Finanțat de Uniunea Europeană NextGenerationEU
Planul Național de Redresare și Reziliență

Breaking barriers: an expanded TOE framework for identifying main barriers in digital technology adoption within the service sector

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„TRANSFORMING PEOPLE AND PROCESSES FOR A BETTER WORLD”
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Agenda

1. Introduction

2. Literature Review

3. Methodology

4. Results

5. Discussion and conclusion

Introduction

The process of digitalization varies across organizations, with many encountering significant barriers that hinder them from fully harnessing the benefits of digital technologies.

The **adoption of digital technologies** has experienced **rapid acceleration**, particularly in the aftermath of the COVID-19 pandemic, **primarily in the service sector**.

(RQ) What are the most important factors that affect technology adoption in the service sector?

Technology–Organization–Environment (TOE) framework to examine the factors affecting the adoption of digital technologies.

Recognizing that the TOE framework does not include behavioral aspects, the present study **extends the TOE framework by incorporating the behavioral dimension.**

Semi-structured interviews -> Content analysis (QualCoder)

Source: own construction

Inclusion criteria

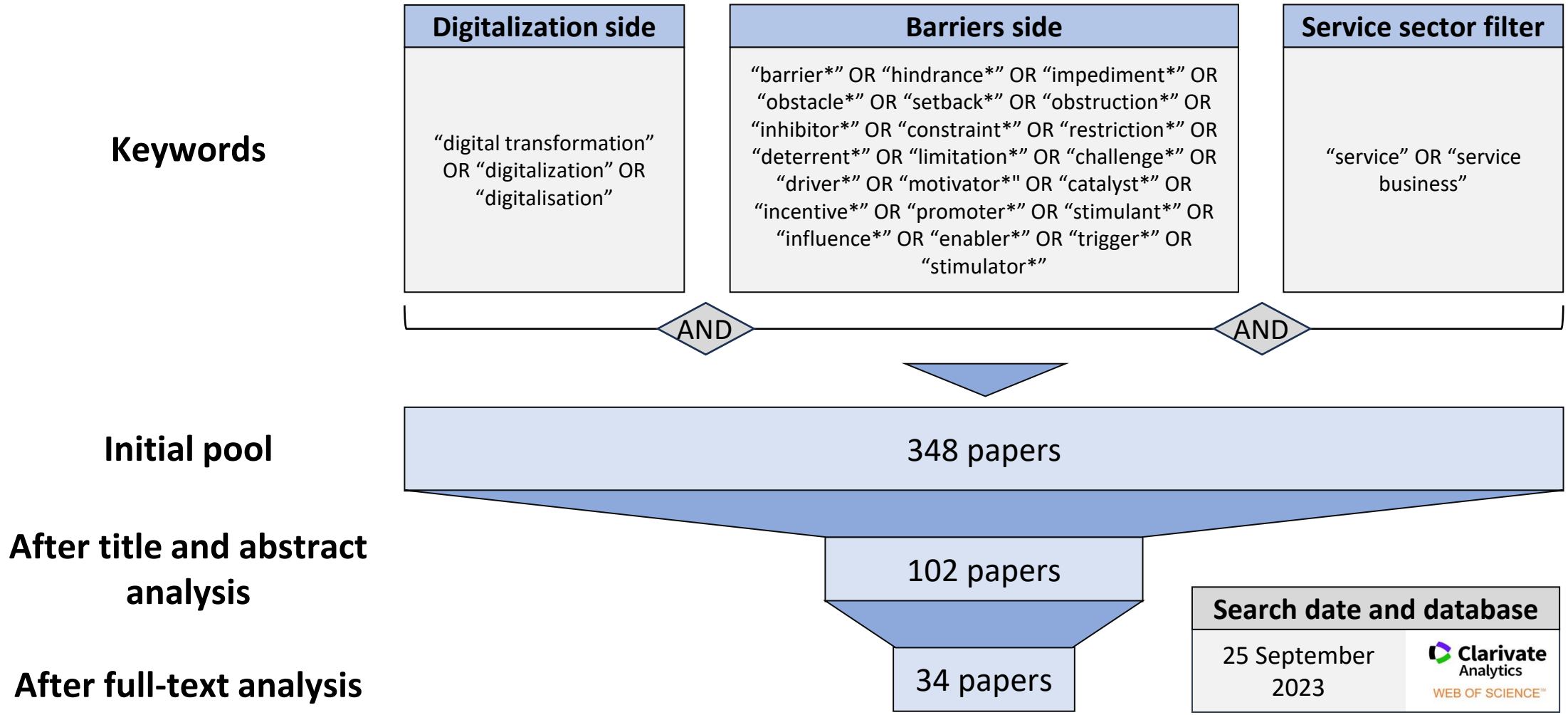
To map current literature, we have conducted a systematic literature review based on the recommendations of Durach et al. (2017). Several inclusion criteria have been defined to create a relevant initial pool of sources.

Inclusion criteria	Detailed argument
(a) Papers written in English.	English is the dominant research language in business and economics research; the use of English ensures the accessibility and comparability of our results.
(b) Type of publication: scientific article.	We focus only on high-quality, peer-reviewed scientific papers, where a rigorous review process ensures the reliability of the results. Other publication types, such as conference papers or book chapters are excluded. Literature reviews and conceptual papers were also excluded, only the empirical papers were analysed.
(c) Based on its topic, the journal is included in at least one of the Management, Business, Business Finance or Economics categories in Web of Science.	This review focuses exclusively on the managerial and economic-related barriers to digital transformation.
(d) The paper focuses on the barriers of digital transformation in the service sector.	Various barriers to change have been identified in the literature, but this research focuses only on the barriers related to digital transformation and in addition only in the service sector.

Source: own construction

Keyword selection

In operationalizing the last inclusion criterion (d), several keywords have been defined to identify potentially relevant articles. These keywords were established in connection with the two main domains of investigation: digitalization and its barriers.

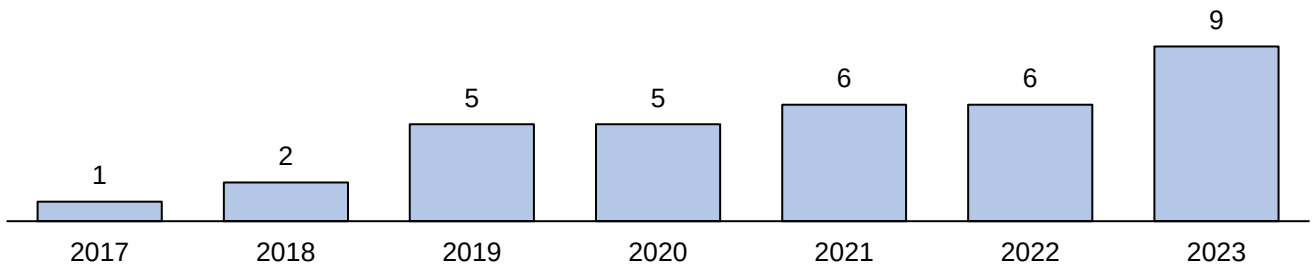


Source: own construction

Summary of findings from the literature review

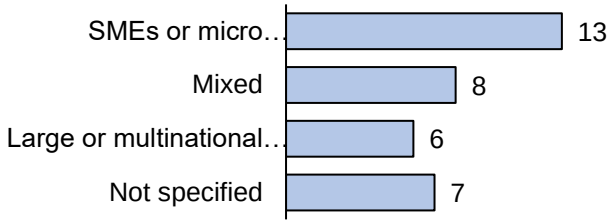
Barriers associated with DT may emerge in any country, irrespective of its level of development. The balanced distribution of research across different country categories underlines the universal nature of challenges related to DT.

Number of papers by publishing years

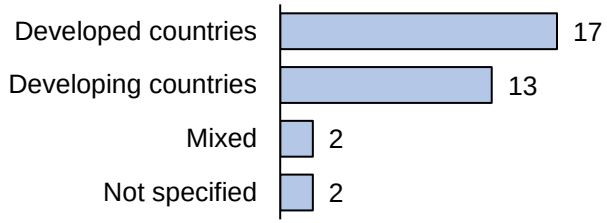


Number of papers by countries

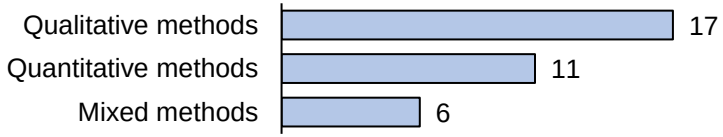
Company types analysed (number of papers)



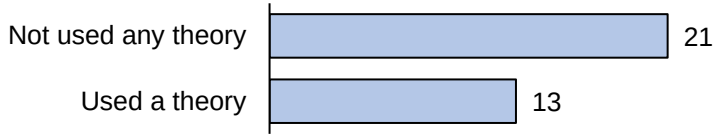
Sample countries analysed (number of papers)



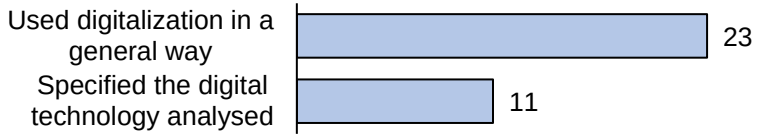
Number of papers by research methodologies



Number of papers by the use of a theory



Number of papers by applying a theory or not



Source: own construction

Summary of the literature results about barriers and drivers

In today's business landscape, adopting digital technologies is essential for competitiveness and efficiency.

Barriers

Dimension	Variable	Count	SUM
Technology	Effort expectancy	2	8
	Perceived risk	1	
	Innovation process	1	
	Wrong IT perceptions	1	
	Old technology	1	
	Lack of infrastructure and capacities	2	
Organisation	Lack of knowledge	4	38
	Lack of financial resources	3	
	Missaligned digital strategy	7	
	Poor leadership	2	
	Lack of resources	6	
	Lack of strategy	9	
	Lack of skills and capabilities	6	
	Ethical and security issues	1	
Environment	Customers' aversion to change	1	8
	Fear of dependence on the technological provider/ partner	1	
	Lack of integration of activities conducted with the network of actors	1	
	Structural and cultural barriers	1	
	Legal barriers	1	
	Lack of government subsidies and innovation governance	3	
Behavioral	Resistance to use	1	16
	Resistance to change	5	
	Organizational culture	1	
	Lack of knowledge generating capabilities	2	
	Satisfaction with the status quo	1	
	Competence of the members	1	
	Negative attitudes towards learning	3	
	Lack of motivation	1	
	Anxiety	1	

Enablers

Dimension	Variable	Count	SUM
Technology	Perceived usefulness	1	15
	Digital readiness and orientation	4	
	Infrastructure and technological compatibility	8	
	Perceived ease of use	2	
Organisation	Knowledge sharing	2	32
	Sufficient funds	2	
	Access to resources	3	
	Supportive leadership	3	
	Innovation culture	3	
	Developed strategy	12	
	Necessary skills	6	
	Enhanced security	1	
Environment	Adoption to customers' needs	4	9
	Interaction with industry actors	1	
	Proper digital integration	3	
	Compliance with new regulations	1	
Behavioral	Self-efficacy	4	5
	Customer involvement	1	

Source: own construction

Methodology

Drawing from literature findings, a semi-structured interview protocol was meticulously crafted to facilitate exploratory discussions, thereby integrating insights from industry experts.

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The interview guide encompassed ten distinct blocks, commencing with an overview of the company, delving into the digitalization context, motivations, and implementation strategies, and progressing to explore employee attitudes and expectations regarding the introduced technologies. Additionally, it probed into the barriers, enablers, and behavioral aspects of the digitalization process.

Sample:

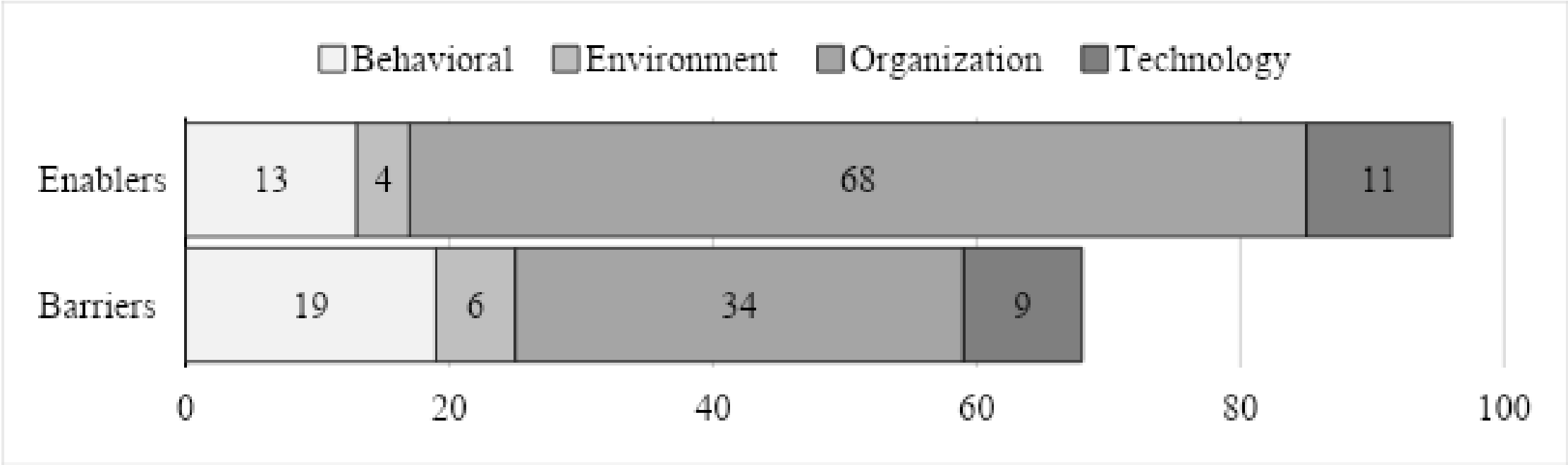
Subsequently, the **interviews were transcribed**, and the qualitative data **were analyzed using QualCoder**.

Company code	Country	Sector	Interview duration	Date
A	Hungary	Energy services	60 min	30.01.2024
B	Hungary	IT service provider	60 min	20.03.2024
C	Romania	Travel agency	80 min	15.03.2024
D	Romania	IT consultancy	60 min	31.05.2024
E	Hungary	IT consultancy	60 min	10.06.2024
F	Hungary	IT consultancy	45 min	07.06.2024

Source: own construction

Main results

Based on the interviews, this research identified more enablers (96) than barriers (68). In both cases, organizational factors are the most frequent ones, highlighting the importance of aligning digitalization with the organization.



Source: own construction

Main results

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Barriers

Dimension	Variable	Count	SUM
Behavioral	Fear of growth	2	19
	Lack of motivation	2	
	Passive mindset	3	
	Resistance to change	8	
	Resistance to learn	2	
	Unreasonable mimic	2	
Environment	Cultural differences	1	6
	Generational gap	1	
	PES factors	4	
Organization	Destructive culture	2	34
	Lack of benchmark practices	1	
	Lack of business honesty	3	
	Lack of business process alignment	2	
	Lack of communication	1	
	Lack of education	1	
	Lack of knowledge	3	
	Lack of skilled workforce	3	
	Lack of skills	2	
	Lack of technology integration	1	
	Missevaluation of workforce	2	
	Poor client-company cooperation	4	
	Poor leadership	6	
	Project visionary fail	3	
Technology	Lack of business proof	4	9
	Lack of technological infrastructure	3	
	Poor specification	1	
	Technology misalignment	1	

Enablers

Dimension	Variable	Count	SUM
Behavioral	Need for digitalization	2	13
	Openess to change	8	
	Openess to learn	2	
	Trust	1	
Environment	Competitive landscape	1	4
	Young workforce	3	
Organization	Agile management	4	68
	Bottom-up input	2	
	Business strategy	7	
	Continous improvement	2	
	Cooperation with branches	3	
	Cooperation with departments	3	
	Dedicated responsible	1	
	Experienced workforce	4	
	Feedback system	4	
	Good benchmarking	1	
	Good client management	2	
	Good coordination	1	
	Good leadership	6	
	Knowledge base	2	
	Leading by example	2	
	Learning abilities	2	
	Market monitorization	1	
	Process management	2	
	Proper expression of needs	1	
	Skilled workforce	8	
	Specialized departments	1	
	Support from employees	2	
	Support from management team	1	
	Training programme	5	
	Transparent communication	1	
Technology	Customizability	3	11
	Easy-to-use	1	
	Interconnectivity	1	
	Perceived usefulness	2	
	Technological innovation	3	
	Technological maturity	1	

Source: own construction

Main results

Based on the interviews, this research identified more enablers (96) than barriers (68). In both cases, organizational factors are the most frequent ones, highlighting the importance of aligning digitalization with the organization.

Organizational enablers

skilled workforce, a well-developed business strategy, and good leadership are the basis

Alignment of technological initiatives with business objectives

"It works well, and it is correct if it starts from business motivation."

Clear business vision

"To achieve business motivation, you need everything else, but it is correct if you have a business vision."

Good leadership

"A lot depends on an enlightened leader."

Skilled workforce

"Yes, we had an advantage in that most employees already understood the technology."

Behavioral enablers

Openness to change is essential

Openness to change

"*Perhaps openness to change is an aspect of this culture, as these IT solutions can change quickly and develop from nothing."*

Culture of learning

"Learning is very important to the company."

"The most important thing is to have learning in the value system. I think this is the most crucial aspect of digitalization."

Technology enablers

infrastructure and technological compatibility ≠ customizability and perceived usefulness of technology

Customization

"If the decision is to handle money in the form of travel agency activities, then this methodology can be implemented, fully customized, made country specific. If a new payment method appears elsewhere, it can be introduced in a similar manner."

PU

"They expected increased efficiency. It should help processes operate more efficiently."

Source: own construction

Main results

Based on the interviews, this research identified more enablers (96) than barriers (68). In both cases, organizational factors are the most frequent ones, highlighting the importance of aligning digitalization with the organization.

Organizational barriers

Poor leadership, power-centric approach, lack of necessary skills, lack of communication

Poor leadership

"After the 2008 crisis, the management culture in Hungary became extremely insular, and over the past 11-12 years, it has dramatically declined."

Hierarchical and power-centric approach

"In conservative management logic, everything is a power issue. If we place digital competences in new organizational silos, these projects will have no substantive impact. They will purely be conduits of power struggles."

Lack of training

"Training for users often does not happen, and that hinders the process. I am thinking of internal users, like a cashier who should be using the software."

Behavioral barriers

Lack of internal motivation

Lack of motivation

"There is no internal motivation to learn and use new things. I think this is a very strong barrier."

Resistant to change

"There are always a few who grumble when there is a change."

"Generally speaking, people do not like change. Whenever there is a major modification or a complete change of logic, it is harder for them to accept it."

Technology barriers

Lack of technological infrastructure, lack of business proof and poor technical specification of the technology

Inadequate specification of requirements

"The specification was not very precise, not very detailed in a particular development area."

Lack of justification

"In many places, there is no business goal behind the technological implementations."

Deficiencies in existing technology infrastructure

So far, they have solved everything, but there was something they couldn't do; at one point, they said it couldn't be done. We asked for something, and they said it couldn't be done with the current program."

Source: own construction

Discussion and conclusion

This research makes a fair contribution to the understanding of digital technology adoption within the service sector by expanding the traditional Technology-Organization-Environment (TOE) framework to include behavioral factors.

TOE model extension: role of **human behvaior**

Factors to manage during implementation / organizational change
("heat map" for the allocation of management attention & resources)

No one best way – **common pitfalls** but **different routes** to avoid them

The capability to increase profitability through digitalization remains to be a differentiator for **competitiveness**

To be continued...

Source: own construction

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Source: own construction

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Thank you!

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Appendix