BARRIERS AND ENABLERS OF AGILITY DEVELOPMENT IN INDUSTRIAL ENTERPRISES

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Abstract

In today's volatile business environment, an agile approach to business management is a key aspect of sustainable competitiveness. Knowing how to build agility in the enterprise is an essential skill for managers. The aim of this paper is to analyse the barriers and enablers of the enterprise agility development and their perception by managers of Slovak industrial enterprises. To achieve the stated objective, secondary research was conducted in order to summarize the findings and create a unified interpretation, as well as a primary survey in Slovak industrial enterprises by means of a questionnaire. The result and contribution of this study is the unification of the conceptual apparatus in the field of barriers and enablers of agility and empirical knowledge from the environment of Slovak entrepreneurs.

Keywords: *enterprise agility, agility barrier, agility enabler, industrial enterprise*

1. INTRODUCTION

Enterprise agility refers to the ability to react quickly and effectively to changes in the external and internal environment, to adapt to new conditions and to take advantage of opportunities that arise. According to Sharifi and Zhang (1999) agility is the successful exploration of competitive bases (speed, flexibility, innovation, quality, and profitability) through the integration of reconfigurable resources and best practices in a knowledge-rich environment. It requires flexibility, speed of response, ability to manage change, and innovativeness.

Manufacturing companies face specific challenges such as fluctuations in demand, disruptions in supply chains, pressure to shorten product development cycles, digitalisation and Industry 4.0. The main domains in building agility in manufacturing enterprises are flexibility of production systems, digital integration, shared supply network as well as predictive demand management (Obeidat et al. 2021).

Organizational agility is a strategic imperative for surviving market turbulence and it has become a necessity rather than a choice (Tallon and Pinsonneault, 2011). Agility enables firms to reduce the impacts of uncertainty and complexity, accelerate innovation, improve customer orientation and build competitive advantage in rapidly changing markets. Agile businesses have higher resilience, the ability to accelerate innovation, reduced time to market and greater customer value (Dubey et al. 2018, Omowole et al. 2024).

Agility can be viewed as a multi-level concept encompassing reactive and proactive forms of agility. Reactive agility focuses on a flexible response to unexpected changes already underway, where firms typically apply a defensive strategy (Wamba et al. 2020). Proactive agility emphasizes anticipating future challenges and preparing for them before they occur (Werder et al. 2023). While reactive agility helps organizations recover from shocks, proactive agility allows them to benefit from turbulence (Doz and Kosonen, 2008).

However, significant obstacles to the development of agility, and especially its proactive form, are barriers that can be identified at the level of strategy, structure, culture and technology (Weichbroth, 2022), as well as in the external environment, such as legislative measures, supply chains, infrastructure, and eco-economic uncertainty (Kamble et al., 2020). The most common include resistance to change, lack of trust in teams, rigid hierarchical structures, poor internal communication, or lack of leadership support and clear direction (Nguyen et al., 2024). These barriers can cause fragmented implementation of agile principles or even failure of transformation initiatives (Werder et al. 2023). On the other hand, agility enablers are activators that enable the application of agile principles and build agility in the

enterprise. Among SMEs, the main enablers of agility are leadership support, employee engagement, and digital readiness (Alayón and Säfsten, 2022).

In this paper, the attempt was to make an overview of the detected barriers and enablers by building agility in the firm and to analyze their presence in Slovak industrial companies. The aim of the paper is to point out the existing barriers to agility in manufacturing companies and to suggest ways of eliminating them through agility enablers.

2. MATERIALS AND METHODS

2.1. Materials

The input information by extensive literature search of existing knowledge was publications of foreign authors review, which we drew from scientific articles registered in various databases and book publications available online. The selection of publications included theoretical, review articles and also empirical studies with application in enterprises. The second source of data the results of the primary quantitative survey in Slovak industrial enterprises were.

2.2. Methods

The first part of the research was a summary of scientific knowledge from secondary sources, through which possible barriers and enablers to the development of agility in the enterprise were identified. In this part, mainly logical methods such as: analysis, synthesis, deduction, comparison, description and analogy were used.

In the second part, we focused on primary empirical research in Slovak industrial enterprises using a questionnaire survey. The aim of the survey was to find out what attitude Slovak enterprises have towards agility, what barriers they perceive in its development and what enablers are important for the development of agility. The questionnaire survey was conducted using Google questionnaires platform in the period from January 2024 to June 2024. The size of the research sample was 155 respondents from a total set of 5327 enterprises. The evaluation of the results from the questionnaire survey was done by using descriptive statistics methods, contingency tables and by testing the dependencies using Pearson chi-square test.

Finally, the linkages between barriers and enablers of agility in manufacturing enterprises were identified and options for eliminating barriers to agility development were suggested.

3. RESULTS

By analyzing the findings on the two basic forms of enterprise agility, we arrived at the resulting proposition that reactive agility ensures survival, but proactive agility creates competitive advantage. Firms that develop only reactive agility are constantly under pressure. Mature agile businesses combine both, i.e. they are ready to react quickly but at the same time create space for strategic adaptation. By applying both forms of agility, the enterprise increases resilience to change and long-term performance.

In the following sections of this chapter, attention is paid to summarising the barriers and enablers to the development of agility and clarifying their nature with focus on the conditions of manufacturing enterprises.

3.1. Agility barriers

Barriers to building agility are factors that negatively affect or block, i.e. do not allow the implementation of agile principles in an enterprise. These barriers can be divided into internal and external:

- *Internal barriers* arise from the situation inside the enterprise and can be influenced or eliminated by the enterprise through the right measures.

- *External barriers* arise from the enterprise's environment, whether micro or macro, and cannot be eliminated directly by the enterprise, but can be mitigated.

A review of existing knowledge published by authors such as Dikert et al. (2016), Holbeche (2019), Kuchel et al. (2024), Kovynyov et al. (2020), Ciampi et al. (2021) showed that ***internal barriers*** are mainly considered to be:

- *Hierarchical and rigid organizational structure*: traditional hierarchical structures slow down decision-making, lack of decentralization hinders team autonomy and initiative.
- *Resistance to change*: employees and managers may be used to "tried and tested" practices; fear of loss of power, uncertainty or increased work pace.
- *Silo thinking*: departments (e.g. IT, marketing, production) do not communicate effectively with each other; lack of information sharing hinders rapid adaptation.
- *Unclear vision and strategy*: if it is not clear why the business wants to be agile, employees do not feel the purpose of the changes, and without clear direction, agility turns into chaotic changes without results.
- *Inappropriate technology and tools*: old or non-integrated IT systems make collaboration and automation difficult, poor support for digital tools for agile teams (e.g. project tools, cloud).
- *Micromanagement and distrust in teams*: managers cannot 'let go of control' and hinder the autonomy of teams, lack of psychological safety leads to reduced initiative.
- *Lack of skills and training*: teams and leaders are not experienced in agile methods and there is a lack of training in soft skills (communication, time management, feedback).
- *Focus on short-term results*: emphasis on quarterly numbers hinders investment in long-term agile change; agile is seen as a 'project', not a cultural transformation.
- *Corporate culture incompatible with agile values*: a culture based on control, fear and avoidance of mistakes is the antithesis of agility. It lacks openness, feedback, experimentation.

External barriers to agility originating from the external environment of companies have been addressed by authors such as Kamble et al. (2020), Ali et al. (2022), Yusuf et al. (1999), Sharifi and Zhang (2001), Büechl et al. (2021) and can be summarized as follows:

- *Regulatory and legislative constraints*: government bureaucracy, rigid regulations, long approval processes. E.g. GDPR in the EU - companies have to be careful about data protection when agile systems changes, which slows down development.
- *Dependence on suppliers and partners*: weak flexibility or inability of partners to react quickly, agile business can be hampered by rigid supply chain, e.g. in manufacturing.
- *Unstable or slow markets*: if the market is slow, conservative or does not regulate change, the firm has no reason to change quickly, or even clients may reject rapid iterations of products/services. For example, in traditional B2B industries, customers prefer stability over rapid change.
- *Economic uncertainty and macroeconomic factors*: inflation, recession, rising interest rates may inhibit investment in agility.
- *Technology dependency and country infrastructure*: poor digital infrastructure, limited access to cloud or poor internet connectivity limits the ability to use modern agile tools (e.g. remote team collaboration).
- *Cultural and societal factors*: a country's cultural norms may favour authoritarian management, stability and risk minimisation, which hinders the adaptation of an agile mindset (collaboration, experimentation, open feedback).

- *Lack of available talent on the labour market*: difficulties in recruiting agile-minded professionals - developers, agile coaches, product managers. The labour market may not keep up with the agile trend.

The success of agile transformation depends not only on internal readiness, but on the openness of external partners to embrace flexibility. However, external barriers are difficult to overcome unless business partners or even government economic policy instruments change in favour of agility.

3.2. Agility enablers

Enablers of agility are seen as means to promote rapid business change and streamline responses to a dynamically changing market environment. We consider enablers defined in this way to be essential elements of successful agility adoption, as they enable effective responses to changing conditions by optimising resources and promoting an agile approach.

From the literature review (Ciampi et al., 2021; Rasi and Namakavarani, 2020; Nguyen et al., 2024; Vázquez Bustelo et al., 2007; Lokuge and Duan, 2023; Alayón and Säfsten, 2022; Yusuf et al., 1999), we identified the following main types of ***agility enablers***:

- *Digital and IT capabilities* (big data analytics, IT infrastructure, digitalization of processes and products)
- *Leadership and a culture that supports agility* (adaptive leaders, agile mindset, organizational learning)
- *Social capital, knowledge and innovation* (collaborative knowledge, social capital, teamwork)
- *Process and organisational flexibility* (resource reconfiguration, agile processes)
- *External partnerships & supply chain collaboration* (flexible suppliers, digital partners)
- *Technology and market infrastructure* (flexible market linkages)

According to Yusuf et al. (1999), agility enablers must be aligned across processes, technology, and people to generate performance benefits.

3.3. Results of primary research - agility barriers and enablers in Slovak industrial enterprises

The research on barriers to agility development in manufacturing enterprises in the Slovak Republic showed the results presented in Table 1 below.

Barrier	Relative frequency
Lack of financial resources for investment in new technologies and innovations	32.26%
Complex bureaucracy and regulatory environment that slows down our decisions	40.00%
Lack of qualified staff with the necessary skills	36.77%
Competition also seeks to react quickly to change and adapt.	23.87%
Lack of senior management commitment	9.03%
Slow implementation and process changes	15.48%
None	21.29%
SUM of barriers	157.51%

Table 1. Agility barriers in Slovak industrial enterprises

Source: own processing.

From Table 1, we observe that the most frequently identified barrier to agility in business is complex bureaucracy and a regulatory environment that slows down decision making (40%). This is followed by a lack of skilled workers with the necessary skills and experience (36.77%) and a lack of funding to invest in new technologies and innovation (32.26%). Competition is also seen as a significant barrier, which itself reacts quickly to change (23.87%). Less common barriers are slow implementation and process changes (15.48%) and low commitment from top management (9%). Interestingly, 21.29% of respondents did not identify any barriers. The results show that Slovak manufacturing companies perceive 1 to 2 barriers to the development of agility.

The second question in the questionnaire asked what enablers manufacturing companies have and use for agility development. The results are shown in Table 2.

Enabler	Relative frequency
Regular monitoring of the market and competition	67.74%
Investments in research and development of new technologies and products	12.90%
Maintaining flexible workflows and processes	38.71%
Collaboration with external experts to gain new perspectives	12.90%
Continuous gain of knowledge of customer preferences and processes	30.97%
None	11.62%
SUM of enablers	163.22%

Table 2. Agility enablers in Slovak industrial enterprises

Source: own processing.

The findings in Table 2 show what Slovak industrial enterprises are doing to build agility. Two-thirds of enterprises regularly monitor market changes and competitors' activity, more than one-third of enterprises (38.7%) maintain flexible processes, and 31% of enterprises gain knowledge about customer preferences. Only 11.6% of enterprises do not use any enabler. We also observe a low level in investment in new technologies (12.9%), which is related to the existing barrier of insufficient financial resources for investment.

4. DISCUSSION

The results of the research in Slovak industrial enterprises show that the biggest barriers are considered to be external, namely bureaucracy and regulatory environment and lack of skilled workers with knowledge in the field of agility. The fact that almost a third of respondents identified the regulatory environment as a limiting factor points to the need for systemic changes, especially in the area of simplifying administration and promoting innovation in Slovakia. On the other hand, Slovak companies are trying to build agility through enablers, which include mainly process flexibility and gaining knowledge about customers, competition and market trends.

The relationships between barriers and enablers of agility in the enterprise are dynamic, interactive and often adversarial. Enablers can act as a counterbalance or a tool to overcome barriers, but they can also become ineffective if barriers are not systematically addressed. Examples of the relationships between barriers and enablers in the context of manufacturing enterprises are shown in Table 3.

Barrier	Typical linkage	Potential enabler
Rigid hierarchy	Transformation/deactivation	Cross-functional teams, delegation
Resistance to change	Compensation	Leadership agility, psychological safety, fail-safe
Outdated thinking in management	Deactivation	Training managers in agility, coaching
Weak technologies	System dependency	Cloud tools and sensors (IoT), IT modernization (MES/ERP integration)
Long production cycles, low production flexibility	System dependency	Lean + flexible production cells + Kanban
Silo effect	Compensation / cascade	Transparent communication, collaborative platforms
Lack of skills	Direct linkage	Upskilling, training, agile coach
Regulatory constraints	Deactivation	Agile GRC (Governance, Risk, Compliance)
Weak external linkages	Transformation	Integrated supply networks, B2B digital platforms - EDI systems

Table 3. Relationships between agility barriers and enablers of manufacturing enterprises

Source: own processing.

How to overcome internal barriers to agility development:

- Leadership change - leaders must lead by example.
- Education and coaching - training, agile coaches, support for pilot teams.
- Small steps - build agility iteratively, not revolutionarily.
- Mindset change - emphasis on collaboration, trust, learning from mistakes.

Recommendations for successfully introducing and leveraging agility enablers in manufacturing companies, thereby reducing the impact of agility barriers, are as follows:

- Map key barriers in the context of operations (processes, people, technology).
- Introduce pilot agile teams - first in planning or maintenance.
- Increase real-time data visibility (IoT, MES, digital dashboards).
- Connect suppliers through digital platforms (B2B portals, EDI, planning sharing).
- Train managers in change culture and autonomous management.

Agility requires not only IT investments, but also rethinking internal dynamic capabilities aligned with digital environments. Digital technologies are essential enablers for agility, but their impact depends on leadership capability and organisational culture. Agile teams are often limited not by process knowledge, but by cultural frictions and conflicting values in traditional organizations.

5. CONCLUSIONS

Agility as the ability to adapt, innovate and respond quickly to change in a turbulent environment is much needed today. Agile enterprises can pick up market signals faster than competitors and transform them into actionable steps. Manufacturing businesses are characterised by standardised processes, higher dependence on suppliers and lower tolerance to instability. In their environment, the goal of agility is to respond quickly to changing demand, customer requirements, supply chain disruptions and innovation pressures. Agility in manufacturing firms means, for example, rapid reconfiguration of production lines, customer involvement in product development, and the implementation of lean and digital technologies.

The results of many studies have shown that building business agility has a significant impact on an organisation's performance, its innovation capabilities and enables to become sustainable competitive. However, building agility and implementing agile principles in enterprises depends on the success of removing agility barriers, introducing and effectively using agility enablers. Their knowledge and detailed analysis is a prerequisite for the development of an agile enterprise.

In future research, we would like to focus on identifying mechanisms that enable manufacturing enterprises to overcome barriers in the process of agile transformation. At the same time, it is recommended to focus research attention on specific forms of agile management in different industries and size categories.

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