sell products on the Chinese market: CCC (China Compulsory Certificate). The chosen documents of Quality Management System, connected to the elimination of the inconsistency of a given enterprise, have been discussed.

The procedure which is connected to the inconsistency elimination is procedure P06 "Supervision on the incompatible choice." The team decides on the root cause of the problem, defines and introduces corrective actions and/or the ones which are preventive in a certain time. The inconsistencies management takes place with the use of the following methods: "5 Why," "Fishbone," Pareto analysis, "Brainstorming," etc. In order to describe and solve a given problem/inconsistency, the form M01P06 is used "inconsistencies management" (Procedure P06).

Extremely important, in the aspect of inconsistencies management is complementary to the discussed procedure P06, the system procedure P08 "Complaints." The way of behaving in case of external inconsistency appears, and reporting it by a customer in the form of a complaint has been defined in this procedure.

The aim of this procedure has been defined as follows (*Metoda G8D – materiały szkoleniowe*, 2008; Rosenfeld, 2014):

> The following procedure is to [The procedure P08]: make sure that effective correcting actions are taken immediately after a customer makes a complaint, guarantee that the recognized and removed problem will not repeat again in the future (preventing actions) and keep records of actions which concern the complaints about the products.

The procedure is based on the G8D method and it refers to it, but it also contains information that the complaint managing process must be consistent with the client's demands. If the client does not have any specific demands, the process consists of the steps mentioned below. There are elements of G8D which correlate to the steps: keeping records of the complaints [D0, D2], immediate correcting actions (Interim Containment Actions) [D3], material decision and possible return to the client [D3], the analysis of the complaint [D4], correcting and preventing actions [D5–D7], the closure of the complaint [D8] and monitoring records of complaints from the customer.

In order to monitor the inconsistencies in an enterprise, special indicators have been created. They are shown in Table 12.1.

Table 12.1. System indicators

No.	Name of the indicator	The way of calculating
50	Internal deficiencies	The value of the scrapped internal deficiencies The value of declared finished goods
80	"PPM"	The number of items returned to the client The number of items sent
180	Punctuality of closing inconsistencies	Internal closed inconsistencies connected to the delay during a year The total number of inconsistencies emitted
190	Effectiveness of correcting actions	The number of internal inconsistencies, which repeat in the enterprise during 12 consecutive months / The total number if inconsistencies emitted Since the beginning of the year
210	Complaints rate	The number of complaints from a client The number of batches sent to a client

Source: (Ford Motor Company, 1997).

Indicator no. 50 "internal deficiencies" is crucial from the point of view of the company's quality and economy.

Indicator no. 80 "PPM" is the relation of the number of the products clients complained about and returned by them during one month to the number of the products sent in the same month to the clients. This rate is run collectively – for the whole sale, as well as individually – for the biggest clients.

Indicator no. 180 "punctuality of closing inconsistencies" shows the participation of closed inconsistencies in percentage, with a delay in the whole, registered inconsistencies during the year.

The next indicator is no. 190. It allows to monitor "effectiveness of corrective actions." In order to count it, you need to divide the number of internal inconsistencies, which repeat in the company during consecutive 12 months at least once by the whole number of inconsistencies occurring since the beginning of the year. The agent who looks after the system quality management is responsible for indicators 180 and 190.

The last indicator is 210 "complaints rate." It monitors the number of complaints which come from the customers every month. The indicator includes the size of the sale in a given month. It is received as a relation of the number of complaints to the number of batches sent in a given month (the value is presented in percentage). The indicator is included not only for the whole sale but also for individual clients.

In the first year, the management established the aim for the "internal inconsistencies" indicator on the level of 2.5%. By observing the course of values of the indicator in the first year of research in Figure 12.3, it can be noticed that it got worse in every consecutive month reaching 4.75% in October. The high level of the crapped material in December resulted from the necessity of scrapping the inconsistent goods produced in the earlier months before "closing the year." It can be accepted then that the improvement of the indicator values began in November of the first year.

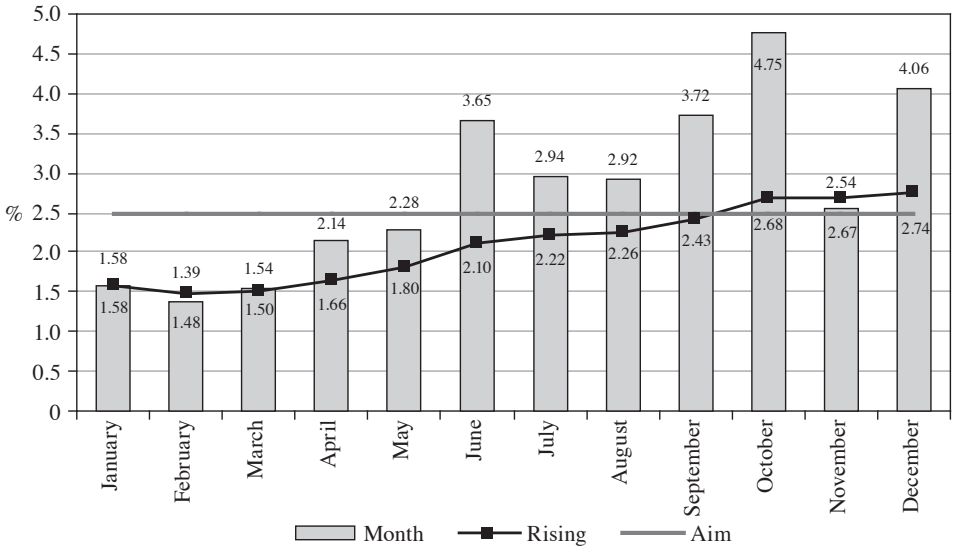

Figure 12.3. The "internal inconsistencies" indicator values in the first year of research
Source: (Ford Motor Company, 1997).

In the following year, the tendency turned back. As Figure 12.4 presents, the inconsistencies rate systematically decreased from January to August, reaching 1.96%. In August, during the second year, for the first time in 10 months, the value fell below the level predicted by the management, even though the aim was lowered in comparison to the previous year from 2.5 to 1.9%.

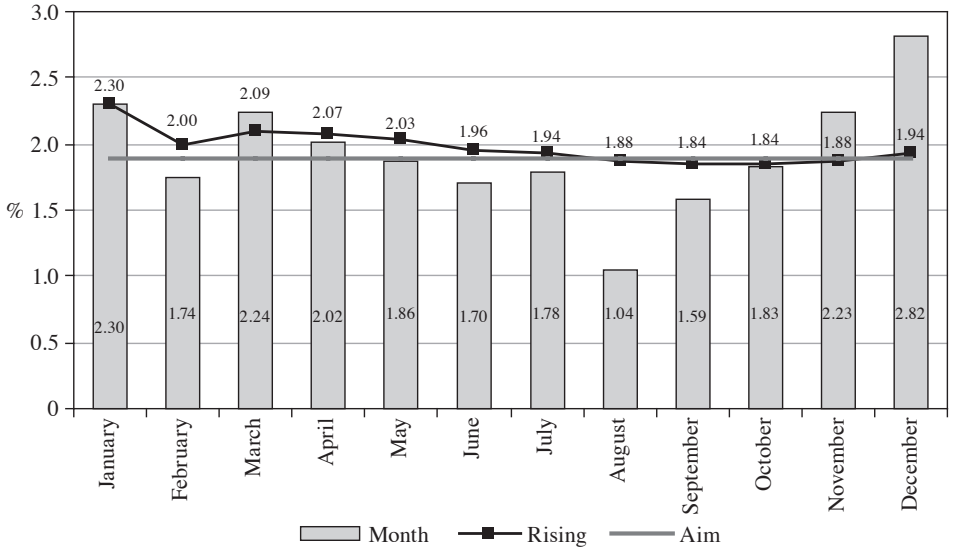

Figure 12.4. The "internal inconsistencies" indicator values in the second year
Source: (Ford Motor Company, 1997).

The positive tendency of the indicator discussed in this period was expected according to the inconsistencies management system introduction. The increase in October–December is the effect of introducing a new product to the production. It required new technologies. The enterprise was systematically learning them. This new process caused a bigger number of inconsistencies.

Another indicator is the external inconsistencies index "PPM" – system indicator no. 80.

The course of the indicator in the months in the first year is presented in Figure 12.5. As is clear from it, the clients returned many fewer inconsistent (suspicious) goods to the company in the second year than one year earlier. It can be regarded as the efficiency proof of the introduced system of "problem solving," especially if at the same time the decrease in the number of complaints has been noted.

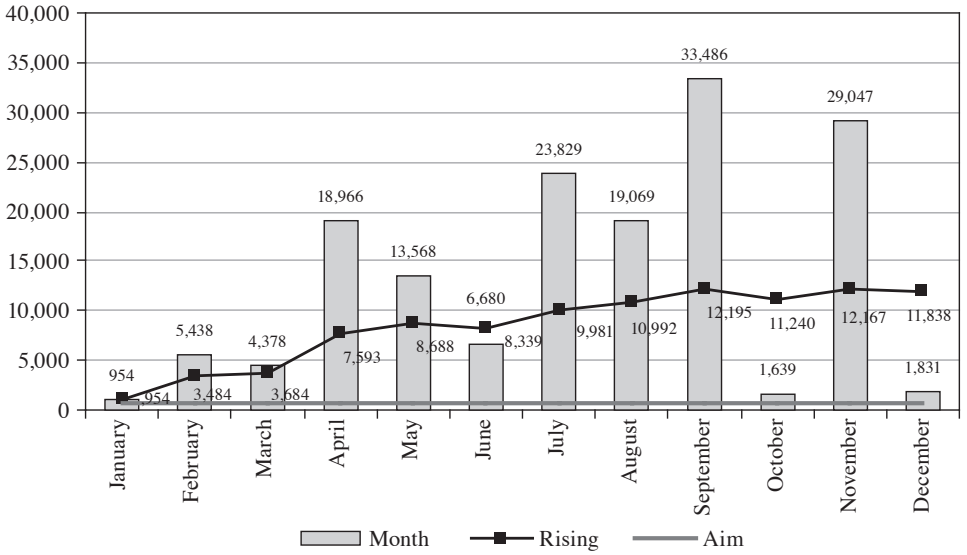

Figure 12.5. The "PPM" indicator values in the first year
Source: (Ford Motor Company, 1997).

It can be seen from Figure 12.6 that in the second year, the indicator is still far from the established target, but it is noticeably lower than in the first year.

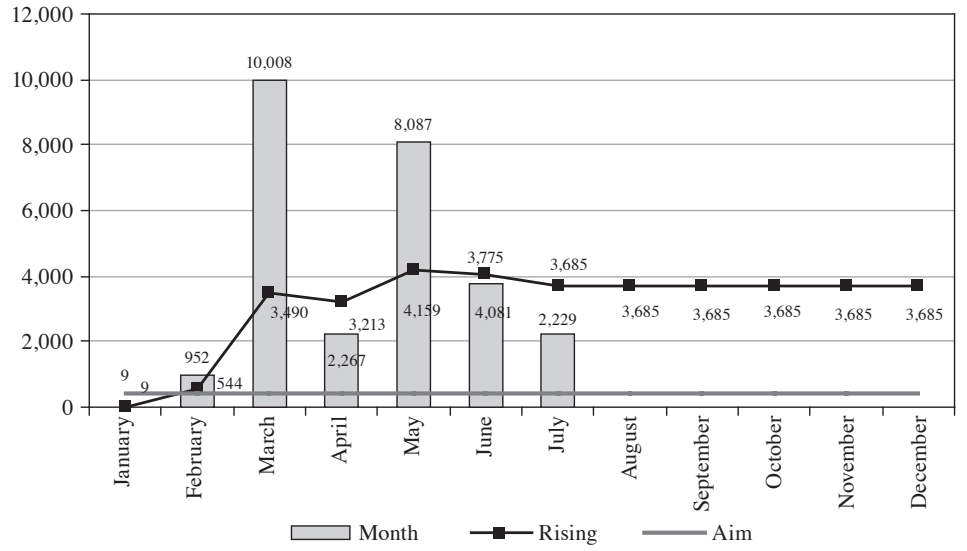

Figure 12.6. The "PPM" indicator values in the second year
Source: (Ford Motor Company, 1997).

12.5. Discussion

In general, systems allow development and change of the way of a company's work bringing in any benefits: economical, quality of product, quantity of production, reduction of waste, effective use of workers, mechanical stage and others. A lot of research proves its positive influence. In this context, the work contributes to the dissemination and development of smart manufacturing by incorporating information and data from multiple fields, which can be utilised at every stage of implementing changes. The presented method was applied to the engine calibration process. The entire operation focused on integrating an auxiliary braking system consisting of an electric vacuum pump. The system assists in collecting and sharing information across different areas of the project and thus the calibration stage. The results demonstrate the system's potential for interoperability, information exchange, and identifying inconsistencies within the smart manufacturing system (Adamczyk *et al.*, 2020).

Using the G8D method in the automotive industry is quite successful. A company which produces large trucks in China is a case in point. Thanks to the G8D method, the problem with unbalanced excitation force of the wheel system was fixed. All corrective actions allowed the product to become more advanced and comfortable (Guo *et al.*, 2019). G8D helps also in relations between the consumer and the enterprise, however it can never change and control the behaviour of factory workers. Only gives definitions of problems what may help in future functioning (Chomicz, 2020). Other authors also present the G8D method as an effective tool in controlling and making changes at the production line but in the sphere of quality, specially relations between consumer and worker, it finds abnormalities after the fact. Using a wide-ranging data base of examples could prevent the possible incorrectness, which is the key to improvement of the G8D method (Cyganiuk *et al.*, 2019). Undoubtedly the advantage of the G8D method is the possibility of introducing interim corrective actions, which lets make changes in the enterprise almost immediately (Cyganiuk *et al.*, 2022). Specially, the method is useful in reducing time waste and taking the most adequate production factors (Perez & Cabrera, 2020). However, in case of choosing wrong people to work and manage a project, lack of knowledge and necessary information, the corrective actions must be much deeper and the G8D method can only find the problems (Phanden *et al.*, 2022).

Another segment of the market shows that there are theories about costs incurred in construction and their overruns. These include emerging technical problems, disproportionate calculations and assumptions regarding ongoing work, incompetence, and other errors that arise during the production process. It is important to remember that budget decisions are often made at an early

planning stage and are subject to high risk. This also means limited information is available to accurately estimate the project. By utilising non-parametric bootstrapping and ensemble modelling in artificial neural networks, a highly useful cost forecasting model has been developed to ultimately minimise errors in financial planning. This model was created using 1,600 completed projects. As a result, a database of information from completed projects has been established, which can be used in the early stages of production. It was subsequently found that out of 100 evaluated samples, as many as 92% were within +/– 10% of the final project costs, and 77% were within +/– 5% of the final project costs. This demonstrates the model's usefulness and efficiency at a satisfactory level. The models are used and implemented by an industry partner involved in the research to increase the reliability and accuracy of early cost estimates (Ahiaga-Dagbui & Smith, 2014). Lean Management, based on the motor company Toyota, as well as G8D helped to optimise the production process, increased the product quality and reduced waste parts of production (Bertagnolli, 2022). As it known, Artificial Intelligence (AI), especially neural networks can create optimal decision trees, show the way of development and solve problems appearing during the production process (Nagargoje *et al.*, 2023). Systems like ISO also may influent the scale of production and cause positive changes seen in results, including higher income. Among surviving employers, ISO adopters had higher growth rates for sales, employment, payroll, and average annual earnings. Injury rates declined slightly for ISO 9001 adopters, although total injury costs did not. Among the rest of the employers who decided to adopt and implement ISO, higher levels of sales, employment, wages, and annual earnings were recorded. Among the tools aimed at optimising the production process, one can distinguish the causes that also serve as the motivation for their use. The uniqueness of this paper for the global community lies in presenting 15 universal root causes of cost overruns, which can be utilised in any other operation (Rosenfeld, 2014). Despite conducting a case analysis and comparing it with other works regarding the use of the G8D method, there are certain limiting factors that require further development and expansion of the perspective on this method. These include the multi-stage nature of the process and the necessity for detailed analysis. Additionally, the effective implementation of the G8D method largely depends on the qualifications of the employees or the available resources. Without these, the planned implementation of the method may prove impossible. Similarly, the lack of a complete database of information necessary for constructing the corrective plan can be an issue. There are also possible errors arising from algorithmic programming. Recommendations for future research include continuous improvement and building of a database, sustainable development of automation, and eliminating errors related to the lack of refinement of the chosen topic, streamlining procedures without compromis-

ing the accuracy of analyses, and selecting the most appropriate solutions related to production economy and quality.

12.6. Conclusion

The results of the analysis turned to be in keeping with the ones predicted. The implementation of the coherent system of inconsistencies elimination in the enterprise proved to be effective. It favourably influenced the quality aspects of its activity. The theory which concerns the methods, tools and techniques used in the system proved to be useful. The most important was the use of the complete method created by Ford Motor Company – Global 8 Disciplines (Ford Motor Company, 1997), where possible.

Additional conclusion resulting from the analysis is the fact that the wide use of the D8D method in an organisation may lead to lengthening the average time needed to conduct the process of eliminating inconsistencies.

The advantage of method was clearly visible in the case of amount complaints and material waste. Also, every enterprise which using the G8D method must remember that study of quality of relations between consumer and enterprise, the level of satisfaction and quality in relation to the future use of product are still an incompletely researched area of the use of the G8D method requiring further improvement.

The methods and techniques spectrum used to eliminate inconsistencies in manufacturing enterprises in the automotive trade is wide. A long-term practice of the best companies within the trade showed that it is worth knowing all these tools, but in everyday work it is better to use a fixed and unchangeable methodology which embraces the ordered way of dealing with inconsistencies and using only some chosen quality tools. In the sample enterprise the introduced managing inconsistencies system was based on the G8D method.

References

Adamczyk, B. S., Szejka, A. L., & Canciglieri, O., Jr. (2020). Knowledge-based Expert System to Support the Semantic Interoperability in Smart Manufacturing. *Computers in Industry*, *115*. https://doi.org/10.1016/j.compind.2019.103161

Ahiaga-Dagbui, D. D., & Smith, S. D. (2014). Dealing with Construction Cost Overruns Using Data Mining. *Construction Management* & *Economics*, *32*(7–8), 628–694. https://doi.org/10.1080/01446193.2014.933854

Bertagnolli, F. (2022). *Lean Management*. Springer.

Chomicz, A. (2020). Application of G8D Method for the Quality Issue Analysis in a Manufacturing Company. *Zeszyty Naukowe. Organizacja i Zarządzanie / Politechnika Śląska*, 143, 23–33. https://doi.org/10.29119/1641-3466.2020.143.2

Cyganiuk, J., Idzikowski, A., Kuryło, P., & Tertel, E. (2022). Analysis of the Possibility of Using the D3 Discipline of the G8D Method in Solving Quality Management Problems for NOK Products. *System Safety: Human – Technical Facility – Environment*, *4*(1), 196–204. https://doi.org/10.2478/czoto-2022-0021

Cyganiuk, J., Idzikowski, A., Kuryło, P., Tomporowski, A., & Kruszelnicka, W. (2019). Application of Algorithm of Discipline D2 of G8D Method in Solving Selected Problems of Quality Control Management. *System Safety: Human – Technical Facility – Environment*, *1*(1), 599–606. https://doi.org/10.2478/czoto-2019-0076

Ford Motor Company. (1997). Ford Technical Education Programme – Global 8D.

Guo, H., Chen, M., Zhang, R., Li, J., Li, C., Qu, T., Huang, G. Q., He, Z., & Zeng, Y. (2019). Research on Improvement of Truck Vibration Based on Systematic G8D Method. *Shock and Vibration*, 1, 1416340. https://doi.org/10.1155/2019/1416340

ISO/TS 16949:2009. The Quality Managing Systems – the Detailed Requirements to Use ISO 9001 in the Automotive Trade.

Levine, D. L., & Toffel, M. W. (2010). Quality Management and Job Quality: How the ISO 9001 Standard for Quality Management Systems Affects Employees and Employers. *Management Science*, *56*(6), 978–996. https://doi.org/10.1287/mnsc.1100.1159

Metoda G8D – materiały szkoleniowe (the G8D Method – Training Materials). (2008). TQMsoft.

Nagargoje, A., Kankar, P., Jain, P., & Tandon, P. (2023). Application of Artificial Intelligence Techniques in Incremental Forming: A State-of-the-Art Review. *Journal of Intelligent Manufacturing*, *34*(3), 985–1002. https://doi.org/10.1007/s10845-021-01868-y

Perez Cabrera, C. (2020). *Implementation of the 8D Methodology in a Tyre Manufacturer Company* (doctoral dissertation, Politecnico di Torino).

Phanden, R. K., Sheokand, A., Goyal, K. K., Gahlot, P., & Demir, H. I. (2022). 8Ds Method of Problem Solving within Automotive Industry: Tools Used and Comparison with DMAIC. *Materials Today: Proceedings*, *65*(3), 3266–3272. https://doi.org/10.1016/j.matpr.2022.05.383

PN-EN ISO 9000:2015-10. Systemy zarządzania jakością – podstawy i terminologia (Quality Managing – the Basics and Terminology).

Rambaud, L. (2011). *8D Structured Problem Solving: A Guide to Creating High Quality 8D Reports* (2nd ed.). PHRED Solutions.

Rosenfeld, Y. (2014). Root-cause Analysis of Construction-cost Overruns. *Journal of Construction Engineering and Management*, *140*(1), 357–369. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000789

Visser, C. (2017). *8D Problem Solving Explained – Turning Operational Failures into Knowledge to Drive Your Strategic and Competitive Advantages.* CreateSpace Independent Publishing Platform.

Chapter 13

Difficulties in Implementing Management Control Systems: Insights from a Case Study Analysis

Anna Kołodko, Michał J. Kowalski, Janusz Nesterak

13.1. Introduction

Currently, controlling is experiencing a renaissance and gaining significance in business, especially in the VUCA world (Volatility, Uncertainty, Complexity, Ambiguity). Companies that employ controlling must work intensively on integrating operational and strategic flexibility with daily controlling practices. This is essential because, firstly, entrepreneurs are searching for solutions that will enable them to manage their companies more effectively and remain flexible in offering their products and services to customers (Kotter, Akhtar & Gupta, 2022). Secondly, the role of controlling is becoming increasingly critical, as enterprises need to rely on thorough analysis to define new solutions tailored to their business needs. Contemporary trends in controlling are shifting its role from mere data reporting to active participation of the controller in enterprise management. Nesterak discusses this evolution as a transformation from reporting control to management control (Nesterak, 2015).

Despite many years of research, numerous obstacles continue to hinder the development of controlling, which is most evident in the limited number of its implementations. A review of the literature indicates that a lack of knowledge in managing the implementation process of controlling and the fear of project failure are the primary barriers limiting the practical use of this discipline's achievements. The main obstacles to implementing controlling systems include: 1) change-related costs concerning people and time, 2) a lack of appropriate skills and awareness among employees, and 3) limited access to information on controlling tools (Dugdale & Jones, 1998; Adler, Everett & Waldron, 2000; Joshi, 2001; McChlery, Godfrey & Meechan, 2005). Survey respondents have also pointed out issues related to IT support and the flow of information between different organisational levels within a company, such as accounting and pro-

duction (Adler, Everett & Waldron, 2000). A significant problem in the correct implementation of controlling systems is also the fear of lacking the skills to utilise the implemented tools in decision-making processes or in assessing the company's performance (Hopper, Koga & Goto, 1999; Nandan, 2010; Lucas, Prowle & Lowth, 2013; Ma *et al.*, 2022).

The aim of this paper is to explore the practices of implementing controlling, the course of the implementation process, and to assess the outcomes of the project. The authors' task is to identify implementation practices that maximise the chances of successfully introducing controlling. The authors intend to seek out implementation practices that will allow companies to effectively adopt the concept of management control, rather than just reporting control.

The primary research method used in this study is case study analysis. Employing the case study as a research method (Flyvbjerg, 2006) will enable the authors to identify individual methods and solutions employed by companies during the implementation of controlling. The practices identified through case study analysis (Gerring, 2004) can later be evaluated on a broader research sample using quantitative methods. The conclusions drawn will allow for the formulation of guidelines aimed at addressing the identified research gap and contribute to overcoming the barriers that limit the use of management control.

13.2. Data and Methods

The authors adopted a research procedure tailored to the objectives defined in the introduction. This procedure encompasses six key steps, presented in Table 13.1.

Table 13.1. Research procedure

Research procedure		
1. Preparation for the study	1.1. Defining the research objectives	Evaluation of the effectiveness of management control implementation, identification of issues, and assessment of compliance with adopted methodologies
	1.2. Determining the scope of the study	Specification of which aspects of the project will be examined and what areas of the company's operations will be analysed
	1.3. Selection of research methods	Decisions regarding the selection of research methods, such as the analysis of existing documentation, organisational charts, and data, financial data analysis, controlling reports, other analyses, surveys, data analysis, observation, interviews with controlling teams and operational staff, and interviews with key managers and implementation teams
	1.4. Preparation of research tools	Development of questionnaires, checklists, evaluation matrices, and other tools that will be used for data collection and analysis

Table 13.1 cnt'd

Research procedure		
2. Data collection	2.1. Gathering project documentation	Collection of all relevant documents related to the project, such as project plans, schedules, budgets, reports, and controlling documentation
	2.2. Conducting interviews and surveys	Collecting feedback from project team members, managers, and other key stakeholders regarding the project execution and the effects of management control implementation
	2.3. Financial and operational data analysis	Gathering data from accounting systems, ERP systems, and other IT systems that can provide information on costs, revenues, operational efficiency, and financial results
	2.4. Process observation	Direct observation of processes related to the implementation of management control, including the practical analysis of reporting and budgeting tools
3. Data analysis	3.1. Compliance evaluation with methodologies	Conducting a comparative analysis to assess how well the project was executed according to the selected implementation methodology based on established criteria
	3.2. Project task execution evaluation	Analysing the effectiveness of task execution within the project, including the assessment of timeliness, budget adherence, and quality of execution
	3.3. Evaluation of management control implementation effects	Analysing data related to the outcomes of management control implementation, including its impact on cost management, reporting quality improvement, and process optimisation
	3.4. Identification of problems and barriers	Identifying issues that may have affected the project execution and implementation outcomes, along with an analysis of their causes
4. Formulating conclusions	4.1. Synthesising analysis results	Compiling all analysis results into a cohesive whole, identifying the main strengths and weaknesses of the project
	4.2. Identification of key conclusions	Highlighting the most significant findings from the study, such as the effectiveness of management control implementation, problems encountered during the project, and potential areas for improvement
	4.3. Recommendations for the future	Developing recommendations for future actions, including improvements in project management, enhancement of management control tools, and organisational process changes
5. Presentation of results	5.1. Preparation of the final report	Developing a report from the study that includes all collected data, analysis, conclusions, and recommendations
	5.2. Presentation of results to stakeholders	Presenting the study results to key stakeholders, such as the management board, project team members, managers, and other authorised individuals
	5.3. Discussion of results	Organising a meeting to discuss the study results, conclusions, and possible further actions
6. Implementation of conclusions	6.1. Planning corrective actions	Based on the conclusions and recommendations, planning specific actions aimed at improving the identified issues
	6.2. Monitoring the implementation of recommendations	Regularly monitoring the progress of the recommended actions and continuously evaluating their effectiveness

Source: authors' own elaboration.

The study utilised the following data sources: 1) organisational data of the company, 2) project documentation, 3) financial data from the accounting system, such as detailed cost registers, revenues, and settlements within various responsibility centres, which constituted the primary source of information, 4) management and controlling reports, 5) operational data, such as production records[1], operational plans, and production schedules, reflecting the complexity of processes, 6) data from the ERP (Enterprise Resource Planning) system, integrating various company functions, 7) planning and budgeting documentation, including financial plans, forecasts, and detailed investment budget plans, 8) interviews with key employees and managers, 9) interviews with implementation team members, essential for understanding the practical aspects of data management within the company and the impact of human factors on internal processes and gathering opinions at various management levels, 10) analysis of internal processes and procedures revealing an extensive investment monitoring system and a management system for strategy execution, analysis of regulations, and operational processes affecting investment management and strategy execution.

13.3. Characteristics of a District Heating Company in the Context of Management Control

Municipal district heating companies, as public utilities, are firms owned by local authorities, formed through the transformation of state-owned enterprises. Through ownership transformations and privatisation processes, these companies have been converted into market entities and operate based on commercial law (Klimek, 2017; Swianiewicz, 1998).

The municipal district heating company, hereafter referred to as the Organisation, which is the focus of the authors' analysis, provides heating and central hot water to local residents. It is a modern and continually evolving enterprise that implements the latest technological solutions.

The Organisation has a complex organisational structure, which is adapted to the scale of its operations and the specifics of the energy sector. Several key organisational subunits can be identified, including: *the management board*; *technical divisions* covering heat production, district heating networks, investments, maintenance, and repairs; *commercial divisions* divided into sales, customer service, and marketing; a *financial division* that includes accounting, controlling,

[1] The authors, under the term "production" in a municipal enterprise, included the production/generation of heat, steam, and the production of installations related to the construction of structures within the entire system of heat delivery and distribution.

settlements, and risk management; and an *administrative division* comprising human resources, legal, and IT departments, as well as an operational *support division* that includes logistics and procurement departments.

13.4. Project for the Expansion of the Management Control and Reporting System

13.4.1. General Remarks

In the context of dynamic market and organisational changes, the Organisation recognised the need to improve its management control and reporting systems. Therefore, a decision was made to implement a project aimed at providing adequate management information that would reflect the complexity of business processes, the specifics of contracts and services offered, and would serve as a tool to support management.

13.4.2. Existing Organisation of Controlling and the Objectives of the Controlling Development Project

It should be emphasised that the Organisation, as a large economic entity organised according to certain established rules, had developed controlling structures within the broadly understood financial department. Controlling tasks are carried out by the Planning and Controlling Department, which reports directly to the Director of Economics and Project Management. This department, employing six staff members, is located within the President's division, allowing it to influence the management of the entire enterprise. The main activities include managing heat energy pricing tariffs, coordinating capital investments, analysing the purchase, production, and sale of heat energy, and developing technical and economic indicators. The department prepares materials for annual and multi-year plans and conducts economic analyses, supporting the controlling and management accounting system.

Controlling also encompasses budgeting and steering of Profit and Cost Centres, as well as operational and strategic planning. The department does not have separate sections, and specialisation arises from the responsibilities of individual employees. Some tasks related to project management are within the investment division, allowing for the efficient utilisation of the analytical team's economic potential. Tasks related to the strategic scorecard are handled by the Director of Organisation and the Management Systems Department.

The new controlling project was driven by the idea of developing and enhancing the existing reporting system into an advanced, coherent management control system that would encompass the entire enterprise at every management level.

It aimed to transform from a unit rooted locally within the financial and accounting department into a unit that supports the management and top leadership organisationally.

The primary objectives of the controlling project were to improve the system for recording costs and revenues, optimise the management reporting process, and increase the transparency and efficiency of controlling. According to the project assumptions, efforts were also made to introduce new tools and procedures to support strategic management, which was intended to contribute to better decision-making within the enterprise.

The project was planned to be executed in three key stages, as illustrated in Figure 13.1 below.

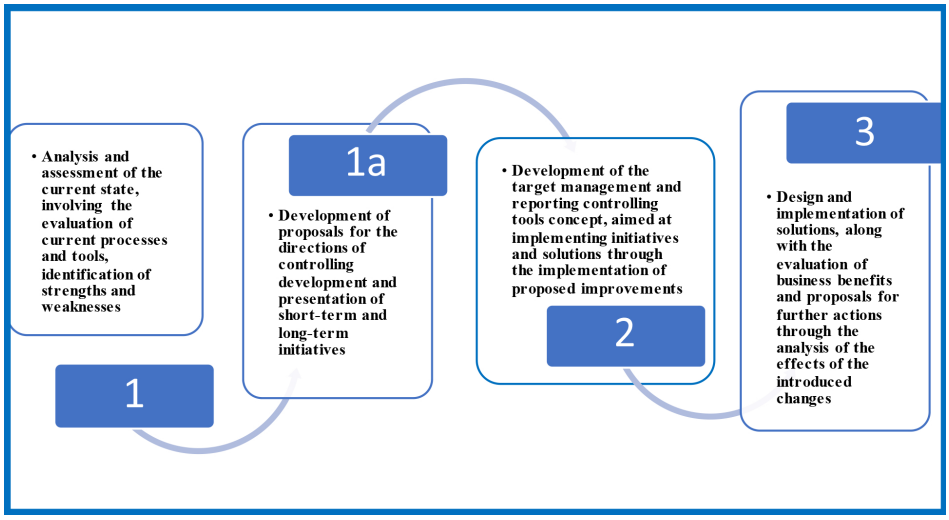

Figure 13.1. Stages of reporting project implementation
Source: authors' own elaboration.

13.4.3. Project Course

The analysis of the enterprise was fundamentally initiated by focusing on the understanding of the company's business processes, which were identified based on operational records and documentation. The business process analysis was conducted concerning the company's current organisational structure. Another significant input element was the financial source documents, including cost and revenue records, the management reporting system, the budgeting process, investment management, the strategy execution management system (BSC, Balanced Scorecard), and existing procedure descriptions. Additionally, interviews with employees involved in creating processes and their workflows,

who also generated the operational documentation, were another crucial input source.

The analysis of all these elements within the enterprise primarily served to identify key areas requiring improvement and subsequently assess the effectiveness of the management reporting system.

As a result of the analysis, several areas were identified as having potential for improvement and requiring attention, such as: 1) overly complex cost accounting rules, although reflecting the complexity of the business processes, 2) complicated and non-transparent accounting code rules that were difficult to process further and inconsistent with the codification methodology, 3) non-uniform format of accounting data and the absence of an account attributes database, 4) omission of profit centres, 5) lack of a comprehensive or cascading logic for presenting management information, 6) absence of narrative comments that could serve as information for a broader management audience, which would subsequently allow for drawing conclusions applicable to the entire organisation, 7) a fragmented data supply system deriving from various incompatible systems: financial accounting software, MS Excel, ERP-class software, without the ability to reference source data and/or the necessity for individual data corrections, 8) an overly complex and labour-intensive reporting system that was not utilised to build a coherent management information system and required very advanced knowledge of the system's organisation, 9) an overly complex planning system based on extensive procedures, centrally managed, and not accounting for the needs of smaller organisational units, resulting in no added value, and 10) an investment monitoring system lacking uniform organisational standards, where verification was difficult due to the absence of verification procedures in the units responsible for investment execution, particularly concerning the recording of work time allocated to investment execution.

13.4.4. Achieved Results

In the Organisation, as a large economic entity with extensive controlling structures in the financial department, there was a recognised need to enhance the work of current system resources, to expand and supplement them with new knowledge. This new knowledge would fuel the company with new ideas and drive future development, supporting the managers and the team in adapting to the dynamically changing economic environment. The new controlling project aimed to develop and enhance the existing reporting system to create an advanced, coherent management control system encompassing the entire enterprise. The project was designed to improve cost and revenue accounting, optimise management reporting, and increase the transparency and efficiency

of controlling. Additionally, the plan included the introduction of new tools and procedures to support strategic management, facilitating decision-making within the company.

As a result of an extensive, multi-month analysis of processes and data across various levels, the following were completed and developed:

- detailed documentation of the principles for recording economic events and the codification used in accounting accounts,
- procedures for exporting data from the accounting system,
- a set of tools for decoding accounting data into a database,
- attribute dictionaries for database dimensions,
- the structure of the database,
- a complete database covering the analysed period,
- reports for two quarters within the analysed period.

The scope of work also included the preparation of a reporting system based on the database, as well as the development of proposals for modifications to the management reporting model and training on database-driven reporting. Additionally, project feasibility was confirmed.

The data flow diagram and the method of generating management reports based on the data warehouse consist of the following elements: Primary Data Sources: 1) financial-accounting system: the main financial-accounting system, from which data is exported to the data warehouse, 2) work time recording system (EPM): this system tracks and records employee working hours, 3) other cost carriers: additional data sources encompassing various cost carriers, 4) budgeting system: a budgeting tool from which data is also sent to the data warehouse, 5) data warehouse: the central repository for storing and processing data from various sources. In the data warehouse, data is aggregated and organised for further analysis and reporting. The data warehouse centralises and integrates data from different systems. This data is enriched with attributes and standardised using data dictionaries. 6) Final product – reports: the integrated data in the data warehouse is used to generate management reports. The system ensures that only integrated data from the data warehouse is used for report generation. These reports are created in MS Excel and are available to authorised users.

Figure 13.2 illustrates the complex management reporting system based on the central data warehouse. Data from various sources, such as the financial--accounting system, work time recording system, and budgeting system, is aggregated and integrated into the data warehouse. Data dictionaries and attributes ensure data standardisation and accuracy. This method of data construction is superior to the currently existing version in the Organisation, providing more organised and readable information. The centralisation of data in the data warehouse, the use of dictionaries and attributes for standardisation, and the clear

flow of data and reporting make the information consistent, accurate, and easy to analyse. The data warehouse allows for more efficient data management and report generation, leading to better quality management information.

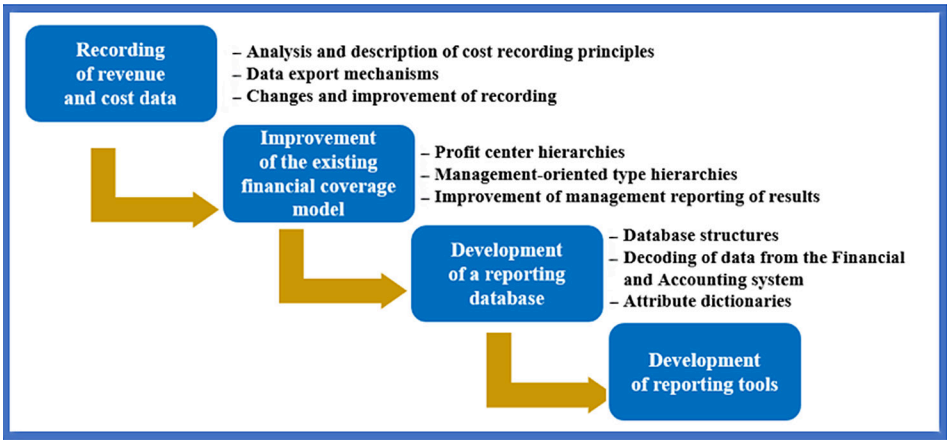

Figure 13.2. Step-by-step implementation model for financial management and reporting tools
Source: authors' own elaboration.

Thanks to the centralisation of data in the warehouse, it is possible to create comprehensive and accurate management reports that support the decision-making process within the enterprise. MS Excel tools are used to create these reports, enabling easy access to key management information for authorised users. This system ensures transparency, accuracy, and efficiency in data and report management within the enterprise, as illustrated in Figure 13.3.

The objective of the new approach to controlling within the company is to shift the focus from mere reporting to management analyses and initiatives that enhance the company's efficiency. Creating a flexible data source for analyses and automating processes in the preparation of management information provides a wide range of opportunities for the entire company. Primarily, it enables a reduction in the time spent on laborious data transcription from the financial-accounting system and complex operations in Excel files. Additionally, introducing flexibility in reporting and better attribute assignment in the database will significantly simplify reporting processes and enable better identification of costs and their origins. The use of detailed cost accounting will allow for the preparation of more accurate analyses and reports and prevent the duplication of information, as cost allocations will be continuously verified, thereby reducing errors. The relationships between reports will be transparent, and reports will be prepared according to the top-down principle, providing a comprehensive insight into the company's results. It is crucial to recognise that the role controlling plays

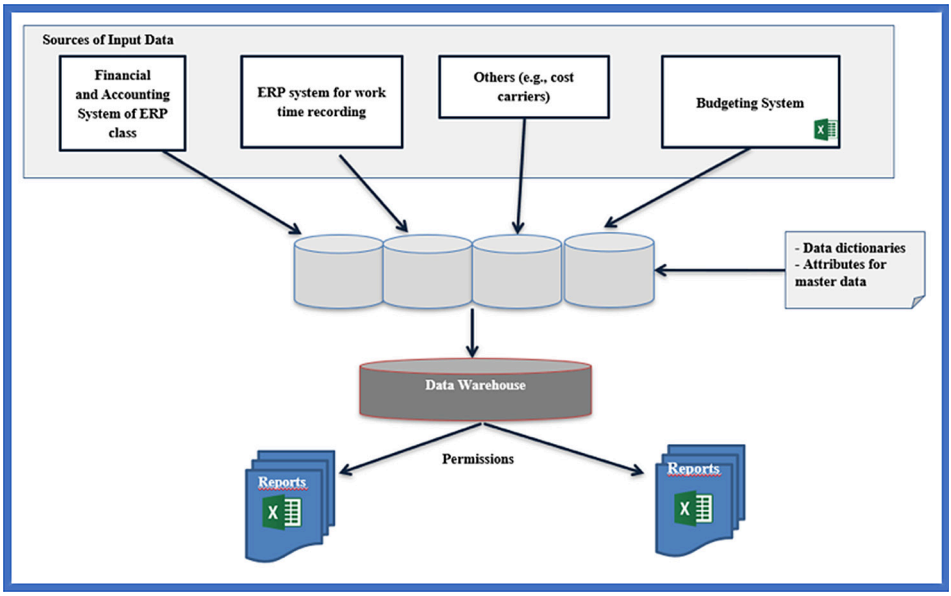

Figure 13.3. Report retrieval system based on the database
Source: authors' own elaboration.

when applied to the entire organisation is merely a tool for effective management, and it should grow and evolve at the pace at which the organisation expands and broadens its business scope. Therefore, in subsequent phases of implementing the management controlling project within the company, further work is planned in areas requiring support, particularly in enhancing both investment budgeting standards and cost accounting, as well as improving budgeting and reporting procedures. Further support is also needed in strengthening the role and expanding the tasks of controlling. The business benefits for the company following the implementation of these improvements pertain to a range of proposed changes. The tangible business benefits achieved from the project work include increased accuracy and transparency of financial data, more precise cost and resource management, improved reporting and budgeting processes, enhanced capability to make informed strategic decisions, and, most importantly, improved operational and financial efficiency across the entire enterprise.

13.4.5. Evaluation of Implementation Outcomes and Project Progress

The analysis of the presented implementation project leads to the conclusion that it ended in failure. Despite the execution of a significant portion of the planned activities and the achievement of partial results, the authors and

the project teams within the company agree that the idea of management controlling was not successfully implemented.

13.4.5.1. Achieved Results and Project Process

The project was carried out over 10 months. Four out of the eight planned stages of work aimed at improving controlling procedures were completed, according to the schedule presented in Figure 13.4.

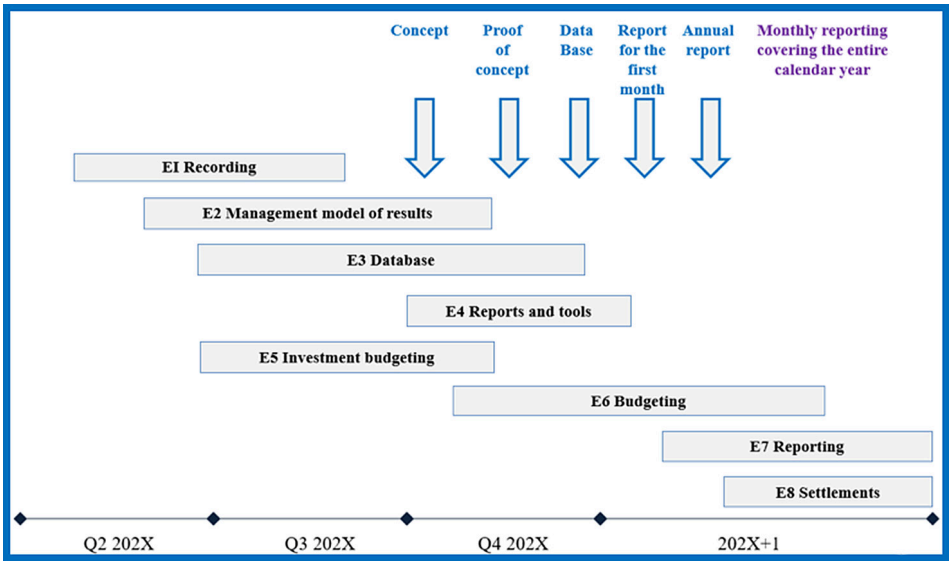

Figure 13.4. Project implementation schedule
Source: project materials.

Several changes were made to the cost accounting principles, including modifications to the chart of accounts to align it with management needs. Adjustments were implemented in the procedures for recording economic events, leading to the application of decrees to the target chart of accounts. A management presentation model of results was developed, reflecting the processes within the company, and the profit centre hierarchies and a functional cost accounting system were implemented. Management reporting frameworks were defined, covering all levels from top management to operational managers responsible for specific profit and cost centres, ensuring adherence to the controlling principle of reporting from the general to the specific. Subsequently, reporting procedures were revised. The previous practice of preparing management reports based on trial balances and cumbersome MS Excel spreadsheets was replaced with a database that integrated financial and business data. The created relational database

maintained source data and management reporting dictionaries. It provided dynamic access to the company's results in various formats, realising the concept of Business Intelligence analyses. Cyclical management reporting procedures were implemented, ensuring the company had consistent, repeatable analytical data on a monthly basis.

It is important to note that the work on developing the controlling system, although supported by external consultants, was carried out with intensive involvement from the company's management and the controlling structures within the enterprise, specifically the head of the controlling department and department employees. Initially, an approved development concept and proposed changes were developed. This concept was accepted by the company's management and served as the basis for a pilot system implementation (proof of concept) based on the company's actual financial and business data. The results of the pilot were evaluated, approved, and adopted for use in operational reporting.

In summary, the implementation procedure followed a model implementation process for controlling systems (Kołodko & Kowalski, 2020) and allowed for the achievement of key outcomes essential for the development of management controlling.

The evaluation of the project's implementation process is summarised in Table 13.2 below.

Table 13.2. Evaluation of project implementation process

Implementation process evaluation		
No.	Verification questions	Evaluation
1	How long was the project implemented?	9 months
2	Was the project budget defined and approved before the project started?	Yes
3	Was the project implementation schedule developed and approved before the project started?	Yes
4	Was a business process analysis conducted?	Yes
5	Was a cost structure and accounting principles analysis conducted?	Yes
6	Was a management needs analysis conducted for:	Yes
	– top management?	Yes
	– company's controlling/financial departments?	Yes
	– operational managers?	Yes
7	Were the project objectives defined?	Yes
8	Were the project objectives approved at the level of:	Yes
	– top management?	Yes
	– company's controlling/financial departments?	Yes
	– operational managers?	Yes
9	Were trainings on controlling conducted?	Yes
10	Was the progress of the project and partial results communicated?	Yes

Table 13.2 cnt'd

Implementation process evaluation		
No.	Verification questions	Evaluation
11	Was the concept for changes resulting from the project developed?	Yes
12	Was the concept of changes approved at the level of:	Yes
	– top management?	Yes
	– company's controlling/financial departments?	Yes
	– operational managers?	Yes
13	Was a pilot implementation of the planned changes conducted?	Yes
14	Was the availability of source data, including non-financial data, confirmed?	Yes
15	Did the project costs pose a limitation to its implementation?	No
16	Did the project timeline pose a limitation to its implementation?	No
17	Was the project executed according to the approved schedule?	No

Source: authors' own elaboration, based on document analysis and interviews.

13.4.5.2. Evaluation of Implementation Outcomes

The project implementation was halted. After five months of reporting using the defined data structures, the company's management decided to suspend the project and revert to the previously used formats and methods of reporting. As a result, the project did not contribute to the implementation of the concept of management controlling. There was no observed increase in controlling competencies, nor any significant impact on management or decision-making within the company. The tasks performed by controllers were largely limited to reporting and financial documentation. The data prepared by the controlling department was minimally utilised within the company, with the primary recipients being selected members of the company's management board. The tasks of the controllers were mostly confined to reporting for the Energy Regulatory Office or the supervisory board. The evaluation of the project's outcomes is presented in Table 13.3.

Table 13.3. Evaluation of management controlling implementation outcomes

Achievement of implementation outcomes		
No.	Verification questions	Evaluation
1	Were the formal objectives of the project achieved?	Yes
2	Were the management objectives of the project achieved?	To a limited extent
3	Are the project objectives still being utilised within the company?	To a limited extent
4	Were the project outcomes made available to operational managers?	No
5	Are the project outcomes being used in managerial decision-making at the level of:	
	– top management?	To a limited extent
	– company's controlling/financial departments?	To a limited extent
	– operational managers?	No

Table 13.3 cnt'd

Achievement of implementation outcomes		
No.	Verification questions	Evaluation
6	To what extent do post-project controlling tasks involve the preparation of financial and operational reports?	
	– preparation of financial and operational reports	Nearly 100%
	– commenting on achieved results	Marginally
	– optimisation of core business processes	0%
	– optimisation of auxiliary business processes	0%
	– evaluation of business solutions	0%
	– proposing business solutions	0%
	– formulating company or area strategies	0%
7	Is controlling responsible/accountable for:	
	– company performance?	No
	– increasing company value?	No
8	Did the project result in increased controlling competencies?	No
9	Does controlling participate in managerial decision-making post-project?	No
10	Does controlling provide managerial decisions for implementation post-project?	No
11	Do the project outcomes impact performance evaluation and compensation methods for:	
	– top management?	No
	– company's controlling/financial departments?	No
	– operational managers?	No
12	Do the project outcomes serve as:	
	– support for formulating company strategy?	No
	– a basis for monitoring the company's economic metrics?	To a limited extent
	– support for management in decision-making processes?	No
	– a basis for coordinating the achievement of the company's main and subsidiary goals?	No
	– a basis for preparing internal management reports and reporting?	No
	– a basis for capital planning?	No

Source: authors' own elaboration, based on document analysis and interviews.

13.4.6. Reasons for Abandoning the Controlling Project

In response to the growing need for effective cost management and business process optimisation, it is surprising that the project was not completed, despite its initial implementation yielding results that aligned with stakeholder expectations, who had approved the implementation plan. An analysis conducted after the project's interruption identified several factors that led to its cessation, despite the potential benefits it could have brought to the organisation.

1. The first and most significant factor identified was the *lack of interest from the top management in the project and its implementation*. The analysis

did not provide a clear answer as to why the project was abandoned. Despite the initial alignment of implementation outcomes with expectations and enthusiasm for the new challenge, the project was deemed unnecessary. This could be attributed to the misalignment of new solutions with the company's organisational culture and the habits of the management itself. The management preferred a return to the "old order," indicating a deep-rooted attachment to traditional reporting structures and resistance to change (Flamholtz, Das & Tsui, 1985; Malmi & Brown, 2008).

2. Another factor was the *dissatisfaction of the controlling department*, which had to adapt to the new model of preparing management reports and new tasks. The new tools, based on the data warehouse, led to changes in the team's division of responsibilities, which ultimately resulted in resistance from the staff towards implementing new tasks. The controlling department lost some of its previous functions, which was the main cause of the reluctance shown by the team of controllers (Hope & Fraser, 2003).

3. The next factor that hindered the project was the *lack of genuine interest from employees in the project's outcomes*, as well as the *existing organisational culture* characterised by resistance to change and limited awareness of the impact on the company's overall operations and functioning. This negatively affected the project's implementation, as noted by Kaplan and Norton (2004).

4. *The ownership structure of the company also played a significant role*. As a state-owned enterprise, the company was deeply embedded in a complex web of regulations, rules, and public governance, which fundamentally hindered and limited agile management. This element contributed to the project's failure, as there was a strong dependency on the supervisory board's decisions, which limited the management's autonomy (Anthony & Govindarajan, 2007).

5. Additionally, a *change in the composition of the management board – specifically, the departure of a board member who initiated the project* – resulted in a lack of further determination to carry it out (Flamholtz, Das & Tsui, 1985). Ultimately, without a champion within the management and the inappropriate positioning of controlling within the organisational structure, strong resistance to change, and a lack of support from top management led to the project being abandoned, despite the potential benefits it could have delivered (Mintzberg, 1980; Chandler, 1962).

6. Another critical factor was the *lack of integration of the project into the company's development strategy* (Dent & Goldberg, 1999). Without strategic support and a clear place in the company's plans, the project lacked sufficient priority and resources from the very beginning.

7. The *company's extensive hierarchical organisational structure and highly formalised management culture* also hindered the project's continuation. The size of the enterprise complicated the execution of complex processes, and some tasks were often developed far from the locations that truly needed support.

Based on the analysis of this case, it can be concluded that the abandonment of the management controlling implementation in the described enterprise resulted from a *combination of structural factors, legal and cultural conditions, and a complex and very extensive organisational structure* (Shleifer & Vishny, 1997).

13.4.7. Conclusions for Further Research

The case study of a municipal organisation, such as the district heating company, helped the authors uncover several significant issues in the implementation of a controlling project, which will be further analysed using quantitative methods. Among them, the following issues, listed in Table 13.4, are highlighted.

Table 13.4. Key issues in the implementation of a controlling project for quantitative analysis

Problem area	Problem description
Efficiency of controlling processes	Assessment of whether the changes introduced in the controlling system (e.g., new reporting tools) actually improve process efficiency
Impact of organisational changes on financial results	Changes in the organisational structure that affected the performance of the controlling department and the overall financial results of the company
Employee engagement and controlling efficiency	Lack of employee engagement in the new controlling system may reduce its effectiveness
Resistance to change and implementation effectiveness	Strong resistance from the controlling department and other employees may negatively impact the success of the implementation
Assessment of investment profitability in new controlling tools	Potential lack of profitability of investments in new reporting and management tools
Impact of ownership structure on controlling effectiveness	The relationship between the company's ownership structure (e.g. state-owned) and the effectiveness of controlling implementation
Relationship between organisational structure and the position of controlling	The impact of the position of the controlling department in the organisational structure (line vs. staff position) on its effectiveness
Analysis of satisfaction with the new controlling system	Employee dissatisfaction/satisfaction with the new system and its impact on performance
Change management and implementation effectiveness	The effectiveness of change management in the context of controlling implementation

Source: authors' own elaboration.

13.5. Conclusion

The effective integration of lessons learned from past experiences with business strategies and decision-making processes requires a systematic approach to gathering, analysing, implementing, and monitoring. This enables organisations to avoid repeating the same mistakes, better respond to changing market conditions, and continuously improve their operations. This, in turn, leads to better business outcomes, increased efficiency, and sustainable success. Drawing from the wealth of data and firsthand accounts presented in the case of the municipal enterprise, this chapter provides a comprehensive exploration of controlling practices in the municipal industry. The case studies cover a wide range of sectors, demonstrating the versatility and adaptability of controlling as a function (Eisenhardt, 1989).

The key features of these studies include in-depth analysis, contextual realism, and the use of multiple sources of evidence, ensuring a robust and comprehensive examination of each case. As a result, readers of this information, by analysing these case studies, will gain valuable insights into the practical applications of controlling, understanding how theory translates into practice. This exploration will shed light on the key success factors, the impact of contextual variables, and innovative solutions that have been applied to overcome challenges. Ultimately, this paper aims to enrich the understanding of controlling by providing both academics and practitioners with useful conclusions and a deeper understanding of its significance in contemporary practical business management.

References

Adler, R., Everett, A. M., & Waldron, M. (2000). Advanced Management Accounting Techniques in Manufacturing: Utilization, Benefits, and Barriers to Implementation. *Accounting Forum*, *24*(2), 131–150.

Anthony, R. N., & Govindarajan, V. (2007). *Management Control Systems*. McGraw-Hill Education.

Chandler, A. D. (1962). *Strategy and Structure: Chapters in the History of the American Industrial Enterprise*. MIT Press.

Dent, E. B., & Goldberg, S. G. (1999). Challenging "Resistance to Change". *The Journal of Applied Behavioral Science*, 35(1), 25–41. https://doi.org/ 10.1177/0021886399351003

Dugdale, D., & Jones, T. C. (1998). Throughput Accounting: Transforming Practices? *The British Accounting Review*, 30(3), 203–220.

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *Academy of Management Review*, *14*(4). https://doi.org/10.5465/amr.1989.4308385.

Flamholtz, E. G., Das, T. K., & Tsui, A. S. (1985). Toward an Integrative Framework of Organizational Control. *Accounting, Organizations and Society*, *10*(1), 35–50. https://doi.org/ 10.1016/0361-3682(85)90030-3

Flyvbjerg, B. (2006). Five Misunderstandings about Case-study Research. *Sage Journal*, April. https://doi.org/10.1177/1077800405284363

Gerring, J. (2004). What Is a Case Study and What Is It Good for? *American Political Science Review*, *98*(2). https://www.cambridge.org/core/journals/american-political-science-review/article/abs/what-is-a-case-study-and-what-is-it-good-for/C5B2D9930B94600EC0DAC93EB2361863#article

Hope, J., & Fraser, R. (2003). Beyond Budgeting: How Managers Can Break Free from the Annual Performance Trap. *Harvard Business School Press*.

Hopper, T., Koga, T., & Goto, J. (1999). Cost Accounting in Small and Medium Sized Japanese Companies: An Exploratory Study. *Accounting and Business Research*, *30*(1), 73–86.

Joshi, P. L. (2001). The International Diffusion of New Management Accounting Practices: The Case of India. *Journal of International Accounting, Auditing and Taxation*, *10*(1), 85–109.

Kaplan, R. S., & Norton, D. P. (2004). The Strategy Map: Guide to Aligning Intangible Assets. *Strategy* & *Leadership*, *32*(5), 10–17. https://doi.org/10.1108/10878570410699825

Klimek, D. (2017). Spółka komunalna – ekonomiczne i społeczne aspekty zarządzania. *Studia ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, 322.

Kołodko, A., & Kowalski, M. J. (2020). Praktyczne problemy zarządzania. Wybrane prace słuchaczy 40. i 41. Edycji PASB Executive MBA. Oficyna Wydawnicza Politechniki Wrocławskiej.

Kotter, J. P., Akhtar, V., & Gupta, G. (2022). *Zmiana w świecie VUCA 3.0 – Jak organizacje mogą osiągać sukcesy dzięki nowemu podejściu do zarządzania zmianą*. ICAN Institute.

Lucas, M., Prowle, M., & Lowth, G. (2013). *Management Accounting Practices of* (*UK*) *Small-Medium-Sized Enterprises* (*SMEs*). *Improving SME Performance through Management Accounting Education*, *9*(4).

Ma, L., Chen, X., Zhou, J., & Aldieri, L. (2022). Strategic Management Accounting in Small and Medium-sized Enterprises in Emerging Countries and Markets: A Case Study from China. *Economies*, *10*(4).

Malmi, T., & Brown, D. A. (2008). Management Control Systems as a Package – Opportunities, Challenges and Research Directions. *Management Accounting Research*, *19*(4), 287–300. https://doi.org/10.1016/j.mar.2008.09.003

McChlery, S., Godfrey, A. D., & Meechan, L. (2005). Barriers and Catalysts to Sound Financial Management Systems in Small Sized Enterprises. *Journal of Applied Accounting Research*, *7*(3), 1–26.

Mintzberg, H. (1980). Structure in 5's: A Synthesis of the Research on Organization Design. *Management Science*, *26*(3), 229–344. https://doi.org/10.1287/mnsc.26.3.322

Nandan, R. (2010). Management Accounting Needs of SMEs and the Role of Professional Accountants: A Renewed Research Agenda. *Journal of Applied Management Accounting Research*, *8*(1).

Nesterak, J. (2015). *Controlling zarządczy. Projektowanie i wdrażanie.* Oficyna A Wolters Kluwer business.

Shleifer, A., & Vishny, R. W. (1997). A Survey of Corporate Governance. *The Journal of Finance*, *52*(2), 737–783. https://doi.org/10.1111/j.1540-6261.1997.tb04820.x

Swianiewicz, P. (1998). Usługi komunalne w krajach europejskich. Współczesne przemiany w sposobie organizacji. *Samorząd Terytorialny*, 7–8.

Chapter 14

Polish-Serbian Research Collaboration within the European Union Framework Programmes: Overview and Perspectives*

Sylwia Krzyżek-Liburska

14.1. Introduction

14.1.1. General Remarks

This chapter delves into the scientific research partnership between Poland and Serbia within the European Union Framework Programmes. It aims to provide a detailed overview of their past accomplishments and future development prospects. The chapter analyses data from the CORDIS European Commission's database on the 7th framework programme, Horizon 2020 programme, and Horizon Europe, along with a review of scientific literature to identify key areas of cooperation in medicine, technology, social sciences, and humanities. Additionally, it discusses the current challenges and opportunities for furthering this collaboration, including funding, researcher mobility, and research infrastructure integration. The insights provided intend to encourage future scientific cooperation initiatives between Poland and Serbia within EU research programmes.

Serbia, with its rich history and strategic geographical location in Southeast Europe, has demonstrated significant progress in scientific research and development. The country's scientific landscape is marked by a robust network of research institutions, universities, and innovation centers that contribute to various fields of science and technology.

* The publication was co-financed from scholarship no BWS/BIL/2022/1/00298/U/00001 funded by the Polish National Agency for Academic Exchange and from the subsidy granted to the Krakow University of Economics – Project no 72/SD/2023/PRO.

14.1.2. Major Scientific Institutions in Serbia

University of Belgrade

The University of Belgrade, established in 1808, is a leading institution in higher education and research in Serbia. It plays a significant role in advancing research across various fields, including natural sciences, engineering, social sciences, and humanities. The Vinča Institute of Nuclear Sciences, affiliated with the university, focuses on nuclear physics, radiation protection, and material sciences through collaborations with international organisations such as CERN and the International Atomic Energy Agency (Univerzitet u Beogradu, 2024).

University of Novi Sad

Similarly, the University of Novi Sad, established in 1960, is a hub for scientific research with a strong focus on diverse research activities, including biotechnology, information technology, and environmental sciences. The BioSense Institute, affiliated with the university, is recognised for its pioneering research in bioengineering and precision agriculture (University of Novi Sad, 2024).

Serbian Academy of Sciences and Arts (SANU)

The Serbian Academy of Sciences and Arts (SANU), founded in 1841, plays a pivotal role in promoting scientific and artistic endeavours. It operates numerous research institutes covering a wide array of disciplines, and the Institute for Physics Belgrade, under SANU, focuses on theoretical and experimental physics, contributing significantly to international research projects and collaboration (Serbian Academy of Sciences and Arts, 2024).

Innovation Fund of Serbia

The Innovation Fund of Serbia, established in 2011, aims to support innovative projects and startups by providing financial resources and mentorship to foster technological development and commercialisation of research (Innovation Fund, 2024).

Science and Technology Park Belgrade

The Science and Technology Park (STP) Belgrade serves as an essential innovation center, fostering collaboration between academia and industry by providing infrastructure, business support, and networking opportunities for startups and established companies, particularly in the fields of ICT and biotechnology (Technopark Serbia, 2024).

Serbian scientific institutions proactively engage in international collaboration to enhance their research capabilities and integrate into the global scientific

community. Engagements with programmes such as Horizon 2020, Erasmus+, and bilateral agreements with countries like the United States, Germany, and China have significantly strengthened Serbia's research infrastructure and facilitated knowledge exchange (CORDIS, 2024).

14.2. The Framework Programmes for Research and Technological Development

14.2.1. General Remarks

The European Union Framework Programmes (FPs) have been instrumental in shaping the landscape of research and innovation in Europe. These programmes began in 1984 with FP1, designed to foster collaboration across member states and streamline research funding. FP1 focused on coordination and cooperation in various scientific fields with a modest budget, laying the groundwork for future expansions (Arnold, Clark & Muscio, 2005). FP2 (1987–1991) and FP3 (1990–1994) continued this trajectory, with FP3 introducing significant thematic programmes. By the time of FP4 (1994–1998), the budget had increased, and the programme began emphasising more strategic areas like information technology and biotechnology. FP5 (1998–2002) further consolidated this approach by prioritising societal challenges and sustainable development (Deighton & O'Donnell, 2014).

FP6 (2002–2006) was a pivotal moment, marking the formal introduction of the European Research Area (ERA) concept. This era focused on creating a unified research area to enhance scientific integration and collaboration across Europe (Olechnicka, Ploszaj & Celińska-Janowicz, 2020).

The Seventh Framework Programme (FP7), which ran from 2007 to 2013, was the largest and most ambitious up to that point, with a budget of €50 billion. FP7 aimed to boost Europe's competitiveness by supporting research excellence and technological innovation. It also introduced the European Research Council (ERC) to fund groundbreaking research projects driven by individual scientists (Arnold, Clark & Muscio, 2005; Deighton & O'Donnell, 2014).

Horizon 2020, the successor to FP7, spanned from 2014 to 2020 with an even larger budget of approximately €80 billion. This programme aimed to address societal challenges through three main pillars: "Excellent Science," "Industrial Leadership," and "Societal Challenges." Horizon 2020 emphasised open access to research results and greater involvement of small and medium-sized enterprises (SMEs) in research activities (Schögler & König, 2017).

Horizon Europe, the current framework programme running from 2021 to 2027, builds on the successes of its predecessors with a budget of €95 billion.

It continues to focus on global challenges and aims to enhance Europe's research and innovation capabilities. Horizon Europe introduces new elements such as the European Innovation Council (EIC) and missions aimed at tackling specific societal challenges like cancer and climate change (European Commission, 2024; Schögler & König, 2017).

The evolution of these programmes reflects the EU's commitment to advancing scientific research and technological development. Each iteration has expanded the scope, funding, and strategic objectives, aligning with broader EU policies and responding to emerging global challenges. The cumulative impact of these programmes has been significant, fostering collaboration, driving innovation, and maintaining Europe's competitive edge in the global research arena (Arnold, Clark & Muscio, 2005; Schögler & König, 2017).

14.2.2. History of Poland's Participation in EU Framework Programmes

Poland's involvement in EU Framework Programmes began before its accession to the European Union in 2004. Even as a candidate country, Poland participated in Framework Programmes 5 (FP5) and 6 (FP6), which allowed it to integrate gradually into the European research community and build collaborative networks. During FP5 and FP6, Polish researchers faced significant challenges, including limited experience in international research cooperation and lower levels of research infrastructure compared to other EU countries (Andrijauskiene, Dumciuviene & Stundziene, 2021; Kim & Yoo, 2019).

Poland's participation saw substantial improvement in the FP7, running from 2007 to 2013. With a budget of €50 billion, FP7 aimed to enhance Europe's competitiveness by supporting research excellence and technological innovation. Poland became increasingly successful in securing funding, reflecting the growing quality and competitiveness of its research institutions. Polish entities coordinated 62 projects and participated in over 1,000 projects, receiving around €570 million in funding (CORDIS, 2024).

Horizon 2020 (2014–2020), with a budget of €80 billion, marked a period of continued growth and deeper integration for Polish researchers. Poland's participation in Horizon 2020 was marked by significant successes in various thematic areas such as health, nanotechnology, and information and communication technologies (ICT). Polish institutions were involved in over 1,400 projects, with a total funding allocation exceeding €700 million. The increased participation and funding reflect Poland's enhanced research capabilities and strategic alignment with European research priorities (Directorate-General for Research and Innovation, 2024; ESFRI, 2017; Kim & Yoo, 2019). Table 14.1 presents numerical data regarding Poland's participation in the last three framework programmes.

Figure 14.1 presents data on the projects received by Polish institutions over the successive years of the framework programmes.

Table 14.1. Poland's participation in EU framework programmes

Specification	FP7 (2007–2013)	H2020 (2014–2020)	HORIZON (2021–2024)
Total funding obtained:	€441.1 million	€743.1 million	€451.6 million
Number of projects	1,734	1,961	937
Number of participations	2,243	2,872	1,291
Number of participants	397	898	490
Success rate	18.56%	13.67%	18.83%

Source: (CORDIS, 2024).

Horizon Europe, the current framework running from 2021 to 2027, with a budget of €95 billion, aims to further strengthen Europe's research and innovation landscape. Poland continues to play an active role, building on its successes in previous programmes. The focus areas for Poland include climate change, digital transformation, and health, aligning with national priorities and leveraging EU support to address these critical challenges. Polish researchers are expected to continue their active engagement, leveraging Horizon Europe to enhance their contributions to scientific and technological advancements (Andrijauskiene, Dumciuviene & Stundziene, 2021; Deighton & O'Donnell, 2014).

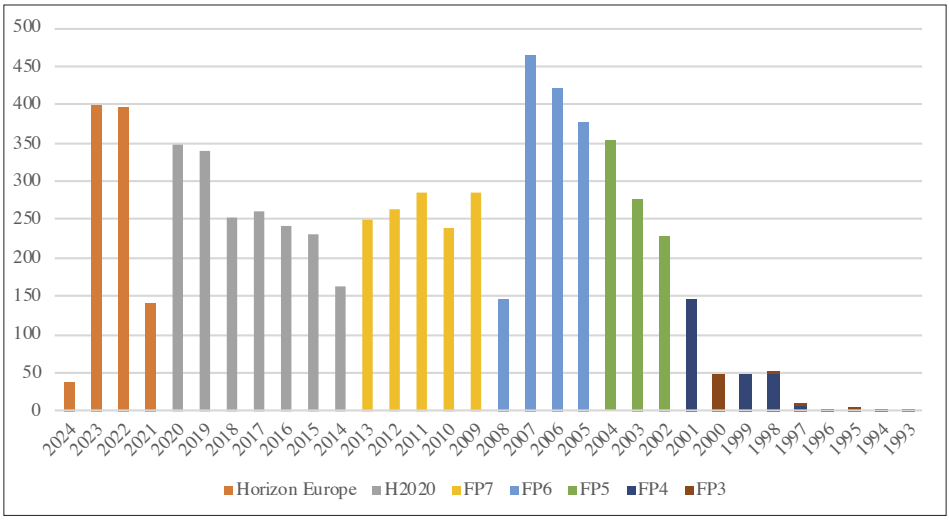

Figure 14.1. Poland in EU framework programmes
Source: (CORDIS, 2024).

14.3. Polish-Serbian Research Partnership under European Union Framework Programmes

14.3.1. History of Serbia's Participation in EU Framework Programmes

Serbia's engagement with EU Framework Programmes began with its signing of the Framework Agreement on participation in the EU programmes in 2005. This agreement laid the groundwork for Serbia's integration into European research and innovation initiatives, enabling Serbian researchers and institutions to partake in these collaborative efforts. During the initial years, Serbia's participation was primarily supported through the Instrument for Pre-accession Assistance (IPA) funds, which helped cover the costs associated with entry into these programmes (CORDIS, 2024).

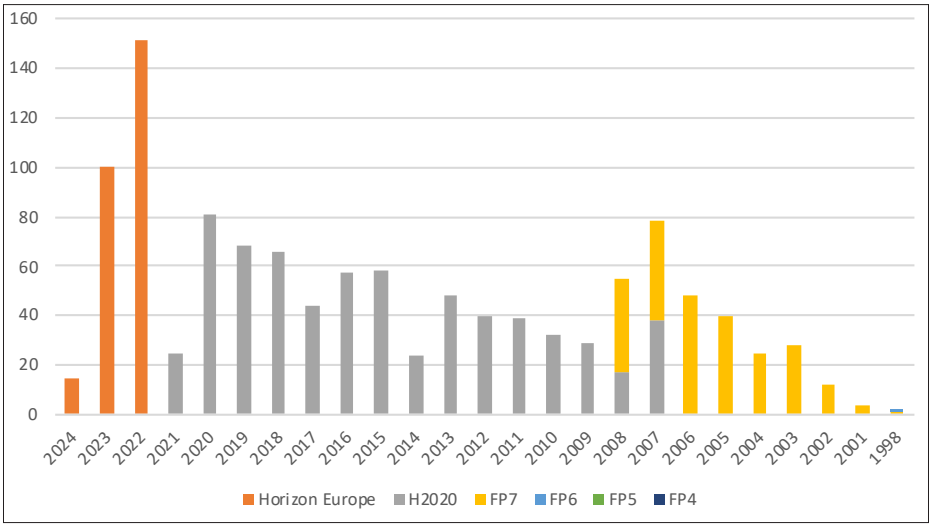

Figure 14.2. Serbia in EU framework programmes
Source: (CORDIS, 2024).

Serbia's substantial involvement began with the Seventh Framework Programme (FP7), running from 2007 to 2013. During this period, Serbia actively engaged in various research projects, leveraging the opportunities provided to enhance its national research capacities. FP7 facilitated the growth of Serbian research capabilities through participation in international consortia, improving the quality and competitiveness of Serbian research institutions (CORDIS, 2024; Deighton & O'Donnell, 2014).

Serbia's performance significantly improved with Horizon 2020 (2014–2020). The country became one of the most successful participants from the Western

Balkans, with its performance quadrupling since 2014. Key areas of success included Information and Communication Technologies (ICT), agricultural research, and energy. This period marked a notable increase in the number of projects involving Serbian entities and the amount of funding secured. Serbia's active participation helped bolster its research infrastructure and foster international collaborations, contributing to the nation's scientific and technological advancements (Andrijauskiene, Dumciuviene, & Stundziene, 2021; CORDIS, 2024). Table 14.2 presents numerical data regarding Serbia's participation in the last three framework programmes. Figure 14.2 presents data on the projects received by Serbian institutions over the successive years of the framework programmes.

Table 14.2. Serbia's participation in EU framework programmes

Specification	FP7 (2007–2013)	H2020 (2014–2020)	HORIZON (2021–2024)
Total funding obtained	€64.12 million	€135 million	€92.21 million
Number of projects	238	419	266
Number of participations	326	603	355
Number of participants	105	222	164
Success rate	15.35%	12.54%	18.92%

Source: (CORDIS, 2024).

In January 2021, Serbia became a fully associated member of Horizon Europe, the EU's current framework programme. This association marks a significant milestone, providing Serbian researchers with extensive opportunities to engage in cutting-edge research and innovation projects across Europe (Deighton & O'Donnell, 2014).

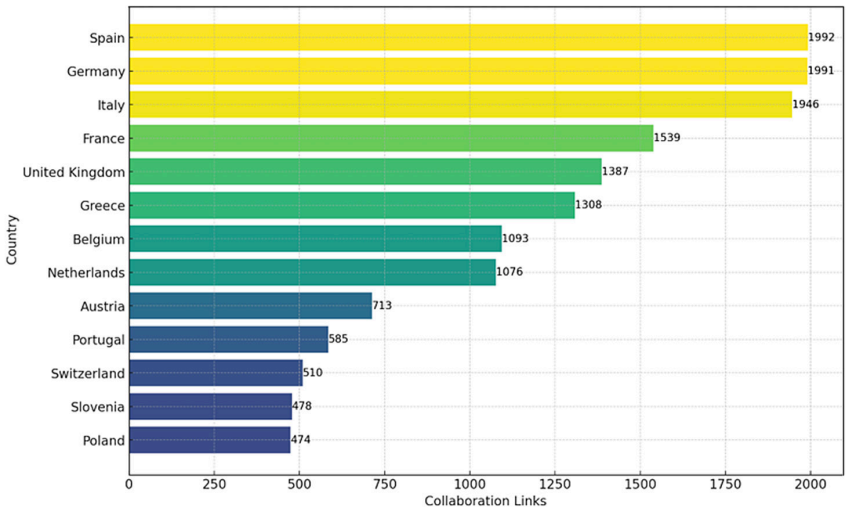

Figure 14.3. Serbia's collaboration with other countries within the EU framework programmes
Source: (CORDIS, 2024).

14.3.2. Benefits of Polish-Serbian Collaboration in EU Framework Programmes

The collaboration between Poland and Serbia within EU framework programmes, such as Horizon 2020 and Horizon Europe, offers several benefits that enhance research, innovation, and economic growth in both countries. Joint projects between Poland and Serbia have led to significant advancements in various scientific fields. By pooling resources and expertise, both countries can undertake more comprehensive and cutting-edge research. This is particularly evident in areas like biotechnology and information technology, where collaboration has resulted in innovative solutions and products (Paszek, 2010; Shrum, Genuth & Chompalov, 2007).

Collaborative efforts between Polish and Serbian institutions have stimulated economic growth by fostering innovation and providing access to broader markets and funding opportunities. These partnerships enable the commercialisation of new technologies and ideas, enhancing the competitiveness of businesses in both countries. Participation in EU framework programmes has been instrumental in building research capacities in Serbia, benefiting from Poland's more advanced research infrastructure and EU experience. This collaboration facilitates the transfer of knowledge, skills, and technologies, strengthening Serbia's research landscape and contributing to its integration into the European Research Area (ERA) (Olechnicka, Ploszaj & Celińska-Janowicz, 2020; Paszek, 2010).

EU programmes promote cultural and academic exchange, fostering mutual understanding and cooperation. Collaborative projects often involve mobility schemes for researchers and students, enabling them to work and study in diverse environments, thus broadening their perspectives and enhancing their professional skills (vom Brocke & Lippe, 2015; Coskeran *et al.*, 2021). Through this collaboration, Poland and Serbia can jointly influence EU research policies, ensuring that their specific needs and priorities are addressed. Strategic partnerships developed within these programmes can lead to long-term collaboration beyond individual projects, creating a sustainable network of innovation and research excellence.

Table 14.3. Overview of joint Polish-Serbian projects within framework programmes

Framework programme	FP6 (2002–2006)	FP7 (2007–2013)	H2020 (2014–2020)	HORIZON (2021–2024)
Number of joint projects	2	61	119	60

Source: (CORDIS, 2024).

Overall, Polish-Serbian collaboration within EU framework programmes significantly contributes to scientific progress, economic development, and

stronger bilateral relations, illustrating the value of international cooperation in addressing global challenges (Paszek, 2010). Table 14.3 presents data on joint Polish-Serbian projects received over the successive years of the framework programmes.

14.3.3. Challenges of Polish-Serbian Cooperation within the Framework Programmes

Polish-Serbian cooperation within the framework programmes of the European Union offers many benefits but also presents several challenges. These challenges can arise from structural differences as well as varying political and economic contexts of the two countries (Andrijauskiene, Dumciuviene & Stundziene, 2021; Bansal *et al.*, 2019; Freshwater, Sherwood & Drury, 2006; Paszek, 2010; Wilkins *et al.*, 2020; Zikos, Diomidous & Mantas, 2012).

One of the main challenges is the difference in the institutional structures of Poland and Serbia. Poland, as a member of the European Union, has already gone through the process of adapting its research infrastructure to EU standards, while Serbia is still in the preparatory stages for full membership. This difference can cause difficulties in coordinating joint research projects, especially in terms of fund management and compliance with complex administrative procedures (Dusdal & Powell, 2021; Stamm, Figureroa & Scordato, 2012; Zikos, Diomidous & Mantas, 2012).

Although the framework programmes offer significant financial support, they often require substantial own contributions from participating institutions. For Serbian organisations, which may have limited financial resources, meeting these requirements can be challenging. Additionally, economic disparities between the two countries can affect the ability to effectively co-finance projects and sustain long-term research endeavours (Zikos, Diomidous & Mantas, 2012).

The complexity of administrative and bureaucratic procedures within the EU framework programmes is another challenge. The process of applying for funds, as well as subsequent reporting and auditing of projects, requires advanced knowledge and experience, which can be a problem especially for less experienced Serbian institutions. Poland, with its longer experience in utilising these funds, can provide some support to Serbian partners, but procedural differences remain a significant obstacle (Atkinson, Gilleland & Barrett, 2007; Dusdal & Powell, 2021).

Political and economic differences between Poland and Serbia also impact cooperation. Serbia, on its path to EU membership, faces pressure to meet numerous political and economic criteria, which can influence the stability of cooperation and the implementation of joint projects. Moreover, political instability in

the Western Balkans region can create additional risks for long-term research initiatives. International cooperation always brings challenges related to cultural and language differences. Although both Poland and Serbia have rich academic traditions, cultural differences can affect communication and project management styles. Language barriers can hinder effective information exchange and daily cooperation, requiring additional efforts in translation and cultural adaptation (Dusdal & Powell, 2021; Freshwater, Sherwood & Drury, 2006; Zikos, Diomidous & Mantas, 2012).

14.3.4. Perspectives of Polish-Serbian Cooperation within the Framework Programmes

Polish-Serbian cooperation within the European Union's framework programmes, such as Horizon 2020 and Horizon Europe, offers numerous opportunities for scientific and technological advancement for both countries. Joint efforts in research and innovation can significantly contribute to achieving ambitious goals in various fields, from hard sciences to sustainable development and digital technologies (Paszek, 2010; Wilkins *et al.*, 2020).

One of the primary goals of the EU framework programmes is to enhance Europe's position on the global research and innovation stage. For Poland and Serbia, collaboration within these programmes is an opportunity to strengthen their research institutions and improve the quality of conducted research. Long-term involvement in international research consortia can elevate the prestige of both countries in the scientific community.

Polish-Serbian cooperation within Horizon Europe enables the development and implementation of innovative technologies applicable across different economic sectors. Projects in the fields of information and communication technology (ICT), biotechnology, and green technologies are particularly promising. Joint efforts can accelerate technology transfer and the commercialisation of research results, which are crucial for enhancing the competitiveness of both economies (CORDIS, 2024).

One of the priorities of the EU framework programmes is sustainable development, including environmental protection and climate change mitigation. Polish-Serbian cooperation can contribute to projects aimed at developing renewable energy sources, energy efficiency, and natural resource management. These initiatives align with the goals of the European Green Deal and can provide tangible environmental and economic benefits for both countries.

The framework programmes promote the mobility of researchers and students, facilitating the exchange of knowledge and experience between research institutions in Poland and Serbia. Increased academic mobility allows young

scientists to gain international experience, which is essential for their professional development and for fostering innovative research projects. Programmes like Erasmus+ also play a significant role in this process (Andrijauskiene, Dumciuviene & Stundziene, 2021; Luukkonen, 2000; Mantegazzini & Lepori, 2019; Olechnicka, Ploszaj & Celińska-Janowicz, 2020).

Collaboration within the framework programmes is also crucial from the perspective of Serbia's integration with the European Union. Participation in these programmes allows Serbia to align more closely with EU standards and practices, potentially accelerating its accession process. Poland, with its experience in this area, can act as a mentor, supporting Serbia in implementing necessary reforms and adapting to EU standards (Andrijauskiene, Dumciuviene & Stundziene, 2021; Piro *et al.*, 2020).

14.4. Conclusion

Scientific institutions in Serbia are pivotal to the country's development and integration into the global scientific community. Prominent establishments such as the University of Belgrade, University of Novi Sad, and the Serbian Academy of Sciences and Arts (SANU), along with innovation hubs like the Innovation Fund of Serbia and Science and Technology Park Belgrade, lead in scientific research and technological advancement. Sustained investment in research and international collaboration positions Serbia to make significant contributions to science and technology in the future.

The EU Framework Programmes have been instrumental in fostering a robust research and innovation environment in Europe. From the modest beginnings of FP1 to the comprehensive and ambitious Horizon Europe, these programmes have evolved to address the growing and changing needs of the scientific community and society. Their strategic focus on cooperation, societal challenges, and innovation has established Europe as a global leader in research and technological development.

Poland's participation in the EU Framework Programmes demonstrates a trajectory of growth and increasing integration into the European research area. From initial challenges in FP5 and FP6 to notable successes in FP7, Horizon 2020, and Horizon Europe, Poland has effectively used these programmes to enhance its research infrastructure, build international collaborations, and contribute to global challenges. The consistent support and strategic alignment with EU priorities highlight the importance of these programmes in promoting scientific excellence and innovation in Poland.

Similarly, Serbia's engagement with the EU Framework Programmes illustrates its growing integration and success in European research and innovation. From its early involvement in FP7 to its full association with Horizon Europe, Serbia has significantly bolstered its research capabilities and international partnerships. This progress highlights the critical role of these programmes in advancing scientific excellence and addressing global challenges through cooperative efforts.

Collaboration between Poland and Serbia within the EU's Framework Programmes has yielded substantial benefits, including strengthened research capacities, enhanced innovation and technological development, economic growth, human capital development, and long-term institutional partnerships. These benefits underscore the significance of continued cooperation and the potential for future joint successes. By leveraging their combined strengths, Poland and Serbia can continue to make significant contributions to the global scientific and technological landscape.

Despite numerous challenges, Polish-Serbian cooperation within the EU Framework Programmes holds the potential for significant benefits for both countries. Recognising and addressing challenges such as structural differences, financial issues, bureaucratic barriers, political and economic tensions, and cultural and language differences are crucial for the success of these joint research initiatives.

The prospects for Polish-Serbian cooperation within the European Union's Framework Programmes are promising. Joint efforts in research and innovation can lead to advancements in various areas, from technological development to sustainable growth and European integration. However, effective management of challenges and full utilisation of available opportunities are essential to ensure that this cooperation yields maximum benefits for both countries.

References

Andrijauskiene, M., Dumciuviene, D., & Stundziene, A. (2021). EU Framework Programmes: Positive and Negative Effects on Member States' Innovation Performance. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, *16*(3), 471–502. https://doi.org/10.24136/EQ.2021.017

Arnold, E., Clark, J., & Muscio, A. (2005). What the Evaluation Record Tells Us about European Union Framework Programme Performance. *Science and Public Policy*, *32*(5), 385–397. https://doi.org/10.3152/147154305781779335

Atkinson, T. N., Gilleland, D. S., & Barrett, T. G. (2007). The Dimensions of Influence on Research Administrator Behavior: Toward a Theoretical Model of Research Administration as a Public Service Profession. *The Journal of Research Administration*, *38*(1).

Bansal, S., Mahendiratta, S., Kumar, S., Sarma, P., Prakash, A., & Medhi, B. (2019). Collaborative Research in Modern Era: Need and Challenges. *Indian Journal of Pharmacology*, *51*(3), 137–139. https://doi.org/10.4103/ijp.IJP_394_19

Celebrating 40 Years of Innovation: The Journey of EU Framework Programmes. (2024). Retrieved from: https://data.europa.eu/en/news-events/news/celebrating-40-years-innovation-journey-eu-framework-programmes in May, 2024.

CORDIS. (2024, May). European Commission. https://cordis.europa.eu/

Coskeran, H., Lawn, J., Mwamakamba, S., & Wilson, G. (2021). *Effective Project Support for International Research Collaboration: Key Considerations*. BRECciA.

Deighton, B., & O'Donnell, P. (2014). Europe's Framework Programmes – a Key Element of Research Policy in Europe. *Horizon. The EU Research & Innovation Magazine*, 16 December. Retrieved from: https://projects.research-and-innovation.ec.europa.eu/en/horizon-magazine/europes-framework-programmes-key-element-research-policy-europe in May, 2024.

Directorate-General for Research and Innovation. (2024). *Interim Evaluation of Horizon 2020*. Retrieved from: https://research-and-innovation.ec.europa.eu/knowledge-publications-tools-and-data/publications/all-publications/interim-evaluation-horizon-2020-book-version_en in May, 2024.

Dusdal, J., & Powell, J. J. W. (2021). Benefits, Motivations, and Challenges of International Collaborative Research: A Sociology of Science Case Study. *Science and Public Policy*, *48*(2), 235–245. https://doi.org/10.1093/scipol/scab010

ESFRI. (2017). Horizon 2020 Work Programme 2018–2020 – Part 4. European Research Infrastructures (including e-Infrastructures) – Pre-Publication). Retrieved from: https://www.esfri.eu/project-landmarks-news/horizon-2020-work-programme-2018-2020-%E2%80%93-part-4-european-research in May, 2024.

European Commission. (2024, May). Horizon Europe. https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en

Freshwater, D., Sherwood, G., & Drury, V. (2006). International Research Collaboration: Issues, Benefits and Challenges of the Global Network. *Journal of Research in Nursing*, *11*(4), 295–303. https://doi.org/10.1177/1744987106066304

Innovation Fund. (2024, May). https://www.inovacionifond.rs/en/fond/about-fund

Kim, J., & Yoo, J. (2019). Science and Technology Policy Research in the EU: From Framework Programme to HORIZON 2020. *Social Sciences*, *8*(5). https://doi.org/10.3390/SOCSCI8050153

Luukkonen, T. (2000). Additionality of EU Framework Programmes. *Research Policy*, *29*(6), 711–724. https://doi.org/10.1016/S0048-7333(99)00041-4

Mantegazzini, B. A., & Lepori, B. (2019). *HEIs Participations and Mobility in the European Framework Programmes*.

Olechnicka, A., Ploszaj, A., & Celińska-Janowicz, D. (2020). *The Geography of Scientific Collaboration*. Routledge. https://www.researchgate.net/publication/328492549

Paszek, Z. (Ed.). (2010). *Poland-Serbia – the Challenges of the Scientific Cooperation*. Krakow Society for Education: AFM Publishing House.

Piro, F. N., Børing, P., Scordato, L., & Aksnes, D. W. (2020). University Characteristics and Probabilities for Funding of Proposals in the European Framework Programs. *Science and Public Policy*, *47*(4), 581–593. https://doi.org/10.1093/scipol/scaa037

Schögler, R., & König, T. (2017). Thematic Research Funding in the European Union: What Is Expected from Social Scientific Knowledge-making? *Serendipities. Journal for the Sociology and History of the Social Sciences*, *2*(1), 107–130. https://doi.org/10.25364/11.2:2017.1.7

Serbian Academy of Sciences and Arts. (2024, May). https://www.sanu.ac.rs/en/

Shrum, W., Genuth, J., & Chompalov, I. (2007). *Structures of Scientific Collaboration*. MIT Press.

Stamm, A., Figueroa, A., & Scordato, L. (2012). Addressing Global Challenges through Collaboration in Science, Technology and Innovation. In: *Meeting Global Challenges through Better Governance: International Co-operation in Science, Technology and Innovation* (pp. 25–42). OECD Publishing. https://doi.org/10.1787/9789264178700-5-EN

Technopark Serbia. (2024, May). https://ntpark.rs/en/

University of Novi Sad. (2024, May). https://www.uns.ac.rs/en/

Univerzitet u Beogradu. (2024, May). https://www.bg.ac.rs/home/

vom Brocke, J., & Lippe, S. (2015). Managing Collaborative Research Projects: A Synthesis of Project Management Literature and Directives for Future Research. *International Journal of Project Management*, *33*(5), 1022–1039. https://doi.org/10.1016/j.ijproman.2015.02.001

Wilkins, K. W., Rosa-Marín, A., Weisend, R. E., & Kurosawa, E. (2020). Benefits, Challenges, and Opportunities for International Research Collaborations: Perspectives from the Limnology and Oceanography Research Exchange. *Limnology and Oceanography Bulletin*, *29*(4), 125–130. https://doi.org/10.1002/lob.10412

Zikos, D., Diomidous, M., & Mantas, J. (2012). Challenges in the Successful Research Management of a Collaborative EU Project. *Acta Informatica Medica*, *20*(1), 15–17. https://doi.org/10.5455/aim.2012.20.15-17

Chapter 15

Between Management, Art and Finance – Premises for Undertaking Research on Theatre in Management Science

Julia Karcz-Ryndak, Marek Jabłoński, Ivana Bestvina Bukvić

15.1. Introduction

One of the main aims of researchers is to explain conditions and events on the assumption that they have causes. The same objective applies to research in management sciences, including research in the cultural sector from a management perspective, or in theatres themselves, which are the focus of this study. With this in mind, the authors of this study set out to discuss causality in theatre research from a management perspective. The reason for reflecting on the issue of causality in this field is the sheer lack of research on the cultural sector in both Polish and foreign literature (Hausmann, 2013; Mandel & Lambert, 2020, p. 15), and in particular research on the functioning of an artistic institution such as a theatre (Dragicevic-Sesic, 2018, p. 15).

The question of causality in theatre studies from a management perspective raises a number of dilemmas. On the one hand, they relate to more general problems in management science and, on the other hand, they arise from the context provided by the cultural sector itself and, even further, from the conditions specific to the arts, with a particular focus on the performing arts. Theatre as an organisation is a dichotomous environment in which the director undertakes the task of balancing artistic and business objectives (Amans, Mazars-Chapelon & Villesèque-Dubus, 2015), while facing a scarcity of funding (Bestvina Bukvić, Mihaljević & Tokić, 2016) and a series of contradictions coming from both the internal and external environment. Under these conditions, classical management methods can be unreliable and the picture blurred, for example, by abstract terminology that cannot be captured in a clear definitional framework.

15.2. The Concept of Causality

When considering the problem of causality[1] in the social sciences, including management, it is worth starting by quoting Aristotle, for whom the concept is closely related to the notion of process, understood as a transformation in which a potential state is transformed into an actual state. Such an understanding of process makes it possible to distinguish causality: formal (relating to the form of the process); material (relating to the physical properties of the process); causal (involving the relationship between the transformer and the object of transformation); and intentional (understood as the result of the process) (Losse, 2011, p. 3).

The later understanding of causality was clearly influenced by David Hume's conception. He proposed an empiricism based on scepticism in which impressions and ideas are responsible for cognition (Hume, 1977, p. 77), which contrasted with the previous understanding of causality in terms of objective relations (Gałganek, 2016, p. 39). By impressions, Hume meant sensory experiences through which humans can experience reality. Ideas, on the other hand, arise as a consequence of impressions through reasoning. Consequently, Hume concludes that causal reasoning is a characteristic of the human mind and that the relationship between cause and effect is the only relationship that occurs between facts (Gorazda, 2016, p. 235). Causality is conditioned by (Hume, 2005, p. 233):

- spatial tangency – understood as the absence between a cause and an effect of another event,
- temporal precedence – the cause must occur earlier than the effect in a temporal sequence,
- necessary connection – this is based on the universality and generality of the relationship that occurs between events.

The conditions outlined give rise to the expectation that in every other case the same cause will produce the same effect, and vice versa – if the cause does not occur, the effect will not occur either.

Hume's concept was developed by Adam Smith, who saw causation not as a relationship between facts arising from human impressions, but as an element of reality. Smith proposes the concept of a system whose purpose is to link movements and effects that occur in reality, e.g. in nature. Examples of such systems for Smith are language and scientific theories. Smith sees a difference between

[1] There are many texts in the literature on the subject of causality, but it is not the aim of the authors to provide a complete overview, they only intend to outline the material necessary for understanding further considerations. Therefore, in this paper, the authors have limited their consideration to selected concepts.

a causal mechanism that is a product of the human mind, which can be treated as a closed system, and a mechanical causality that is realised in reality and determined by a given system (Gorazda, 2016, p. 237). This leads to the conclusion that to speak of the existence of a causal relationship it is not enough to identify a potential cause and effect, but it is necessary to explain the mechanism behind its occurrence or non-occurrence.

Causality was also considered by John Stuart Mill (1882), who drew attention to the complexity of processes and the consequent possibility of implicit causation due to the unauthorised separation of some of them or the existence of parallel processes. Mill also points to the reduced importance of the requirement to link cause and effect due to the possibility of counter-effects in complex processes. As a result, despite the occurrence of a cause, the expected effect may not occur. In addition, Mill formulates the notion of unconditionality, which states that a relationship is causal if events occurring in an invariant sequence do not depend on other events in that sequence that are not revealed.

Pearl and Woodward also made important contributions to the contemporary understanding of causality. The authors indicated that their understanding of causality is based on the concepts of mechanism, intervention and probability distribution (Gorazda, 2016, p. 241). The former suggests that causal analyses should focus on the empirical evidence of cause and effect and the inferences (with an indication of the inferences) that flow from the identified causal relationships (Pearl, 2009). According to Pearl, causality is equivalent to the coding of a given behavioural variable as a result of the occurrence of an intervention, understood in terms of a "surgical operation on the mechanism," which is in the nature of a functional relationship presented in the form of equations or a graph (Pearl, 2009). Woodward (2002), on the other hand, treats a causal mechanism as a representation that characterises a set of elements (either ordered or structured). This representation is characterised by immutability (the state is described by a generalisation that is not susceptible to the influence of intervention) and modularity (the possibility of independent modifications in terms of the generalisation). Consequently, the representation allows observations to be made on the performance of the mechanism under manipulation (involving changes to individual elements or their values).

A consequence of understanding the nature of causality has been the development of two explanatory models in the social sciences: idiographic and nomothetic (Niemczyk, 2020, p. 22; Piórkowska, 2014, p. 98). The idiographic approach is appropriate for unique phenomena that are susceptible to alternative explanations. This approach is dominated by qualitative methods (Matejun, 2023, p. 77) and simulation experiments (Sagan, 2016, p. 31). The nomothetic approach is

appropriate for general explanations based on an isolated set of causal factors, making it inevitably probabilistic (Babbie, 2004, p. 88). The research methods appropriate to this approach are primarily observations and experiments – thought and randomised (Sagan, 2016, p. 30).

There are three criteria for identifying causal relationships in studies based on a nomothetic approach (Lazarsfeld, 1959):

- the empirical association or correlation of variables,
- the variable which is the cause must occur earlier than the variable which it influences,
- the effect of a cause cannot be explained by the effect of another variable.

In contrast, the idiographic model requires two criteria to establish a causal relationship (Babbie, 2004, s. 92):

- the plausibility of the explanation,
- rejecting alternative explanations.

When conducting causal research, it is important to bear in mind that it does not involve a subjective evaluation of observed facts, but aims to objectively demonstrate the state of knowledge about a given phenomenon in relation to an appropriate theoretical model (Sagan, 2015, p. 278). It is therefore important to adopt an appropriate mode of explanation, and to be cautious about drawing overly hasty conclusions about the causal relationships that are the subject of the research being conducted.

15.3. Problems with Causality in Theatre Studies from a Management Perspective

In the literature, theatre is relatively rare as an object of research within the management sciences. This area of research requires in-depth exploration, and this in turn requires particular care in the research process leading to the establishment of causal relationships.

Problems with establishing causal relationships already arise at the level of placing management science among other disciplines. This can be seen, among other things, in the classifications of scientific fields and disciplines used in Poland. Before the recent change, management science was a discipline distinguished within the field of economics, but also within the field of humanities, where the humanistic management stream is developed (Kociatkiewicz & Kostera, 2013; Melé, 2016). With the introduction of the current classification, management science has been placed in the field of social sciences within the discipline of

management and quality sciences[2]. Such a situation, in addition to the pragmatic efforts of the legislator, is an expression of the interdisciplinarity of management sciences, where it is common to draw on the achievements of economics, sociology, psychology and many other scientific disciplines, but also to enter the field. As a result, it is difficult to define clear boundaries for management as a discipline (Sudoł, 2016, p. 4). Relating this situation to considerations of causality, the dangers should be distinguished at the terminological level. The influence of other disciplines leads to the possibility of errors due to chance, ignorance or, even worse, the deliberate action of the researcher, involving the wrong choice of definitions used to prove causal relationships that would not otherwise be provable. For this reason, it seems very important to embed the research carried out in the perspectives developed by the discipline. It is possible, for example, that research carried out within arts management will give a completely different view of the same issue from research carried out from the perspective of humanistic management or public management. In turn, the adoption of a particular perspective should lead to a clearer choice of research methods.

Similar caution must be exercised when attempting to transfer research from other management sub-disciplines. This problem has been evident, e.g. in public management (Kożuch, 2005). The same is true of the cultural sector and the theatre industry itself. An example is leadership research, where the implementation of concepts developed in business practice has not been applied because the people interviewed did not want to take on leadership roles (Goodwin, 2020). This example illustrates the need to consider context when looking for causal relationships.

In addressing the issue of causality, it is also important to bear in mind the specific conditions of the theatre. One can point to the need to take into account blurred concepts and phenomena that create problems at the stages of defining, operationalising and measuring variables. Examples include:

- the specific aesthetic contract that theatres have with their audiences (Anderton & Pick, 1996, p. 16),
- the autonomy of arts (Bourdieu, 1996; Kleppe, 2018; Rius-Ulldemolins & Klein, 2021; Røyseng, Paoli & Wennes, 2020), which, together with artistic identity (Elstad & Jansson, 2020), translates into an artistic-economic split (Barańska, 2006, p. 66),
- the phenomenon of idolisation and romanticisation of leaders (Nisbett & Walmsley, 2016, p. 9),

[2] Right next to economics, where it used to be distinguished as a discipline.

- the importance of passion for art (Richardson, Jogulu & Rentschler, 2017) and the impact of artistic awareness on the products created (Clements & Frankcom, 2020, p. 382),
- creativity as a key resource in the creation of products with unique aesthetic qualities (Montanari, Della Torre & Sikora, 2021, p. 2).

These examples take on even greater significance when one considers the complexity of the research field of theatre. The space in which theatre operates is itself a difficult creature to define. The very need to consider the functioning of theatres from the level of concepts of culture and art leads to complications. This is already evident at the level of the definition of theatre. As with management, it can be argued that there are as many definitions as there are people making them (Kuc, 2015, p. 115). The national literature lacks a coherent definition of theatre that is useful in the context of management science. For this reason, researchers refer to definitions with roots in, for example, theatre studies and theatre history (Raszewski, 1990, p. 235; Suzuki, 2012, pp. 22–23), pedagogy (Miller, 1968, p. 132) or economics (Trzeciak, 2011, p. 32). The same applies to the definitions of the concepts of culture and art mentioned above. Because such problems arise at such a fundamental level of theatre analysis, a researcher working in this area may jump to conclusions about the mechanisms governing the phenomenon. By under-defining concepts at the stage of collecting empirical material, important information may be omitted that could alter the results of the study. Babbie (2004, p. 99) uses the term "silent evidence" in this context. Consequently, such a situation can negatively affect the spatial tangency condition identified by Hume and, in the case of non-disclosure of a variable crucial to the explanation of a phenomenon, lead to the formulation of a spurious causal mechanism in the sense of Pearl and Woodword. An example of this can be seen in the paradox of the divergence of artistic and business objectives of theatres (Amans, Mazars-Chapelon & Villesèque-Dubus, 2015; Eikhof & Haunschild, 2007). Artistic goals may be set at an unrealistic level in relation to the resources required, leading to inefficiencies in the financial resources available. On the other hand, too strong an attachment to the pursuit of business objectives can lead to the phenomenon of the commercialisation of the arts and ultimately to a lowering of artistic standards. At the same time, theatre organisers demand a high artistic level, focusing mainly on controlling the financial aspects of the theatre (Alcouffe *et al.*, 2019). In this example, the problem of defining the concept of artistic level (on the part of both the theatre and the organiser) and the terms describing the artistic goals themselves, as well as the intangible nature of the produced good, such as a theatre performance, can be seen. This, in turn, leads to problems with the measurability of their implementation and the efficiency of the use of the financial

resources allocated for these purposes (Velli & Sirakoulis, 2018). Despite attempts by researchers to include the artistic level in the evaluation of theatres' activities, effective methods have not yet been developed. This is confirmed by interviews with theatre directors conducted for the research project "Managing contemporary theatre in an environment of progressive technological change with an international perspective," conducted at the Krakow University of Economics (Table 15.1).

Table 15.1. The views of theatre directors on the evaluation of the measurement of theatre performance

Director	Opinion
Director 10	"I can already see new ideas on how to use the advances of modern technology to measure the performance of theatres. Instead of focusing on the art (...) we will have to fit into algorithms designed for the whole industry, whereas each theatre is a completely separate entity."
Director 11	"I am afraid of the new indicators created by technology, especially those concerning the artistic level. For so many years, no objective way has been found to measure the artistic level of performances, and this time it will not work either."

Source: (Karcz-Ryndak, 2024).

Basing research on ways of measuring theatre productivity and efficiency mainly on financial indicators and inadequate ways of measuring the artistic level (which do not take into account the individual specificities of a given entity) can lead to the above-mentioned omission of relevant information and to the occurrence of the "silent evidence" paradox, e.g. regarding the influence of stakeholders in shaping the theatre's repertoire. It can also lead to the formulation of a false causal mechanism in the sense of Pearl and Woodword (e.g. treating the theatre as a public entity when its activities are hybrid (neither public nor private) due to the strong influence of political factors that are difficult to identify in practice without in-depth field research) (Rubio Aróstegui & Rius-Ulldemolins, 2022).

In the study of theatre from a management perspective, it is also easy to fail to meet the necessary condition that Hume pointed out. Indeed, in the theatre industry there are unique and unusual situations that can lead to a failure to meet this condition. An example would be the author's way of establishing a relationship with the audience and managing the audience during a performance in light and shadow theatres, which are rare in the national and international theatre scene. A researcher whose experience is limited to this type of theatre may mistakenly generalise his observations to other forms of theatre. Meanwhile, it may turn out that his observation is not very common and universal in nature, and therefore impossible to apply when formulating general laws for the theatre industry as a whole.

On the other hand, in situations where the researcher is dealing with a common and universal phenomenon, e.g. in the general sense of the production cycle of theatre performances, it is necessary to take into account the complexity of these processes at each stage. This is because it is possible for the parallel or counteracting processes mentioned by Mill to occur, the occurrence of which can lead to the absence of the expected effect despite the occurrence of the cause. An example would be the influence of the theatre organiser on the production process and the significant modification of his assumptions.

In addressing the issue of causality in theatre research from a management perspective, it is also important to discuss the explanatory models used. A review of the literature suggests that an idiographic approach using qualitative research methods is dominant. Nomothetic models or the integration of these approaches are less common. This is undoubtedly related to the under-exploration of this field of research and the difficulty of obtaining empirical material[3]. Researchers are forced to develop their own conceptual constructs or, as mentioned above, to use the conceptual apparatus of other disciplines, e.g. theatre studies, cultural studies, etc. Using an idiographic approach, they try to reduce the possibility of overlooking important determinants of a phenomenon.

The nomothetic approach is mainly applied at the level of cultural policy, which covers theatres, audience research, funding of public theatres and the impact of theatres on socio-economic development. In most cases, research on theatres is not exclusively limited to theatres, so it is possible that the specificities of theatres are not taken into account. In addition, research tends to focus on public theatres and, to a much lesser extent, foundation, association and private theatres. The same applies to amateur theatres. It is therefore reasonable to suspect that causal relationships resulting from research on the representation of public theatres may not be justified for theatres with other forms of ownership.

In theatre research, it is legitimate to mix approaches and to use nomothetic and idiographic models simultaneously or sequentially. This has been demonstrated in a small number of national studies (Karna, 2006). Relationships identified in nomothetic research can be deepened in idiographic research and, conversely, causal relationships identified in idiographic research can be subjected to attempts at generalisation.

---

[3] There are known cases in the literature of problems of accessibility to the units surveyed – this is related, among other things, to the social and political nature of the theatre managers' functions, which, combined with the evaluative nature of the research, results in a reluctance to participate in the research. In addition, statistical studies or databases of theatre institutions are hardly available on the national market. In turn, the authors of the available studies themselves point to their limitations and recommend caution in their use (Theatre in Poland, 2013, p. 30).

15.4. Conclusion

As can be seen from the argument presented, causal research in theatre institutions is fraught with many problems. This is mainly due to the infancy of the field from a management perspective, the complexity of the processes and the specificity of theatre institutions. The use of conceptual tools from other research – even from the cultural sector or other scientific disciplines – requires special consideration.

To sum up the discussion of selected causality issues in theatre research from a management perspective, it should be noted that the development of this line of research gives the discipline the opportunity to develop research procedures and conceptual apparatus that meet the needs of theatres. Furthermore, from the perspective of nomothetic research, it seems very important to implement a systematic approach in theatre statistics that also includes private and non-profit sector entities.

References

Alcouffe, S., Amans, P., Assassi, I., & Oriot, F. (2019). French Budget Act (LOLF) Indicators as Seen through the Lens of the National Drama Centres: A Case Study. *International Journal of Arts Management*, *21*(3), 57–72.

Amans, P., Mazars-Chapelon, A., & Villesèque-Dubus, F. (2015). Budgeting in Institutional Complexity: The Case of Performing Arts Organizations. *Management Accounting Research*, *27*, 47–66. https://doi.org/10.1016/j.mar.2015.03.001

Anderton, M., & Pick, J. (1996). *Arts Administration*. E & FN Spon Press.

Babbie, E. (2004). *Badania społeczne w praktyce.* Wydawnictwo Naukowe PWN.

Barańska, K. (2006). Zarządzanie dla wartości, czyli o odpowiedzialności menedżerów kultury słów kilka. *Zarządzanie w Kulturze*, *7*, 63–69.

Bestvina Bukvić, I., Mihaljević, M., & Tokić, I. (2016). Financing the Theatre: The Role of Management and the State. *Ekonomski Vjesnik*, *29*(1), 125–142.

Bourdieu, P. (1996). *The Rules of Art: Genesis and Structure of the Literary Field*. Polity Press.

Clements, R., & Frankcom, S. (2020). In Conversation on the Royal Exchange Theatre, Manchester. *New Theatre Quarterly*, *36*(4), 369–383. https://doi.org/10.1017/S0266464X20000615

Dragicevic-Sesic, M. (2018). Questioning Theatre Management: Southern (Contextual) Perspective. In: L. Bonet, H. Schargorodsky, *Theatre Management: Models and Strategies for Cultural Venues* (pp. 14–27). Elverum: Kunnskapsverket.

Eikhof, D. R., & Haunschild, A. (2007). For Art's Sake! Artistic and Economic Logics in Creative Production. *Journal of Organizational Behavior*, *28*(5), 523–538. https://doi.org/10.1002/job.462

Elstad, B., & Jansson, D. (2020). From Artist to Manager – Working Conditions, Career Satisfaction, and Professional Identity among Graduated Arts Management Students.

Journal of Arts Management, Law, and Society, *50*(3), 184–198. https://doi.org/10.1080/10632921.2020.1746717

Gałganek, A. (2016). Przyczynowość w nauce o stosunkach międzynarodowych. *Przegląd Politologiczny*, 4, 37–58. https://doi.org/10.14746/pp.2016.21.4.4

Goodwin, K. (2020). Leadership Reluctance in the Australian Arts and Cultural Sector. *The Journal of Arts Management, Law & Society*, *50*(3), 169–183. https://doi.org/10.1080/10632921.2020.1739184

Gorazda, M. (2016). O niektórych problemach z przyczynowością w ekonomii. *Studia Metodologiczne*, *36*, 233–260.

Hausmann, A. (2013). Empirische Forschung zum Personalmanagement in Kulturbetrieben: Ein Literaturüberblick. *German Journal of Human Resource Management*, *27*(2), 103–124. https://doi.org/ 10.1688/1862-0000_ZfP_2013_02_Hausmann

Hume, D. (1977). *Badania dotyczące rozumu ludzkiego*. PWN.

Hume, D. (2005). *Traktat o naturze ludzkiej*. PWN.

Karcz-Ryndak, J. (2024). The Impact of Ongoing Technological Changes on Key Aspects of Theatre Management – the Director's Perspective. *Scientific Papers of Silesian University of Technology – Organization and Management Series*, 197.

Karna, W. (2006). *Organizacyjne i ekonomiczne zmiany w zarządzaniu publicznymi instytucjami kultury* (PhD thesis, Jagiellonian University). Repozytorium Uniwersytetu Jagiellońskiego.

Kleppe, B. (2018). Managing Autonomy: Analyzing Arts Management and Artistic Autonomy through the Theory of Justification. *The Journal of Arts Management Law and Society*, *48*(3), 191–205. https://doi.org/10.1080/10632921.2017.1377661

Kociatkiewicz, J., & Kostera, M. (2013). Zarządzanie humanistyczne: zarys programu. *Problemy Zarządzania*, *11*(4), 9–19.

Kożuch, B. (2005). Zarządzanie publiczne jako dyscyplina naukowa. *Zarządzanie Publiczne*, 1.

Kuc, B. R. (2015). *Aksjologia organizacji i zarządzania. Na krawędzi kryzysu wartości*. Ementon.

Lazarsfeld, P. (1959). Foreword. In: H. Hyman (Ed.), *Survey Design and Analysis*. Free Press.

Losse, J. (Ed.). (2011). *Theories of Causality. From Antiquity to the Present*. Transaction Publishers.

Mandel, B. R., & Lambert, P. D. (2020). International Arts/Cultural Management: Global Perspectives on Strategies, Competencies, and Education. *The Journal of Arts Management, Law, and Society*, *50*(4–5), 249–266. https://doi.org//10.1080/10632921.2020.1771495

Matejun, M. (2023). Metody, techniki i narzędzia gromadzenia danych w badaniach mieszanych. In: Ł. Sułkowski, R. Lenart-Gansiniec (Eds), *Metody badań mieszanych w naukach o zarządzaniu* (pp. 75–116). Wydawnictwo Naukowe Akademii WSB.

Melé, D. (2016). Understanding Humanistic Management. *Humanistic Management Journal*, 1, 33–55. https://doi.org/10.1007/s41463-016-0011-5

Mill, J. S. (1882). *A System of Logic, Ratiocinative and Inductive*. Harper & Brothers Publishers.

Miller, R. (1968). Z rozważań nad edukacją teatralną. *Kwartalnik Pedagogiczny*, 3.

Montanari, F., Della Torre, E., & Sikora, D. M. (2021). Bohemian Like You? Managing People and Organizations in Creative Industries. *European Management Review*, *18*(4). https://doi.org/10.1111/emre.12471

Niemczyk, J. (2020). Metodologia nauk o zarządzaniu. In: W. Czakon (Ed.), *Podstawy metodologii badań w naukach o zarządzaniu*. Wydawnictwo Nieoczywiste.

Nisbett, M., & Walmsley, B. (2016). The Romanticization of Charismatic Leadership in the Arts. *The Journal of Arts Management, Law, and Society*, *46*(1), 2–12. https://doi.org/10.1080/10632921.2015.1131218

Pearl, J. (2009). *Causality. Models. Reasoning and Inference.* Cambridge University Press.

Piórkowska, K. (2014). Metodologiczne i metodyczne aspekty prowadzenia badań naukowych w świetle badań nad lojalnością menedżerską – kontekst triangulacji teoretycznej i metodycznej. *Organizacja i Kierowanie*, 2(162), 95–111.

Raszewski, Z. (1990). *Krótka historia teatru polskiego*. Państwowy Instytut Wydawniczy.

Richardson, J., Jogulu, U., & Rentschler, R. (2017). Passion or People? Social Capital and Career Sustainability in Arts Management. *Personnel Review*, *46*(8), 1835–1851. https://doi.org/10.1108/PR-02-2016-0023

Rius-Ulldemolins, J., & Klein, R. (2021). From Artistic Direction to Cultural Management: Governance and Management of Barcelona's Artistic Institutions in the Twenty-first Century. *International Journal of Public Sector Management*, *34*(1), 33–49. https://doi.org/10.1108/IJPSM-03-2020-0082

Røyseng, S., Paoli, D. D., & Wennes, G. (2020). As You Like It! How Performance Measurement Affects Professional Autonomy in the Norwegian Public Theater Sector. *Journal of Arts Management, Law, and Society*, *50*(1), 52–66. https://doi.org/10.1080/10632921.2019.1693458

Rubio Aróstegui, J. A., & Rius-Ulldemolins, J. (2022). Opera Houses: From Democratization to Plutocratic Control? Lyric Production, Economic Management, and Elite Control in the Main Spanish Opera Houses during the Period of Austerity (2009–2018). *International Journal of Cultural Policy*, *28*(3), 359–378. https://doi.org/10.1080/10286632.2021.1949004

Sagan, A. (2015). Przyczynowość w badaniach marketingowych. *Zeszyty Naukowe Uniwersytetu Szczecińskiego. Problemy Zarządzania, Finansów i Marketingu*, 38, 273–283.

Sagan, A. (2016). *Metodologia badań ekonomicznych*. Wydawnictwo Uniwersytetu Ekonomicznego w Krakowie.

Sudoł, S. (2016). Zarządzanie jako dyscyplina naukowa. *Przegląd Organizacji*, 4, 4–11.

Suzuki, T. (2012). *Czym jest teatr?* Instytut im. Jerzego Grotowskiego.

Theatre in Poland. (2013). *Documentation on the Season 2011/2012*. Instytut Teatralny im. Zbigniewa Raszewskiego.

Trzeciak, H. (2011). *Ekonomika teatru*. Instytut Teatralny im. Zbigniewa Raszewskiego.

Velli, V., & Sirakoulis, K. (2018). Performance Measurement in Non-profit Theatre Organizations: The Case of Greek Municipal and Regional Theatres. *International Journal of Arts Management*, *21*(1), 49–60.

Woodward, J. (2002). What Is a Mechanism? A Counterfactual Account. *Philosophy of Science*, 69(S3), 366–377.

Chapter 16

Verification of the Effectiveness of Discriminant Analysis as a Tool for Enterprise Bankruptcy Prediction

Kacper Stabryła-Tatko

16.1. Introduction

The bankruptcy of enterprises is inextricably linked to the functioning of a free market economy. Entrepreneurs, when starting a business, bear full responsibility for it, invest resources, and take on risks associated with running it (Krajewska, 2018, pp. 175–208). The main purpose of private enterprises is to remain in the market, which involves ensuring lasting profitability and maintaining financial liquidity. At the same time, entrepreneurs are exposed to various types of risks. Many enterprises, due to poor management methods and incorrect decision-making, fall into financial trouble (Kuciński, 2013, p. 104).

In a market economy, the phenomenon of corporate bankruptcies intensifies during periods of an economic downturn. It is precisely these periods of weak economic conditions, combined with a lack of skills necessary for running the business that led to insolvency and consequently bankruptcy.

It should be emphasised that insolvency is not a sudden phenomenon; its symptoms appear much earlier (Kuciński, 2013, p. 103). For this reason, worldwide, as early as the beginning of the 20th century, attempts were made to create a system for early warning indicators of financial problems within enterprises. According to the classification made by C. Zavgren, two groups of models can be distinguished: models based on discriminant analysis and models based on conditional probability calculations (Zavgren, 1983, pp. 1–33). The discriminant method is a statistical method that classifies objects based on several explanatory variables (Kasjaniuk, 2006, p. 95).

The observations presented above motivated the author to develop a study of corporate bankruptcy and discriminant models. Furthermore, in the empirical part, the effectiveness of selected models was examined.

The aim of the study is to present theoretical issues relating to discriminant analysis and verify the effectiveness of selected models as tools for forecasting corporate bankruptcy. To achieve the main goal of the study, partial goals were defined:

- analysis of issues concerning corporate bankruptcy,
- presentation of the concepts of discriminant analysis and characteristics of selected models developed by Polish authors,
- application of selected discriminant models in the analysis of enterprise bankruptcy in Poland.

The author posed research questions as to whether the use of models developed by Polish economists to predict bankruptcy of enterprises in Poland is effective, and which of the popular discriminant models demonstrates the best bankruptcy prediction.

For research purposes, a hypothesis was formulated which assumed that discriminant models developed by Polish economists are highly effective in predicting corporate bankruptcy, and their effectiveness depends on the industry in which they operate. To verify the hypothesis, data from financial statements of the enterprises analysed was used covering the period of four years before declaring bankruptcy until the year of its declaration.

Section two discusses the issue of business bankruptcy. Section three presents a characteristics and operation method of discriminant models: INE PAN 6, INE PAN 7, D. Hadasik's, B. Prusak's P_1 and P_2, and the Poznań model. Section four looks at research methodology and the results of a comparative analysis of six national models. This was done using reports from twelve enterprises, which were divided according to their main activities into three groups: trading, service, and manufacturing enterprises. The study involved comparing the results of the discriminant analysis and assessing the effectiveness of national discriminant models. The final section presents comparison of the research results and provides conclusions.

16.2. Bankruptcy of Enterprises in Poland

A significant drawback of the market economy is the uncertainty of achieving success in the market. It is the market that determines who will sustain and who will go bankrupt (Tokarski, 2012, p. 169). Article 11, paragraph 1 of the Polish Bankruptcy Law (Ustawa z dnia 28 lutego 2003 r. Prawo upadłościowe) defines bankruptcy as the state when an enterprise loses the ability to meet its due financial obligations. Article 11, paragraph 2 considers such a loss of ability to perform obligations when the delay in fulfilling financial obligations exceeds three months. Article 11, paragraph 5 indicates that an entity is also insolvent

when its financial obligations exceed the value of the company's assets, and this state persists for more than 24 months.

Observing the number of bankruptcies in Poland, it can be concluded that fewer and fewer enterprises are going bankrupt each year. A significant decline in bankruptcies has been noticeable since 2020, and this is due to the confluence of several factors. The factors influencing these data include, among others, the significant simplification of restructuring procedures, the anti-crisis shields implemented by the Polish government during the COVID-19 pandemic, as well as numerous technical issues relating to the National Register of Debtors (Krajowy Rejestr Zadłużonych) introduced at the end of 2021. The data concerning bankruptcies and restructurings are presented in Figure 16.1.

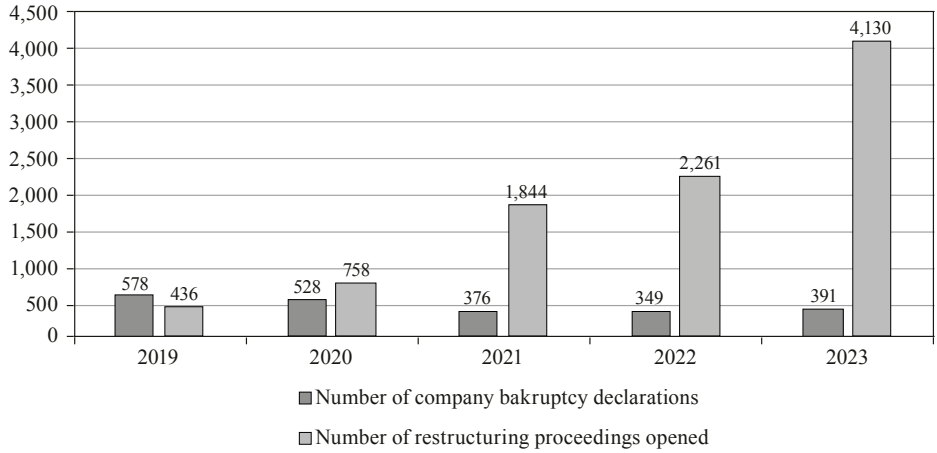

Figure 16.1. Bankruptcies and restructurings of enterprises in Poland from 2019 to 2023
Source: own elaboration based on data provided by Statistics Poland (2024a).

Statistical data provided by Statistics Poland (Główny Urząd Statystyczny) clearly indicate that by 2019, restructuring proceedings accounted for just under 40% of all insolvency proceedings. This situation changed significantly in 2020 with the outbreak of the COVID-19 pandemic. Due to the state of epidemic in Poland, the Act on Special Solutions Related to the Prevention, Counteracting and Combating COVID-19, Other Infectious Diseases and Crisis Situations Caused by Them (Ustawa z dnia 2 marca 2020 r. o szczególnych rozwiązaniach związanych z zapobieganiem, przeciwdziałaniem i zwalczaniem COVID-19, innych chorób zakaźnych oraz wywołanych nimi sytuacji kryzysowych) was introduced. One of the significant changes introduced at that time was a temporary suspension of the obligation to file for bankruptcy within a specified period. Therefore, if the state of insolvency arose during the state of epidemic threat or

the state of epidemic declared due to COVID-19, it is assumed that it occurred due to the epidemic.

In practice, the legislator allowed enterprises to operate while insolvent without the need to report this condition. This legal state translated into a low number of bankruptcy declarations and an increased number of opened restructuring proceedings.

16.3. Discriminant Analysis

16.3.1. The Essence of Discriminant Models

Discriminant analysis is a statistical method used for classifying data obtained from financial statements according to a specific criterion and organising them based on a few dependent variables at the same time. The dependent variable is a qualitative variable (Tłuczak, 2013, p. 424). To conduct an examination, a linear discriminant function, in practice the function referred to *Z*-score, is used. Discriminant function is the sum of the coefficients that characterise a company's economic (X) and their corresponding weights, i.e. discriminant coefficients (W). The function formula is given:

$$Z = W_0 + W_1 \times X_1 + W_2 \times X_2 + \ldots + W_n \times X_n, \tag{1}$$

where:

Z – the value of the discriminant function,

W_0 – constant value,

W – the weights of chosen variable,

X – dependent variables.

By calculating the *Z*-score value, it is possible, by comparing it to the so-called critical values are determined by the condition of the company. The critical values are determined by the author of a specific model. Most creators of discriminant models divide companies into two main categories: "bankrupt" meaning companies at risk of bankruptcy, and "healthy," where the value of the function exceeds a certain critical value. Selected authors define the so-called "grey zone." This is a range of values that does not allow an assessment of bankruptcy risk (Altman & Hotchkiss, 2005, p. 246).

Due to the increasing popularity of discriminant models worldwide, economists in Poland also made numerous attempts to make domestic discriminant models. Because of the formation of a free market economy, it was in the first half of the 1990s that the development of domestic models took place. It is considered extremely important by economists because only these models can deal with individual factors in each country such as accounting regulations or the structure of financial statements (Kovacova & Kliestikova, 2017, p. 2).

In Poland, several models have been published over the years that achieved relatively good results. The most popular and the oldest of these is the model developed by Professor Elżbieta Mączyńska in 1994 (Lichota, 2018, p. 404). Other well-known domestic models include D. Hadasik's model (1998), the Poznań model (2004), the INE PAN model (2004), and the B. Prusak's model (2005) (Pitera, 2018, p. 346). All these models were developed in Poland (Korol & Prusak, 2022, p. 89).

16.3.2. INE PAN Models

The model was developed by a team supervised by E. Mączyńska. The team worked on developing models at the Institute of Economic Sciences of the Polish Academy of Sciences. Apart from E. Mączyńska, the team included M. Zawadzki, M. Żuchowski, and J. Janek. They utilised the INE PAN database which contained financial statements from over 500 enterprises in Poland.

The researchers examined financial data of 80 companies listed on the Warsaw Stock Exchange. Half of the companies were at risk of bankruptcy (the selection of companies for this category was based on various criteria such as negative revenue dynamics, assets, or equity), while the others were classified as "healthy" (Korol & Prusak, 2022, p. 86). Ultimately, the authors reduced the number of indicators from 45 to 12, based on which they developed a total of 7 discriminant models. As the work progressed and the models were continuously updated, their effectiveness gradually increased. Consequently, contemporary economic literature most frequently highlights the last two models (Model 6 INE PAN and Model 7 INE PAN) as the most effective in discriminant analysis of enterprises. Model 6 is expressed by the formula:

$$Z_{6\ INE\ PAN} = 9.478 \times X_1 + 3.613 \times X_2 + 3.246 \times X_3 + 0.455 \times X_4 + 0.802 \times X_5 - 2.478, \quad (2)$$

where:

$Z_{6\ INE\ PAN}$ – the value of the discriminant function in Model 6 INE PAN,
X_1 – operating profit/total assets,
X_2 – equity/total assets,
X_3 – (net profit + depreciation)/liabilities and provisions for liabilities,
X_4 – current assets/short-term liabilities,
X_5 – sales revenue/total assets.

The values of the $Z_{6\ INE\ PAN}$ function were as follows:

$Z_{6\ INE\ PAN} < 0$ – no bankruptcy risk detected,
$Z_{6\ INE\ PAN} = 0$ – critical value of the model,
$Z_{6\ INE\ PAN} > 0$ – bankruptcy risk detected.

With the update of the INE PAN model, the authors eliminated as many as eight indicators they considered the least effective (Mączyńska & Zawadzki, 2006, p. 228). This decision was driven by the fact that the number of variables did not correlate with the quality of discriminant models. The result of the authors' efforts was to leave only four indicators in Model 7 INE PAN, which they considered the most effective as a predictive tool. The weights of the indicators and the constant term were changed. Model 7 is expressed by the formula:

$$Z_{7\ INE\ PAN} = 9.498 \times X_1 + 3.566 \times X_2 + 2.903 \times X_3 + 0.452 \times X_4 - 1.498, \quad (3)$$

where:

$Z_{7\ INE\ PAN}$ – the value of the discriminant function in Model 7 INE PAN,
X_1 – operating profit/total assets,
X_2 – equity/total assets,
X_3 – (net profit + depreciation)/liabilities and provisions for liabilities,
X_4 – current assets/short-term liabilities.

The values of the $Z_{7\ INE\ PAN}$ function were as follows:

$Z_{7\ INE\ PAN} < 0$ – no bankruptcy risk detected,
$Z_{7\ INE\ PAN} = 0$ – critical value of the model,
$Z_{7\ INE\ PAN} > 0$ – bankruptcy risk detected.

As noted by the model's authors, E. Mączyńska and M. Zawadzki, and emphasised by J. Kitowski, "classification errors of selected models may indicate a subjective nature (not resulting solely from the financial condition) of corporate bankruptcies" (Kitowski, 2015, p. 96). It was also pointed out that the models have universal features, mainly because they enable bankruptcy risk prediction up to four years in advance (Mączyńska & Zawadzki, 2006, p. 226).

16.3.3. D. Hadasik's Model

Another model was developed by by D. Hadasik based on financial data of companies that filed for bankruptcy in courts in Poznań, Piła, and Leszno between 1991 and 1997. The selection of companies was based on financial statements attached to the bankruptcy petition. For each bankrupt company, the economist matched a similar company characterised by a good financial situation (Hadasik, 1998, p. 133).

The author created as many as nine versions of the model, differing in the indicators used and their weights. Due to the highest level of result accuracy, D. Hadasik's Model IV is said to be the best (Hadasik, 1998, p. 136). This is also because this model considers as many as six variables characterising the financial

situation of a company, including the most important ones: financial liquidity, debt, and operational efficiency. The Hadasik's model was expressed by formula:

$$Z_{HA\,IV} = 0.365425 \times X_1 - 0.765526 \times X_2 - 2.40435 \times X_3 + 1.59079 \times X_4 + \\ + 0.00230258 \times X_5 - 0.0127826 \times X_6, \quad (4)$$

where:

$Z_{HA\,IV}$ – value of the discriminant function in D. Hadasik's Model IV,
X_1 – current assets/short-term liabilities,
X_2 – (current assets – inventory)/short-term liabilities,
X_3 – liabilities and reserves for liabilities/total assets,
X_4 – working capital/total assets,
X_5 – short-term receivables × 365/total assets,
X_6 – inventory × 365/sales revenue.

The values of the Z_{H4} are as follows:

$Z_{HA\,IV} < -0.374345$ – no risk of bankruptcy,
$Z_{HA\,IV} = -0.374345$ – critical value of the model,
$Z_{HA\,IV} > -0.374345$ – risk of bankruptcy is identified.

16.3.4. B. Prusak's Models

Another well-known discriminant model was developed in Poland in 2004 by B. Prusak. Based on 27 financial indicators, the author developed two models: P_1 – with a one-year lead time and P_2 – with a two-year lead time relative to the date of the company's bankruptcy declaration (Korol & Prusak, 2022, p. 119).

The author set up two samples – a training sample and a test (validation) sample. Forty manufacturing companies at risk of bankruptcy were selected and matched with the same number of healthy companies. In the validation sample, the number of bankrupt companies and healthy companies was 39 respectively (Korol & Prusak, 2022, p. 121).

Unlike other Polish models, B. Prusak's models have a so-called "grey zone," but its ranges are different for both models. The P_1 Model was expressed by formula:

$$Z_{P1} = 6.524 \times X_1 + 0.148 \times X_2 + 0.406 \times X_3 + 2.176 \times X_4 - 1.568, \quad (5)$$

where:

Z_{P1} – the value of the discriminant function in Model P_1,
X_1 – operating profit/total assets,
X_2 – operating costs/short-term liabilities,
X_3 – current assets/short-term liabilities,
X_4 – operating profit/sales revenue.

The threshold values for the Z_{P1} were as follows:

$Z_{P1} \leq -0.13$ – real threat of bankruptcy for the company,

$-0.13 < Z_{P1} \leq 0.65$ – "grey zone,"

$Z_{P1} > 0.65$ – the company is not threatened with bankruptcy.

The P_2 model was expressed by formula:

$$Z_{P2} = 1.438 \times X_1 + 0.188 \times X_2 + 5.023 \times X_3 - 1.871, \quad (6)$$

where:

Z_{P2} – the value of the discriminant function in Model P_2,

X_1 – (net profit + depreciation)/total liabilities,

X_2 – operating costs/short-term liabilities,

X_3 – sales profit/total assets.

The threshold values for the Z_{P2} were as follows:

$Z_{P2} \leq -0.7$ – real threat of bankruptcy for the company,

$-0.7 < Z_{P2} \leq 0.2$ – "grey zone,"

$Z_{P2} > 0.2$ – the company is not threatened with bankruptcy.

According to B. Prusak, Model P_2 is superior to Model P_1 as it allows a more effective classification of companies two years before bankruptcy. Additionally, it indicates a slightly poorer performance than Model P_1 in predicting bankruptcy one year prior to bankruptcy (Korol & Prusak, 2022, p. 133).

16.3.5. The Poznań Model

The Poznań model was developed and published in 2004 by three scientists – M. Hamrol, B. Czajka, and M. Piechocki.

The process of creating the model consisted of three stages. In the first stage, the time frames and data sources were established. Like most model creators, the authors selected two groups of enterprises for the study. The ratio of one group to the other was 50 : 50. In the second stage, a total of 31 indicators were analysed whose selection was based on the forward stepwise method. According to the authors, this method demonstrated the best performance. The last stage involved calculating the formula and verifying its accuracy (Hamrol, Czajka & Piechocki, 2004, p. 36). The Poznań model is expressed by formula:

$$Z_{PZ} = 3.562 \times X_1 + 1.58 \times X_2 + 4.288 \times X_3 + 6.719 \times X_4 - 2.368, \quad (7)$$

where:

Z_{PZ} – the value of the discriminant function in the Poznań model,

X_1 – net profit/total assets,

X_2 – (current assets – inventory)/short-term liabilities,

X_3 – equity + long-term liabilities/total assets,

X_4 – financial result from sales/sales revenue.

The threshold values of the Z_{P1} were as follows:

$Z_{PZ} < 0$ – threat of bankruptcy for the enterprise,

$Z_{PZ} = 0$ – critical value of the model,

$Z_{PZ} > 0$ – the enterprise was not threatened with bankruptcy.

16.4. Research Methodology and Results

16.4.1. Research Methodology

The aim of this study was to analyse theoretical issues relating to bankruptcy and discriminant models, as well as to evaluate the effectiveness of selected models in predicting corporate bankruptcy. The author set several partial goals focusing on presenting the bankruptcy theory and related topics, discriminant models, and checking the effectiveness of national models as tools for predicting corporate bankruptcy.

The objective of the research was to verify the effectiveness of six discriminant models developed by Polish economists in predicting the performance of enterprises operating in Poland. All models were created on the basis of financial statements of Polish companies and with the assumption that they would be used as bankruptcy prediction tools for Polish firms. The following models were utilised:

- INE PAN 6 Model,
- INE PAN 7 Model,
- D. Hadasik's (IV) Model,
- B. Prusak's P_1 Model,
- B. Prusak's P_2 Model,
- the Poznań Model.

While analysing bankruptcy issues and prediction models, the author made certain observations. These observations, combined with the analysis of financial statements of enterprises, made it possible to formulate research problems. The following research questions were addressed:

- Is the use of models developed by Polish economists effective in predicting bankruptcy in Poland?
- Which one of the popular discriminant models is considered the best bankruptcy predictor?

For research purposes, a hypothesis was formulated, stating that discriminant models authored by Polish economists demonstrate high effectiveness in

predicting corporate bankruptcy, and their effectiveness depends on the industry in which they operate.

The groups of enterprises, along with their respective PKD[1] (Polish Classification of Activities) codes, were selected based on insolvency data. Simultaneously, when assigning entities to specific groups, the author was guided by current insolvency statistics in Poland and prevailing market trends. In order to verify data relating to specific industries, an equal number of enterprises were included in the study. The decisive factor for qualifying enterprises was the completeness of their financial statements throughout the entire study period.

Financial data covering twelve enterprises were used for the study: four for trading, manufacturing, and service enterprises respectively. Each firm met specific criteria such as bankruptcy proceedings declared by the competent court, bankruptcy proceedings initiated between 2021 and 2023, or an enterprise with a uniform legal form, such as limited liability company.

Apart from being divided into groups, the enterprises differed in the years of establishment (time period 2004–2015), enterprise size, and the amount of share capital. It is worth noting that none of the differences affected the analysis results.

The study was conducted using data accessed based on Ministry of Justice. The necessary data for analysis were found in the balance sheet and profit and loss statement of the enterprises. The study covered the period of four years before declaration of bankruptcy until the year of its declaration.

16.4.2. Research Results for Enterprises in the Trading Sector

The first group comprised enterprises from the trading sector for which the author selected bankrupt companies and analysed their financial reports from the PKD G group (*Wholesale and retail trade; Repair of motor vehicles, including motorcycles*) with their main activity defined by PKD-46 section (*Wholesale trade excluding motor vehicles*). In the group of trading enterprises, the key criterion for selecting the analysed companies was the high number of bankruptcies. The following companies were included: CHEMILAND limited liability company in bankruptcy, CEDRUS horticultural wholesale limited liability company in bankruptcy, B.B.-POL production-trade-service limited liability company in bankruptcy, and PAK production-trade-service limited liability company in bankruptcy. The research results were presented in Table 16.1.

[1] PKD (Polska Klasyfikacja Działalności), or Polish Classification of Activities, is a system for categorising and grouping types of business activities conducted in Poland. PKD is based on NACE – The Statistical Classification of Economic Activities in the European Community (Statistics Poland, 2024b).

Table 16.1. Discriminant analysis results for the companies in the trade sector

The name of the bankrupt	4 years before bankruptcy	3 years before bankruptcy	2 years before bankruptcy	1 year before bankruptcy	Bankruptcy year
INE PAN 6 Model					
CHEMILAND	–2.06	–16.39	–14.13	–13.00	–31.62
CEDRUS	–4.76	–4.60	–4.96	–4.75	–7.06
BB-POL	0.29	–2.06	–2.39	–6.58	–22.00
PAK	–4.42	–4.28	–4.04	–5.56	–7.50
INE PAN 7 Model					
CHEMILAND	–2.39	–16.37	–13.80	–12.75	–32.63
CEDRUS	–5.63	–4.42	–4.92	–4.76	–6.84
BB-POL	–0.62	–2.39	–3.21	–7.81	–20.78
PAK	–3.43	–3.28	–3.04	–4.77	–6.41
D. Hadasik's (IV) Model					
CHEMILAND	–1.98	–13.30	–12.70	–12.52	–38.58
CEDRUS	–1.53	–3.33	–2.90	–3.36	–4.31
BB-POL	–1.10	–1.98	0.23	–1.90	10.68
PAK	17.71	29.21	–2.07	17.31	16.50
B. Prusak's P_1 Model					
CHEMILAND	–1.66	–3.27	–3.49	–2.37	–0.18
CEDRUS	–2.80	–2.53	–2.38	–1.91	–2.78
BB-POL	–0.68	–1.66	–2.63	–5.26	0.77
PAK	–3.29	–2.96	–1.28	–5.90	–1.34
B. Prusak's P_2 Model					
CHEMILAND	–0.47	–2.17	–1.60	–1.06	–2.16
CEDRUS	–3.28	–2.66	–2.18	–2.07	–2.19
BB-POL	–1.53	–2.08	–2.97	–4.68	–1.77
PAK	–1.97	–1.92	–1.87	–1.97	–2.18
The Poznań Model					
CHEMILAND	–2.96	–18.33	–16.83	–15.77	–44.28
CEDRUS	–3.82	–4.40	–3.87	–4.20	–5.65
BB-POL	–2.96	–1.59	–5.32	–20.19	–27.56
PAK	–6.24	–4.72	–2.14	–5.41	–6.37

Source: author's own work.

The INE PAN 6 Model demonstrated very high effectiveness, as it correctly indicated the threat in all trade enterprises from three years before bankruptcy up to the year of its announcement. The model did not indicate existing danger four years before bankruptcy only in one company.

An even higher effectiveness in analysing trade enterprises was shown by the newer model developed at the Institute of Economic Sciences of the Polish

Academy of Sciences – INE PAN 7. In all analysed trade enterprises, regardless of the period examined, it correctly indicated the threat of bankruptcy. This was achieved even though both the structure of the function in the newer version and the final analysis results were similar to those of the previous model (INE PAN 6).

The effectiveness of the model developed by D. Hadasik was lower than that of the models developed at the Polish Academy of Sciences but was still at an acceptable level. In the case of two enterprises, the model correctly indicated the threat of bankruptcy throughout the entire period analysed. Surprisingly, in the case of two companies, the model did not indicate financial distress, which is quite unusual because the model indicated poor financial condition of these companies in previous years.

The first model by B. Prusak, used for predicting bankruptcy with one-year lead time, showed high overall effectiveness. In three out of four enterprises, it indicated the threat of bankruptcy, regardless of the period examined. Only in the case of one enterprise, did the model not indicate the threat of bankruptcy in the year of its announcement. The paradox is that the author's assumption, the P_1 model was intended for short-term analysis.

The second model by B. Prusak, used for predicting bankruptcy with two-year lead time, showed similar effectiveness to the first model, but in this case, the threat of bankruptcy was indicated in each company from three years before bankruptcy to the year of its declaration. Moreover, for the first time, the model indicated the so-called "grey area," which is an area that does not allow a clear assessment of the company's financial situation.

The Poznań model showed the highest effectiveness among all of the models. The threat of bankruptcy was correctly indicated for each company, regardless of the period examined or the bankrupt enterprise.

16.4.3. Research Results for Enterprises in the Service Sector

The second group comprised enterprises from the service sector. All the companies belong to to the PKD H group (*Transportation and warehousing*), with their activities defined by PKD-49 (*Land and pipeline transport*). The selection of service enterprises, unlike other sectors, was based not on a high bankruptcy rate in the industry but on the large number of transport companies in Poland. A key factor in choosing enterprises from this group was the availability of data. They were as follows: Radom Bus communication company limited liability company in bankruptcy, I-LOG limited liability company in bankruptcy, MPW-Transport limited liability company in bankruptcy, Cargo Morawa Polska limited liability company in bankruptcy. The research results were presented in Table 16.2.

Table 16.2. Discriminant analysis results for companies in the service sector

The name of the bankrupt	4 years before bankruptcy	3 years before bankruptcy	2 years before bankruptcy	1 year before bankruptcy	Bankruptcy year
INE PAN 6 Model					
PKS Radom	–0.55	1.93	–15.72	–5.41	–3.40
I-LOG	1.68	1.61	–123.57	–34.44	–26.30
MPW-Transport	–10.41	–9.25	–	–35.91	–39.87
Cargo Morawa Polska	3.40	2.94	1.66	3.31	–8.48
INE PAN 7 Model					
PKS Radom	–0.55	1.94	–15.39	–5.89	–3.30
I-LOG	0.97	0.97	–126.68	–34.22	–25.10
MPW-Transport	–14.88	–15.59	–	–39.15	–38.50
Cargo Morawa Polska	0.83	0.41	–0.73	0.86	–15.04
D. Hadasik's (IV) Model					
PKS Radom	0.99	1.16	0.08	–2.79	–3.02
I-LOG	1.35	1.38	–26.12	–45.66	–22.41
MPW-Transport	–1.72	–4.93	–	–8.78	–31.66
Cargo Morawa Polska	0.37	0.27	0.61	0.87	–1.64
B. Prusak's P_1 Model					
PKS Radom	–1.10	0.08	–7.29	–2.53	–1.57
I-LOG	0.07	0.01	–18.41	10.93	–4.55
MPW-Transport	–7.68	–7.31	–	–13.55	–4.96
Cargo Morawa Polska	0.47	0.42	–0.79	0.13	–4.38
B. Prusak's P_2 Model					
PKS Radom	–1.51	–0.52	–5.73	–5.75	–5.75
I-LOG	–1.55	–2.17	–13.41	–4.40	–3.04
MPW-Transport	–7.23	–7.69	–	–8.25	–6.53
Cargo Morawa Polska	–0.20	–0.55	–1.47	–2.30	–7.28
The Poznań Model					
PKS Radom	–0.07	1.68	–6.10	–7.01	–20.04
I-LOG	2.01	–70.22	–64.66	–27.50	–72.08
MPW-Transport	–7.65	–10.89	–	–8.31	–39.28
Cargo Morawa Polska	0.86	0.40	0.62	0.91	–7.57

Source: author's own work.

The effectiveness of the INE PAN 6 Model for the service sector enterprises was much lower compared to those in the trading sector. The model indicated a threat in all enterprises only in the year of bankruptcy. Moreover, only in one enterprise did the model indicate a threat throughout the entire study period.

The INE PAN 7 demonstrated identical effectiveness to the older model. Apart from minor changes in the values of selected indicators, the interpretation

of the results remained unchanged. Like in the previous model, only one enterprise was indicated as "at risk of bankruptcy" throughout the entire period.

Similar to trading enterprises, in the service sector, the model developed by D. Hadasik showed lower effectiveness than the models of the Polish Academy of Sciences. The main difference was a lack of indication of existing bankruptcy risk in the first enterprise from four years to two years before bankruptcy was declared. Apart from that, the results achieved by the model were like those of the INE PAN models.

The model authored by B. Prusak, used for predicting with one-year lead time (P_1), indicated bankruptcy risk in all the enterprises in the year of their bankruptcy declaration. Furthermore, unlike the previous group of enterprises, the model indicated the emergence of the so-called "grey area" in a significantly greater number of cases. Like the INE PAN models and D. Hadasik's model, the only enterprise in which bankruptcy risk was indicated in every period was MPW-Transport.

The B. Prusak's model used for predicting with two-year lead time (P_2) demonstrated significantly higher effectiveness than the P_1 model. In all the enterprises, from two years before bankruptcy declaration to the year of its declaration, it correctly indicated existing bankruptcy risk. At the same time, in two firms, regardless of the period, the model indicated a poor financial situation.

The Poznań model, in analysing the service sector enterprises, demonstrated much lower effectiveness than the same in trading enterprises. It indicated bankruptcy risk during all periods only in one enterprise. At the same time, in all the enterprises, only in the year of bankruptcy declaration the model indicated existing risk.

16.4.4. Research Results for Enterprises in the Manufacturing Sector

The last group comprised enterprises from the manufacturing sector. All the enterprises belong to the PKD F group (*Construction*), with their activities defined by PKD-41 (*Construction works related to building construction*). In the case of manufacturing enterprises, companies were selected due to the increasing number of bankruptcies among firms engaged in construction in recent years. They included the following: Starhus limited liability company in bankruptcy, Perkun Investment limited liability company in bankruptcy, NC Investment 1 limited liability company in bankruptcy, and Empire Profit limited liability company in bankruptcy. The research results were presented in Table 16.3.

Table 16.3. Discriminant analysis results for companies in the manufacturing sector

The name of the bankrupt	4 years before bankruptcy	3 years before bankruptcy	2 years before bankruptcy	1 year before bankruptcy	Bankruptcy year
INE PAN 6 Model					
Starhus	–7.45	–8.42	–5.47	–7.34	–6.01
Perkun Investment	–2.49	–2.71	–1.60	–3.21	–2.28
NC Investment 1	–1.08	–1.86	–1.71	–2.98	–2.80
Empire Profit	6.81	2.42	–0.20	–2.22	–9.93
INE PAN 7 Model					
Starhus	–8.37	–9.24	–4.62	–6.31	–5.07
Perkun Investment	–1.51	–1.73	–0.88	–2.56	–1.30
NC Investment 1	–0.11	–0.87	–0.76	–1.98	–1.81
Empire Profit	6.87	2.72	0.70	–1.27	–8.83
D. Hadasik's (IV) Model					
Starhus	–1.66	–6.35	–14.48	–145.98	–20.40
Perkun Investment	–0.44	–3.56	–13.46	–0.43	–1.23
NC Investment 1	–53,923.46	1.47	–178.50	–0.10	–0.22
Empire Profit	3.12	1.02	6.55	8.76	8.23
B. Prusak's P_1 Model					
Starhus	–4.49	–2.73	0.57	–2.15	0.53
Perkun Investment	–1.25	–1.36	–0.42	–1.49	–1.62
NC Investment 1	–452.76	–0.75	–0.45	–1.48	–1.36
Empire Profit	2.65	–0.17	–0.25	–2.99	–31.15
B. Prusak's P_2 Model					
Starhus	–4.31	–3.06	–1.19	–1.89	–1.43
Perkun Investment	–1.87	–1.95	–1.51	–2.16	–1.94
NC Investment 1	–1.94	–2.02	–1.77	–1.97	–1.92
Empire Profit	1.33	–0.92	–1.69	–2.03	–2.65
The Poznań Model					
Starhus	–6.51	–9.90	–3.40	–10.20	–2.88
Perkun Investment	–2.71	–2.80	–1.37	–3.10	–1.95
NC Investment 1	–1,395.60	0.37	4.51	–2.93	–2.91
Empire Profit	7.74	3.17	3.45	–5.79	–7.70

Source: author's own work.

The INE PAN 6 Model demonstrated very high effectiveness in analysing manufacturing enterprises. In three firms, the model indicated bankruptcy risk throughout the entire study period. Additionally, in one of the enterprises, the model indicated bankruptcy risk from two years before bankruptcy until the year of its declaration.

To the author's surprise, the newer model developed at the Institute of Economic Sciences (INE PAN 7) showed slightly lower effectiveness than the older one. Despite the fact that INE PAN 6 model indicated a risk two years before bankruptcy in the Empire Profit, such a risk did not appear in the newer model. Apart from this minor difference, the model demonstrated high effectiveness in forecasting the bankruptcy of manufacturing enterprises – in three out of four enterprises, it indicated the bankruptcy risk in each period.

Similar to manufacturing and trading enterprises, D. Hadasik's model showed average but acceptable effectiveness in the service sector as well. The model indicated existing bankruptcy risk in two enterprises throughout the entire period. However, despite occasional earlier indications, this model did not signal any risk one year before or in the year of bankruptcy announcement. The exception was the Empire Profit enterprise, where the model did not demonstrate any poor situation throughout any of the periods.

The P_1 model by B. Prusak demonstrated very good effectiveness, despite the author's assumptions that it is used for predicting with one-year lead time regardless of the study period. In three out of four enterprises, the model indicated the existing risk, regardless of the period. In the fourth enterprise, the model indicated the existence of a "grey area" two years before bankruptcy and in the year of its declaration.

The newer P_2 model showed almost perfect effectiveness. Only in one enterprise, four years before bankruptcy declaration, did the model not indicate any existing risk. The other periods and enterprises were correctly determined.

The Poznań model showed average effectiveness, similar to the results of the D. Hadasik's model. In the case of two enterprises, the model indicated existing bankruptcy risk regardless of the period. At the same time, in all enterprises, in the year preceding and in the year of declaration, the model indicated bankruptcy risk.

16.4.5. Comparison of Research Results

The study utilised a total of six popular discriminant models developed by Polish economists. Using these models, the author analysed twelve enterprises over a period of four years leading up to the declaration of their bankruptcy. Apart from categorising the companies based on the type of business activity, the author conducted calculations to identify the model best suited for analysing mixed enterprises.

The companies were divided into three groups based on their main activities: trading, service, and manufacturing. This allowed the verification of which

group of enterprises the models exhibited the highest effectiveness for. Table 16.4 presents data on risk indications showed by the models for each type of activity.

Table 16.4. Interpretation of the results of the discriminant analysis for enterprises

Model	Industry			
	Trading enterprises	Service enterprises	Manufacturing enterprises	Average percentage of risk indications
INE PAN 6	95%	63%	90%	83%
INE PAN 7	100%	68%	85%	85%
D. Hadasik (IV)	70%	52%	60%	61%
B. Prusak (P_1)	95%	63%	95%	85%
B. Prusak (P_2)	95%	84%	95%	91%
The Poznań	100%	65%	75%	80%

Source: author's own work.

For trading enterprises, the INE PAN 7 model demonstrated the highest effectiveness, which indicated existing threats in all the companies, regardless of the period preceding bankruptcy. Similarly, the Poznań model demonstrated the same results, with all correct indications. Following these models, a high number of indications were observed for three models – the INE PAN 6 Model and both models by B. Prusak. The model by D. Hadasik showed acceptable but lower effectiveness than the previously mentioned ones. It is noteworthy that in this group of enterprises, the models exhibited the highest effectiveness among all three industries.

For service enterprises, the models showed lower overall effectiveness than in the previous group. This time, the most effective model was P_2 by B. Prusak. The next model showing acceptable effectiveness was model 7 developed at INE PAN. Models P_1 by B. Prusak, The Poznań Model, and the INE PAN 6 Model showed a similar number of risk indications. In the model by D. Hadasik, only slightly over half of the results indicated a threat.

The last group comprised manufacturing enterprises. Like the previous group, the highest number of correct indications appeared in the P_2 Model by B. Prusak, followed by two models: P_1 and INE PAN 6, which had the same number of indications. For the first time, the previous INE PAN 7 Model showed slightly lower effectiveness. The Poznań Model demonstrated good effectiveness in predicting companies in the group. Similar to the previous group, the model by D. Hadasik showed only average prediction effectiveness.

16.5. Conclusion

Based on the research, it can be concluded that the use of discriminant models developed by Polish economists for predicting corporate bankruptcies in Poland is highly effective in some cases.

The P_2 Model by B. Prusak consistently achieved excellent results across all scenarios. In many cases, it indicated threats well in advance, exceeding the author's declaration of two years before bankruptcy. Moreover, in each group of companies, the model demonstrated a correctness rate of risk indications exceeding 83%, proving its versatility. Therefore, the use of the P_2 Model is recommended for predicting corporate bankruptcies regardless of the type of business activity.

Similarly, the P_1 Model showed good effectiveness, yet slightly lower than the P_2 Model. Its performance for trading and manufacturing enterprises was at an acceptable level. However, it exhibited the poorest performance in analysing service industry enterprises, with significantly lower effectiveness compared to other models. Nevertheless, overall, the model demonstrated decent effectiveness.

Models developed by INE PAN also showed high overall effectiveness. Model 7 had slightly more indications, but the previous model's effectiveness was satisfactory. It should be noted that the effectiveness of model 7 in predicting bankruptcies of trading enterprises, reached exactly 100% accuracy. Additionally, in analysing service industry enterprises, the newer model achieved better result, but model 6 was slightly more effective in manufacturing enterprises. Similar to B. Prusak's models, this model can be considered reliable.

It is noteworthy that different versions of models by the same author (INE PAN 6 and 7, and B. Prusak's P_1 and P_2 models) show varying levels of predictive ability. Interestingly, significant differences in analysis results appear in the model developed under the supervision of E. Mączyńska. Specifically, in selected cases, despite the values of discriminant functions being similar and the differences appearing negligible, significant changes occurred in the final analysis result. This demonstrates that slight alteration in the construction of newer models (the main difference between models being the absence of the asset efficiency ratio and modifications to the weights of selected indicators) contributes to the improvement of their effectiveness. Conversely, in the case of B. Prusak's models, the differences between versions were significant, resulting in a tangible improvement in their results. Additionally, in the course of the scientific research, the author's assertion about the higher capabilities of the P_2 Model was proved.

Furthermore, it is important to note that the models described above demonstrated high effectiveness. Thus, it is essential for the author not to cease

working on the model but to continue developing it, as it will certainly lead to improved model performance. Such a situation may also result from continuous changes in accounting regulations in Poland and economic transformations, which, in turn, require that model creators adapt them to the prevailing realities.

A model with significantly lower effectiveness compared to its predecessors was developed by D. Hadasik. The model, however, exhibited slightly higher effectiveness than average only in the analysis of trading enterprises. In service and manufacturing enterprises, the model's effectiveness was described as poor. In general analysis, utilising the model is possible but should be supported by other methods for assessing the company's situation.

References

Altman, E. I., & Hotchkiss, E. (2005). *Corporate Financial Distress and Bankruptcy.* John Wiley & Sons.

Hadasik, D. (1998). Upadłość przedsiębiorstw w Polsce i metody jej prognozowania. *Zeszyty Naukowe. Seria 2, Prace habilitacyjne*, 153. Akademia Ekonomiczna w Poznaniu.

Hamrol, M., Czajka, B., & Piechocki, M. (2004) Upadłość przedsiębiorstwa – model analizy dyskryminacyjnej. *Przegląd Organizacji*, 773(6), 35–39. https://doi.org/10.33141/po.2004.06.09

Kasjaniuk, M. (2006). Zastosowanie analizy dyskryminacyjnej do modelowania i prognozowania upadłości. *Barometr Regionalny. Analizy i Prognozy*, 6, 95–100.

Kitowski, J. (2015). *Metody dyskryminacyjne jako instrument oceny zagrożenia upadłością przedsiębiorstwa*. Wydawnictwo Uniwersytetu Rzeszowskiego.

Klasyfikacje kodów PKD. (2024, June). Retrieved from: https://klasyfikacje.gofin.pl/pkd/4,0.html on June 1, 2024.

Korol, T., & Prusak, B. (2022). *Upadłość przedsiębiorstw a wykorzystanie sztucznej inteligencji*. CeDeWu.

Kovacova, M., & Kliestikova, J. (2017). Modelling Bankruptcy Prediction Models in Slovak Companies. *SHS Web of Conferences*, *39* (pp. 1–12). https://doi.org/10.1051/shsconf/20173901013

Krajewska, A. (2018). Produkcja i koszty w przedsiębiorstwie. In: E. Kwiatkowski, R. Milewski (Eds), *Podstawy ekonomii* (pp. 175–208). Wydawnictwo Naukowe PWN.

Kuciński, A. (2013). Niewypłacalność, upadłość przedsiębiorstw. In: J. Frąś, K. Czyrka (Eds), *Przedsiębiorczość szansą rozwoju regionu. Wybrane problemy* (Vol. 1) (pp. 103–112). Wydawnictwo Państwowej Wyższej Szkoły Zawodowej im. Jakuba z Paradyża.

Lichota, W. (2018). Weryfikacja skuteczności predykcji wybranych modeli analizy dyskryminacyjnej na przykładzie przedsiębiorstw funkcjonujących w specjalnych strefach ekonomicznych w Polsce. *Acta Scientifica Academiae Ostroviensis. Sectio A, Nauki Humanistyczne, Społeczne i Techniczne*, 12(2), 402–414. https://doi.org/10.33674/acta_2520182

Mączyńska, E., & Zawadzki, E. (2006). Dyskryminacyjne modele predykcji upadłości przedsiębiorstw. *Ekonomista*, 2, 205–235.

Pitera, R. (2018). Ocena wiarygodności wybranych modeli wczesnego ostrzegania w badaniu kondycji finansowej przedsiębiorstwa. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 514, 342–354. https://doi.org/10.15611/pn.2018.514.32

Tłuczak, A. (2013). Zastosowanie dyskryminacyjnych modeli przewidywania bankructwa do oceny ryzyka upadłości przedsiębiorstw. *Zeszyty Naukowe Wyższej Szkoły Bankowej we Wrocławiu*, 2(34), 423–434.

Tokarski, A. (2012). Charakterystyka podstawowych rodzajów upadłości firm w edukacji przedsiębiorczości. In: Z. Zioło, T. Rachwał (Eds), *Przedsiębiorczość – Edukacja. Rola przedsiębiorczości w edukacji* (Vol. 8) (pp. 169–182). Nowa Era.

Statistics Poland. (2024a). Activity of Enterprises. Activity of Companies. Retrieved from: https://stat.gov.pl/en/topics/economic-activities-finances/activity-of-enterprises-activity-of-companies/ on June 1, 2024.

Statistics Poland. (2024b). Classifications. Polish Classification of Activities (PKD 2007). Retrieved from: https://stat.gov.pl/en/metainformation/classifications/?pdf=1 on June 1, 2024.

Ustawa z dnia 28 lutego 2003 r. Prawo upadłościowe. Dz.U. 2003 Nr 60 poz. 535. Retrieved from: https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20030600535/U/D20030535Lj.pdf on June 1, 2024.

Ustawa z dnia 29 września 1994 r. o rachunkowości. Dz.U. 1994 Nr 121 poz. 591. Retrieved from: https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU19941210591/U/D19940591Lj.pdf on June 1, 2024.

Ustawa z dnia 2 marca 2020 r. o szczególnych rozwiązaniach związanych z zapobieganiem, przeciwdziałaniem i zwalczaniem COVID-19, innych chorób zakaźnych oraz wywołanych nimi sytuacji kryzysowych. Dz.U. 2020 poz. 374. Retrieved from: https://sip.lex.pl/akty-prawne/dzu-dziennik-ustaw/szczegolne-rozwiazania-zwiazane-z-zapobieganiem-przeciwdzialaniem-i-18966440 on June 1, 2024.

Zavgren, C. (1983). The Prediction of Corporate Failure: The State of the Art. *Journal of Accounting Literature*, 2, 1–33.

Authors

Ewa Bąchor – ORCID: 0000-0001-6857-6856
Andrzej Frycz Modrzewski Krakow University
Faculty of Management and Social Communication

Ivana Bestvina Bukvić – ORCID: 0000-0002-9157-1479
Josip Juraj Strossmayer University of Osijek (Croatia)

Bartolomeo Rafael Bialas – ORCID: 0009-0001-8554-6613
Kazimieras Simonavicius University (Lithuania)

Krzysztof Borodako – ORCID: 0000-0002-7348-8372
Krakow University of Economics
College of Management and Quality Sciences
Institute of Management

Marian Bursztyn – ORCID: 0000-0002-5318-7484
Krakow University of Economics
College of Management and Quality Sciences
Institute of Management

Sérgio Veludo Coelho – ORCID: 0000-0002-8145-8827
School of Education of Polytechnic of Porto (Portugal)

Adam Figiel – ORCID: 0000-0002-5846-4612
Krakow University of Economics
College of Management and Quality Sciences
Institute of Management

Marek Jabłoński – ORCID: 0000-0002-5464-7147
Krakow University of Economics
College of Management and Quality Sciences
Institute of Management

Julia Karcz-Ryndak – ORCID: 0000-0002-2749-4325
Krakow University of Economics
College of Management and Quality Sciences
Institute of Management

Urszula Kobylińska – ORCID: 0000-0001-9435-7841
Bialystok University of Technology

Maria Kocot – ORCID: 0000-0001-5150-3765
University of Economics in Katowice
Institute of Management

Anna Kołodko – ORCID: 0009-0006-6476-8344
Krakow University of Economics
Doctoral School KUE

Izabela Konieczna – ORCID: 0000-0002-3632-3245
Jan Kochanowski University of Kielce
Institute of Management

Michał J. Kowalski – ORCID: 0000-0001-9843-5122
Wroclaw University of Science and Technology
Institute of Management

Marta Krajewska-Beentjes – ORCID: 0009-0008-3276-3893
Krakow University of Economics
Doctoral School KUE

Sylwia Krzyżek-Liburska – ORCID: 0000-0003-3079-0819
Krakow University of Economics
Doctoral School KUE

Janusz Nesterak – ORCID: 0000-0001-9114-4947
Krakow University of Economics
College of Management and Quality Sciences
Institute of Informatics, Accounting and Controlling

Michał Niewiadomski – ORCID: 0000-0002-3129-3331
University of Applied Sciences in Nowy Targ

Dominik Pawelec – ORCID: 0009-0009-1154-7582
Krakow University of Economics

Katarzyna Piecuch – ORCID: 0009-0001-1770-0965
University of Agriculture in Krakow

Maria Inês Pinho – ORCID: 0000-0002-5868-6514
Polytechnic of Porto (Portugal)

Grażyna Plichta – ORCID: 0000-0003-1690-3522
Krakow University of Economics
College of Management and Quality Sciences
Institute of Management

Adam Popek – ORCID: 0000-0001-9322-4692
Academy of Physical Education in Krakow

Piotr Sedlak – ORCID: 0000-0001-8147-1960
Krakow University of Economics
College of Management and Quality Sciences
Institute of Management

Sandra Snarska – ORCID: 0000-0002-9489-170X
Bialystok University of Technology

Kacper Stabryła-Tatko – ORCID: 0009-0004-2963-6843
School of Banking and Management in Cracow

Ilona Staszewska-Daca – ORCID: 0009-0006-1293-9906
Krakow University of Economics
Doctoral School KUE

Angelika Wodecka-Hyjek – ORCID: 0000-0002-6930-4438
Krakow University of Economics
College of Management and Quality Sciences
Institute of Management

Bernard Ziębicki – ORCID: 0000-0003-3628-8264
Krakow University of Economics
College of Management and Quality Sciences
Institute of Management

Index of Tables

Index of Figures

ISBN 978-83-7252-903-9