

Processes and Problems of Digitalizing Economies and Enterprises. European-Asian Context

Editors:

Barbara Siuta-Tokarska, Katarzyna Żmija



Krakow 2025

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Proceedings and Book of Abstracts

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**This publication has been prepared to disseminate the results of the project
Overcoming Digital Divide in Europe and Southeast Asia “ODDEA”**

The publication presents a collection of papers delivered during



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Knowledge – Economy – Society**

within the framework of the international scientific session ODDEA entitled
*"Processes and Problems of Digitalizing Economies and Enterprises.
European-Asian Context."*



ODDEA

OVERCOMING DIGITAL DIVIDE
IN EUROPE AND SOUTHEAST ASIA

**Project No. 101086381
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Introduction

The contemporary world, standing at the threshold of the twenty-first century, is marked by a multitude of diverse and multifaceted challenges of a social, economic and environmental nature. These challenges, which frequently constitute serious dilemmas on the path of socio-economic development, represent a source of concern for decision-makers and managers alike, ranging from the micro scale (enterprises), through the meso level (industries and sectors), to the macro scale (the economy as a whole). It should be noted that economic history vividly illustrates that, while economic growth is generally regarded as a desirable phenomenon, it does not invariably bring about exclusively beneficial outcomes. Assuming that the principal driving force of modern economies is a well-functioning market mechanism, it must nevertheless be emphasised that such a mechanism is not without its imperfections. Despite substantial scientific and technological progress, new problems and associated challenges continue to emerge at operational, tactical and strategic levels.

A salient characteristic of the contemporary era is the rapid advance of digital transformation – a phenomenon arising from the scientific and technological revolution that bridged the twentieth and twenty-first centuries. This transformation highlights technological, organisational and managerial changes occurring within economies and societies, as well as the intricate interrelations between them.

The present volume, entitled *Processes and Problems of Digitalising Economies and Enterprises. European - Asian Context*, has been conceived by its editors and contributing authors with the intention of elucidating, at least in part, the complex, dynamic and multidimensional socio-economic realities of the twenty-first century. Through an examination of the processes and structures underlying the digital transformation of modern economies and enterprises, the publication seeks to interpret these phenomena and to provide a foundation for their critical assessment. By identifying the realities of contemporary transformations from various analytical perspectives, it becomes possible to formulate empirically grounded conclusions and to derive practical and utilitarian recommendations. The research problem underlying this publication can be expressed in the form of the following question: *What are the main processes and problems associated with the digitalisation of economies and enterprises in Europe and Asia? Are these phenomena similar, or do they display significant differences?*

The work has been divided into four logically ordered parts, progressing from general to more specific considerations, and following a deductive approach to scientific inquiry.

The **first part** of the volume, entitled *Digital Transformation of Economies: Challenges and Dilemmas*, presents research on issues such as:

- overcoming digital divides in the light of economic implications, productivity and policy insights,
- the role of digital transformation in fostering green economic productivity, and
- an analysis of key factors in digital trade.

The **second part** focuses on the significance of institutions in the digital transformation of economies. It addresses topics such as the role of institutions in shaping productivity growth, *institutional quality as a moderator in the digitalisation–growth nexus*, and the interrelations between *digitalisation*, *institutional quality* and *market competition*.

The **third part**, entitled *Industries and Enterprises Undergoing Digital Transformation*, comprises five studies devoted to the functioning of enterprises and economic sectors in their pursuit of digital development. The analyses address, inter alia, the measurement of digitalisation, the development of family businesses, the role of value perceptions and consumer

expertise, the digital divide in tourism, and motivational resistance in the digital transformation of healthcare systems.

The **fourth and final part** of the publication reflects the perspectives of young researchers on the phenomena, processes and transformations accompanying digitalisation. It includes discussions on:

- mapping digital behaviours and perceptions of artificial intelligence;
- sentiment towards digitalisation; and
- the digital gender divide.

This publication is the result of research conducted by scholars from European and Asian universities participating in the ODDEA (*Overcoming Digital Divide in Europe and South-East Asia*) research project, funded by the European Union under the *Horizon Europe* programme, *Marie Skłodowska-Curie Actions*. The authors of the individual contributions presented their findings at the 17th International Scientific Conference of the College of Management and Quality Sciences, “*Knowledge – Economy – Society*”, held at the Krakow University of Economics, within three thematic research panels. The scientific abstracts included in this volume are derived from those presentations.

The editors are fully aware that this publication does not provide an exhaustive answer to the research question outlined above. Nevertheless, it constitutes an integral step towards addressing the identified problem and contributes to defining directions for further exploratory research. Moreover, it serves as a source of inspiration for continued inquiry into digital transformation and its practical implications for economic systems and the everyday functioning of contemporary enterprises.

Barbara Siuta-Tokarska, Katarzyna Żmija

Part 1. Digital Transformation of Economies: Challenges and Dilemmas

1.1. Bridging the Digital Divide: Economic Implication, Productivity and Policy Insights

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Abstract

Research background:

Rapidly advancing digital technologies have been deeply changing economies around the world through unparalleled innovation, transformation of labour markets, and an impact on productivity growth. The Authors attempted to investigate and explore the economic implications of the digital divide by analysing its impact on productivity, labour market outcomes, and the role of policy interventions. While the digital gap has been widely discussed in the literature, little attention has been paid to its relationship with economic performance. This identified research gap became a source of interest for researchers who addressed this topic in their study.

Purpose of the article:

The aim of the undertaken scientific research is to identify the impact of disparities in digital infrastructure—such as broadband access, ICT investment, digital literacy, and e-government usage—on GDP growth, labour productivity, unemployment, and the ICT sector's economic contribution. Furthermore, the paper investigates how structural conditions and policy frameworks influence digital adoption and inclusiveness. Particular attention is paid to the effectiveness of national strategies aiming to reduce digital inequalities across sectors and demographics.

Methods:

Both parametric and non-parametric methods are used to measure each country's digital gap via its distance to the digital frontier. Using dynamic panel data for the period 2010–2023, this research offers a comparative cross-regional study of the Visegrád Four countries (Czech Republic, Hungary, Poland, Slovakia) and selected Southeast Asian nations (Indonesia, Malaysia, Thailand, Vietnam).

Findings & value added:

By bridging gaps in the existing literature, this research provides new insights into the relationship between digital transformation and inclusive economic development, offering policymakers practical recommendations to design strategies that foster digital inclusion and sustainable growth.

Keywords: Digital divide, productivity, ICT investment, policy effectiveness, economic growth, Visegrád Four, Southeast Asia.

1.2. The Role of Digital Transformation in Driving Green Economic Productivity: A Cross-Regional Study of ASEAN and Europe

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Abstract

Research background:

Recent advancements emphasize the critical role of digital technology in enhancing green total factor productivity (GTFP) and advancing sustainable economic development. Empirical studies suggest that digital transformation positively affects GTFP through mechanisms such as institutional governance, market structure and innovation. However, these effects vary significantly across regions, especially between developing areas like ASEAN and developed regions like Europe.

Purpose of the article:

This study investigates the role of digital transformation in driving green economic productivity through a cross-regional analysis of ASEAN and Europe. The research focuses on three main questions: (1) How does digital transformation influence GTFP in ASEAN and European countries? (2) What mechanisms—market structure, research and development, and institutional governance—mediate this relationship? (3) What regional disparities exist in digital transformation's impact on GTFP?

Methods:

A two-stage quantitative methodology will be employed. First, GTFP will be measured using a Slack-Based Measure (SBM) Data Envelopment Analysis (DEA) model incorporating undesirable outputs. Second, panel data from 2014–2023 will be analyzed using a panel regression, LSDVC (Least Squares Dummy Variable Corrected) estimator to assess the dynamic influence of digital transformation indicators—such as institutional governance, market structure and innovation—on GTFP. Mediation analysis and panel regression will identify both direct and indirect effects, while interaction terms and regional dummies will explore cross-regional heterogeneity.

Findings & value added:

This study reveals that there are differences in the impact of digitalization transmission on green economy efficiency between regions. In general, in both countries of the European Union and Southeast Asia, the development of broadband technology has a significant but negative influence on GTFP, while the development of mobile systems has a positive effect in the Southeast Asia region only. On the other hand, research and development has not played an effective role as a mediating variable for the role of digitalization in both regions, and even has a negative role. Besides, institutional governance—as measured by regulatory quality, government effectiveness and rule of law—is able to strengthen the role of digitalization for GTFP in the Southeast Asia region but not for the European Union. Barriers to entry, such as the application of tariffs, have a negative role for GTDPs in both regions, but trade openness has a positive role for GTDPs in the EU region.

This study contributes to the green and digital economy development literature by offering insights into relevant policy mechanisms. The relevance of research and development, state governance, FDI and market structure need to be considered in overseeing digitalization to effectively encourage green development.

Keywords: Green total factor productivity, digitalization, research and development, institutional governance, market structure.

1.3. The Analysis of Key Factors of Digital Trade from the View of Digitalization: The Case of Southeast Asia

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Abstract

Research background:

Digitalization has become a transformative force in the global economy, fundamentally reshaping the nature of international trade. Southeast Asia, with its rapidly growing economies, rising internet penetration, and expanding digital adoption, is experiencing profound structural changes in trade dynamics. The rise of e-commerce platforms, mobile connectivity, and digital services has enabled new business models, lowered entry barriers for small and medium-sized enterprises (SMEs), and facilitated the emergence of cross-border digital transactions. As a result, digitalization not only transforms how trade is conducted but also redefines the scope and composition of global trade flows in the region.

Purpose of the article:

The purpose of this article is to examine the impact of digitalization on the scale and structure of international trade in Southeast Asia. Specifically, the study seeks to identify the key determinants driving exports and imports of digitally deliverable services (DDS) and information and communication technology (ICT) goods. It also evaluates the extent to which economic, regulatory, and technological factors contribute to countries' performance in digital trade.

Methods:

The research applies panel data regression models to a dataset comprising Southeast Asian countries. The models assess the impact of economic indicators (GDP, exchange rate, consumer price index), digital infrastructure (constructed using Principal Component Analysis), and regulatory factors such as the Digital Services Trade Restrictiveness Index (STRI), the E-Government Development Index (EGDI), and the E-Participation Index (EPI). The analysis differentiates the effects of macroeconomic conditions from those of digital policy and infrastructure on trade outcomes.

Findings & value added:

The results show that macroeconomic variables—particularly GDP and CPI—are significant and consistent predictors of digital trade flows. While digital infrastructure does not have a statistically significant direct effect on ICT exports, it positively influences DDS exports in value terms. One of the most robust findings is the negative effect of regulatory restrictiveness (STRI) on both ICT and DDS trade, suggesting that countries with more liberal digital trade policies achieve better digital export and import performance.

A key value added of this study lies in the construction of a composite digital infrastructure index using PCA, which effectively captures multi-dimensional digital capacity without multicollinearity. Moreover, the analysis highlights the crucial role of regulatory frameworks: countries with more developed e-government systems and stronger citizen participation tend to perform better in digital trade, especially in-service exports. The findings point to the need for harmonized digital trade policies and targeted investments in digital governance and infrastructure. This research provides actionable insights for policymakers aiming to enhance their countries' participation in the global digital economy and offers empirical evidence for academics investigating the intersection of digitalization and international trade. It also underscores the need for improved data availability on digital transactions to support more precise analysis in the future.

Keywords: digital trade, Southeast Asia, digitalization, international trade

Part 2. The Role of Institutions in Digital Transformation of Economies

2.1. The Role of Institutions and Digital Investments in Shaping Productivity Growth across the EU and Southeast Asia

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Abstract

Research background:

Digitalisation has rapidly changed the global economic landscape, but not all countries have benefited equally. While access to digital tools has expanded, deep differences remain between regions like the European Union and Southeast Asia. Many previous studies focus mainly on the spread of technology itself, paying less attention to the environment in which it operates. This paper addresses that gap by exploring how institutional quality — including governance, regulatory efficiency, and policy support — shapes the impact of digital investments on productivity growth.

This article examines how digitalisation — through broadband infrastructure, ICT investments, and e-commerce activity — drives productivity growth in European Union and Southeast Asian economies between 2012 and 2023. While technology is often seen as a universal driver of economic performance, this study shows that institutional quality plays a crucial role in determining whether digitalisation leads to real productivity gains. Using dynamic panel data analysis (system GMM) alongside non-parametric growth accounting methods, the research finds that investments in ICT and strong e-commerce uptake are closely linked to improved productivity, particularly where governance structures are strong. In contrast, expanding broadband access alone offers limited benefits in countries with weaker institutions. These findings highlight the importance of combining digital strategies with institutional reforms to achieve sustainable growth and more inclusive economic outcomes. The study offers practical insights for policymakers seeking to bridge digital divides and harness the full potential of digital technologies for long-term development.

Purpose of the article:

The main goal of this article is to explore how different aspects of digitalisation, particularly broadband access, ICT investment, and e-commerce use, contribute to productivity growth across countries. It also aims to show how strong institutions can amplify these effects, and why focusing on technology alone is not enough for sustainable economic improvement.

Methods:

The research is based on a panel of 38 countries observed between 2012 and 2023. It uses dynamic panel data methods, particularly two-step system GMM estimators, to address challenges like endogeneity and time dependence. Alongside these regressions, the study also applies growth accounting techniques, namely Data Envelopment Analysis (DEA) and the Malmquist Productivity Index, to cross-check and validate the results. Various robustness tests and sensitivity checks ensure the reliability of the findings.

Findings & value added:

The results show that digitalisation can indeed boost productivity — but mainly when it is supported by strong institutions. Investments in ICT and widespread e-commerce adoption are particularly effective in driving growth. However, simply expanding broadband access without improving governance has limited effects. The study adds to the academic discussion by highlighting the importance of "usage intensity" rather than just infrastructure, and by showing how institutions make a difference. It also offers clear recommendations for policymakers on how to close the digital divide more effectively and promote inclusive growth.

Keywords: Digital Economy, Governance Structures, ICT Usage, Productivity Growth, Institutional Resilience, Southeast Asia, European Union, Economic Convergence, E-commerce Adoption, Growth Accounting Methods

2.2. Institutional Quality as a Moderator in the Digitalization-Growth Nexus: Evidence from the European Union

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Abstract

Research background:

The European Union (EU) has invested heavily in digital infrastructure and governance reforms in its pursuit of sustainable and inclusive growth. While digitalization is widely believed to be a driver of productivity and economic growth, the role of institutional quality in shaping this impact remains underexplored, particularly in the context of differentiated governance capacities across EU member states. Understanding whether strong institutions enhance or constrain the growth effect of digitalization is crucial in designing policy frameworks that align digital and institutional development strategies.

Purpose of the article:

This article investigates the impact of digitalization on economic growth in the EU, with a specific focus on the moderating role of institutional quality. It aims to empirically test whether the interaction between digital development and institutional strength yields a synergistic effect on economic performance or whether, under certain conditions, institutional factors may hinder the realization of digital benefits.

Methods:

The study uses a balanced panel dataset of 27 EU countries covering the period from 2004 to 2022. Digitalization is measured using proxies such as internet usage and fixed broadband subscriptions, while institutional quality is captured using indicators of regulatory quality and government effectiveness. Feasible Generalized Least Squares (FGLS) estimation is employed to examine short-run relationships, with Fully Modified Ordinary Least Squares (FMOLS) planned for assessing long-run effects. The models control for standard growth determinants such as trade openness, FDI, labor participation, and government expenditure on education.

Findings & value added:

Initial results from the FGLS estimation indicate that digitalization has a positive standalone effect on economic growth in the short run. However, the interaction between digitalization and institutional quality unexpectedly shows a negative effect, suggesting that institutional rigidities or transitional governance inefficiencies may dilute the immediate gains from digital transformation. The study offers value by highlighting the complex dynamics between digital and institutional development and implies the need for coherent strategies that integrate digital policy with institutional reform. Pending long-run analysis via FMOLS will further assess whether this relationship shifts positively over time.

Keywords: Digitalization; Economic Growth; Institutional Quality; European Union; Panel Data; Interaction Effects; FGLS; FMOLS

2.3. Digitalization, Institutional Quality, and Market Competition: Unlocking Economic Growth in Southeast Asia

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Abstract

Research background:

The rapid rise of digital technologies, improvements in institutional governance, and evolving market competition have become key forces shaping economic growth globally. In recent years, Southeast Asian countries have achieved substantial progress in developing digital infrastructure, though they continue to encounter difficulties in aligning regulations and improving market efficiency. Previous studies have highlighted the region's unique position as an emerging digital economy, yet gaps remain in understanding how institutional frameworks mediate technology's growth effects.

Purpose of the article:

This study investigates how digitalization, institutional quality, and market competition jointly influence GDP growth in Southeast Asia—a region undergoing rapid economic transformation.

Methods:

Using panel data from Southeast Asian countries, the research analyzes how market competition (measured by ease of doing business, trade openness, FDI, and entry barriers) interacts with digitalization (internet access, ICT investment, and e-commerce adoption) and institutional quality to drive economic expansion. The study controls for critical factors like labor force participation, education, inflation, and urbanization. By employing panel data econometrics, the analysis assesses whether digitalization's impact depends on institutional quality and competitive market conditions.

Findings & value added:

The findings may reveal that (1) digitalization boosts growth more effectively in countries with strong institutions; (2) competitive markets amplify the benefits of technology adoption; and (3) weak governance undermines the gains from digitalization. These insights will help policymakers in Southeast Asia prioritize institutional reforms, digital infrastructure, and fair competition to sustain long-term growth.

Keywords: Digitalization, Institutional Quality, Market Competition, Economic Growth, Southeast Asia, ICT, Trade Openness, FDI

Part 3. Industries and Enterprises Undergoing Digital Transformation

3.1. Measuring Digitalization and its Impact on Performance in Small Firms

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Abstract

Research background:

Digital transformation is increasingly recognized as a critical driver of competitive advantage for enterprises across the world. However, effective digitalization requires not only the implementation of new technologies but also a structured understanding and measurement of its dimensions. Despite its importance, small and medium-sized enterprises (SMEs), particularly in the manufacturing sector, often struggle with how to assess the degree of digitalization in a systematic way. This study addresses this gap by identifying the key components of digitalization in SMEs operating within the Polish furniture manufacturing industry, thus contributing to the broader debate on how to overcome the digital divide in transitional economies.

Purpose of the article:

The main objective of the study is to empirically identify the key dimensions of digitalization in manufacturing SMEs and to propose a validated measurement model. By doing so, the article aims to provide a foundation for more advanced studies linking specific digitalization patterns to firm performance and competitiveness in the context of Industry 4.0.

Methods:

The study is based on survey data collected from 150 small and medium-sized enterprises in the Polish furniture manufacturing industry. Exploratory Factor Analysis (EFA) was conducted using principal components extraction with Varimax rotation. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.909, and Bartlett's test of sphericity was significant ($\chi^2(210) = 2107.893$; $p < 0.001$), confirming the dataset's suitability for factor analysis. A loading threshold of 0.50 was applied.

Findings & value added:

The analysis revealed a four-factor structure of digitalization with good statistical properties, explaining 67.12% of the total variance. The four dimensions identified were: (1) Digitalization of Operational Processes, (2) Digitalization of Supply Chains, (3) Digital Infrastructure, and (4) Digital Customization. These results provide a validated framework that can be used to better understand the digital transformation pathways of SMEs. The findings have both theoretical and practical implications, offering policymakers and managers a robust tool to assess and enhance digital maturity in small firms. This can be useful in the context of mitigating the digital gap between European and Southeast Asian economies.

Keywords: digitalization; small and medium-sized enterprises (SME); exploratory factor analysis; Industry 4.0; furniture manufacturing; Poland

3.2. Development of Digitalization of Family Businesses in Thailand

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Abstract

Research background:

Family businesses are considered to be the oldest and most common form of entrepreneurship in the world, and they play an increasingly important role in the modern economy. This role is played both in the global economy and the Thailand economy – they generate national income, create many jobs and influence the formation of organizational culture. Family businesses in Thailand are growing rapidly and are now the backbone of Thailand's economy. In 2018, these organizations generated a value of THB 28 trillion, which was about 72 per cent of the value of all businesses in Thailand. In the modern economy, one of the important aspects of the functioning of family organizations is digital technology, which includes digitization, digitalization, and digital transformation. These processes are used by family businesses to improve and adapt existing organizational solutions. As a result, they also contribute to greater liquidity and efficiency of the organization's operations, which leads to an increase in their competitiveness and opening up to new markets and new customers. The development of the digitization of family organizations in Thailand is very important because it can determine the strength and success of these enterprises in the current world. However, despite this, Thai family organizations do not prioritize the digital transformation of their business. For this reason, the author of this paper became interested in this topic and decided to explore it.

A preliminary analysis of the literature on the subject, taking into account bibliometric research within the Web of Science and Scopus databases, revealed the existence of a research gap concerning the identification of only a few scientific publications devoted to this subject. As a result, undertaking theoretical and cognitive research, based on the literature and analysis of specialized reports and other statistical and empirical documents, turned out to be necessary to be able to achieve the scientific goal and solve the research problem in this area.

Purpose of the article:

The purpose of the article is to indicate and describe the importance and significance of digitization in the activities of family businesses in Thailand. The article poses a research question: do family businesses in Thailand implement digitization processes in practice, and if so, to what extent.

Methods:

In order to achieve the aim of the study, the method of qualitative research through a critical analysis of the literature on the subject was used. In addition, reports and other statistical and analytical documents were also included, allowing to achieve the goal of the study and solve the research problem formulated above.

For this purpose, publications were used in the field of digitization of family businesses. An analysis was carried out on the basis of reports (2019-2023) on the level of digitization of family businesses in Thailand.

Findings & value added:

The added value in the cognitive aspect of this work consists in systematizing and detailing the concepts, indicating the essence and specificity of family businesses and their level of digitization. This was done on the basis of literature on the subject including scientific publications, specialist reports and other source documents of a statistical and analytical nature. The added value in the utilitarian area is related to the analysis of reports, through the presentation of conclusions and indications resulting from them, including relevant recommendations, which may be an important element of knowledge to be used by entrepreneurs in the future in the field of vision of the development of their organization in the light of the volatility of the economic market and the conditions of their operations.

Keywords: family business in Thailand, digitization, digital transformation, development of digitization.

3.3. Digital versus Physical Touchpoints: The Role of Value Perceptions and Consumer Expertise in Organic Personal Care Repurchase

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Abstract

Research background:

Organic personal care products (OPCPs) are increasingly purchased through both digital touchpoints (e.g., e-commerce platforms, social media channels) and physical ones (e.g., department stores, in-store consultations) in Asian markets. While prior research has extensively examined initial purchase decisions, relatively little is known about how consumers form intentions to repurchase through the same type of channel—a behavior we term channel-consistent repurchase. Understanding this mechanism is especially important in symbolically and experientially rich product categories, where value formation is closely tied to the nature of the channel experience.

Purpose of the article:

To address this gap, this study integrates the Theory of Consumption Values (TCV) and Expectation-Confirmation Theory (ECT) to examine how four post-use value perceptions, namely hedonic, efficacy, health, and environmental value influence channel-consistent repurchase intention. It further explores the moderating role of consumer expertise and whether these effects vary by channel type (online vs. offline).

Methods:

The study adopts a two-stage mixed-method design. An exploratory online focus group (n = 6) was conducted to validate key value dimensions, followed by a large-scale survey (n = 298) with Chinese OPCP users. Data were analyzed using partial least squares structural equation modeling (PLS-SEM) and multi-group analysis (PLS-MGA).

Findings & value added:

Results indicate that, overall and without differentiating by channel, consumers' repurchase intention is significantly driven by hedonic, efficacy, and health values. Surprisingly, environmental value shows no effect, challenging prevailing assumptions about sustainability-driven loyalty in the OPCP category. Channel-based analysis reveals important differences: hedonic value is the dominant driver in offline settings but plays virtually no role online. Efficacy and health values are significant drivers in both contexts, while online repurchase relies exclusively on these two dimensions, reflecting a more rational and outcome-oriented logic. Furthermore, consumer expertise significantly reduces the influence of hedonic value, particularly in offline contexts. As consumers gain experience, they become less swayed by hedonic cues, especially in physical environments, possibly due to increasing skepticism toward overly pleasurable packaging or presentation, which may signal greenwashing rather than genuine product quality.

This study contributes to omnichannel literature by introducing channel-consistent repurchase as a novel behavioral outcome, extending TCV to post-use contexts, and identifying channel-contingent value salience. Managerially, it offers actionable insights for tailoring value communications to channel type and consumer expertise level.

Keywords: Omnichannel retail, consumption values, expectation-confirmation theory, repurchase intention, consumer expertise, organic personal care products, China.

3.4. Dissecting the Digital Divide: Aspect-Based Sentiment Mining on Indonesia and Montenegro Tourism Discourse

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Abstract

Research background:

Tourism is one of the sectors that has been greatly impacted by the Covid-19 pandemic. Digitalization plays a crucial role in improving operational efficiency, tourism experiences, and personalization of services, especially in the context of post-Covid-19 pandemic recovery. With the projected growth of Indonesia's digital economy value estimated to reach USD 210–260 billion by 2030, the tourism sector is expected to become one of the main pillars of economic growth and job creation. In addition to Indonesia, Montenegro is one of the countries in Europe that also has a growing tourism sector. Learning between the two countries in terms of implementing digitalization in tourism is expected to provide insights that can be used as a basis for policy development strategies.

Purpose of the article:

This study aims to analyze the differences in tourism digitalization between Indonesia and Montenegro using the Aspect-Based Sentiment Analysis (ABSA) approach. This analysis will reveal important aspects such as digital payment systems, information quality, user experience (UX/UI), interactivity, and security that affect tourist satisfaction.

Methods:

The methodology used consists of three main stages. First, review data is collected through web scraping techniques from tourism reviews in several provinces with the highest number of visits. Second, the obtained dataset was analyzed using ABSA with two Large Language Model (LLM) models, namely Qwen and DeepSeek, which were chosen because of their ability to support multiple languages and their advantages in multi-class sentiment analysis. Third, the results of the analysis were visualized to provide in-depth insights into the advantages and disadvantages of digital tourism services in each country.

Findings & value added:

The output of this study is the formation of a labeled dataset that shows sentiment and digital aspects of tourism, as well as visualization of the analysis results that can be the basis for strategic policy making by tourism industry players.

Keywords: digital divide; aspect-based sentiment analysis; Indonesia; Montenegro; tourism

3.5. Beyond Usability: Unveiling Motivational Resistance in the Digital Transformation of Indonesian Healthcare Systems

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Abstract

Research background:

Digital transformation has become a global policy imperative, particularly in sectors like healthcare where information efficiency, service integration, and traceability are vital to improving outcomes. In some developing countries, public and private investments have accelerated the deployment of digital health systems. Yet, a recurring issue persists: while systems are installed, their usage remains sporadic (Amir *et.al.* 2024), passive (Ezeudoka and Fan 2024), or reluctant (Ezeudoka and Fan 2024), especially among frontline health workers.

The conventional interpretation of this phenomenon tends to focus on technical or logistical constraints, such as limited internet bandwidth, lack of training, or misaligned workflows (Nascimento *et. al.* 2023). While these are undoubtedly influential, our study suggests that an equally critical but less explored domain lies in motivational disengagement: the phenomenon where individuals, despite having access and training, refrain from deep system use due to psychological, emotional, or normative hesitations (Milne-Ives *et. al.* 2024).

Existing frameworks such as TAM (Davis 1989), UTAUT (Venkatesh *et. al.* 2003), and TTF (Goodhue & Thompson 1995) have laid a strong foundation for analysing digital adoption. However, these models often assume rational actor behaviour and presume that users are motivated to optimize efficiency once technical barriers are removed. This assumption does not always hold true in environments shaped by rigid hierarchies, cultural constraints, and legacy mindsets.

Theoretical Framework: Conventional Models of Digital Adoption

TAM, UTAUT, and TTF have each made major contributions to the understanding of digital technology uptake. These models operationalize user engagement through constructs such as perceived usefulness, effort expectancy, facilitating conditions, and task-technology alignment. Their effectiveness in explaining large-scale trends has been validated across sectors and countries (Spies *et. al.* 2020). Yet, these models are not without critique.

TAM, while parsimonious, reduces user perception to utility and ease, neglecting deeper emotional or cultural attachments to traditional practices. UTAUT improves upon this by incorporating social and institutional pressures, but still presumes adoption follows logically from social norms and support. TTF addresses functional alignment but overlooks whether users feel that their values, identities, or professional roles are reflected in the system design.

In real-world settings, especially in public health systems characterized by bureaucratic inertia and protocol dominance, these models risk oversimplifying the very human motivations behind resistance. Our paper responds to this gap by introducing motivational disengagement as a third layer of digital readiness, alongside the well-studied structural and cognitive dimensions.

Szabó (2024) offers a compelling refinement to existing models by proposing that motivational disengagement arises when users experience emotional detachment, perceived irrelevance, or loss of agency in digital transformation processes. These psychological states are not irrational but are often grounded in real-world misalignments: systems that fail to reflect user workflow, cultural expectations, or interpersonal dynamics.

In the healthcare context, motivational resistance may manifest through habitual preference for paper-based systems (even when digital alternatives are technically superior), passive compliance due to managerial enforcement rather than genuine buy-in, or selective use, where only the minimally required modules are adopted, leaving core features unused.

By positioning motivational barriers as central rather than residual, this study seeks to broaden the conceptual toolkit available to scholars and practitioners involved in digital transformation initiatives.

Purpose of the article:

In this working paper, we explore two contrasting healthcare institutions in Indonesia: a rural clinic in Central Java and an urban hospital in Gorontalo. Both have adopted digital systems, yet neither has achieved deep, sustained use across all departments. This paper explores why that is, using a hybrid framework of TAM, TTF, and UTAUT enriched by Szabó's motivational lens (Szabó 2024). The findings offer early evidence for expanding the adoption discourse to include non-rational, affective, and culturally contingent factors.

Methods:

The research adopts a comparative, partially mixed-methods approach, selecting two case sites that vary in geography, institutional culture, and degree of system maturity. In Case 1, we investigate a small rural clinic operating with relative autonomy. In Case 2, we examine a larger, urban hospital embedded in hierarchical governance.

The mixed-methods design includes: 1) Quantitative instruments derived from validated TAM and UTAUT constructs; 2) Descriptive and inferential statistics including path modelling and T-tests; 3) Qualitative interviews with system users, developers, and administrators; and 4) Motivational interpretation using Szabó's framework. This design enables triangulation between measurable adoption factors and latent psychological indicators, providing a multi-dimensional view of technology use behaviour.

Findings & value added:**Case 1: The Rural E-Clinic (TAM-Based Analysis)**

Survey results show high perceived ease of use and usefulness. Most staff agree that the system improves patient services and reduces administrative errors. However, path analysis reveals that intention to use the system (BI) is only weakly predicted by these variables. Interviews reveal emotional reservations, particularly around unfamiliar modules, lack of ownership in system design, and sporadic training sessions.

Users articulate statements like, *"I still use the ledger because it feels more personal"* or *"I only use the system when the supervisor is around."* These remarks reflect a motivational hesitancy rooted not in ignorance or fear, but in disconnection from the system's development and from perceived relevance to daily clinical work.

Case 2: The Urban SIMRS (UTAUT–TTF Analysis)

The urban hospital exhibits more structured adoption. Survey responses indicate strong support for system reliability, facilitating conditions, and perceived performance expectancy. However, when actual use behaviour is measured, only a fraction of users employs the full range of SIMRS features.

Importantly, the power distance index signals a latent tension: decisions are made by top management, often without frontline input. This results in symbolic compliance rather than active engagement. Despite the appearance of success, deep use remains limited. TTF analysis shows that misalignment between system modules and departmental workflows contributes to quiet disengagement.

Discussion: From Models to Meaning

Both cases demonstrate the limitations of conventional models in predicting realworld behaviour. Favourable scores in TAM, TTF, and UTAUT do not guarantee high adoption. What these models fail to capture is the emotional reality of system use: reluctance, indifference, or outright psychological fatigue.

By applying the motivational lens, we surface insights otherwise hidden. In the rural clinic, digital detachment stems from isolation and undertraining. In the urban hospital, disengagement is masked by formal compliance and low participatory governance. These dynamics reveal the fragility of digital transformation when motivational alignment is absent. Thus, We argue that motivation must be treated not as noise in the model, but as signal, meaning that a crucial explanatory force in understanding why systems succeed, stall, or fail.

Conclusion and Future Directions

This working paper offers an early but significant contribution to rethinking how we conceptualize digital adoption in healthcare. The findings underscore that even when infrastructure, literacy, and managerial support are present, psychological dissonance and disengagement can erode transformation efforts. We advocate for an expansion of existing models to include motivational constructs as first-class elements.

Next steps included developing an integrated adoption-motivation index that combines TAM/UTAUT variables with psychological readiness markers, piloting motivationally attuned training interventions in similar healthcare settings, scaling the study to additional institutions to test external validity.

Keywords: motivational resistance, digital transformation, healthcare systems

Part 4. Youth in the Era of Digital Transformation

4.1. Mapping Digital Behaviors and AI Perceptions: A Descriptive Profiling of University Students in Krakow

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Abstract

Research background:

The persistence of digital inequalities within Europe's higher education sector remains understudied, particularly regarding how students engage with technology in their academic and personal lives. This study examines the digital behaviors and competencies of Bachelor's students at Krakow University of Economics, where 169 participants provided insights into their daily device usage, self-assessed digital skills, and awareness of artificial intelligence applications. As digital fluency becomes increasingly tied to educational and professional success, this research offers timely evidence of how a key demographic of economics students in a major European university navigates the digital landscape.

Purpose of the article:

This paper seeks to establish baseline data on three critical dimensions of the digital divide: the allocation of time across different digital devices for various activities, patterns in self-reported digital competencies across multiple skill domains, and emerging attitudes toward artificial intelligence. By focusing on these interconnected aspects, the study aims to identify potential disparities in technology adoption and digital literacy that may inform institutional strategies for digital education.

Methods:

The research employed a comprehensive survey instrument collecting quantitative data across several key areas. Demographic information including age, gender, and academic year was recorded alongside detailed accounts of daily device usage patterns for smartphones, tablets, laptops and desktop computers. Participants self-evaluated their proficiency in ten digital skill areas using a standardized 5-point Likert scale. The survey also captured qualitative and quantitative data on AI awareness through frequency measures about perceived benefits and concerns. All data were analyzed using descriptive statistical methods to identify the distribution patterns.

Findings & value added:

Preliminary analysis reveals several notable trends in student technology engagement. Smartphones emerge as the dominant device for entertainment purposes, while laptops show stronger association with academic activities. Self-assessed digital skills present an interesting distribution, with highest ratings in productivity tools like word processing and lowest in technical areas like programming. Regarding AI awareness, many respondents report strong encounters with AI applications, with majority recognize potential educational benefits. Meanwhile, privacy concerns appear as a prominent theme in qualitative responses. This study contributes to the growing literature on digital inequalities in higher education by providing empirical evidence from a European economics university context. The detailed profiling of device usage patterns coupled with comprehensive skill assessments offers educators and policymakers specific targets for digital literacy interventions. Furthermore, the documentation of emerging AI perceptions provides a foundation for future research on technology acceptance in educational settings. The methodological approach demonstrates how similar institutions might conduct self-assessments of their students' digital readiness.

Keywords: digital divide, technology adoption, digital literacy, artificial intelligence, higher education

4.2. Sentiment toward Digitalization: a Comparative Study of Polish and Indonesian Youth

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Abstract

Research background:

Digitalization is one of the significant phenomena that captures the attention of researchers in various scientific disciplines. The discussion about the impact of digitalization on organizations and society has intensified in recent years highlighting its role not only in enhancing access to knowledge but also in fundamentally reshaping organizational functions and public services. Digitalization contributes significantly to economic development and social well-being by enabling the efficient dissemination and use of information, improving business operations and fostering innovation. While extensive research has addressed the organizational and economic dimensions of digitalization, relatively little attention has been paid to individuals' emotional and psychological responses – particularly fear and satisfaction – toward digital transformation. Recent studies emphasize the need for more citizen-centered research exploring the impact of digitalization on individuals and societies, as well as the long-term societal consequences of implementing digital technologies.

Purpose of the article:

The purpose of the study is to analyze individual sentiments toward digitalization in Southeast Asia and Poland. This research aims to explore how individuals in these regions perceive and respond to digital transformation, considering factors such as digital infrastructure, access, literacy, and cultural attitudes. Understanding these sentiments is crucial for developing effective digital policies and strategies that align with the needs and expectations of the populations in Southeast Asia and Poland.

Methods:

In this paper, we examine the factors influencing satisfaction and fear related to digitalization among Polish and Indonesian students. Using Structural Equation Modeling (SEM), we identify key drivers behind these sentiments.

Findings & value added:

Our results show that fear is predominantly shaped by concerns over the expansion of artificial intelligence and the risk of digital unemployment, despite other issues – such as fake news, digital addiction, and cybercrime – being perceived as more prevalent. In terms of satisfaction, institutional engagement and the quality of public digital services emerge as the most influential factors, underscoring the importance of policy and infrastructure in ensuring an inclusive and equitable digital transition. Digital competencies and openness to new technologies also play a meaningful role. While general patterns are consistent across both countries, we find notable differences: Indonesian students report significantly higher levels of fear and lower levels of satisfaction compared to their Polish counterparts.

Keywords: digitalization, survey study, model SEM, Poland, Indonesia

4.3. Digital Gender Divide: Assessing Experience of Online Gender-Based Violence (OGBV) Among University Students in Indonesia and Montenegro

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Abstract

Research background:

As the world becomes more digital, the phenomenon of gender inequality that has been a long persistent issue in many countries has expanded to the online sphere, creating a digital gender divide. Online Gender-Based Violence (OGBV) is one of many issues of inequality in the digital gender divide and is another form of violence threatening women and girls based on their identity. This research discusses OGBV among university students in Indonesia and Montenegro, and examines the occurrence of OGBV incidents, its impacts, as well as efforts and measures in combating such incidents.

Purpose of the article:

This study aims to assess the prevalence and types of OGBV experienced or witnessed by university students in both countries and explore their perceptions of the prevention and actions taken by universities and governments regarding cases of OGBV. It hopes to contribute to better understanding and more effective strategies in preventing OGBV in both countries, specifically in higher education institutions environment.

Methods:

This study uses qualitative method and conducted data collection through questionnaires filled by students in both Indonesia and Montenegro, who answered questions related to internet habits, experience in OGBV, actions in reporting OGBV cases, and what they think could be effective measures in preventing OGBV. It employs an approach of technofeminism by Wajcman that highlights patriarchal structures of technology development and its relations to sex and class. It helps to provide clarity in the analysis of this paper as the advancement of online and digital technology is unavoidable, and OGBV is both a consequence and a cause of the digital gender divide. Therefore, tackling one requires tackling the other through intersectional, feminist, and structural policy approaches.

Findings & value added:

The findings of this study discovers that almost half of the respondents have experienced or witnessed OGBV yet the majority of them chose to not report it for various reasons. Many have limited confidence in authorities while some have difficulties in figuring out the mechanism of reporting, as well as fear of social stigma of being judged, and fear of retaliation. Although respondents of this research might not represent the overall sentiments or current circumstances in both countries, expectations on better strategies in combating OGBV such as stronger legal frameworks, digital safety education, university support services, and stricter regulation of online platforms are still an important recommendation to be considered by managerial boards of universities, governments, and law enforcement in Indonesia and Montenegro.

Keywords: Online Gender-Based Violence, Indonesia, Montenegro

Summary and Conclusions

This publication, presenting the results of research conducted within the framework of the ODDEA – *Overcoming Digital Divide in Europe and South-East Asia* research project (HORIZON-MSCA-2021-SE-01-1, No. 101086381), reveals the complexity of digitalisation processes from a European – Asian perspective, combining multiple analytical approaches: macroeconomic and microeconomic, institutional, sectoral and social. The studies presented herein confirm that digital transformation is not a uniform phenomenon: its pace, directions and outcomes vary considerably across regions, countries and industries. The observed *digital divide* arises from disparities in the numerous factors shaping the digitalisation process, encompassing, among others, infrastructural, competency-related, regulatory, economic and social dimensions.

In the first part of the volume, the authors demonstrate that the level of infrastructure development, investment in ICT and the advancement of digital competences translate directly into productivity, labour market performance and economic growth. At the same time, they argue that the effects of digitalisation are not automatic: they depend on the intensity and quality of technology use (rather than its mere availability), as well as on the quality of the regulatory environment and the effectiveness of public policies aimed at inclusiveness and the reduction of digital inequalities.

The second part places particular emphasis on the role of institutions as catalysts of digitalisation outcomes. High standards of governance, regulatory predictability and market competitiveness determine whether digital processes, in a broad sense, generate sustainable developmental benefits. These benefits manifest not only in economic growth but also in inclusiveness, innovation, long-term stability and the adaptive capacity of economies and societies. The findings clearly indicate that technological infrastructure alone is insufficient: it is the intensity and manner of technology use, embedded in a supportive institutional and market environment, that determine the tangible effects of digital transformation.

The third part exposes the diversity of digitalisation pathways across enterprises and sectors. The proposed tools for assessing the digital maturity of SMEs and the case studies presented illustrate that the success of transformation depends on the alignment of technologies with business processes and models, as well as on the organisational and motivational readiness of end users. Barriers to digital transformation are seldom purely technical; more often, they are rooted in organisational culture and managerial practices.

In the fourth part, attention shifts towards the younger generation – the principal co-creators and beneficiaries of the digital world. Analyses of attitudes towards artificial intelligence, digital competences, perceptions of digitalisation processes and experiences of online abuse demonstrate that, alongside technological investments, there is a pressing need for educational, preventive and institutional measures (including at universities) to mitigate risks and strengthen user agency.

In conclusion, the research presented in this volume demonstrates that digitalisation in Europe and Asia is a multidimensional process characterised by the growing importance of digital competences, institutional quality, regulatory environments and openness to competition. Significant differences, however, remain with regard to the pace, direction and consequences of digital transformation. In relation to the research problem posed in the introduction, it may be concluded that the course of digitalisation processes and the challenges they encounter in both regions exhibit both similarities and clear divergences, arising from distinct infrastructural, institutional, economic and socio-cultural conditions. From the perspective of public policy, it becomes crucial to design tailor-made interventions – those that account for the systemic specificities resulting from the overall functioning of a given country's

or region's economic, political and institutional framework, as well as for sectoral and socio-cultural characteristics.

The findings presented herein identify areas for further exploration of digital transformation, including analyses of how institutional quality, public policy and market competition shape the tangible outcomes of digitalisation across regions. Further research is also required on measuring both the intensity and the quality of technology implementation in different sectors and enterprises, particularly in relation to cultural and organisational barriers. Another important direction concerns the social consequences of digital transformation, especially attitudes towards new technologies, the risks of digital exclusion and mechanisms for enhancing inclusiveness.

Although the present volume does not provide a complete resolution to the research problem formulated in the introduction, it nonetheless represents a significant step towards a deeper understanding of the mechanisms of digital transformation and its implications for economies and societies. It is our hope that the conclusions presented here will prove valuable both to the academic community and to practitioners and policymakers responsible for shaping digital strategies.

The editors wish to express their sincere gratitude to the authors of the individual papers for their substantive contributions, as well as to the ODDEA project partners for their collaboration and support, which have made the preparation of this publication possible.

Barbara Siuta-Tokarska, Katarzyna Żmija