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EDITORIAL

# Future Trajectories of the Management Systems

In the contemporary business landscape, “change” is no longer a localized, periodic event but a constant, systemic reality. Consequently, the discipline of navigating this reality has shifted from traditional *Change Management* - which typically focuses on discrete, incremental adjustments of existing processes - to *Transformation Management*. Transformation management is a comprehensive, structured approach to fundamentally modify an organization’s strategy, operational models, culture, and technological foundations. It aims not merely to improve the existing state but to radically reinvent the enterprise to ensure its survival, agility, and long-term competitiveness in a highly volatile global market.

Historically, the formalization of organizational change emerged in the late 20th century, largely driven by the triad of global economic powerhouses: the United States, Japan, and Western Europe. In the 1980s and 1990s, the international standard was quite polarized. The American model frequently prioritized rapid, top-down restructuring, emphasizing radical Business Process Reengineering (BPR) and short-term shareholder value. Conversely, the Japanese model championed *Kaizen* - a philosophy of continuous, incremental improvement, heavy employee involvement, and long-term consensus building. Over the last two decades, these divergent philosophies have synthesized into modern “agile transformation” models. Today, the international consensus recognizes that successful transformation requires a hybrid approach: the speed and radical ambition of the American model combined with the human-centric, culturally embedded resilience of the Japanese approach.


The evolution of transformation management in Europe followed a distinctly unique trajectory, historically acting somehow as a balancing point between the US and Japanese extremes. The European approach has traditionally favored stakeholder capitalism over pure shareholder primacy. For instance, the German “Rhine model” heavily emphasized worker co-determination, social market economy principles, and long-term industrial strategy, making European transformations generally more consensus-driven and socially integrated. Furthermore, Europe experienced a massive regional transformation

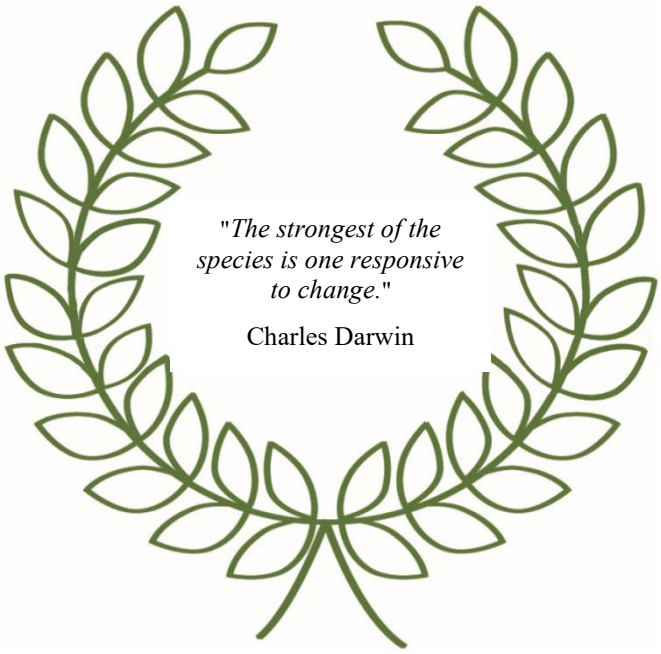
macro-case in the 1990s: the integration of Central and Eastern European countries transitioning from command economies to free markets. This era required unprecedented managerial transformation, dealing with the privatization of state-owned enterprises and the complete overhaul of organizational cultures. Today, the European context is heavily defined by a regulatory and sustainability-driven approach to transformation. Frameworks such as the General Data Protection Regulation (GDPR), the Digital Operational Resilience Act (DORA), and the European Green Deal compel organizations to ensure their transformation initiatives are not just economically viable, but ethically sound, secure, and environmentally sustainable.

It is impossible to discuss modern transformation management without centralizing its most vital catalyst: *Digital Transformation*. Digital transformation goes far beyond mere digitization (converting paper to digital) or digitalization (upgrading IT infrastructure). It is the strategic integration of advanced digital technologies - such as Artificial Intelligence (AI), Cloud Computing, the Internet of Things (IoT), and Robotic Process Automation (RPA) - into all areas of a business, fundamentally changing how value is created and delivered to customers.

However, despite the universally recognized need for transformation, the current landscape is fraught also with challenges. Some industry studies show that between 50% to 70% of digital and business transformation initiatives fail to meet their original objectives.

As we move toward a future defined by AI-human collaboration, hyper-automation, and ecosystem-based business models, the current significant failure rates of these initiatives highlight a critical truth: technology alone cannot transform an enterprise. Successful transformation management will ultimately rely on leadership that provides a balanced approach between technological adoption, human psychology, and ethical governance.

Dan DUMITRIU
Guest Editor



# A Perspective of Organizational Digital Transformation

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**Abstract**

*This essay presents a point of view on the concept of transformation management in the specific case of organizations, in the larger framework of transformation typology, underlying the critical role of managing the transformation processes, with a focus on the management of digital transformation (DT). Mainly theoretical, the methodological approach involves basic literature survey. The practical implications are impactful, since arguable strategic decisions may lead not only to unexpected but to unwelcome outcomes. Among conceptual clarifications, a transformation typology framework is proposed. A case is illustrating the concepts discussed. As a predominantly theoretic endeavour, there are inherent limitations, which also reveal possible future research paths. Implications are both theoretical and practical, mostly for organization leaders, strategists and top executives.*

**Keywords:** business transformation, digital transformation (DT), organization strategy

## Introduction

It is rather difficult to disagree with Francis Collet who concluded in his *History of Ideas* (Collet, 2008) that the antinomy *stability – movement* is the centrepiece and engine of the Western culture that witnessed, along centuries, continuous challenge between champions of order, stability and tradition (on one side) versus those of contest, innovation and change (on the other).

The origin of this debate has its roots in the conflict between two pre-Socratic philosophers from Ancient Greece: Heraclitus of Ephesus and Parmenides, respectively. According to Korab-Karpowicz (2016, p.58), Heidegger also believed that the ancient thinking of Heraclitus and Parmenides was at the origin of philosophy.


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*The change* is one of the core-concepts pioneered by Heraclitus: the world is always 'becoming" not "being"; everything flows (*panta rhei* in Greek): "no man ever steps in the same river twice". In the same respect of continuous change, Heraclitus is also known for the *Ship of Theseus* paradox (Thomson, 2021).

Notably, according to Ross (1951), it was Plato who merged Heraclitus' "becoming" and Parmenides' "being" in his *Theory of Forms* (or *Theory of Ideas*).

In an arch over time, reasoning with the above philosophical roots, Lotfi Zadeh and Elijah Polak have superbly integrated stability (being) and movement (becoming) in their *system theory* (Zadeh and Polak, 1969), although von Bertalanffy (1950; 1969; 1972) is considered as the father of *general system theory* (also acknowledged for his contributions in biology). Actually, Ervin Laszlo, in the foreword to von Bertalanffy's *scientific-philosophical studies* (von Bertalanffy, 1975) noticed the broader meaning of "theory" in German than in its English translation. For the sake of truth, von Bertalanffy himself regarded the German philosopher Cusenius (1401–1464) "as a precursor of systems thinking" (Hanika, 1977, p. 143). Von Bertalanffy (1969) is also credited for initiating the *systems theory of management.*

According to the system theory, input, *process,* output, and feedback are the basic elements of a system. Although the system theory is beyond the scope of this piece of work, it is important to define the process as the transition of any given system from a state (usually called the *initial state* of the system under scrutiny) to another state (the *final state* of the system). Among various types of processes in many types of systems, the *transformation process* is of particular interest for this discussion. In other words, *transformation is a particular type of process*.

Yet in the conceptual area of transformation processes (depending on the system type, Table 1), *the focus of this essay is on organizational transformation* (marked in blue colour), considering organization as an artificial (man-made) system. Moreover, since organizations can be of global to local interest, the scope of this work is limited to *microeconomic level* (marked in dark blue colour).

**Table 1** – *A typology of systems and transformations respectively*

| System scale | Natural systems | Artificial systems |
|---|---|---|
| Universe scale | | |
| Global scale | | |
| … | | |
| Macroeconomic scale | | |
| Microeconomic scale | | **Organizational transformation processes** |
| … | | |
| Microscopic scale | | |
| Atomic scale | | |
| Sub-atomic scale | | |

Notably, the white areas in the Table 1 are not empty. Either natural or artificial systems (and transformations respectively), they are vast fields of activity, study and applications for many disciplines, from astronomy to quantic physics, from geology to biology, from sociology to mathematics and informatics.

Consequently, the purpose of this essay is to deepen the understanding of organizational transformation processes in two respects.

- As far as the most recent type of organizational transformation process (i.e. *digital transformation*).

- From management standpoint (i.e. to explore the mechanisms of the *transformation management*).

## Understanding the concepts

*Transformation versus change in organizations.* As simple as it seems, there is "confusion about what constitutes *change* versus *transformation*; we have a good idea of how to manage change, but most organizations continue to struggle with transformation" (Bourne, 2015). Change means to apply principles of change management (Phillips, 1983; Oakland and Tanner, 2007; Raza and Standing, 2011; Burnes, 2020; Cameron and Green, 2024; Raina, 2025), while transformation management is a more complex matter of organization strategy (Table 2).

**Table 2** – *Organizational change and organizational transformation*

| **Criteria** | Change | Transformation |
|---|---|---|
| Focus on | Specific areas or processes | Organization as a whole |
| Objective | Update what exist | Create something new |
| Improvement | Incremental improvements | Radical and profound |
| Pace | More rapid, in stages | Continuous shift |
| Duration | Relatively shorter | Relatively longer |
| Amplitude | Relatively smaller | Relatively larger |
| Impact | Part of organization | Whole organization |
| Reversibility | Reversible usually | Generally irreversible |
| Responsibility | Executive manager | Project manager |
| Matter of | Current management | Organization strategy |
| Business model | Does not change | Does change |
| Organization nature and culture | Do not change | Do change |

However, in practice, the multitude of concrete circumstances and environmental influences make sometimes difficult to impossible to neatly discern if a certain company is facing change or transformation: either it is experiencing a change, or this change is just an emerging transformation, or it simply displays mixed features of both change and transformation. These kinds of situations explain not only confusions generated by the weak knowledge and proper terminology, but also notable studies in this area (Kotter, 1995; Balogun, Hailey and Gustafsson, 2016; Muravu, 2020; Baez, 2025) that discuss the concept of *strategic* change. Another worth mentioning issue is the level the words *transformation* and *change* are used at: e.g., a change in organization can well be a transformation of work settings (Scarlat, 2023).

*Digital transformation.* While it is obvious that *digital transformation* is a process more advanced and complex than *digitization* and *digitalization* (usually explained in business English dictionaries), digital transformation and business transformation are also different: if digital transformation implies business transformation as well, the reciprocal does not necessarily stand true (Scarlat and Tudose, 2025, p.43). Shoikova (2021, pp.6–7) compared several definitions of digital transformation (DT) provided by internationally recognized organizations (Forbes, OECD, European Commission) and preferred the Forbes' definition: "the creation of new business designs by blurring the digital and physical worlds", underlining its dominant advantage ("the speed of a digital business is as much as 5 times faster than the speed of a traditional business").

Mikalef and Parmiggiani (2022) agreed with Vial's definition that digital transformation is "a process that aims to improve an entity by

triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies" (Vial, 2019, p. 119), and they extended Vial's work, developing a conceptual model (Mikalef and Parmiggiani, 2022, p. 4) that includes theoretical insights from the literature on digital business strategy (Bharadwaj et al., 2013) as well as organizational change management (Hanelt et al., 2021).

Recent trends identified in the studies related to digital transformation are mirroring more general tendencies – organizational resilience (Awad and Martin-Rojas, 2024), flexibilization of energy networks (Cheng et al., 2024), and the role played by digital transformation in the future sustainable, circular economies (Mili, 2025).

*Transformation management.* As it was shown, the management of organizational transformation is organically linked to organization's strategy. Nevertheless, despite abundant literature dedicated to strategic management as well as to digital transformation (Vial, 2019; Kraus et al., 2022; Raković et al., 2024), its impact (Schilirò, 2024) and its positive effects reported both in business (Mikalef and Parmiggiani, 2022) and society (Lamarre et al., 2023), the literature on *digital transformation management* is less so. This paper is an attempt to have a contribution in this matter.

The remaining of this paper is structured as follows: methodological approach; instruments and tools to manage the digital transformation process associated with an illustrative case; discussion and managerial implications; conclusion and further studies.

## Methodological approach

This piece of work aims to understand the transformation-related concepts (transformation versus change; digitization-digitalization-digital transformation; transformation management; digital transformation management) as well as relationship between them and, eventually, in the case of *organizational digital transformation*:

- to identify suitable instruments and practical tools to strategically manage the digital transformation process; and
- to highlight the role of top executives while managing this process.

Accordingly, the methodological approach involves two steps: (i) secondary research (literature survey) for conceptual clarifications; and (ii) findings analysis and discussion for managerial implications.

***Five domains of strategy.*** For companies facing digital transformation, Rogers (2016, pp.4–5) identifies "five *domains of strategy* that digital is changing": Customers, Competition, Data, Innovation, Value proposition. For each strategy domain, Rogers proposes strategic themes and actions as well as the operational key-concepts and managerial tools. Table 3 synthetically displays strategic domains and managerial actions during digital transformation processes.

**Table 3** – *Key-concepts associated by strategy domains*

| Strategy domains | Strategic themes & actions | Operational key-concepts & instruments |
|---|---|---|
| Customers | Harness customer networks | ▪ Marketing funnel (reinvented)<br>▪ Path to purchase<br>▪ Core behaviours (of customer networks) |
| Competition | Build platforms, not just products | ▪ Platform-based business model<br>▪ In/direct network effects<br>▪ Dis/intermediation<br>▪ Competitive "value trains" |

| | | |
|---|---|---|
| Data | Turn data into assets | ▪ Template of data value<br>▪ Drivers of big data<br>▪ Data-driven decision making |
| Innovation | Innovate by rapid experimentation | ▪ Divergent experimentation<br>▪ Convergent experimentation<br>▪ Minimum viable prototype (MVP)<br>▪ Paths to scaling-up |
| Value proposition | Adapt the value proposition | ▪ Concepts of market value<br>▪ Paths out of a declining market<br>▪ Steps to value proposition evolution |

(Source: Adapter after Rogers 2016, p.11).

For each strategy domain there is a strategic theme, respectively recommended managerial actions and operational instruments. For example, building digital platforms (not just products) is a better strategy to face competition, since platforms display a series of competitive benefits (Rogers, 2016, pp.64–67): light in assets; scaling fast; winner-takes-all consolidation; efficiency.

Thus, amongst their direct and indirect effects on *customer networks* (Rogers, 2012), there is no wonder that many successful companies (Alphabet/Google, Amazon, Apple, and Microsoft are among the best-known) have built their success on *platform-based business models.*

***Platform-based business models: typology and theory of platforms***. According to Evans and Schmalensee (2007), there are four types of platforms:

- Exchange platforms – to exchange either goods (e.g., *eBay*) or services (e.g., *Uber*).
- Transaction systems (e.g., *PayPal, Bitcoin*).
- Ad-supported media – such as social networks and websites with advertisements.
- Platforms that provide uniform standards – either hardware standards (e.g., *PlayStation*) or software standards (e.g., iOS).

The economic theory of platforms was studies by Rochet and Tirole (2003; 2006), who provided a definition of two-sided-markets. "A market is two-sided if the platform can affect the volume of transactions by charging more to one side of the market and reducing the price paid by the other side by an equal amount; in other words, the price structure matters, and platforms must design it so as bring both sides on board." (apud Evans and Schmalensee, 2007, p.153).

Acknowledging the work of Hagiu and Wright (2015a; 2015b) on multi-sided platforms – an extension of two-sided markets – Rogers (2016, p.56) provides the following "condensed definition" of "what constitutes a platform": "A platform is a business that creates value by facilitating direct interactions between two or more distinct types of customers". The author underlines the key-elements of this definition: distinct types of customers, direct interactions, and facilitation.

***Impact of digitalization on platform-based business models.*** Digital technologies seriously impacted platform-based business models (Rogers, 2016, pp.63–64) in four key areas. Frictionless acquisition, Scalable growth, On-demand access and speed, Anonymity (yet paying the price of trust).

Trust is key in business, mainly in case of business networks (Scarlat et al., 2024) as the "trust allows for the rapid spread of recommendations and referrals through social media distribution, which is critical to growing a new platform business" (Rogers, 2016, p.64). On the other hand, from the trust standpoint, digital platforms are a two-edged sword: in some situations, the customers prefer anonymity but not always. In that case of romantic relationships (Scarlat and Ioanid, 2025) and mainly when looking to build life partnerships (Scarlat and Ioanid, 2024), the social media platform should be trustworthy. Therefore, the ability of social media

platforms to authenticate customers is a key-characteristic.

***Digitalization's biggest impact on platforms***. Rogers (2016, p.64) considers that "the biggest impact of digital technology on platforms may be in the size of the business involved [so that] multisided platforms are no longer the domain only of large enterprises; they are the preferred launch pad for entrepreneurial ventures of all sizes".

Besides the so-called "rapid innovation" (i.e. innovation by rapid experimentation, Table 3), Nobel (2013) promoted the *lean startup strategy* – or *lean startup* (Ries, 2011) – which is very suitable not only for startups in general (Blank & Dorf, 2012; Furr & Dyer, 2014) but for the platform-based startups. Table 4 depicts the four strategic approaches for scaling-up an innovation, depending on answers to two questions (MVP = minimum viable product), (Rogers, 2016, p.155).

**Table 4 –** *A scheme of strategic approaches to scale-up an innovation to a full release of the innovative product*

| **Can iterate the offering quickly after launch?** | **Can limit the roll-out in stages?** | |
|---|---|---|
| | Yes: Roll-out | No: Launch |
| No: Polish it | Polished roll-out | Polished launched |
| Yes: MVP | MVP roll-out | MVP launch |

(Source: after Rogers (2016, p.155).

***Managing digital transformation successfully: Case Britannica.*** The very first edition *Encyclopaedia Britannica* (Figure 1) was printed in Edinburgh, Scotland, more than two and half centuries ago (1768–1771), by the lifetime of massive personalities (Adam Smith in economy, Samuel Johnson in literature, Edward Gibbon in history) as well as champions of industrial revolution like inventor James Watt and explorer James Cook.

Reference standard for English language, *Britannica* has developed in content and volumes over years, up to 24 volumes on the 14th edition (1926–1929), when it marked an important change, mirroring the rapid changes in the world: more than 50 associate editors in London and New York as well as all big names of the time have contributed. Then *Britannica* experienced a series of corporate management changes. No new editions were out, but continuous revision was initiated.

In the late 1990s annual revisions continued. They were supplemented by a major revision of *Britannica* for the 15th edition (1985). The result was a set of 32 volumes (12-volume Micropaedia, 17-volume Macropaedia, 1 volume Propaedia, and two-volume Index). Printings of the 15th edition continued in the 21st century (Figure 1). The first edition (top-left: 3 volumes, 1768–1771) and the 15th edition, the last printed edition (2010).

Surprisingly, in 2012, after 244 years of successful operation and continuous development, the company announced that future printings would be discontinued. When the announcement was made, the large public thought that *Encyclopaedia Britannica, Inc.*, like many other companies–unable to adapt to changes and cope with the technology challenges of the 21st century–was going to fall.

The declaration of the *Britannica's* President Jorge Aguilar-Cauz set the things right in March 2013: "By the time we stopped publishing the print set, the sales represented only about 1% of our business. We're as profitable now as we've ever been." (Cauz, 2013).

The explanation is the transformation process that *Britannica* started decades before the decision to discontinue the print version. The company top management understood that their customers' behaviour radically changed while facing emerging digital technologies.

Between being stuck on the old business model and keeping the company mission (high level educational services and editorial quality), the company strategists did not hesitate, voting not only for online subscription for *Encyclopaedia* but also for new online educational products, considering the basic needs of their customers (home users, educational institutions).


**Figure 1** – *Library with Encyclopaedia Britannica*
(Source: author's collection)

- The first digital version of the *Encyclopaedia Britannica* was created for an emerging service (LexisNexis) in 1981.
- New CD-ROM-based products (including the *Britannica Electronic Index* and the *Britannica* CD) were made available for e-delivery in the early 1990s.
- Specialized websites for universities and schools were introduced by *Britannica Digital Learning* in 2001.
- *Britannica Blog* (2006), a mobile site (2008) and the first *Britannica apps* (2010) have followed.

With no intention to make any parallels, the French language pair of *Britannica*, *Larousse* (Figure 2), founded in 1852, following a series of ownership changes (*Éditions Larousse* is a subsidiary of *Hachette Livre* since 2004), pursued a strategy of diversification, and went online (www.larousse.fr) as well. The iconic *Petit Larousse Illustré* is still printed and released yearly.


**Figure 2** – *Library with Larousse du XXe Siecle, 6 volumes, 1928–1933.*
(Source: author's collection)

## Managerial implications and lessons learnt

The case *Britannica* vividly illustrates the *strategic essence of digital transformation*, in all its dimensions and managerial functions: prevision, organization, leadership, control. Amid frequent managerial changes in turbulent environment dominated by the emergence of digital technologies, *all was well-prepared in decades* before the formal decision to discontinue the centuries-old print version of the iconic *Encyclopaedia Britannica* was made. Apparently, the announcement looked like a radical change with catastrophic effect, but the result was insignificant (about 1% of business).

Despite unfriendly environment and internal changes, the company remained *faithful to its mission and loyal to its customers*, aiming to better serve and be a source of knowledge for its market, even by giving up an outdated business model and going for a platform-based business model.

Diversification of *Britannica* products (services) was continuous, as longer term, continuous process. All marketing-mix components have changed, but its logo (Figure 3) was rock-stable. A quasi-similar transformation pattern was followed by *Larousse* (yet with more dramatic changes in ownership). Significantly, the Larousse motto still is *Je sème à tout vent* (literally *I sow to all wind*; i.e. sharing knowledge worldwide). To notice that easy-to-grow, popular, herbs (thistle, dandelion) are on their logos, and their seeds are easily spread by wind.

There are several characteristics of digital transformation processes that should be the in the top managers' view.


**Figure 3** – *Logos of Encyclopaedia Britannica (left) and Larousse (right)*
(Source: author's collection)

- Digital transformation impacts customers, competition, data, innovation, and value proposal (Rogers, 2016).
- In the process of digital transformation data turn to be assets.
- Customers are important; they turn into customer networks (Rogers, 2011).
- Development of products (either goods or services) becomes (digital) platform development (Rochet and Tirole, 2003; Eisenmann, Parker and Van Alystyne, 2006). Thus, the value proposal and business model change.
- While business models change, the company mission and values do not.
- There are four types of platforms. The digital transformation makes them more competitive and suitable for startups (platform-based startups).
- Besides innovation by rapid experimentation, the lean startup strategy (Ries, 2011; Nobel, 2013) becomes very suitable for startups in general (Blank and Dorf, 2012; Furr and Dyer, 2014).
- The first strategic decisions to digitally transform the organization are just the beginning of a long term strategic path: "the digital transformation roadmap" (Rogers, 2023).

Besides managerial implications, there also are legal and ethical issues related to two-sided platform business models (Evans and Schmalensee, 2013). Since many two-sided platforms in practice subsidize one side and earn profits on the other, "failure to account for the consequences of interlinked demand between the two sides can lead antitrust analysis into serious error" (Evans and Schmalensee, 2008). Such a case (*American Express*) is discussed by Evans and Schmalensee (2019).

Trust is key in business, mainly in case of digital transformation towards platform-based business networks (Scarlat et al., 2024). The ability of *keeping the right balance between anonymity and transparent authentication* of customers is not only a core managerial ability, but also an investigation path for further studies.

## Conclusion

Apparently similar concepts in light of philosophy, system theory and even literally, *transformation and change are significantly different concepts in organizational management*.

While from theoretic point of view the differences might not seem important, *in the practical terms of organizational management, the difference is essential since the transformation management is a strategic issue.*

For companies facing digital transformation, there are *five domains of strategy* (customers, competition, data, innovation, and value proposition); for each of them there are strategic themes and actions; suitable operational key-

concepts and managerial tools are recommended in each domain of strategy.

The role of top managers is essential while planning and running digital transformation. To fail in digital transformation is not failing as manager only; it is a business failure.

The platform-based business models are becoming significant, since they are among the most successful businesses. The impact of digital technology on platform-based business models is considerable. Nonetheless, the most important result is that multisided platforms are the "preferred launch pad for entrepreneurial ventures of all sizes".

Although with significant practical implications, this essay is essentially theoretical; then it has the limitations of such topic. Further studies should be oriented primarily to testing the *models, methods and drivers of rapid start-up of digital platform-based businesses*.

The digital transformation is around, progressing, and becoming dominant.

*How capable are we to manage it?*

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# Transformative Management in Higher Education

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**Abstract**

*The transformation of higher education institutions is a topic of current interest, given the social, economic, and technological changes of the last decade. This article addresses change management as a determining factor in organizational transformation and traces the main directions of change in higher education. The research methods applied were literature review and bibliometric analysis of scientific articles indexed in Web of Science. Leadership and management, organizational culture, sustainability, technological innovation, and digital transformation are considered strategic directions, turning points that will decisively influence the future of educational organizations, according to the results obtained through the bibliometric analysis of specialized literature.*

**Keywords:** organizational change, higher education, bibliometric analysis

## Introduction

Organizational transformation management plays an important role in balancing resources and assets with organizational strategy and beneficiary needs, but also in responding quickly to changes in the external environment. Richard R. Bahner and Linda K. Stroh stated that to ensure success, managers must identify areas "with the highest potential for short-term returns." (Bahner and Stroh, 2004)

Change is a constant in life. Society and all its constituent parts (people, institutions, organizations, etc.) undergo transformations, with change being either natural or imposed. This article presents the particularities of change, with educational organizations as their main object of analysis. The authors present change management from a transformative perspective, identifying and presenting the main dimensions of change through bibliometric study. The general objectives of the paper are: to present the theoretical framework of




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change management, to identify the models of change used over time in organizations, and to determine the trends in transformative management through bibliometric analysis.

## Literature review

1. ***Change management***. Management is the process of systematizing and exploiting a set of resources to achieve defined strategic objectives. (Konopaske et al., 2017) The concept of management has undergone an evolutionary process, from Taylor's scientific management and Fayol's administrative management to contemporary approaches to change management, grounded in Lewin's theories of organizational change.

The keyword that has decisively influenced management dynamics is changing. Regardless of structure, field of activity, or stage of development, organizations are affected by change. Practice has shown that there is no single model for adapting to change, as change brings uncertainty and a certain level of confusion. (Phillips and Klein, 2022)

Change management can be defined as the ability of organizations to implement new, innovative approaches or to balance themselves in an environment undergoing continuous restructuring. It has become a fundamental direction for organizational transformation. In 1995, Van de Ven and Poole analyzed theories on how change is achieved in organizations, managing to define four general theories, which are highlighted in Table 1.

**Table 1** – *Overview of Theories of Organizational Change*

| No. | Theory name | Underlying principles |
|---|---|---|
| 1. | Teleological theories | Change is seen as an iterative process, based on defining objectives, implementing them, and evaluating the results, with the ultimate goal being learning and adaptation based on learning. |
| 2. | Dialectical theories | Change is based on balancing power between different organizations. |
| 3. | Life cycle theories | Change is progressive, based on interdependent stages. |
| 4. | Evolutionary theories | Change is defined by a series of variation-decision-retention. Variations are unpredictable but can be chosen (selected) in relation to internal capabilities and environmental demands. Retention involves the preservation and continuity of the organizational forms obtained from these variations, through forces of inertia and persistence (Hayes, 2014) |

The four theories highlighted in Table 1 share the common idea that change is based on interconnected stages, choices, and actions. However, a distinctive feature of the four theories is the extent to which change is planned or predicted.

**2. *Change management models.*** Lewin and Kotter are two important representatives of the change of universe. Lewin advocates a general approach to change, while Kotter approaches change in relation to managerial practice, supporting the role of leadership and vision in this process.

**Lewin's model.** Lewin starts from the premise that change is possible when a balance is created between the major forces within the organization, defining these forces as driving and resisting, the former needing to overcome the latter for evolution to take place. Lewin also defined the steps for implementing change, as shown in Figure 1.

Each step highlighted in Figure 1 has a well-defined purpose. In the unfreezing stage, members of the organization become aware that the status quo is no longer effective. In the moving stage, transformation takes place, or rather, the transition to change action. The final stage, refreezing, aims to adapt to the new status quo and accept it. Lewin's model can be successful if:

- individuals who can influence change are aware and informed about the gap between the current state and the desired state;
- the forces that impose resistance are minimized and the driving forces are maximized;
- a strategy is developed, a plan with well-defined steps to achieve change, with a clearly defined final goal. (Cameron and Green, 2009)

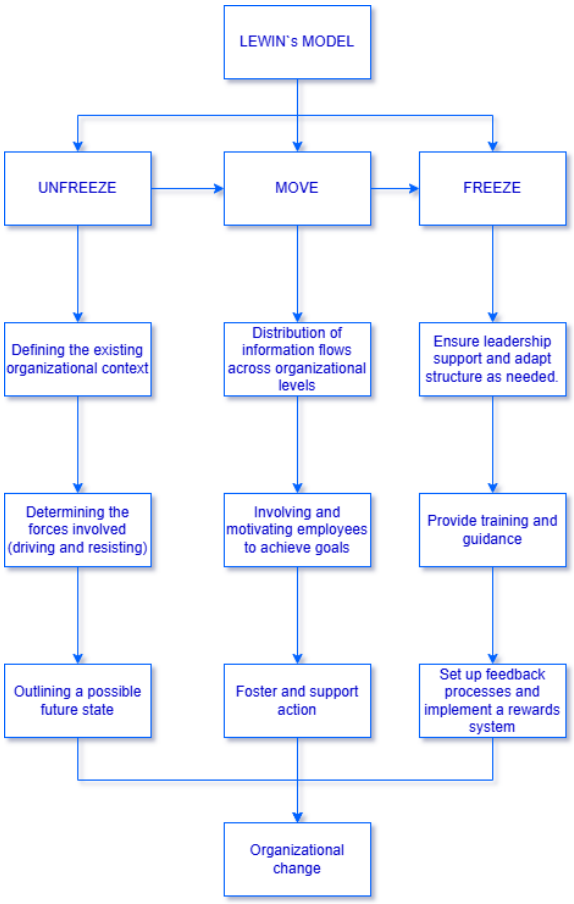


**Figure 1** - *Lewin's change model*
(Source: adapted from Cameron and Green, 2009)

***Kotter's model.*** Organizations initiate change mechanisms with high expectations, using various concepts such as structuring, reengineering, operational optimization, total quality management, alignment with international best practices, cultural change, etc. However, beyond these labels, the target remains the same: a profound change in the way the organization operates, so that it can cope and remain competitive in a new, more dynamic and demanding market context (Kotter, 1996)). Kotter has developed an 8-step model that coordinates the change process, emphasizing the importance of leadership involvement in this regard. The 8 steps are:

*1. Establishing a sense of urgency.* This phase of the process supports the idea that the success of change is ensured if leadership coordinates key people and succeeds in creating an urgent need for action.

*2. Building the leadership team*. This stage supports the idea that groups have a decisive influence on the success or failure of an activity. Kotter argued that coalitions must meet three characteristics to function properly, namely trust between the individuals who make up the group, common goals, and the existence of essential skills.

*3. Creating a vision.* The vision creates a path to follow, encouraging employees and directing organizational efforts. A clearly defined, coherent, and adaptable vision is crucial for preventing confusion and guiding decisions, supporting the assimilation and acceptance of change by members of the organization.

*4. Communicating the vision.* This step is particularly important because the impact of the vision materializes when the people involved in the change have a convergence of opinions,

understanding its objectives and directions. Failure at this stage is determined by the inability of employees to process new information, as well as the human resistance to change.

*5. Empowering action and removing obstacles.* At this stage, change begins to be consolidated through actions such as developing the knowledge, skills, and independence of the organization's members so that they can take responsibility for the change process. The role of changing managers is to identify the structures that create blockages and work to align them with the organization's vision.

*6. Creating short-term wins.* This stage is based on the principle of small efforts, big gains. Specific goals that require a short time to achieve can be helpful in transformation processes that take a long time to complete, as they keep people engaged if they are directly related to the change effort.

*7. Consolidating improvements.* Kotter suggests several measures to consolidate the results achieved, including correcting methods, structures, and policies that are not compatible with the vision; attracting and developing employees capable of putting it into practice; and maintaining the momentum of change by launching new projects and initiatives and involving new promoters of change.

*8. Anchoring new approaches in the culture and consolidating change.* Change is fully integrated when new approaches become routine, part of the organizational identity. The factors that ensure the success of change are the commitment to validate new perspectives, behaviors, and attitudes that have facilitated better results, but also the implementation of promotion mechanisms that allow those who genuinely align with the new values and mechanisms to reach leadership positions. (Aldemir, 2010)

***Change management in educational organizations.*** Higher education institutions are in the early stages of transformation, transcending traditional boundaries and making the transition to sustainable social progress, in which students become agents of change.

To transcend traditional boundaries, higher education institutions must possess a characteristic specific to transformational organizations, namely adaptability. The traits of transformative organizations, which manage to constantly adapt their practices, are:

- respond to the current needs of their "customers" (students);
- clearly define their mission, objectives, and goals based on the requirements of their beneficiaries (students);
- use new technologies and innovations;
- consider staff (leaders, teachers, and administrative personnel) to be an asset to the organization;
- take risks;
- support and recognize performance through rewards;
- cultivates a culture of individual responsibility and the use of accurate data to plan and deliver a cost-effective service, preparing students to meet the challenges of an increasingly complex and dynamic global environment;
- recruits leaders who become agents of change;
- monitor how the market is changing to know how to develop strategic plans and ensure that strategic plans are implemented, etc. (Stewart, 2016)

The management of transformation in higher education institutions can develop if the organization succeeds in motivating people, determining the internal and external factors that generate change, and understanding the link between change and organizational cohesion, harmony, and order. (Dongare, 2023). Understanding the dynamics of the external environment and the importance of change management for transformation management, some universities have applied Kotter's principles with positive results. (Wentworth et al., 2020) Table 2 shows three examples of educational institutions that have applied Kotter's model.

**Table 2** – *Kotter's model applied in higher education institutions*

| Educational institution | Changes based on Kotter's Model |
|---|---|
| **School of Nursing at Boise State University** | Developing organizational culture and climate. |
| **Faculty of Medicine at McGill University** | Adopting an institutional program for continuing education of teaching staff. |
| **University of Memphis** | Using the model to transform the culture of the department responsible for managing, developing, and securing digital infrastructure. (Wentworth et al., 2020) |

As shown in Table 2, Kotter's model can be applied in many types of organizations, regardless of their field of activity, for the implementation of change.

Analyzing Lewin's model, it remains relevant in terms of organizational transformation. The applicability of the model in higher education institutions can be viewed as follows:

- Unfreezing stage: applying questionnaires, opening forums, analyzing performance indicators. The goal is to initiate the transformation process.
- Moving or changing stage: updating study programs, introducing new technologies into the teaching process, remodeling administrative operations. The goal is to improve efficiency.
- Refreezing stage: internal regulations are modified in line with the changes made in the first two stages, and methods for evaluating efficiency and management processes are introduced. The goal is to ensure sustainability. (Twabu, 2025)

## Research methodology

The study adopts a mixed research approach, combining a narrative literature review with a bibliometric analysis. The literature was selected in line with the research objectives and focuses on the theoretical foundations of change management in educational organizations. In parallel, a bibliometric analysis was conducted to identify publication trends and thematic clusters within the field. Data processing was carried out using VOSviewer, a free, non–open-source bibliometric analysis tool, while the articles were retrieved from the Web of Science database, which was selected due to its accessibility and its compatibility with data export requirements for bibliometric analysis.

To identify the articles needed for the analysis, the following query builder was entered in the "search" section of the Web of Science database: TS=("change management" AND ("higher education" OR universit*)). The analysis filtered articles and review articles from 2015 to 2025, generating 468 results. The results were exported to Excel and a text file for further processing.

The 2015–2025 period was selected to capture a decade marked by intensified organizational change in higher education, driven by digitalization, governance reforms, and increasing environmental uncertainty. From 2015 onward, higher education institutions have increasingly faced structural and cultural transformations related to digital technologies, new management practices, and evolving stakeholder expectations, making change management a central research theme (Bond et al., 2018).

Extending the analysis to 2025 allows the inclusion of recent open-access studies addressing large-scale disruptions and systemic transformations in higher education, particularly those related to emergency remote teaching, institutional resilience, and organizational adaptability (Marinoni et al., 2020; Crawford et al., 2020). Therefore, this timeframe allows for a balanced perspective on trends and research directions in change management within higher education.

**Results and discussions.** Figure 2 shows the number of publications per year on the topic of change management in universities or higher education institutions.

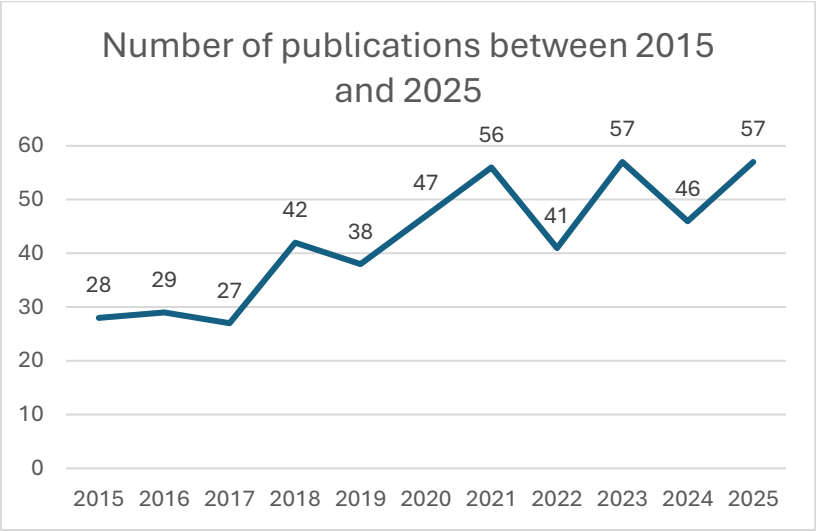


**Figure 2** – *Evolution of publications between 2015 and 2025*

An analysis of the trend shows that scientific concerns regarding the transformation of higher education institutions were particularly pronounced between 2020 and 2025. The main reasons highlighted by researchers are related to the COVID-19 pandemic and digital transformation. As Kotter argued, a sense of urgency creates a desire for action. In this case, "urgencies" create a desire for research. The continuous increase in the number of publications demonstrates interest in changing management in higher education institutions, both in practice and at the scientific level.

To explore the density and relationships between the keywords used by authors in the analyzed articles, co-occurrence analysis was applied using VOSviewer software. The minimum number of occurrences selected was 5, and from the 468 articles, 29 keywords/key phrases were identified, divided into 6 clusters. Figure 3 shows the co-occurrence network map of the authors' keywords on change management in higher education.

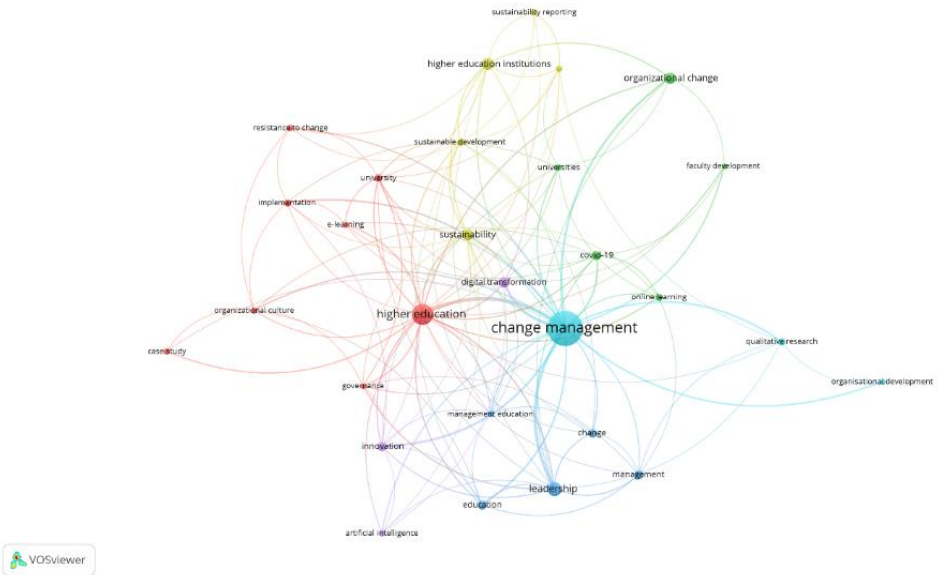


**Figure 3** – *Network visualization of authors' keywords related to change management in higher education*

Cluster 1, represented by red, consists of eight elements: case study, e-learning, governance, higher education, implementation, organizational culture, resistance to change, and university. It presents changes in universities, focusing on governance, resistance to change, and organizational culture. Furthermore, the term "e-learning" highlights the dimension of change in relation to new trends in digital education.

Cluster 2, represented by green, consists of 5 elements: COVID-19, faculty development, online learning, organizational change, universities. It reveals how the internal processes of educational organizations have undergone changes and transformations under the impact of the COVID-19 pandemic, leading to new ways of acting.

Cluster 3, represented by blue, consists of five elements: change, education, leadership, management, and management education. It places management and leadership as the driving forces behind the implementation of change in universities.

Cluster 4, represented by yellow, consists of five elements: higher education institutions, organizational change management, sustainability, sustainability reporting, and sustainable development. It highlights a new direction for organizational change, namely sustainability, through the implementation of sustainability strategies.

Cluster 5, represented by purple, consists of 3 elements: artificial intelligence, digital transformation, innovation. It highlights the emerging factors of change, the transition to digital education.

Cluster 6, represented by the light blue color, consists of three elements: change management, organizational development, and qualitative research. This highlights the need for change management for organizational development, based on qualitative research.

The co-occurrence network of keywords used in the analyzed papers, created using VOSviewer software, provides a concise representation of the concepts and temporal evolution of research on change management in higher education. The two main nodes, "change management" and "higher education," suggest that the articles under analysis focus on the applicability of change management methods, models, and principles in higher education institutions. The analysis of the map allows the dimensions of management change in higher education institutions to be divided into four parts:

- governance, management, and leadership;
- organizational culture;
- sustainability;
- digital transformation.

Figure 4 highlights the co-occurrence network of keywords from the perspective of the evolution over time of the keywords used by authors.

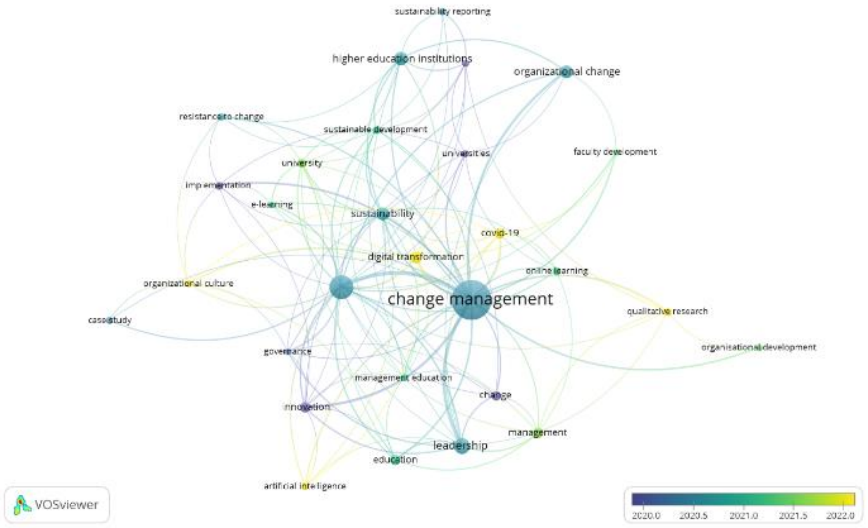


**Figure 4** – *Co-occurrence network of authors' keywords between 2015 and 2025* (Overlay Visualization).

The map can be interpreted by considering both the color coding and the temporal scope of the analysis. According to the map legend, darker colors represent earlier studies (2015–2020), whereas lighter colors indicate more recent research trends. The visualization reveals a systemic perspective on change, evidenced by the strong connections among leadership, management, and organizational change, as well as the interrelationships between organizational processes.

Notably, leadership, management, innovation, and change are closely linked, reflecting Kotter's (1996) proposition that successful transformation depends on leaders fostering a shared sense of urgency and commitment among key stakeholders. Contemporary research interest is increasingly focused on sustainability, artificial intelligence, digitalization, and technological innovation, signaling a shift toward transformative management practices within higher education.

The primary contribution of this study lies in identifying the key dimensions of change in higher education institutions, providing insights that may support the development of the academic environment. However, the study has certain limitations, including reliance on a single database, the inability to conduct in-depth analysis of the retrieved articles, and the dependence of results on the specific search queries employed.

## Conclusions

The organizational transformation of universities is a current topic that is rapidly gaining momentum and has a global impact. Bibliometric analysis has identified new manifestations in change management, with educational organizations undergoing a process of transformation, moving from traditional operating models to strategic approaches focused on sustainability and digital transformation.

Change is a normal, constant phenomenon that has a decisive influence on organizational structures. In a world in constant motion, change management can create an advantage for the continuous improvement of organizations. The classic models of change proposed by Lewin and Kotter can create the framework for organizational development if approached in a transformative manner, following the current directions of change.

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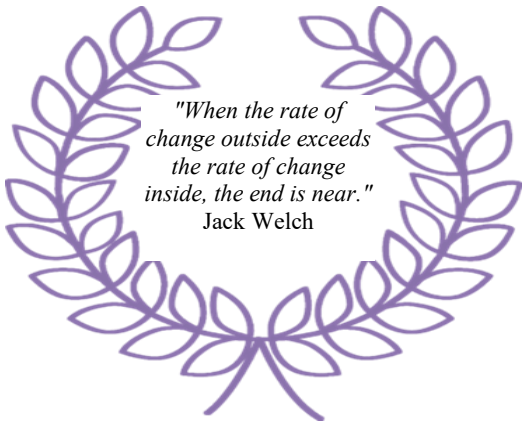

# Model of Integrating Organizational Resilience Into Transformation Management

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Abstract

*This paper addresses this gap by proposing an integrated conceptual framework that embeds organizational resilience within transformation management processes. Based on a review of academic literature published between 2015 and 2025, the study develops the Transformation–Resilience Integration Model (TRIM), which conceptualizes resilience as an enabling mechanism that supports, stabilizes and sustains organizational transformation. The model integrates core transformation dimensions—strategic, structural, people-oriented, cultural and technology—with key resilience capacities. The research adopts a qualitative, theory-building approach, combining literature synthesis with conceptual model development. The results highlight the critical role of resilience as a driver of sustainable transformation rather than a post-change outcome. The proposed model offers both theoretical value and practical relevance for managers operating in entrepreneurial and engineering-oriented organizations.*

**Keywords:** transformation management, organizational change, strategic transformation

## Introduction

Organizations operating in contemporary business environments are increasingly exposed to volatile, uncertain, complex and ambiguous conditions, driven by accelerated digitalization, technological convergence, global crises and shifting stakeholder expectations. In this context, organizational change has evolved from a sequence of discrete, planned interventions into a continuous and systemic phenomenon, commonly referred to as organizational transformation. As a result, the managerial focus has progressively shifted from traditional change management practices toward broader approaches capable of sustaining long-term transformation (Vial, 2019; Hanelt et al., 2021).


The academic literature on change management has long been grounded in classical models, such as

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those proposed by Kurt Lewin and later extended by John P. Kotter, which emphasize structured stages, leadership alignment and behavioral adaptation. While these models remain relevant as foundational references, they were developed in relatively stable environments and assume that change processes can reach a new equilibrium. In contrast, contemporary organizations rarely operate under conditions that allow for such stabilization, as transformation has become an ongoing requirement rather than a temporary state.

Parallel to the growing interest in transformation management, organizational resilience has emerged as a key concept in management and organizational studies. Resilience is commonly associated with an organization's ability to absorb shocks, adapt to disruptions and continue operating under adverse conditions. Existing studies predominantly position resilience within the domains of crisis management, business continuity or risk management, often treating it as a reactive capability or as an outcome observed after major disruptions. Consequently, resilience is frequently discussed as a supporting or downstream concept, rather than as a core element embedded within transformation processes.

This separation between transformation management and organizational resilience represents a significant gap. Although both streams of literature address organizational adaptation and long-term sustainability, they are rarely integrated into a coherent conceptual framework. The lack of such integration limits the explanatory power of existing models and reduces their practical relevance for organizations that must simultaneously transform and remain resilient in the face of persistent uncertainty (Hillmann and Guenther, 2021; Williams et al., 2017).

Considering this background, the present paper aims to contribute to the literature through a conceptual integration of transformation management and organizational resilience. The central assumption of this study is that resilience should not be viewed merely as a consequence of successful transformation, but as an enabling mechanism that actively supports, stabilizes and sustains transformation over time.

In order to address this objective, the paper develops a conceptual framework—the Transformation–Resilience Integration Model (TRIM)— designed to integrate transformation dimensions with key resilience capacities at an analytical level. By doing so, the study seeks to advance theoretical understanding and provide a structured lens for managers operating in entrepreneurial and engineering-oriented organizations. The paper is structured as follows: the next section outlines the methodological approach for conceptual development, followed by the presentation and discussion of the proposed conceptual model, and concluding with implications and directions for future research.

## Research methodology

This study adopts a qualitative, theory-building research approach, suitable for the development of conceptual frameworks in interdisciplinary research domains. The research focuses on the synthesis and integration of existing theoretical perspectives on transformation management and organizational resilience.

The conceptual framework was developed through a structured review of peer-reviewed academic literature published between 2015 and 2025, retrieved from established scholarly databases, including Scopus, Web of Science and Google Scholar. The literature selection focused on academic journals and books addressing organizational transformation, change management, organizational resilience and related dynamic capability perspectives. Moreover, seminal theoretical works were included selectively to ensure conceptual grounding.

The analysis followed an iterative process of literature screening, thematic synthesis and conceptual integration, leading to the development of the Transformation–Resilience Integration Model (TRIM). Illustrative case mapping based on secondary organizational data was employed exclusively for conceptual clarification, without involving primary empirical data collection. As a conceptual study, the findings are presented as analytical propositions intended to inform future empirical research.

## Results and discussion

***The Transformation–Resilience Integration Model (TRIM).*** The primary result of this study is the development of an integrated conceptual framework - the Transformation–Resilience Integration Model (TRIM) - which embeds organizational resilience as a core enabling mechanism within transformation management processes. The model synthesizes key insights from the transformation management and organizational resilience literatures into a unified analytical structure.

The TRIM framework conceptualizes organizational transformation as a multidimensional, socio-technical process supported by a resilience enablement layer that operates continuously across transformation activities. In contrast to traditional models that treat resilience as a reactive or outcome-oriented capability, TRIM positions resilience as an active and dynamic driver that supports, stabilizes and sustains transformation under conditions of uncertainty and disruption. Figure 1 presents the Transformation–Resilience Integration Model (TRIM) and illustrates the systemic interaction between the core transformation dimensions and the organizational resilience capacities. The model does not present transformation as a linear sequence of stages; instead, it emphasizes the simultaneity, interdependence and mutual reinforcement of transformation processes across strategic, structural, human, cultural and technological domains.

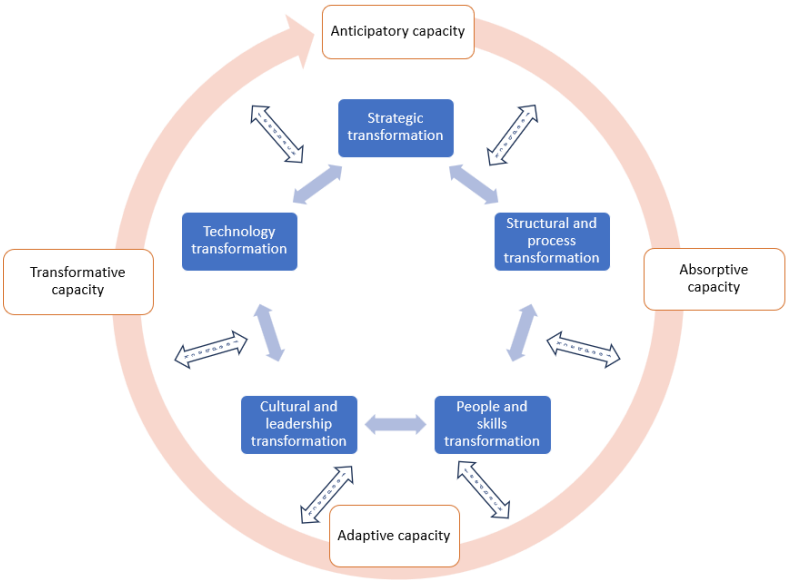


**Figure 1** – *Transformation–Resilience Integration Model (TRIM)*

At the center of the framework are five interrelated transformation dimensions, representing the organizational system undergoing change. These dimensions interact continuously and are influenced by organizational context and external pressures.

Surrounding the transformation core, the model incorporates a Resilience Enablement Layer, which encompasses the organizational capacities required to anticipate disruptions, absorb shocks, adapt to changing conditions and, when necessary, fundamentally reconfigure organizational systems.

The conceptual structure of TRIM highlights the presence of feedback mechanisms between transformation and resilience. These feedback relationships indicate that resilience not only supports transformation initiatives but is also strengthened through transformation processes, reinforcing the view of transformation management as an ongoing cycle of adaptation, learning and renewal rather than a finite change program.

By integrating transformation management and organizational resilience within a single framework, TRIM provides a holistic perspective that addresses

a key gap in existing literature. The detailed conceptualization of the transformation dimensions and the resilience capacities is further developed in the following sections.

***Core dimensions of Transformation management.*** Based on the conceptual synthesis of literature, the model identifies five interrelated transformation dimensions, reflecting a holistic socio-technical perspective on organizational transformation:

- *Strategic Transformation,* referring to changes in organizational direction, value creation logic and long-term objectives, often driven by technological, market or regulatory shifts (Teece, 2018);
- *Structural and Process Transformation,* encompassing modifications to organizational structures, governance mechanisms and operational processes required to support new strategic priorities and coordination mechanisms;
- *People and Skills Transformation*, involving workforce reskilling, role redefinition and capability development to align human capital with evolving organizational requirements (Lengnick-Hall et al., 2011);
- *Cultural and Leadership Transformation,* focusing on shared values, leadership behaviors and decision-making norms that shape organizational adaptability, learning orientation and openness to change (Schein, 2010);
- *Technology Transformation,* addressing the adoption, integration and strategic use of digital technologies—including digital platforms, automation, data analytics and artificial intelligence—as core drivers of organizational transformation rather than merely operational tools (Westerman et al., 2014; Iansiti and Lakhani, 2020; Nambisan et al., 2017; Warner and Wäger, 2019).

These dimensions are consistent with prior transformation management studies but are integrated within a single framework to emphasize their interdependence rather than treating them as isolated change initiatives.

***Resilience as an enabling layer.*** A key conceptual contribution of the TRIM framework lies in the explicit integration of organizational resilience capacities as a core enablement layer (Hillmann and Guenther, 2021; Duchek, 2020). Based on resilience literature, four core capacities are incorporated, as presented below:

- *Anticipatory capacity,* enabling organizations to identify emerging threats and opportunities through environmental scanning and strategic foresight (Duchek, 2020);
- *Absorptive capacity*, reflecting the ability to withstand shocks while maintaining essential functions and performance levels;
- *Adaptive capacity*, which allows organizations to adjust structures, processes and behaviors in response to changing conditions;
- *Transformative capacity,* supporting fundamental reconfiguration of organizational systems when incremental adaptation is insufficient.

By embedding these capacities within transformation management, the TRIM model illustrates how resilience supports not only organizational survival but also continuous renewal and strategic repositioning.

***Conceptual implications and discussion.*** To illustrate the analytical value of the proposed framework, the TRIM model can be examined at a conceptual level in relation to transformation dynamics discussed in the existing literature. Prior studies on large-scale organizational transformation consistently emphasize that sustainable change requires the simultaneous alignment of strategic, structural, human, cultural and technological dimensions, particularly in contexts characterized by uncertainty and environmental turbulence.

From a conceptual perspective, the TRIM framework suggests that transformation initiatives are more likely to be sustained when resilience capacities, particularly anticipatory and adaptive capacities are embedded within transformation processes rather than addressed reactively. This reasoning aligns with existing research indicating that organizations capable of anticipating disruptions and continuously adjusting their structures and practices are better positioned to maintain strategic coherence during prolonged transformation efforts. Conversely, the absence of embedded resilience mechanisms can be conceptually associated with common transformation challenges highlighted in the

literature, such as implementation delays, erosion of organizational capabilities and strategic drift under external pressure.

Overall, this discussion reinforces the argument that integrating organizational resilience into transformation management enhances both theoretical explanatory power and managerial relevance. The TRIM framework extends existing models by offering a systemic perspective on transformation as a continuous, resilience-enabled process rather than a finite change project or program.

***Theoretical and managerial implications.*** To illustrate the analytical value of the proposed framework, the TRIM model can be examined at a conceptual level in relation to transformation dynamics discussed in the existing literature. Prior studies on large-scale organizational transformation consistently emphasize that sustainable change requires the simultaneous alignment of strategic, structural, human, cultural and technological dimensions, particularly in contexts characterized by uncertainty and environmental turbulence.

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## Conclusions

This paper set out to address an identified gap in the transformation management literature, namely the conceptual separation between organizational transformation and organizational resilience. While prior studies have extensively examined these domains independently, limited attention has been given to their systematic integration within a unified analytical framework. In response to this gap, the study proposed the Transformation–Resilience Integration Model (TRIM) as a conceptual contribution that embeds resilience as a core enabling mechanism within transformation management processes.

By adopting a qualitative, theory-building research design grounded in a structured review and synthesis of existing literature, the study advances a holistic, socio-technical perspective on organizational transformation. The TRIM framework conceptualizes transformation as a multidimensional process encompassing strategic, structural and process-related, people and skills, cultural and leadership, and technological dimensions, supported by an overarching resilience enablement layer. This integration highlights the interdependence of transformation activities and the critical role of resilience capacities - anticipatory, absorptive, adaptive and transformative - in sustaining organizational change under conditions of uncertainty and disruption.

From a theoretical point of view, the proposed model contributes to the advancement of transformation management research by repositioning organizational resilience from a reactive or outcome-oriented construct to a dynamic capability embedded within transformation processes. By bridging two previously fragmented research streams, TRIM enhances conceptual coherence and provides a structured foundation for future empirical investigation. From a managerial perspective, the model offers a practical lens for understanding and governing transformation initiatives in complex organizational contexts. By emphasizing the simultaneous development of

transformation dimensions and resilience capacities, TRIM supports managers and decision-makers in diagnosing transformation readiness, designing integrated interventions and sustaining performance during periods of continuous change. The framework is particularly relevant for entrepreneurial and engineering-oriented organizations, where technological advancement, operational complexity and environmental volatility are closely intertwined.

Despite its contributions, this study has several limitations. As a conceptual paper, it does not provide empirical validation of the proposed relationships between transformation dimensions and resilience capacities. Consequently, the TRIM framework should be interpreted as an analytical and integrative model rather than as an empirically tested causal structure. These limitations point to several promising avenues for future research. First, empirical validation of the TRIM framework through qualitative case studies, survey-based research or mixed-method approaches would strengthen its explanatory power and practical applicability. Second, future studies could focus on operationalizing the model's dimensions and resilience capacities into measurable constructs and assessment instruments. Third, sector-specific investigations, particularly in highly dynamic, technology-intensive or regulated environments, could further refine and contextualize the framework. Such empirical extensions would contribute to advancing the TRIM model from a conceptual integration toward a validated analytical tool for studying and managing organizational transformation in volatile environments (Teece et al., 2016; Hanelt et al., 2021).

In conclusion, the TRIM framework offers a comprehensive and integrative approach to understanding transformation management in contemporary organizations. By explicitly embedding organizational resilience within transformation processes, the model contributes to a more robust and sustainable understanding of organizational change, providing a foundation for both theoretical refinement and practical application.

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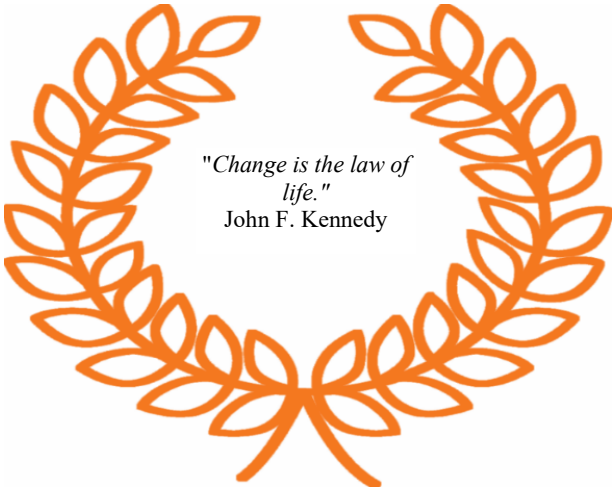

# Assessment Pressure Mapper for Visualizing Peaks in Digital Evaluation Load

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Abstract

*Digital learning platforms provide a substantial amount of assessment-related data, which is hardly used to inform academic administration choices for evaluation scheduling. This article presents Assessment Pressure Mapper, a Python-based tool that examines Moodle action logs and grade records to measure and display temporal concentrations of digital assessment activity. We combine assessment events like quiz attempts and assignment submissions into weekly time intervals to create heatmaps that show when there is more evaluation pressure at the course and program levels. A composite assessment pressure score is used to find the weeks with the most assessments and the times when assessments overlap across courses. The method presented in this paper is shown using an open-source Moodle dataset that contains actual grading and activity data, which shows how useful it is for managing higher education.*

**Keywords:** assessment analytics, academic workload visualization, educational data mining

## Introduction

Colleges and universities today use digital learning platforms and learning management systems (LMS) to plan lessons, tests, and aid students. Modern LMS ecosystems not only store materials, but they also keep track of everything users do, such as quiz attempts, assignment submissions, and grading events. This makes a big data layer that isn't utilized very often, but it can be transformed into helpful information for coordinating academic work.

In parallel, current applied research has put a growing emphasis on how software systems and smart platforms can make learning better and make digital learning environments more flexible. For instance, personalized learning via software-driven methods shows that educational institutions may be improved by structured data processing and analytics-focused application design (Dragoi et al., 2025a).

*"In a world that's changing really quickly, the only strategy that is guaranteed to fail is not taking risks."*
Mark Zuckerberg



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Similarly, there is a larger trend in actual platform implementations that combine artificial intelligence (AI), automation, and interaction: creating operational tools to transform raw data traces into stakeholder-friendly, interpretable outputs (Dragoi et al., 2025b).

Meanwhile, many academic programs still rely on manual or semi-manual assessment planning, often for particular courses. This might cause deadlines, quizzes, and graded activities to be accidentally scheduled at the same time. Because assessment peaks in numerous courses at once make coordination more difficult, increase the perceived effort, and perhaps increase the risk of stress and burnout, this clustering is an academic management problem as well as a student-experience issue. Despite the growing integration of analytics principles into educational technologies, there are still few replicable and readily deployable real systems supporting program-level temporal scheduling.

In response to this need, the authors of this work provide Assessment Pressure Mapper, a Python program that transforms grade reports and LMS logs into a temporal „assessment pressure map". By aggregating assessment data into weekly intervals and then generating heatmaps and organized management outputs, the basic aim is to find out when assessment activity is concentrated and when it overlaps across courses. In other fields, operational prototypes that link sensors, user interaction signals, and automated actuation pipelines (Dragoi et al., 2024) demonstrate how data streams can be processed into actionable outputs in real-time or near real-time. This broader methodological direction is in line with applied system-building work. Our goal is to provide academic managers and program coordinators with a realistic way to find the weeks with the most assessments, measure how much time is spent on each, and make schedule changes using data from actual Moodle use.

Learning analytics, which tries to get relevant information from data generated by LMSs, has become a popular field of research along with the advent of software-based educational systems (Cukurova, 2025). Instead of using traditional surveys or self-reported metrics, data may be obtained via LMS logs, which can effectively indicate student involvement, assessment behaviour, and workload distribution over time (Goh, 2025). Because of this, Moodle's open architecture and strong event recording features, which make it possible to create analytics pipelines that can be used again, have made it a popular reference platform (Romero & Ventura, 2020). Recent research has examined the use of learning management system data to monitor student behaviours, predict academic performance, and identify indicators of disengagement or excessive workload (Hetigan et al., 2025; Barbare et al., 2025).

Dashboards and heatmaps are two ways to exhibit data that have been proven to help teachers and administrators understand difficult educational data. This, in turn, makes it possible to make better decisions and act quickly (Masiello, 2024). Still, these methodologies generally look at one student or one course at a time and don't indicate how different courses affect each other over time.

Academic load has been increasingly discussed recently, particularly in relation to when and how assessments are administered. There has to be coordinated evaluation planning at the program level since empirical data shows that overlapping exams and clustered deadlines may have a negative effect on student well-being and learning outcomes (Zannella and Sutherland, 2025; Islam and Rabbi, 2024). Despite this being recognized, most of the workload research relies on questionnaires or other subjective metrics. Still uncommon are objective, log-based depictions of evaluation pressure.

Recent contributions facilitate the integration of learning analytics with institutional decision support by transforming LMS data into operational instruments for academic administration (Harshani De Silva, 2025). These technologies emphasize the need for aggregation, standardization, and temporal analysis as essential steps for extending analytics beyond individual courses to whole programs. In this ever-changing environment, visual representations of assessment activity across time are a natural approach to illustrate hidden overlaps, peak periods, and structural imbalances that are hard to uncover by looking at them manually or with static schedules (Zhang, 2025).

This approach views assessment not just as an instructional tool, but as a measurable indicator of the accumulation and overlap of evaluative

demands across courses. The suggested method converts real Moodle log data into understandable pressure maps and organized reports. This is in line with current progress in educational data analytics and builds on it to provide practical scheduling help and program-level coordination.

The tool provided in this article works directly with ordinary Moodle CSV outputs and doesn't need any changes or integration at the platform level.

## Methodology of Research

Extracted from a Moodle-based learning management system, the suggested technique is experimentally evaluated using genuine, open-source data. On the Kaggle site, you may find the dataset that is open to the public (Sneiders, 2025).

For educational and research reasons, the dataset is made available, and it contains real logs obtained from a running Moodle system. The suggested technique is both transparent and reproducible because of its open availability.

Two CSV files extracted from the dataset were used in this analysis:

- udk_moodle_log.csv, a 140 MB action log file showing user interactions with the Moodle platform with timestamps. The following fields are included in each entry: a timestamp, a description of the event type, IDs for the user and the course, and the action that caused the event.
- udk_moodle_all_grades.csv, a combined file about grades that includes information on assessed tasks. This file provides an additional perspective on formal assessment results; it contains course and user identities as well as grading timestamps and information pertaining to grades.

These files provide a complete picture of assessment-related activities by combining behavioral interaction traces with grading events from real academic processes.

Since LMS outputs are different, a preprocessing step is done before analysis. Automatic detection and normalization of timestamp data enable support for both string-based date representations and numeric epoch formats (milliseconds or seconds). A standard, time-independent datetime format is applied to all timestamps.

Based on a keyword-based filtering method, the program retrieves assessment-relevant events from the whole collection of Moodle activity logs. Only contacts connected to assessments, such as quizzes, assignment submissions, grading actions, and feedback-related procedures, are kept. This way, the technique may concentrate on tasks relevant to assessment while still being resilient across various Moodle export setups.

Using the parameters of an ISO calendar week, the filtered assessment events are combined into time frames that span one week. The decision to aggregate data weekly was based on a need for a compromise between temporal precision and interpretability, as well as on academic scheduling patterns.

For each course and each week, the application computes multiple indicators, including:

- the total number of assessment-related events;
- the number of distinct users involved in assessment activities;
- the number of grade-related records, when available.

These indicators form the basis for constructing a structured representation of assessment activity over time at both course and program levels.

The program creates a combined evaluation pressure score for every course-week pair in order to measure the severity of evaluations. The level of student engagement and the number of assessment activities are both reflected in the score, which is a composite of many activity markers.

The score is a weighted linear mixture of event numbers, unique user interactions, and data related to grading. The weighing technique is meant to be simple and easy to grasp, which makes it useful in a variety of institutional settings and more flexible.

The primary steps in the application process are as follows:

- data loading and column mapping;
- timestamp normalization and event filtering;
- weekly aggregation and pressure score computation;
- peak period detection using percentile-based thresholds;
- visualization and export of results.

This modular design ensures portability and allows the application to be reused with different Moodle datasets or extended with additional indicators.

To make the proposed method completely functional, an autonomous Python application is needed to directly manage Moodle exports. This system is designed to interact with real-life exports from the Moodle platform, rather than abstract analytics frameworks, which allows for easy replication and direct use in real-world classrooms.

The use of open-source data also ensures openness, allowing for the recommended solution to be independently validated and reused. We utilize two CSV files: one for aggregated grades, which gives additional information on official evaluation events, and one for a large-scale action log, which records user interactions with assessment-related components with timestamps.

Because of its adaptable graphical user interface (GUI), the program can handle different Moodle installations and output formats. Without ever touching the source code, users may set up analytics, choose input files, and assign semantic roles to dataset-specific columns (such as timestamps, course names, user IDs, and event descriptions). This choice in design ensures that the technique is consistent with methodology and does not depend on any particular dataset.

To ensure that the performance is always the same across datasets, each interface component is linked to a specific processing requirement in the analytic pipeline. This makes it possible to compare courses, figure out how many people will be taking each course, and combine data across time. Event description fields are used to filter out actions that are not linked to evaluations so that only activities related to evaluations affect the computed pressure metrics. When gradebook data is available, the assessment pressure score may be adjusted by using grading records as an additional signal.

The interface lets you adjust two visualization factors: whether or not to normalize each course and how many courses to display in heatmap representations. These settings are quite important for making sure that things can be understood when there are a lot of academic programs with hundreds of courses. The outputs are easy for management to read and understand since they concentrate on the most important contributors and only show those visuals.

All things considered, the GUI is like a glass door between the raw Moodle data and the analytical results that the system generates. It enables reproducible configuration of the analysis while supporting the transformation of real LMS logs into structured indicators of temporal assessment pressure.

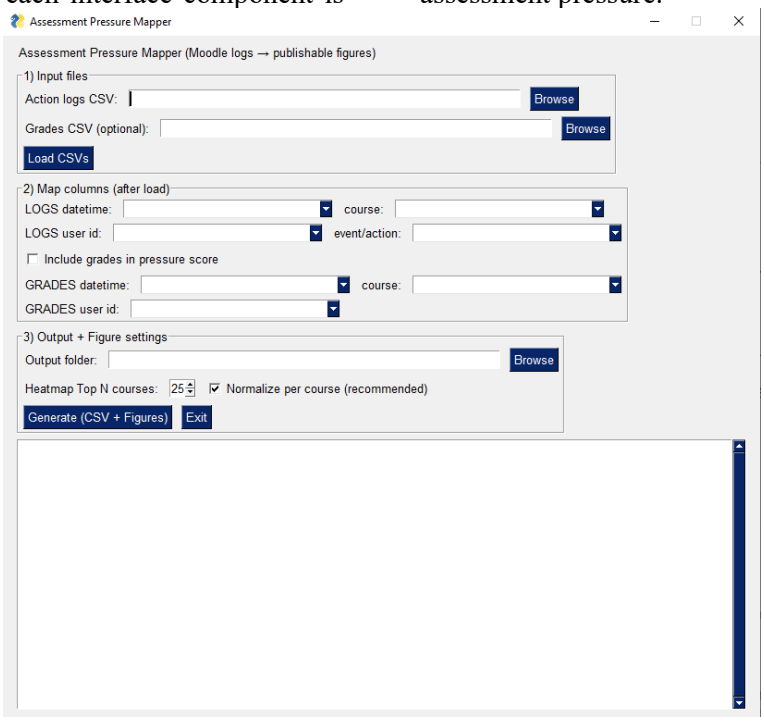


**Figure 1** – *Application GUI*

## Results and Discussion

This section presents and interprets the outputs generated by the Assessment Pressure Mapper using the real Moodle dataset described earlier.

After running the application, two main structured outputs are produced:

- weekly_pressure.csv: the detailed table at the course-week level. Each row represents one course in one ISO week and stores: week, course; n_events = number of assessment-related actions (filtered from logs); n_users = distinct users involved in those actions in that course-week; pressure_score = the composite score used in the figures.

In our run, the file includes 5,654 course-week rows, covering 22 weeks and 633 distinct courses. Across the whole analyzed interval, the filtered assessment events sum to 332,282 log actions.

- peak_weeks.csv: the compact table at program-week level. Each row represents one week and stores: week, pressure_score = total program pressure that week (sum across courses); p90_threshold = the percentile-based threshold used for peak detection; is_peak_week = whether the week is flagged as a peak (above threshold).

In this run, the P90 threshold is 27,701.45, and three weeks exceed it (so they are flagged as peak weeks).

These two files are useful because they allow the figures to be regenerated and checked, but they also allow administrative teams to query concrete questions (e.g., „which courses drove week X?" or „how many courses were active in week Y?") without re-running the full pipeline.

Figure 2 shows a clear rising trend from late 2022 toward early 2023, with a sharp maximum around 2023-W03. Using the P90 threshold rule, the tool flags the following peak weeks, as can be shown in Table 1 (values taken from peak_weeks.csv).

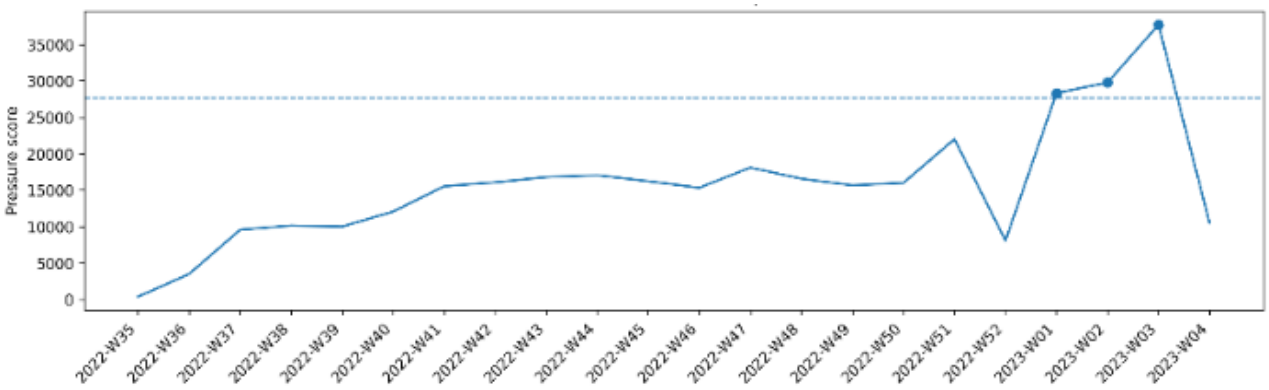


**Figure 2** - *Total assessment pressure per week*

**Table 1** - *Peak weeks of the total assessment pressure per week*

| Peak week | Total pressure score | Active courses (that week) |
|---|---|---|
| **2023-W03** | **37,709.5** | **383** |
| **2023-W02** | **29,780.5** | **356** |
| **2023-W01** | **28,333.5** | **359** |

From a program-level perspective, this result indicates that at the beginning of 2023, many courses aligned their assessment activity, producing program-level pressure spikes. For context, the lowest weeks in the analysed window are much smaller, as can be shown in Table 2 (values taken from peak_weeks.csv).

**Table 2** - *Lowest weeks of the total assessment pressure per week*

| Low week example | Total pressure score |
|---|---|
| 2022-W35 | 379.0 |
| 2022-W36 | 3,490.0 |
| 2022-W52 | 8,088.0 |

This gap (from hundreds to tens of thousands) supports the managerial interpretation that some weeks are structurally „quiet", while others become „crowded" with evaluation-related activity. The heatmap is built for the Top 25 courses (by contribution) and displays per-course normalized pressure across the weeks (Figure 3). This normalization is important: it makes the visualization readable and highlights relative peaks inside each course, not just large courses that naturally generate many events.

Two patterns are visually clear from Figure 3:

- Shared high-pressure period in early 2023:

  Several courses display strong intensity around 2023-W01 to 2023-W03, matching the peak weeks table above. In other words, the program peak is not caused by a single outlier course; it coincides with multiple courses reaching their own local maxima in the same weeks.

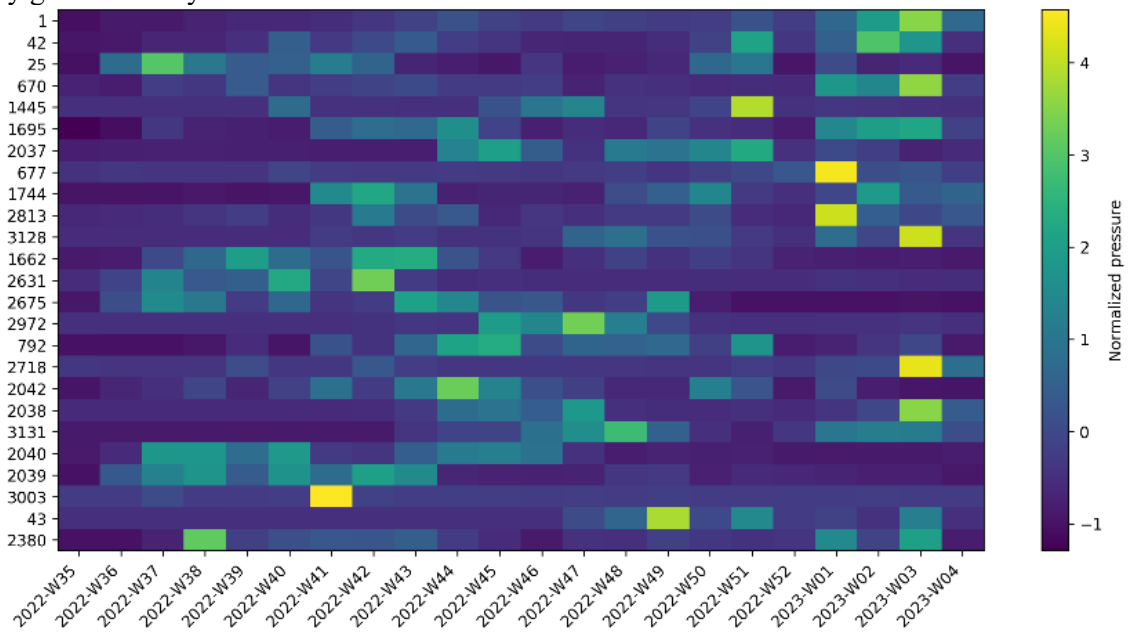


**Figure 3** – *Assessment pressure heatmap (top 25 courses)*

- Course-specific „mini-peaks" earlier in the semester:

  Some courses peak around mid/late 2022 (e.g., around W41–W47). These local bursts matter because they can represent quiz windows or assignment deadlines that may overlap with other courses, even if the program total is not yet above the global peak threshold.

From a managerial perspective, the heatmap provides a calendar-like overview of periods with overlapping assessment activity, which are difficult to identify from static schedules.

To make the peak actionable, the tool also produces a ranking of the largest contributors inside the detected peak week (here: 2023-W03), as can be shown in Figure 4. The top 10 courses and their share of the week's total are presented in Table 3 (values taken from weekly_pressure.csv).

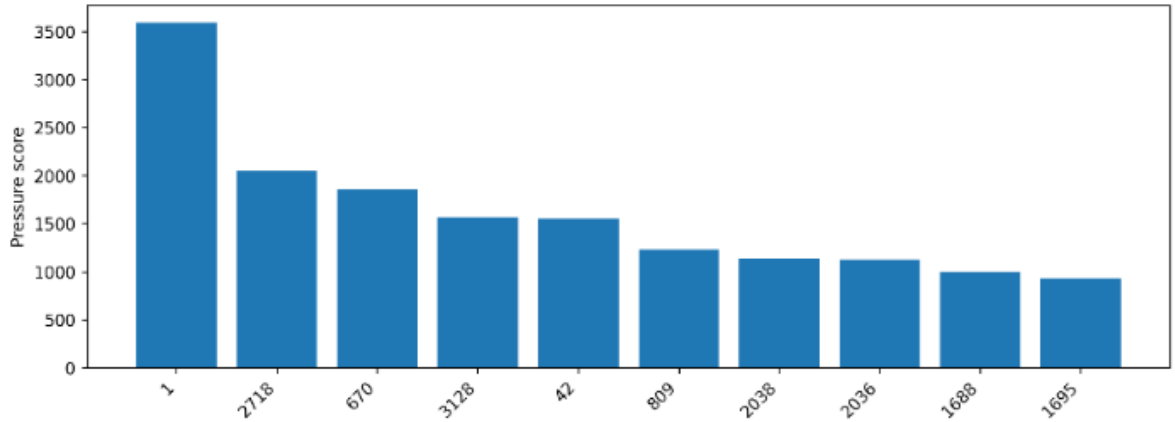


**Figure 4** – *Graphic of Top 10 courses contributing in peak week (2023-W03)*

**Table 3** – *Top 10 course contributions in the peak week (2023-W03)*

| Rank | Course ID | Pressure score in 2023-W03 | Share of the week's total |
|---|---|---|---|
| **1** | 1 | 3,587.5 | 9.5% |
| **2** | 2718 | 2,054.0 | 5.4% |
| **3** | 670 | 1,854.5 | 4.9% |
| **4** | 3128 | 1,566.5 | 4.2% |
| **5** | 42 | 1,556.0 | 4.1% |
| **6** | 809 | 1,225.5 | 3.2% |
| **7** | 2038 | 1,138.5 | 3.0% |
| **8** | 2036 | 1,128.5 | 3.0% |
| **9** | 1688 | 992.5 | 2.6% |
| **10** | 1695 | 931.5 | 2.5% |

A key observation is concentration: the Top 10 courses account for ~42.5% of the whole week's pressure, while the remaining ~57.5% is distributed across many other courses. This is exactly the kind of result that helps coordination: you can first discuss calendar adjustments with the "main contributors", but you also know the peak is partly systemic (spread across the program).

Looking at course-week behavior across the whole dataset:

- The median course-week has 9 events and 2 users, with a median pressure_score of 10.5.
- At the high end, the 99th percentile reaches roughly 741 events and a pressure_score around 755.7.
- The maximum observed in the analyzed window is a course-week with 3,462 events, 385 users, and pressure_score = 3,587.5 (this aligns with the strongest bar in the peak-week contributor plot).

This distribution is typical of LMS data: most course-weeks are quiet, but a small fraction becomes very active during deadlines, quizzes, grading periods, or feedback cycles. The strength of the proposed mapper is that it makes these extremes visible in time and across courses, not just per course.

From a management perspective, the outputs can be read as an early-warning system:

- File peak_weeks.csv identifies when a program is likely overloaded.
- The heatmap shows whether the peak is shared by many courses or dominated by a few.
- The contributor ranking shows where to intervene first if calendar changes are possible.

Even without any subjective survey data, these log-derived indicators provide a concrete basis for discussions about better distribution of evaluation load - especially when programs include hundreds of courses and manual coordination becomes unrealistic.

This analysis focuses on digital traces of assessment-related activity (quiz attempts, submissions, grading/feedback actions, etc.) rather than the pedagogical difficulty of assessments. The pressure score is therefore a proxy for temporal concentration of evaluation activity, not a direct measure of student stress.

Although the tool supports the integration of gradebook records from udk_moodle_all_grades.csv, the results reported here rely primarily on log-derived indicators, as grade-related counts were negligible in the analysed dataset configuration.

## Conclusions

This paper presented Assessment Pressure Mapper, a practical Python-based application designed to transform Moodle action logs into clear indicators of temporal assessment concentration. The suggested method bridges the gap between academic administration's day-to-day demands and learning analytics research by concentrating on the point at which assessment tasks aggregate across classes.

The program showed that evaluation pressure is not uniformly dispersed throughout time and tends to cluster in select weeks using genuine, open-source Moodle data. Academic coordinators may see these trends clearly in the produced visuals and organized outputs, which help them to pinpoint high-pressure weeks, overlapped assessment schedules, and peak times. This application is not meant to replace current planning methods, but rather to supplement them with a data-driven viewpoint that might help with scheduling choices.

The most important thing about this work is that it is operational. The approach is completely developed as a standalone Python program, can be reproduced, and can be used with multiple Moodle CSV outputs without having to change the platform. The suggested pressure score should be seen as a relative indication of how hard the test is, not as a direct measure of how stressed out students are or how well they learn.

Future research may enhance the methodology by including further contextual data, improving pressure measures, or investigating longitudinal patterns across many academic years. The Assessment Pressure Mapper, even in its present state, shows how LMS data may be used to make digital assessment procedures more coordinated and balanced.

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# Environmental Performance Governance: A Digital Comparison of Romania and Croatia

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**Abstract**

*Environmental performance in the domain of public administration has become a major preoccupation in contemporary governance due to the green transition and the need for effective utilization of public resources. The specialized literature and administrative practices tend to treat environmental performance predominantly as a reporting exercise, without explaining the significant differences in results observed between states using similar instruments. The article proposes an alternative approach, conceptualizing environmental performance as a governance system in which data, institutional mechanisms, and incentives are integrated into a results-oriented whole. The article's main contribution is an analytical framework based on six governance mechanisms and its comparative application in the case of Romania and Croatia. The analysis suggests that Romania illustrates a predominant model based on ex-post reporting, characterized by self-reporting, limited managerial integration, and the absence of budgetary conditionality, while Croatia demonstrates a more advanced model based on results-oriented governance. The results suggest that improving environmental performance in public administration depends less on expanding indicator sets and more on strengthening data governance, auditability, and the link between performance, budgeting, and public procurement. The article contributes to the literature on performance governance and provides relevant implications for countries in the process of convergence towards OECD standards.*

**Keywords:** environmental performance, public administration, governance, OECD, recycling, green public procurement

*"You must welcome change as the rule but not as your ruler."*
Denis Waitley

## Introduction

In the last decade, the environmental performance of public administration has become a topic of increasing interest in the governance literature and in the institutional practices promoted at the international level. The ecological

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transition, budgetary pressures, and the significant role of the public sector as a major consumer of resources have led to an expansion of the environmental impact assessment tools of public institutions (OECD, 2019; 2021). In this context, the public administration is no longer analysed exclusively as a regulator of public policies, but also as an institutional actor with direct responsibility for its own impact on the environment.

Various international organisations, such as the Organisation for Economic Co-operation and Development (OECD), have consistently promoted the integration of sustainability criteria into public governance, stressing the importance of performance indicators, the use of data, and public procurement as a tool for market orientation (OECD, 2021; 2023). As a result, many countries have adopted formal frameworks for monitoring consumption, emissions, and administrative practices, often in the form of national programmes or standardized reporting obligations.

However, the existence of similar formal instruments does not automatically translate into comparable results. International assessments show significant differences between countries in the environmental performance of the public sector, especially in areas such as waste management and recycling (OECD, 2020). These differences point to an important question for analysis: What explains the divergent outcomes/ results of public administrations with similar indicators and reporting systems?

From a managerial perspective, environmental performance can be analyzed as a data-driven management system, with feedback mechanisms and incentives comparable to those used in private organizations.

The article starts from the assumption that this variation cannot be adequately explained by extending or refining indicators, but by the way in which environmental performance is governed. Dominant approaches tend to treat environmental performance as a technical ex-post reporting exercise, focused on data collection and aggregation. In the absence of their integration into management, budgeting, and institutional accountability mechanisms, indicators risk remaining descriptive and having a limited impact on organisational behaviour (OECD, 2018; European Commission, 2022).

In this context, the article proposes a change of perspective, the concept of the environmental performance of public administration as a governance system, in which data, institutions, and incentives function as parts of a coherent results-oriented mechanism. Based on this perspective, an analytical framework is developed that allows the assessment of the maturity of environmental performance systems beyond the formal existence of indicators.

The empirical analysis focuses on Romania and Croatia, 2 Member States of the European Union that are in different stages of integrating environmental performance into public governance. Romania provides a relevant example of the recently established formal framework centred on reporting, while Croatia illustrates a more advanced model of data integration, budgeting, and public procurement. In addition, the article examines Romania's deposit-return system (RO-Return) as an analytical example, highlighting the tension between data-driven and incentive-driven mechanisms and their limited integration into overall administrative governance.

The contribution of the article is twofold. Theoretically, the article advances the literature on public-sector performance by shifting the focus from indicators to institutional governance mechanisms. From a practical perspective, the article offers a comparative analysis that identifies the conditions under which environmental performance can move from reporting compliance to an effective tool of public governance.

## Analytical framework

Current publications on public administration and sustainability tend to fall into the category where environmental performance would either represent certain operational indicators or extend the framework of administrative obligation for reporting. This would not, by any means, account for the varying degrees of outcomes characterized by countries using similar instruments. The article, instead, considers environmental performance

from the perspective where it would not represent a reporting process, but rather a strategic framework involving data and incentives integrated into an architectural structure for results-orientation (OECD, 2019; 2021).

From this perspective, the simple existence of indicators or reporting obligations is not decisive for performance. What matters is the way information is collected, verified, and used in the decision-making process. The Organisation for Economic Co-operation and Development emphasises the fact that administrative data only generates public value when they are integrated into management, budgeting, and institutional mechanisms of accountability (OECD, 2019; 2020). In the absence of this integration, performance systems tend to become formal, fragmented, and poorly correlated with environmental outcomes (OECD, 2018).

Starting from this logic, the article proposes an analytical framework for assessing the maturity of environmental performance in public administration, conceived as a continuum between two ideal models: a model based on ex-post reporting and a model based on results-oriented governance. The difference between these models is not purely technical but institutional and is manifested in how six key interdependent mechanisms operate.

The first mechanism involves data governance. In early models, data on consumption and environmental impact were obtained manually, based on accounting documents or internal estimates, and were regularly reported to a central authority. This type of collection is characterized by delays, errors, and a reduced capacity for operative intervention. Meanwhile, in more advanced models, data collection is fully automated and continuous, enabling real-time monitoring and transforming data from simple administrative outputs to managerial control tools (EC, 2022).

The second mechanism concerns the verification and audit of the information reported. In the absence of forms of independent verification, environmental performance is based solely on self-reporting, which reduces the credibility of the system and limits its use in decision-making. The literature on performance governance shows that the lack of audit turns indicators into a symbolic tool with little impact on institutional behaviour (OECD 2021, EC, 2019). In contrast, mature systems integrate audit or validation mechanisms that support institutional learning and behavioural correction.

Environmental performance also requires management integration, which is the third mechanism. In reporting-based models, indicators are collected and centralized without influencing internal decision-making processes, while remaining separate from management assessment and operational planning. In governance models, environmental performance data is used in the management of institutions, in setting priorities, and in the evaluation of administrative efficiency, becoming part of the management logic (OECD, 2020; 2018).

Budgetary integration is a distinctive 4th mechanism. When environmental performance does not influence financial allocations, the incentives to improve results are limited. The indicators remain descriptive and do not produce any institutional consequences. Advanced models introduce forms of budgetary conditionality, where access to finance is related to performance targets reached and sustainability is an effective financial decision criterion (OECD 2023; EC, 2022).

A fifth mechanism is the use of public procurement as a governance lever. In weak approaches, environmental criteria are voluntary or recommended, and monitoring is limited to ex-post reporting of procurement. In mature approaches, environmental criteria are integrated into mandatory technical specifications, and public procurement becomes a tool for market orientation and extension of administrative impact beyond domestic consumption (EC, 2021).

Corrigibility and institutional feedback are the most important elements of the maturity of the system. Models, based on retrospective reporting, do not allow for early identification of deviations and a way to ensure formal compliance. Instead, governance-oriented systems allow for rapid interventions, continuous adjustments, and organisational learning, transforming environmental performance into a dynamic process, not a regular compliance exercise (OECD, 2019; 2018).

The proposed framework evaluates maturity through six interdepenedent mechanism: data governance, independent audit, managerial integration, budgetary conditionality, strategic green procurement, and institutional corrigibility. Figure 1 presents the conceptual model of a mature governance system, demonstrating that environmental performance is not linear, but cyclic, with a correction capacity fueled by data (feedback loop), thus ensuring the continuous optimization of resources.

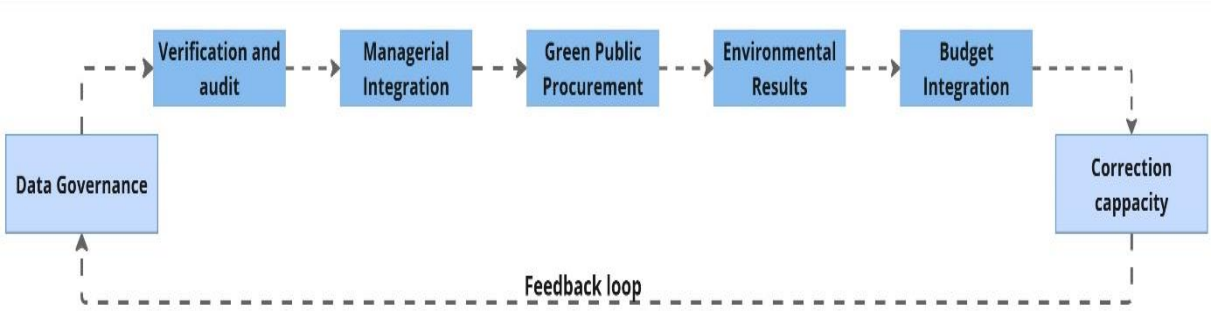


**Figure 1 –** *Integrated cycle of environmental performance governance*

This analytical framework provides the basis for the comparative analysis of environmental performance in public administration and allows the assessment of institutional differences between apparently similar national models in the following sections. The framework is applied comparatively to Romania and Croatia to highlight how differences in institutional design and governance explain divergences in results, including in the field of waste management and recycling.

## Research methodology

This study uses qualitative research based on a normative and comparative analysis. This method is the most robust one for dealing with environmental performance as a case related to the governance of public institutions rather than a discrete result. The target of the research study is not the measurement of various performance indicators in absolute value, but unearthing the institutional mechanisms related to the disparity between the compliance-based results orientation governance model and results-oriented governance.

The study is based on a systematic document analysis focused on obtaining a multi-level outlook on the governance system, spanning three different layers. Internationally, there is an integration of basic OECD frameworks (2018, 2021, and 2023), setting worldwide standards for performance governance and sustainable public administration. These form the basis for a ″results-oriented″ outlook on maturity. This trans-national outlook is followed, for the European Union, by the Environmental Implementation Review (2022), with a serious diagnostic outlook on waste and circular economy goals from a trans-national perspective related to waste management performance.

Finally, the analysis is anchored in the national context by examining the primary legislation in force, Government Decision no. 709/2025 establishing the National Programme for environmental performance, and the Government Decision no. 1074/2021 related to the RO-Return deposit-return system. This distinction allows the research to contrast a general reporting framework with a pre-existing, data-driven operational model.

***Romania: environmental performance as a reporting-based system***

The application of the analytical framework to the case of Romania highlights a predominant environmental performance model based on ex-post reporting, with a limited degree of institutional integration and operational use of data. The national system, created by Government

Decision no. 709/2025, presents a harmonised system of indicators related to consumption and administrative practices, fully in line with OECD recommendations. Moreover, in analysing governance patterns, it is highlighted that there is considerable incongruence between the system and its implementation.

In terms of data governance, the collection of information is mainly based on self-reporting of institutions, using data extracted from invoices and internal records. The lack of integrated digital automatic collection systems limits the accuracy and comparability of data and reduces operational monitoring capacity. The data are aggregated regularly, without allowing for the rapid identification of deviations or inefficiencies, confirming the retrospective nature of the performance assessment (OECD, 2023; 2018).

Verification and auditing are structural weaknesses of the Romanian framework. The Programme does not provide for external audit mechanisms or independent validation of reported data, environmental performance being assessed solely based on information provided by institutions. This reliance on self-reporting reduces the credibility of indicators and limits their use in decision-making, turning environmental performance into a formal administrative exercise (EC, 2019;2022).

As far as managerial integration is concerned, environmental performance indicators are not correlated with the evaluation of the management of public institutions or with operational planning. The data collected are mainly used for reporting and centralization, without generating direct consequences on institutional management. Environmental performance thus remains separate from current decision-making logic, being perceived as a compliance obligation, not as an efficiency tool (OECD, 2020; 2018).

Budgetary integration is practically absent. Environmental performance indicators do not influence budget allocations and do not condition access to public funding in the absence of financial incentives or constraints; institutions do not have structural motivations to improve performance, which limits the impact of the programme on organisational behaviour (OECD, 2021; EC, 2022).

Green public procurement is formally included in the indicators, but functions predominantly as an ex-post monitoring tool. Environmental criteria are not systematically integrated into mandatory technical specifications, and institutional performance is not conditional on the effective use of procurement as a market lever (GR, 2021; Bouckaert and Halligan, 2016).

A distinctive element of the Romanian case is the deposit-return system (RO-Return), established by Government Decision no. 1074/2021. This system offers a relevant contrast to the general logic of the national program (G.D. no. 709/2025). RO-Return is built on the principles of traceability, automatic data collection, and direct economic incentives, allowing real-time monitoring of packaging flows and generating rapid results in increasing collection rates (EC, 2022). However, the system operates relatively in isolation from the general framework of public administration's environmental performance. The data generated is not systematically integrated into administrative governance, and the institutional lessons offered by this model are not transferred to other areas of environmental performance.

Overall, the case of Romania illustrates an aligned but functionally limited formal environmental performance model, where reporting prevails over effective governance, and results are poor in areas such as waste management and recycling (EC, 2022).

***Croatia - environmental performance as a data-driven system***

The application of the same analytical framework to the Croatia case highlights a significantly more integrated model of environmental performance governance, developed in the context of alignment with OECD standards. The difference compared to the Romanian case lies not in the type of indicators used, but in the way in which data are collected, verified, and used in decision-making processes.

In terms of data governance, Croatia uses centralised digital systems for monitoring energy and water consumption in public buildings, with automatic data import. This infrastructure enables constant observation and efficient detection of

irregularities and enables converting environmental observation into a real functional management system rather than just statistical observation.

Verification as well as auditing becomes easier due to the automated nature of the data collection process, as well as the ability to perform an audit on the system, as opposed to the result alone. This improves accuracy as well as the validity of the data used in the decision-making process (OECD, 2018; EC, 2022).

A central element of the Croatian model is the managerial and budgetary integration of environmental performance. The indicators are used in the public investment planning process and are correlated with budget allocations, introducing forms of financial conditionality. Environmental performance thus becomes a criterion of managerial efficiency and a relevant factor in the financing decision.

Public procurement is explicitly used as a governance lever by integrating environmental criteria into mandatory technical specifications and by using centralized platforms that block the purchase of products that do not comply with performance standards. This approach extends the impact of public administration on the market and strengthens the coherence of sustainability policies (Bouckaert and Halligan, 2016).

Overall, the Croatian model can be characterised as a results-oriented environmental performance system, where data, budgeting, and public procurement are integrated into a coherent governance mechanism.

## Comparative discussion

The comparative analysis of the two models highlights a clear distinction between Romania-specific reporting governance and Croatia-specific results-based governance. Although both states have adopted sets of indicators aligned with international standards (OECD), their effectiveness in producing behavioural changes at the level of public institutions depends on the degree of integration of data into decision-making and budgetary processes.

**Table 1 -** *Maturity of environmental performance governance mechanisms*

| Mechanism | Romania | Croatia |
|---|---|---|
| **Data governance** | Self-reporting, manual collection | Automated digital collection |
| **Verification and audit** | Absent/Limited | System audit |
| **Managerial integration** | Reduced | High |
| **Budget integration** | Non-existent | Partial conditionality |
| **Green public procurement** | Ex-post monitoring | Market instrument |
| **Correction Capacity** | Low | High |

To fully understand the dynamics of the two models, Figure 2 details the information flow and responsiveness of the two systems. The fundamental difference results like the feedback loop. In the Romanian model, the process is linear and reactive, while the Croatian model is based on circularity and proactivity enabled by AI-driven predictive analysis and real-time alerts.

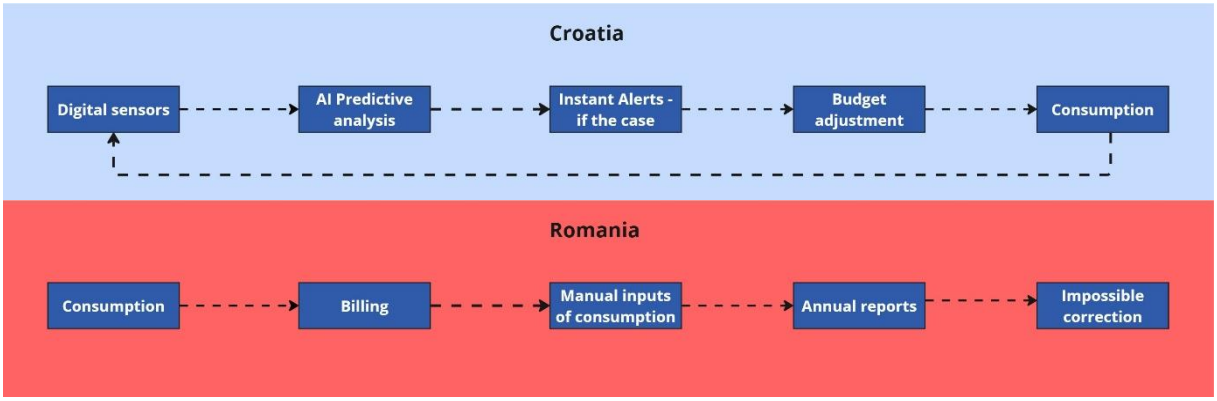


**Figure 2** – *Comparative architecture of data flows and corrections mechanisms*

The differences between the two models cannot be explained solely by administrative capacity or available resources, but by the institutional design of the performance systems. Romania illustrates a model where performance is measured but not governed, whereas Croatia reflects a transition towards a model where environmental performance influences administrative and financial decisions.

## Conclusions

The article demonstrates that environmental performance in public administration should be analysed as a governance system, not as a reporting exercise. The main contribution consists of proposing an analytical framework based on institutional mechanisms and applying it comparatively to Romania and Croatia.

The results show that Romania has made important progress by establishing a unitary formal framework, but it remains stuck in a model based on ex-post reporting, with limited institutional integration. The RO-Return system demonstrates that data-driven and incentive-driven approaches can produce quick results, but the lack of integration into overall administrative governance limits systemic impact.

For Romania, the transition to a mature environmental performance model involves strengthening the digital infrastructure, introducing system auditing, and integrating performance into the budget cycle and public procurement. From a theoretical point of view, the relevance of this article, in relation to the current studies on performance governance, is that it targets not the metrics but the institutional systems, and it could be applied in other contexts as well.

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*"Progress is impossible without change."*
George Bernard Shaw

# Educational and Administrative Needs in Higher Education

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Abstract

*Aiming to identify critical administrative and instructional requirements in higher education, this article provides the results of exploratory research. Thirty people, including students, faculty, and administrative and managerial staff, were surveyed for their opinions. Perceptions of administrative efficiency, decision-making, learning assistance, and system adoption were the primary focus of the investigation. There are clear variations across stakeholder groups, but overall, the findings show that adaptive learning environments, fast feedback, system integration, and data-informed decision assistance are highly sought after. The consensus was that integrated digital management systems would be very beneficial, and many were eager to implement them. A realistic basis for the creation of integrated digital management systems in higher education is offered by the results, which also provide empirical support for needs-driven design methods.*

**Keywords:** higher education, needs analysis, digital systems, exploratory study

## Introduction

The use of digital technologies for educational and administrative purposes is on the rise in the world of higher education. Many colleges and universities today use some kind of digital platform, such as a learning management system or a student information system. These systems' independence may be to blame for the lack of integration between administrative and instructional processes, as well as the fragmentation of workflows and the duplication of tasks. Digital environments that don't satisfy the needs of students, instructors, and administrators for making decisions and doing everyday chores are not commonplace.


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Academic institutions are going through a digital transition, and research reveals that the growth of technology is simply one of several factors. Other essential things to think about include how well stakeholders work together and how ready the company is (Benavides et al. 2020). Digital solutions could not satisfy users' needs since they come from various backgrounds, work in different fields, and have varying levels of digital expertise. When user needs aren't fully understood before implementation, digital solutions may not be utilised as much or at all (Alenezi, 2023).

Research on the potential advantages of educational software, especially in the areas of personalisation and adaptive assistance, has been abundant in recent years. By tailoring course materials and exercises to each student's unique needs, personalised learning platforms have the potential to increase participation and retention rates (Drăgoi et al., 2025). That educational technology must be flexible enough to adapt to various situations is shown, for example, by inclusive learning systems that can function offline or process data locally (Drăgoi et al., 2025). According to these methods, practical use cases, rather than abstract technical details, should be the centre of attention when developing successful digital solutions.

People are paying more attention to how to use institutional data to make better choices about teaching and running a school. Learning analytics have recently attracted considerable interest as a means of assessing online students' engagement, progress, and activities (Nartgün and Kennedy, 2025). To make sense of all the data, lawmakers and instructors need dashboard-based tools and visual analytics (Borrella and Ponce-Cueto, 2025). Teachers and administrators may be able to monitor how their pupils are performing in class and change how they teach quickly if they utilise good dashboards.

One of the major purposes of learning analytics is to identify pupils who are likely to fail school early on. The purpose of early warning systems is to identify trends that can indicate disengagement or poor performance so that preventative measures can be taken (Chang et al., 2025). Recent research has shown that socio-technical techniques may be both ethically and effectively used in higher education settings by combining human-centred intervention tactics with predictive indications. For kids who may otherwise fall behind, these solutions help turn data into immediate assistance.

New research shows that these kinds of systems work best when they include human-centred intervention tactics, clear visualisations, and predictive indications (Masiello et al., 2024). Because of this, it is even more important to have digital systems that link administrative and managerial viewpoints with educational data.

Many higher education digital projects are still focused on technology rather than doing thorough needs assessments, even if this is changing. According to several writers, learning analytics technologies and institutional dashboards cannot be designed or used successfully without first comprehending stakeholder demands (Hernández-Campos et al., 2025). By doing a needs analysis, you may find the right indications, keep your system simple, and make it more user-friendly.

Institutions of higher learning confront complex management and governance issues in areas such as strategy planning, resource allocation, and performance monitoring, in addition to the more traditional areas of teaching and learning. The importance of data-informed decision-making for the long-term viability and transparency of institutions has been highlighted in recent research. Nevertheless, decision-makers often depend on incomplete or delayed data due to a lack of integrated data frameworks and well-defined indicators. By integrating administrative and educational data into consistent analytical perspectives, good educational management systems should back up strategic and operational choices (Ifenthaler et al., 2019; Kaveri et al., 2025).

Several authors have pointed out that one big problem with universities' current digital infrastructures is the lack of connectivity between administrative and instructional technologies. The combined analytical capabilities of learning data, assessment results, and student records are diminished when they are maintained in various locations, as is standard practice. Recent research indicates that institutions' awareness and cooperation may be improved by the integration of

administrative and educational data streams. This method may be a better approach to keep an eye on how well the school is doing and how well the children are doing (Souli et al., 2025). This strategy should be used by any business that wants to change how it manages from reactive to proactive.

Recent research has shown the need of addressing diverse stakeholder expectations and their influence on system adoption. Everyone in the school, from kids to teachers to administrators, uses technology in their own way and for different purposes. Studies reveal that systems that weren't meant to manage these changes typically run into problems or aren't used much. The broad use and sustained importance of digital technologies rely on how well they fit into everyday tasks and responsibilities. For this reason, it is best to use strategies that include people and are oriented toward people (Viberg et al., 2022).

To create integrated digital management systems for higher education, you need to know exactly what stakeholders require, how decisions are made, and what the institutional context is. By focusing on what really counts, digital solutions may aid with learning, administration, and management. This would bring theory and practice closer together. Before you can make digital platforms that are both adaptable and consistent, you need to do some study on what administrative and educational demands are.

This study presents the results of exploratory survey-based research designed to ascertain the instructional and administrative requirements within these educational institutions. The study collected survey responses from students, academic staff, and administrative personnel, concentrating on subjects such as learning support, evaluation methods, administrative duties, and decision-making procedures. The findings provide a framework for identifying the functional needs of integrated digital management systems and offer empirical validation for the proposition that future educational platforms should emphasise user-centricity and coherence.

## Methodology of research

This survey-based exploratory research aimed to identify the types of administrative and instructional assistance required by universities. The focus was on understanding the views and expectations of different stakeholder groups; an exploratory approach was chosen over testing existing theories. Using this strategy makes it easier to get a full picture of how administrative operations, decision-making processes, and the digital learning environment are currently working.

Google Forms was used to send out an anonymous online questionnaire to gather information for this investigation. The questionnaire's design was informed by themes identified in prior research. Some of these themes include making decisions based on data, finding academic problems early, running an efficient school, and tailoring instruction to each student. We didn't ask participants for their names, email addresses, or links to institutions so that they could stay anonymous and provide honest answers.

Most survey items (Q3–Q12) were closed-ended Likert-scale statements rated from 1 (strongly disagree) to 5 (strongly agree). For the sake of easy descriptive analysis and answer comparison, this scale was consistently used across all questions. Q13, an open-ended question, asked respondents to describe the most significant benefit that higher education should expect to get from a digital management system interface.

Thirty people, representing important stakeholder groups in universities, filled out the survey. To provide a diverse range of opinions on educational and administrative procedures, the sample consisted of 17 students, 7 academic personnel, and 6 management/administrative staff. It was deliberate to include many types of stakeholders since users of digital management systems at universities often have diverse positions, duties, and expectations. Everyone who took part did so voluntarily, and each responder only needed one sitting to finish the survey.

The study goals were covered by the questionnaire in several aspects. Concerns about educational expectations mainly concerned the following: the lack of cohesion across different platforms for learning activities; the immediacy and clarity of feedback; and the adaptability of digital platforms to meet the unique requirements of each learner. The following were asked of the respondents via questions marked as „administrative" or „managerial": how efficient

administrative processes are regarded, how important it is to identify academic issues early on, and how valuable it is to summarise data for daily decision-making. We also inquired as to whether or not respondents would be open to using a unified platform for instruction and management, in addition to general opinions on integrated digital management systems.

We used descriptive statistics to analyse the data. The sample's sentiment on closed-ended questions was ascertained by the computation of distributions, percentages, and mean values. We characterised stakeholder group differences to emphasise their conflicting and overlapping viewpoints to prevent statistical generalisation. To supplement the quantitative data, we also categorised free form replies according to recurring themes for the purpose of qualitative analysis.

The study's exploratory character and small sample size meant that analysis focused on pressing issues and priorities rather than drawing conclusions. Finding the functional needs of integrated digital management systems in higher education is a major goal of the research, and this approach helps get us closer to that goal.

## Results and discussion

What follows is a discussion of the most important trends in educational requirements, administrative integration, decision assistance, and system adoption, as well as the main results of the exploration survey.

Platform flexibility, feedback clarity and timeliness, learning-related activity fragmentation across tools, and tailored recommendation utility were used to evaluate educational demands. Flexible and individualised learning environments are what students need, according to the study. The fact that most respondents shared this opinion shows that the digital solutions available today fall short when it comes to offering personalised learning plans and avenues for feedback. The faculty's moderate comments revealed that they were seeking to find a middle ground between the theoretical benefits and more practical issues, such as workload and system usage. Overall, they liked these aspects.

Figure 1 shows that various groups of people who have an interest in students' education have different ideas about what they need to learn. Academic faculty members are more likely to say that values are somewhat important, whereas administrative and management faculty members are more likely to say that values are less important. On the other hand, students always say that they need more customisation, feedback, and flexibility.

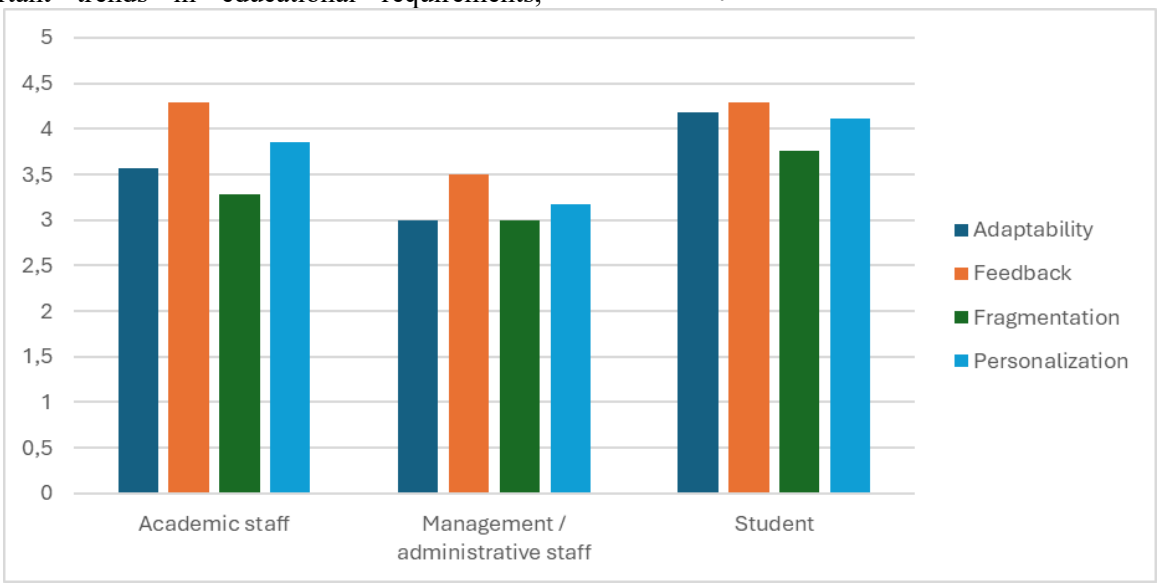


**Figure 1** – *Educational needs across stakeholder groups*

In numerical terms, educational needs were measured through items addressing platform adaptability (Q3), feedback clarity and timeliness (Q4), fragmentation of learning-related activities across multiple tools (Q5), and the usefulness of personalised recommendations (Q6). For students, mean values ranged between 3.76 (Q5) and 4.29 (Q4), indicating high agreement regarding adaptability, feedback, and personalisation. Academic staff reported mean values between 3.29 (Q5) and 4.29 (Q4), reflecting a more balanced perspective on learning support functionalities. In contrast, management and administrative staff reported lower mean scores, ranging from 3.00 (Q3, Q5) to 3.50 (Q4), suggesting that learning-related features are perceived as less central to their daily activities.

The parts on administration and integration spoke about how well the present administrative procedures operate and how crucial it is to make education and administration work better together. The findings demonstrate that the groups of stakeholders are more different from each other than they were before. Most administrators and managers would probably agree, which implies they know that having different systems and performing the same tasks twice costs a lot of money. Academic personnel knew about these limits, particularly when they had to balance teaching and administrative duties. When asked how administrative inefficiencies affect their academic experience, students said that the effect is indirect and not very evident in their daily learning activities. In short, the results show that people think integrated digital infrastructures are helpful and that fragmentation is still a concern for institutions.

Student perceptions of the relevance of administrative inefficiencies and the need for system integration to their everyday academic activities are lower than those of administrative and managerial workers, as shown in Figure 2.

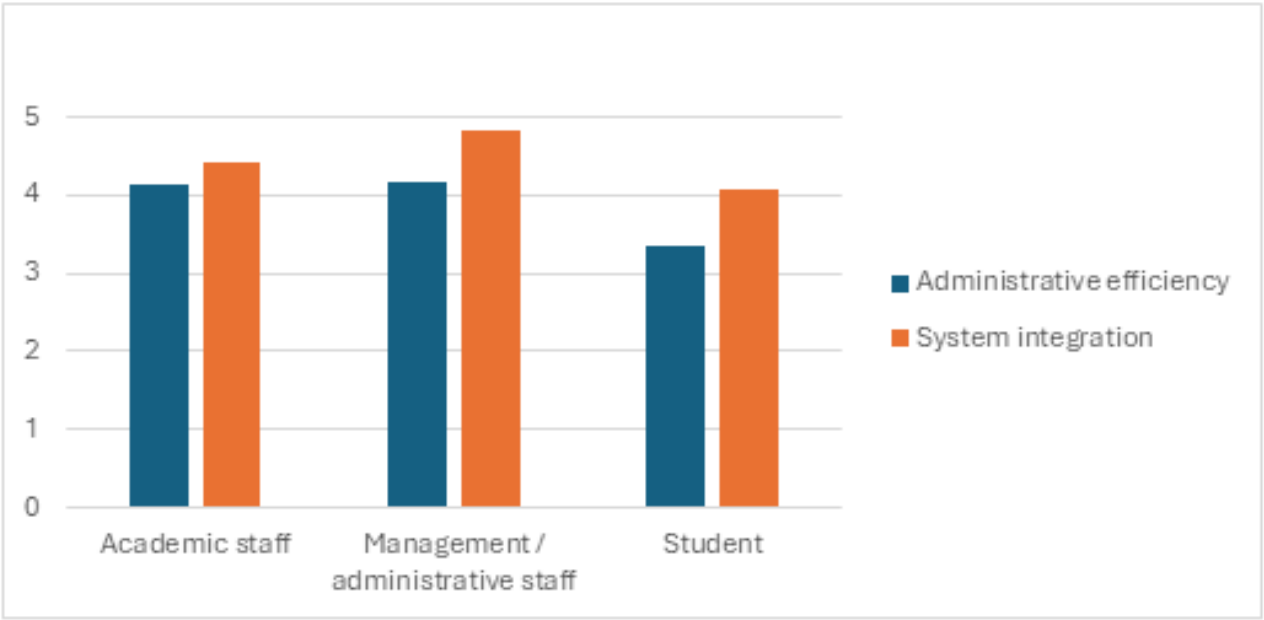


**Figure 2** – *Administrative efficiency and system integration across stakeholder groups*

In numerical terms, management/administrative staff reported a mean of 4.17 for administrative efficiency (Q7) and 4.83 for system integration (Q8). Academic staff reported 4.14 and 4.43, while students reported 3.35 and 4.06, respectively.

Items about the significance of early identification of students at academic risk and access to summary data for academic or management choices were used to analyse decision-making support. The results show that the

academic and administrative personnel are in strong agreement when it comes to the need for trustworthy indicators and early warning systems in place to enable prompt actions. An increase in enthusiasm for preventative measures in student assistance and classroom management is reflected in the high priority that faculty members placed on detecting at-risk pupils. When students see early identification procedures as helpful and instructive rather than harsh and punishing, they are more likely to react favourably to these procedures. Assuming these technologies are introduced in an open and people-focused way, these findings point to widespread support for decision-support tools.

While faculty and administrators strongly agree that decision support and early risk detection are important (Figure 3), students exhibit favourable but somewhat lower levels of agreement.

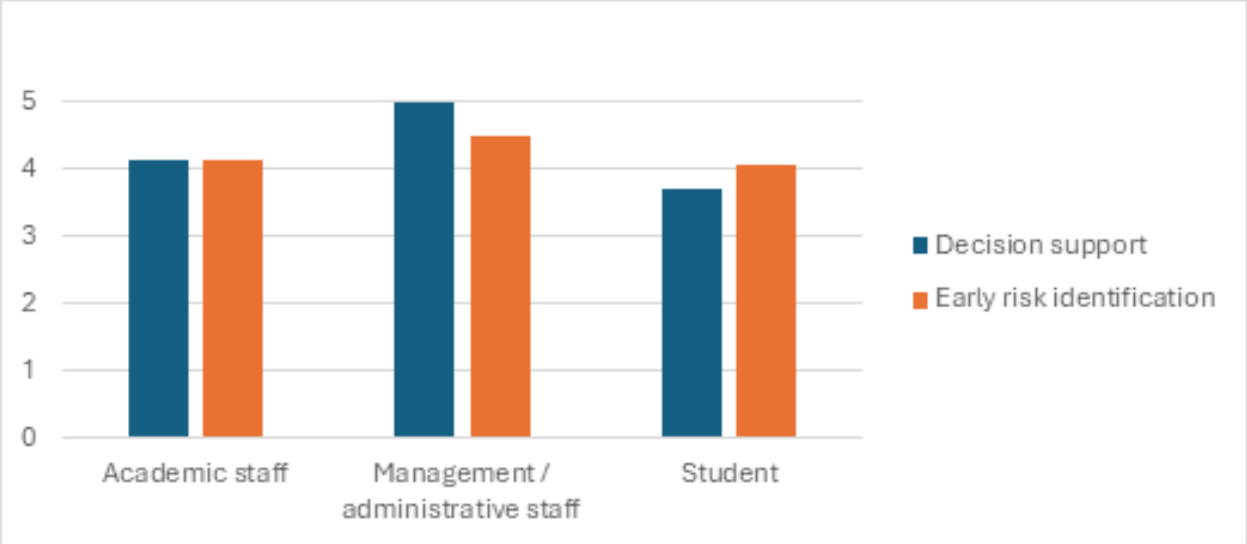


**Figure 3** – *Decision support and early identification of academic risk across stakeholder groups*

Students reported a mean of 3.71 for decision support (Q9) and 4.06 for early risk identification (Q10), while academic staff reported 4.14 and 4.14 and management/administrative staff reported 5.00 and 4.50, respectively.

An integrated digital management system's perceived usefulness and respondents' readiness to utilise a single platform integrating learning and management functions were used to evaluate overall perception and acceptance. Positive answers were received by the majority of stakeholder groups. A unified platform that brings together learning-related tasks, progress tracking, and feedback is something that students are really interested in using. Respondents from the academic and administrative sectors emphasised the possibility of gains in efficiency, coordination, and overall institutional visibility. Positive answers from all types of stakeholders point to an understanding of the problems with current disjointed systems and a desire for better digital solutions that work together.

Among all stakeholder groups, administrative and academic personnel are the most in agreement with the high perceived utility and readiness to implement an integrated digital management system (Figure 4).

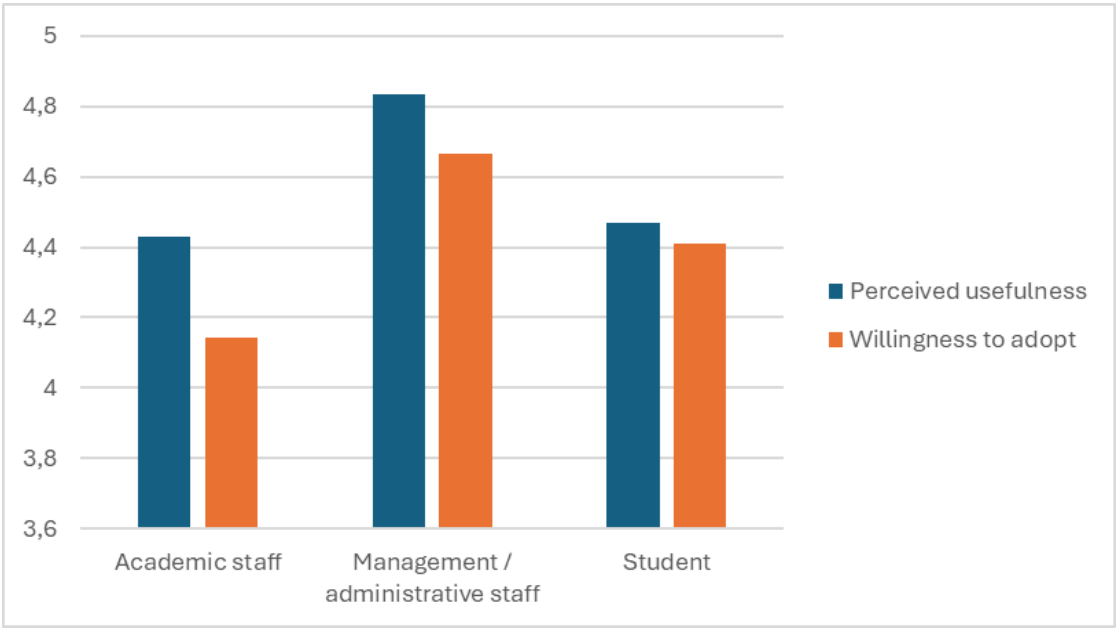


**Figure 4** – *Perceived usefulness and willingness to adopt an integrated digital management system*

Mean values were high across groups: perceived usefulness (Q11) ranged from 4.43 to 4.83, and willingness to adopt (Q12) ranged from 4.14 to 4.67, with the highest scores among management/administrative staff.

The quantitative results are helpful, but the contextual insights provided by the open-ended questions (Q13) are even more so. Many students have voiced their need for centralised access to all course materials, quicker feedback, and more individualised learning plans. Dashboards summarising student involvement and performance, together with early warnings to enhance teaching choices and decrease manual monitoring tasks, were identified as needs by academic staff. Supporting proactive planning and institutional decision-making, administrative responders prioritised integrated reporting and clear performance indicators. Various stakeholder groups prioritise system functionality based on their roles and responsibilities, and these qualitative insights support the quantitative trends.

All things considered, the findings point to the requirement of digital management systems in higher education that are integrated, adaptable, and role-aware. Although different groups of stakeholders have different goals, everyone agrees that the digital infrastructures we have now are inadequate and that we may benefit from solutions that integrate administrative, decision-support, and instructional services into one unified platform. The results presented here provide empirical support for the claims made in the section that follows, as well as for other studies that aim to develop and put into practice digital management systems that are interconnected.

## Conclusions

This study set out to investigate the administrative and pedagogical needs of universities by means of an exploratory survey that reached out to students, teachers, and administrators. Findings demonstrate that several stakeholder groups agree that siloed digital systems are inadequate and highlight the critical need for solutions that unite learning, decision-making, and administration.

The research shows that students place a premium on personalised assistance, rapid feedback, and flexible learning environments, while teachers place a premium on monitoring student performance, seeing potential academic problems early, and offering tools to aid with decision-making. Executives and managers who took the survey stressed the importance of having

access to aggregated data, efficient processes, and integrated systems in order to plan for their institutions. In spite of these distinctions, all stakeholder groups regard integrated digital management systems as valuable and are eager to implement them.

The results of the research may have practical implications for the development of university-wide integrated online learning environments. The findings provide support to the assertion of functional requirements for systems that define stakeholder-specific objectives in a way that satisfies educational, administrative, and managerial expectations. This study paves the way for future user-demand-driven intelligent educational administration applications.

First, there was only one experimental setting and a limited sample size, the findings don't apply to the general population. Second, the research relied on participants' narratives of their experiences rather than objective performance metrics. Using more representative samples, linking survey data with institutional records, and evaluating the impact of digital system integration in practical settings are all ways to address these limitations in future research.

Results show that stakeholders in higher education need to be included in a requirements analysis before digital management systems can be created. Results like these might pave the way for studies on how to build, test, and refine integrated platforms for data-driven decision-making, efficient management, and tailored education in the future.

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# Advantages of Transformation Management Over Change Management

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**Abstract**

*Transformation management has emerged as a critical managerial approach for guiding deep and sustained organisational change. The aim of this paper is to investigate Transformation management as a strategic mechanism for organisational adaptation and long-term performance. Using a qualitative and conceptual research design, the study analyses relevant academic literature to examine how Transformation management differs from traditional change management approaches, to identify the organisational factors influencing transformation success, and to assess its role as a strategic capability. Unlike traditional change initiatives, transformation processes are embedded within organisational strategy and governance structures, enabling ongoing renewal and adaptability. Furthermore, the study demonstrates that Transformation management contributes to sustainable competitive advantage by enhancing organisational agility, resilience, and learning capacity.*

**Keywords:** transformation management; organizational change; digital transformation

## Introduction

The accelerating pace of economic, technological, and social change has fundamentally reshaped how organisations operate and compete in contemporary business environments. Globalisation, digital transformation, and increasing market volatility have compelled organisations to move beyond incremental change and embrace comprehensive transformation initiatives (Grecu et al., 2025). In this context, transformation management has emerged as a critical managerial approach aimed at guiding organisations through profound structural, strategic, and cultural change (Held et al., 2025). While transformation offers significant opportunities for

*"Every success story is a tale of constant adaptation, revision and change."*
Richard Branson



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innovation, competitiveness, and long-term sustainability, it also introduces complexity, uncertainty, and resistance that challenge traditional management practices (Stefan et al., 2019).

Transformation management is particularly relevant in environments characterised by rapid technological advancement and evolving stakeholder expectations. Organisations are no longer able to rely solely on established routines and stable business models; instead, they must continuously reconfigure their resources, capabilities, and processes to remain competitive (Agustian et al., 2023). This necessity has elevated transformation from a reactive response to crisis into a proactive and strategic capability embedded within organisational leadership and governance. The aim of this paper is to investigate transformation management as a strategic mechanism for guiding organisational adaptation and long-term performance. Specifically, the study seeks to explore how transformation processes are designed, implemented, and sustained within modern organisations, with a particular focus on leadership, organisational culture, and resistance to change. To achieve this aim, the research is guided by the following questions: *How does transformation management differ from traditional change management approaches in contemporary organisations? What organisational factors most strongly influence the success of transformation initiatives? To what extent can transformation management be considered a strategic capability for achieving sustainable competitive advantage?* By addressing these questions, the paper contributes to a deeper theoretical and practical understanding of transformation management, offering insights for managers navigating complex and continuous changes in dynamic business environments.

## Theoretical Framework

***Organisational Transformation and Transformation Management.*** Organizational transformation involves fundamental, multidimensional change affecting strategy, structure, culture, and operational logic. Unlike incremental adjustments, it redefines core assumptions and the way value is created. Transformation management represents the strategic coordination of these changes, aligning vision, resources, and behaviour. While early perspectives associated transformation with crisis response, contemporary research views it as a proactive and continuous capability enabling organisations to anticipate and shape change (Al-Moaid and Almarhdi, 2024). Transformation requires both technical adjustments and cognitive and behavioural shifts among employees (Van Der Schaft et al., 2024), integrating strategic intent with cultural change (Saratian et al., 2025). From a dynamic capability perspective, transformation is iterative and adaptive, requiring organisations to sense environmental shifts and reconfigure resources accordingly (Taghizadeh et al., 2024). Effective transformation management rests on strategic vision, leadership commitment, organisational culture, and employee engagement, which together ensure coherence, legitimacy, adaptability, and long-term sustainability.

*Leadership and Organizational Culture in Transformation.* Leadership is central to transformation management, as it articulates vision, mobilises commitment, and sustains momentum throughout change processes. Transformational leadership characterised by inspiration, intellectual stimulation, and individual consideration is particularly effective in periods of profound organisational change (Gupta, 2025). Leaders signal the importance of transformation through consistent actions and aligned decision- making. Organisational culture also significantly influences outcomes. Cultures that encourage learning, innovation, and openness facilitate transformation, whereas rigid, control-oriented environments foster resistance (Chadha et al., 2025). Consequently, transformation management often requires deliberate cultural realignment. Resistance to

change remains a major challenge, often driven by uncertainty or perceived threats (Grecu et al., 2009). Transparent communication, participation, and capacity-building help reduce resistance and build trust (Komna and Mpungose, 2024), highlighting the social dimension of transformation.

*Transformation Management as a Strategic Capability.* The link between transformation management and organisational performance is increasingly viewed through a strategic lens. Rather than treating transformation as an episodic response, organisations that develop strong transformation capabilities are better positioned to adapt and thrive in volatile environments. Transformation management enables organisations to align strategy, structure, and culture, ensuring coherence during periods of change. From a strategic perspective, transformation management supports organisational sensing, decision - making, and renewal. By fostering continuous learning and cross-functional coordination, transformation initiatives enhance organisational agility and resilience. Moreover, when embedded within strategic planning processes, transformation management becomes a source of sustained competitive advantage rather than a temporary adjustment mechanism (Browder et al., 2024). In contemporary organisations, transformation management functions as the connective infrastructure that links leadership intent, employee behaviour, and organisational systems. It enables organisations to navigate uncertainty, manage complexity, and achieve long-term performance in dynamic and highly competitive environments.

## Methodology of research

This study employs a qualitative and conceptual research design suitable for analysing complex phenomena such as transformation management, which encompasses strategic, cultural, and behavioral dimensions. The research is based on a systematic review and synthesis of peer-reviewed literature in transformation management, organisational change, leadership, and strategic management. Sources were selected from internationally recognised journals using criteria of relevance, theoretical contribution, academic rigor, and focus on contemporary contexts. This ensured a balanced integration of foundational and recent perspectives. The analysis was conducted through thematic content analysis to identify recurring patterns and key dimensions. Three core themes were derived: leadership, organisational culture, and resistance to change. These themes guided the distinction between transformation management and traditional change management, highlighting the principal organisational factors influencing successful transformation outcomes.

## Results and discussion

### *Differences between Transformation Management and Traditional Change Management*

The results of the qualitative analysis reveal clear and systematic differences between transformation management and traditional change management approaches in contemporary organisations. While both aim to facilitate organisational change, they differ substantially in scope, strategic orientation, time horizon, and organisational impact. To further deepen the analysis of transformation management, it is useful to adopt a process-oriented perspective that captures the dynamic and continuous nature of organisational transformation. Rather than viewing transformation as a linear or one-time initiative, literature emphasises its cyclical character, involving multiple interconnected phases. Table 1 presents the main stages of the transformation management lifecycle, highlighting the key managerial focus, critical organisational enablers, and expected outcomes associated with each phase.

**Table 1 -** *Transformation Management Lifecycle and Organisational Enablers*

| Transformation Phase | Key Managerial Focus | Critical Organisational Enablers | Expected Outcomes | References |
|---|---|---|---|---|
| Initiation | Defining vision and urgency | Strategic leadership, environmental scanning | Strategic alignment and legitimacy | Kotter (1996); Schiuma et al. (2022) |
| Design | Structuring transformation roadmap | Cultural diagnosis, stakeholder involvement | Coherent transformation architecture | Burnes (2017) |
| Implementation | Executing change initiatives | Employee engagement, communication, learning | Behavioural and operational change | Sliwka et al. (2024) |
| Institutionalisation | Embedding new practices | Culture alignment, governance mechanisms | Sustained transformation outcomes | Baiyere et al. (2025) |
| Renewal | Continuous adaptation and learning | Dynamic capabilities, strategic flexibility | Long-term competitiveness | Teece (2018); Cosa and Torelli (2024) |

Table 1 demonstrates that transformation management is an iterative and cumulative process in which value is progressively generated across stages. Early phases concentrate on strategic direction and legitimacy, while long-term competitiveness emerges during institutionalisation and renewal. Sustainable transformation therefore depends not only on effective implementation but also on embedding learning, flexibility, and renewal into organisational routines and governance. In the other hand, traditional change management is typically reactive and incremental, addressing specific processes or structures to restore stability or efficiency. Transformation management, however, involves holistic and fundamental change, simultaneously affecting strategy, culture, leadership, and organisational identity (Schiuma et al., 2022). A further distinction concerns strategic integration. Transformation management is embedded in long-term planning and competitive positioning, functioning as a continuous process rather than a temporary project. It also requires sustained top leadership involvement to legitimise and reinforce change (Sliwka et al., 2024). By emphasising culture, engagement, and adaptability, transformation management enhances agility and long-term performance (Ibrahim et al., 2025).

### *Organisational Factors Influencing the Success of Transformation Initiatives*

The analysis of the reviewed literature identifies several key organisational factors that strongly influence the success or failure of transformation initiatives in contemporary organisations. Unlike traditional change efforts, transformation outcomes are shaped not by isolated interventions but by the interaction of strategic, structural, cultural, and human elements. Despite its strategic importance, transformation management is frequently confronted with significant organisational barriers that can undermine implementation efforts. Understanding these obstacles and the corresponding managerial responses is essential for translating transformation strategies into sustainable outcomes. Table 2 presents a synthesis of the most identified organisational barriers to transformation, their underlying causes, and the managerial responses proposed in the literature.

Table 2 - ***Organizational Barriers and Managerial Responses in Transformation***

| **Barrier** | **Underlying Cause** | **Managerial Response** | **Impact on Transformation** | **References** |
|---|---|---|---|---|
| Resistance to change | Fear of uncertainty | Transparent communication and participation | Increased acceptance and engagement | Oreg (2006); Halim et al. (2023) |
| Cultural rigidity | Path dependency | Cultural reorientation and leadership modelling | Enhanced adaptability | Martínez-Peláez et al. (2023) |
| Leadership inconsistency | Symbolic commitment | Visible leadership involvement | Increased trust and legitimacy | Ullrich et al. (2023) |
| Strategic ambiguity | Poor alignment | Clear transformation narrative | Reduced confusion and resistance | Ibrahim et al. (2025) |

Table 2 shows that transformation barriers are mainly behavioural and cultural rather than technical. Resistance to change, inconsistent leadership, and strategic ambiguity are key challenges requiring active managerial intervention. Effective transformation depends on proactive leadership, transparent communication, and employee involvement, which help convert obstacles into learning opportunities. Leadership commitment and consistency are critical. Sustained top management involvement ensures vision clarity and alignment, whereas symbolic or inconsistent behaviour weakens progress (Ullrich et al., 2023). Strategic clarity also enhances effectiveness, as alignment with long-term objectives strengthens engagement and reduces confusion (Halim et al., 2023). Organisational culture significantly shapes outcomes. Open, learning-oriented cultures foster adaptability (Nechita et al., 2025), while rigid cultures reinforce resistance (Martínez-Peláez et al., 2023). Employee engagement, transparent communication (Bukar et al., 2025), and adaptive capabilities (Baiyere et al., 2025) further support sustainable transformation and long-term performance.

### *Transformation Management as a Strategic Capability for Sustainable Competitive Advantage*

The results of the conceptual analysis indicate that transformation management can be understood as a strategic organisational capability rather than a temporary managerial response to change. Unlike traditional change initiatives, which are often reactive and episodic, transformation management enables organisations to continuously adapt to environmental volatility and to proactively shape their competitive positioning (Cosa and Torelli, 2024). To conceptualise transformation management as a strategic capability, it is necessary to link it to established strategic management theories. The dynamic capabilities framework offers a valuable lens for understanding how organisations systematically adapt to changing environments. Table 3 integrates transformation management with the core dimensions of dynamic capabilities, illustrating how transformation supports sensing, seizing, and transforming processes.

Table 3 - ***Transformation Management through the Lens of Dynamic Capabilities***

| **Dynamic capability** | **Transformation Management Role** | **Organisational effect** | **References** |
|---|---|---|---|
| Sensing | Identifying need for transformation | Early adaptation | Teece (2018) |
| Seizing | Designing transformation initiatives | Strategic coherence | Abrudan et al. (2024) |
| Transforming | Institutionalising new routines | Sustainable performance | Cosa and Torelli (2024) |

Table 3 emphasizes that transformation management extends beyond operational change, functioning as a higher-order capability that enables strategic renewal. By improving environmental sensing, decision-making, and the institutionalisation of new routines, it enhances adaptability and long-term performance. Organisations with strong transformation capabilities can better interpret environmental shifts and reconfigure resources, accordingly, embedding transformation into leadership practices and organisational processes (Abrudan et al., 2024). When aligned with strategy and supported by leadership and culture, transformation initiatives generate difficult-to-imitate capabilities such as flexibility, learning orientation, and employee adaptability (Alateeg and Alhammadi, 2024). These capabilities strengthen both resilience and sustained value creation. Embedding transformation within governance and strategic planning ensures coherence and long-term competitiveness (Nkomo and Kalisz, 2023; Chavarnakul et al., 2025; Allam et al., 2024).

## Conclusions

This paper analysed transformation management as a strategic mechanism supporting organisational adaptation and long-term performance in volatile business environments. Drawing on qualitative and conceptual literature analysis, the study examined how transformation differs from traditional change management, identified key success factors, and assessed its role as a strategic capability. The findings show that transformation management moves beyond incremental, episodic change by promoting continuous, organisation-wide, and strategically driven processes. Leadership commitment, strategic clarity, organisational culture, employee engagement, and effective communication emerged as critical and interdependent factors shaping transformation outcomes. Sustained leadership involvement and a learning- oriented culture were particularly important. The study also confirms that transformation management functions as a dynamic capability, enhancing agility, resilience, and sustainable competitive advantage. When embedded in governance and strategic planning, it becomes difficult to imitate. Although conceptually grounded, future empirical research is needed to further validate these relationships across industries and contexts.

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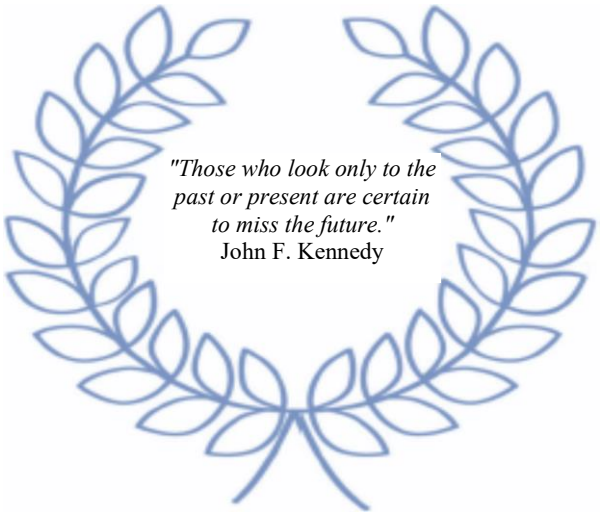

# Optimizing Educational Performance and State Aid Through Artificial Intelligence

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**Abstract**

*This paper examines how artificial intelligence (AI) can improve learning outcomes in pre-university education and increase transparency and efficiency in state aid management. We combine a structured literature review with a qualitative, comparative case analysis of Romanian and EU initiatives. Research question (RQ): To what extent and under what governance conditions do AI systems measurably improve student performance and administrative efficiency in education and state aid management? Hypothesis (H1): When embedded in clear governance frameworks (e.g., EU AI Act), AI is associated with measurable gains in student outcomes and with reductions in processing times and error/fraud risk in state aid administration. Findings support H1* conditionally*: AI can raise achievement (e.g., math outcomes in personalized models) and can strengthen risk-based controls in public funding, but effects depend on implementation quality, data governance, personnel skills, and monitoring. We conclude with an actionable roadmap and indicators for policymakers and school leaders.*

**Keywords:** Artificial Intelligence, education, state aid, predictive analytics, digital governance

## Introduction

Artificial intelligence (AI) has emerged as one of the most transformative technologies of the twenty-first century, influencing a wide range of domains, from education to public administration. In the educational sphere, AI applications such as adaptive learning platforms, intelligent tutoring systems, and predictive analytics have been

*"Small shifts in direction can lead to massive changes in destination."*
Kevin Kelly

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designed to personalize instruction, improve assessment practices, and support early intervention strategies for at-risk students (Woolf, 2010; Holmes, Bialik and Fadel, 2019; Wang et al., 2024). At the same time, in the field of public administration, the integration of AI has been associated with enhanced efficiency in administrative workflows, the reduction of irregularities in state aid management, and greater transparency in public decision-making (Mergel, 2024; Haesevoets, 2025; OECD, 2023).

Despite these promising developments, the current body of evidence demonstrates considerable variation in outcomes depending on contextual factors such as governance frameworks, institutional capacity, data quality, and stakeholder acceptance. While some studies report measurable improvements in student performance and administrative efficiency (RAND, 2015; Chen et al., 2020), others underline the risks of algorithmic bias, over-reliance on automation, and the amplification of socio-economic inequalities (Yan et al., 2023; Al-Zahrani et al., 2024). These findings indicate that the effectiveness of AI is not inherent to the technology itself but contingent upon the governance conditions under which it is deployed.

The research problem addressed in this article is the insufficiently explored relationship between AI adoption and governance capacity, with a dual focus on pre-university education and state aid management in Romania and the European Union. Both sectors are currently undergoing rapid digital transformation, shaped by initiatives such as the EU Artificial Intelligence Act (European Union, 2024), the Digital Education Action Plan (European Commission, 2021), and the National Recovery and Resilience Plan of Romania (Government of Romania, 2021). These policy frameworks classify AI systems in education and state aid as "high-risk," thereby imposing strict requirements concerning transparency, human oversight, and accountability. This classification highlights the critical importance of analyzing not only the technological potential of AI but also the institutional arrangements that determine its practical impact.

The central research question guiding this study is formulated as follows: *under what governance and capacity conditions can AI generate measurable improvements in student outcomes within pre-university education and, simultaneously, increase efficiency and integrity in state aid management in Romania and the European Union?* Building on this, the article advances the following hypothesis: *AI systems produce measurable gains in both education and public administration when integrated within robust governance frameworks that ensure high-quality data, human-in-the-loop oversight, and transparent monitoring mechanisms* (Floridi and Cowls, 2019; OECD, 2023).

The objectives of this article are threefold. First, to consolidate and critically assess recent academic, institutional, and policy evidence on AI adoption in education and state aid management. Second, to analyze the conditions under which AI contributes to efficiency and equity, while also acknowledging and addressing the associated risks. Third, to propose an evidence-based roadmap that links technical functionalities to policy outcomes, with specific recommendations for monitoring and evaluation. By pursuing these objectives, the article contributes to the existing literature by providing an integrated cross-sectoral perspective, positioning AI not merely as a technological innovation but as a governance instrument that can reshape institutional performance in both educational and administrative domains.

## Literature review

The integration of AI in education has been the subject of extensive research over the past two decades, with a strong focus on intelligent tutoring systems, adaptive learning platforms, and predictive analytics. Early contributions highlighted the potential of AI to personalise instruction and create learner-centred environments (Woolf, 2010; Baker and Inventado, 2014). Subsequent studies confirmed that adaptive systems can generate modest but statistically significant improvements in student performance, particularly in mathematics, when applied

consistently over time (RAND Corporation, 2015; 2017; Chen, Chen and Lin, 2020). More recent reviews indicate that AI-based learning tools not only support differentiated instruction but also provide early-warning mechanisms capable of identifying at-risk students with considerable accuracy (OECD, 2023).

The academic literature also underlines critical challenges. Roll and Wylie (2016) describe the "evolution and revolution" of AI in education, emphasising that while technology has advanced rapidly, institutional adoption remains uneven. Ramesh and Sanampudi (2022) identify persistent issues of fairness and validity in automated assessment systems, while Yan et al. (2023) document the ethical risks associated with large language models, including bias, opacity, and limited pedagogical alignment. Walter (2024) and Thomson et al. (2024) explore students' perceptions of AI, noting a complex balance between enthusiasm for personalised feedback and anxiety regarding its implications for career trajectories and teacher roles. Al-Zahrani et al. (2024) further argue that the discourse surrounding AI in education must move beyond superficial enthusiasm to address systemic barriers such as digital divides, uneven teacher training, and socio-economic inequalities.

Generative AI tools and their role in transforming assessment and instruction have also been analysed in comparative studies. Motlagh et al. (2023) highlight both the innovative opportunities of these systems in enhancing student engagement and the risks of undermining academic integrity. Similarly, Mallik and Gangopadhyay (2023) distinguish between proactive and reactive modes of AI use in educational contexts, suggesting that genuine innovation requires not only technical adoption but also pedagogical rethinking. Collectively, these studies suggest that the educational benefits of AI are conditional upon governance safeguards, professional development for teachers, and the provision of adequate infrastructural support.

In the field of public administration, the adoption of AI has been linked primarily to efficiency, fraud detection, and transparency. Mergel (2024) stresses the managerial challenges of implementing AI in bureaucratic contexts, while Haesevoets (2025) documents the perceptions of public servants, who often view AI tools as both an enabler of efficiency and a potential source of accountability concerns. Babšek (2025) provides a comprehensive overview of AI applications in public administration, showing that while they contribute to streamlined workflows, they also raise questions of legitimacy when opacity undermines citizen trust. Aboud (2025) highlights the dual nature of AI adoption in governance: while it accelerates decision-making and risk detection, it simultaneously introduces ethical dilemmas regarding fairness and inclusiveness.

Policy-oriented sources reinforce these academic debates. The European Commission's White Paper on AI (2020) and the EU Artificial Intelligence Act (European Union, 2024) explicitly categorise education and state aid systems as "high-risk" areas, requiring strong safeguards in terms of data quality, explainability, and human oversight. The Digital Education Action Plan 2021–2027 (European Commission, 2021) emphasises the need for AI-enabled systems to support equity and inclusiveness, while the OECD (2023) draws attention to structural risks, such as the possibility that AI might exacerbate rather than mitigate inequalities. At the national level, Romania has incorporated AI into policy frameworks through initiatives such as the National Recovery and Resilience Plan (Government of Romania, 2021) and legislative instruments including Government Decision no. 807/2014, which sets the legal basis for investment aid schemes where AI could support anomaly detection.

At the European level, advanced monitoring tools such as ARACHNE and the Transparency Award Module (TAM), developed by DG EMPL and DG Competition respectively, illustrate the integration of AI-assisted risk scoring and disclosure mechanisms into the governance of EU funds. These tools have been shown to improve anomaly detection rates and strengthen accountability in state aid distribution. The literature on such mechanisms is still developing, yet initial evaluations suggest measurable reductions in processing time and increases in audit effectiveness (European Commission, 2020; OECD, 2023).

From a governance perspective, Al-Barkat (2023) points out that the success of AI adoption in the public sector depends on maintaining human–AI interaction frameworks that ensure accountability, while Floridi and Cowls (2019) propose a unified set of ethical principles—beneficence, non-maleficence, autonomy, justice, and explicability—that are applicable to both education and public administration. These principles highlight that technological deployment must always be embedded in ethical and institutional safeguards.

In summary, previous research has demonstrated the potential of AI to enhance both learning and administrative processes, but has equally emphasised the risks of algorithmic opacity, ethical dilemmas, and uneven implementation. The novelty of the present article lies in bridging the two domains of pre-university education and state aid management, which are typically analysed separately. By synthesising evidence across these fields, the study provides an integrated understanding of AI as both a pedagogical tool and a governance instrument. This dual focus contributes to the literature by illustrating how lessons learned in one sector—such as participatory engagement in education or audit-based monitoring in public administration—can inform practices in the other, thereby advancing a cross-sectoral framework for responsible AI implementation.

## Research methodology

The methodological framework of this study is anchored in a qualitative research design that integrates a structured literature review with comparative case analysis. This approach was considered most suitable given the dual objective of the research, namely to investigate the role of artificial intelligence in both educational and administrative contexts. The emphasis on qualitative methods is consistent with the exploratory nature of the study, which aims to identify patterns, governance conditions, and institutional dynamics rather than to measure causal effects through experimental means.

The literature review was carried out systematically, with the purpose of consolidating existing academic knowledge and identifying research gaps. Peer-reviewed journal articles, policy reports, and legislative documents were included in the review, reflecting the interdisciplinary character of the topic, which spans education sciences, public administration, and digital governance. A particular focus was placed on sources published between 2019 and 2025, a period characterized by rapid developments in AI regulation and application. This temporal delimitation ensured that the study incorporated the most recent empirical evidence and policy initiatives, including the European Union Artificial Intelligence Act (European Union, 2024) and the National Recovery and Resilience Plan of Romania (Government of Romania, 2021).

The selection of sources was guided by several academic criteria. First, relevance to the research question was prioritised, ensuring that only studies directly addressing AI in education, state aid management, or digital governance were retained. Second, methodological clarity was required, with preference given to empirical studies that reported measurable indicators, such as student performance outcomes, administrative processing times, or fraud detection rates. Third, diversity of perspective was sought, including both European and international contributions, in order to contextualise the Romanian case within broader comparative frameworks. This strategy led to the inclusion of seminal works in the field of AI in education (Woolf, 2010; Holmes, Bialik and Fadel, 2019; Wang et al., 2024), recent systematic reviews (Yan et al., 2023; Al-Zahrani et al., 2024), as well as studies focusing on AI in public administration (Mergel, 2024; Haesevoets, 2025; Babšek, 2025).

Beyond academic literature, institutional and policy documents constituted an essential source of data. Reports from the Organisation for Economic Co-operation and Development (OECD, 2023), the European Commission (2020, 2021), and national legislation such as Government Decision no. 807/2014 were analysed to capture how AI is framed within regulatory and governance contexts. The inclusion of these documents was motivated

by their role in shaping the practical implementation of AI systems, providing a complementary perspective to academic discourse. Such triangulation between scholarly and institutional sources allowed for a more comprehensive understanding of both theoretical debates and policy realities.

The comparative case analysis focused on Romania and the European Union as interconnected but distinct contexts. Romania was selected due to its position as an EU member state undergoing significant educational and administrative reforms, supported by EU structural funds and national strategies. This case provided insight into the opportunities and challenges faced by countries with developing digital infrastructures. The European Union, in contrast, was analysed at the supranational level, where regulatory initiatives such as the Digital Education Action Plan (European Commission, 2021) and monitoring tools like ARACHNE and TAM illustrate advanced approaches to AI-assisted governance. This dual perspective enabled the study to examine both the national implementation level and the overarching European regulatory environment.

The analysis was conducted thematically, with attention to four main dimensions: student performance, teacher workload and assessment practices, efficiency and integrity in state aid administration, and governance and ethics. Sources were coded according to these dimensions, allowing for cross-comparison and the identification of recurring patterns. The validity of interpretations was reinforced by triangulating findings across different types of sources—academic studies, policy reports, and legislative frameworks. Where contradictory evidence emerged, priority was given to primary evaluations and systematically reviewed data, while inconsistencies were explicitly noted as limitations.

Although the study relies on secondary data, a deliberate effort was made to enhance methodological rigor. Potential biases, such as publication bias or selective reporting in policy evaluations, were acknowledged and mitigated by consulting a wide range of sources and by cross-referencing findings. The methodology therefore rests on a careful balance between breadth - ensuring inclusiveness of diverse perspectives - and depth- prioritising sources that provide empirical evidence and measurable outcomes.

In conclusion, the methodological design adopted in this study enables a nuanced exploration of the research problem by linking the educational and administrative perspectives of AI adoption. By combining a systematic literature review with comparative case analysis, the study generates insights that are both theoretically informed and policy-relevant, contributing to the academic debate while also addressing practical challenges of implementation.

## Results and Discussion

AI is no longer a speculative concept but a set of practical tools already piloted and, in some cases, integrated into both education and public administration. This section presents findings on the measurable impacts of AI, focusing first on pre-university education and then on state aid management.

***AI in pre-university education.*** Romania has gradually introduced AI into its educational framework. The optional syllabus Introduction to Machine Learning (Order no. 4049/14.06.2022) marked an institutional milestone, following pilot projects developed in collaboration with ARIA and DeepMind. In parallel, teacher training initiatives introduced weekly AI-related workshops. Despite these advances, OECD (2023) highlights persistent gaps: rural schools often lack high-speed internet, updated hardware, or adequately trained staff. Measured impacts:

*Student performance:* Large-scale studies (RAND, 2015; 2017) reported 3-4 percentile-point improvements in mathematics scores for students using personalised learning platforms compared to control groups. These gains were larger in the second year, suggesting a learning curve for both teachers and students.

*Feedback cycles*: Automated grading platforms reduced the average feedback time from days to hours (Ramesh and Sanampudi, 2021). This efficiency allows teachers to reallocate time to mentoring and differentiated instruction.

*Dropout prevention:* Predictive analytics flagged at-risk students with up to 80% accuracy

(OECD, 2023), enabling timely interventions, though outcomes depend heavily on follow-up tutoring and counselling.

*Unintended consequences.* Over-reliance on algorithmic recommendations risks diminishing teacher autonomy. Digital divides reinforce inequalities, as urban students benefit disproportionately. Algorithmic bias, if not addressed, could penalize students from disadvantaged backgrounds. These findings emphasize that AI's success depends on human oversight, equity safeguards, and continuous monitoring.

***AI in state aid management.*** State aid systems are increasingly data-intensive, creating opportunities for AI integration. At the EU level, the State Aid Transparency Public Search (TAM) ensures disclosure of individual awards, while ARACHNE, an integrated IT tool, performs risk scoring for projects co-financed by EU funds. Romania's GD 807/2014 establishes the legal framework for major investment aid schemes, which could integrate AI-assisted pre-screening and anomaly detection. Measured impacts:

*Efficiency*: Case studies show that AI-assisted eligibility checks can reduce median processing time by 25-40%compared to manual evaluation (European Commission, 2020).

*Fraud detection:* Machine learning anomaly detection increased the yield of suspicious cases per audit hour by 15-25% (OECD, 2023).

*Transparency:* AI-enabled dashboards offer real-time monitoring, reducing information asymmetries between authorities and applicants.

*Unintended consequences.* Over-automation risks excluding legitimate applicants flagged as false positives. The opacity of some algorithms challenges accountability, while biases in training datasets may skew results toward certain sectors or regions. Thus, AI must remain a decision-support tool, not a replacement for human judgment.

***Comparative analysis - education and state aid.*** A cross-sectoral look at education and state aid management reveals that AI operates under similar principles but generates very different types of outcomes, with implications for how institutions design, evaluate, and scale these technologies.

*Different scales of impact.*

- In education, the benefits of AI are *long-term and cumulative.* Small improvements in exam performance or retention rates may appear modest at the micro level but, when aggregated across a school system, they can shift national performance indicators and reduce structural inequalities.
- In state aid, the effects are *immediate and procedural*. Faster eligibility checks or better anomaly prioritisation translate into direct efficiency gains visible within a single funding cycle, influencing public trust and administrative costs almost in real time.

*Institutional logics.*

- Schools are primarily *pedagogical institutions*. AI must fit within curricula, teaching strategies, and student wellbeing. Its success depends on how teachers integrate algorithmic insights into lesson planning, how students perceive feedback, and how equity gaps are addressed.
- State aid authorities are *regulatory and administrative bodies.* Here, AI is valued not for shaping behaviour but for reducing bureaucracy, ensuring compliance with EU rules, and demonstrating accountability to citizens and European institutions.

*Dependency on human expertise.*

- In education, human expertise lies in *interpretation and contextualisation*. Teachers translate AI-generated recommendations into personalised support, ensuring that the student is not reduced to a data profile.
- In state aid, expertise lies in *judgment and discretion*. Officials must decide whether an anomaly flagged by an algorithm is a genuine irregularity or a statistical outlier, balancing efficiency with fairness.

*Policy relevance.*

- Educational AI aligns with *social policies:* tackling dropout, improving equity, and supporting digital skills. Its outcomes are assessed against long-term goals such as reducing gaps between rural and urban learners or preparing students for the digital economy.
- State aid AI aligns with *economic governance:* strengthening transparency,

safeguarding public funds, and complying with EU-level oversight. Its performance is measured against tangible indicators like reduced processing time, increased detection of irregularities, and improved public confidence.

*Shared challenges.*Both domains face the risk of algorithmic opacity and **public** distrust**.** A biased grading tool can delegitimise assessments just as a miscalibrated anomaly detection system can delegitimise funding decisions. In both cases, the legitimacy of institutions depends on transparency, explainability, and accessible redress mechanisms.

*Lessons across domains.*

- Education can learn from state aid about rigorous audit practices, embedding monitoring and fairness checks as part of implementation.
- State aid can learn from education about user engagement, as teachers and students are often directly involved in testing, adapting, and refining tools -a model that could enhance participatory governance in public administration.

**Table 1** - Representative AI applications in pre-university education

| **AI Application** | **Functionality** | **Evidence** | **Sources** |
|---|---|---|---|
| Adaptive learning | Adjusts lessons to learner profile | +3–4 percentile-point gains in maths (year 2) | Baker and Inventado (2014); RAND (2015; 2017); Chen et al. (2020) |
| Automated assessment | Instant grading and feedback | Feedback reduced from days to hours | Ramesh and Sanampudi (2021) |
| Predictive analytics | Early-warning for at-risk students | 80% accuracy; impact depends on interventions | OECD (2023) |
| Virtual tutors/assistants | On-demand explanations & practice | Positive engagement; mixed evidence on outcomes | Holmes et al. (2019); Chen et al. (2020) |

Table 1 synthesises the main categories of AI applications in pre-university education, highlighting their core functionalities, documented evidence of impact, and representative sources. Adaptive or personalised learning platforms use student performance data to adjust lesson sequencing and difficulty levels. Evidence from large-scale studies indicates modest but consistent improvements in mathematics performance - typically gains of three to four percentile points after sustained implementation (Baker and Inventado, 2014).

Automated and assisted assessment systems apply natural language processing and machine learning to evaluate essays, quizzes, or problem sets. Their main contribution lies in reducing the turnaround time for feedback, sometimes from several days to just a few hours, thereby allowing teachers to focus more on personalised instruction. However, systematic reviews also caution that fairness and validity issues remain unresolved (Ramesh and Sanampudi, 2022).

Predictive analytics models identify patterns in student behaviour and performance to flag those at risk of failure or dropout. Research shows that these tools can achieve high levels of predictive accuracy, but their educational value depends heavily on whether schools are able to provide timely tutoring, counselling, or other interventions once risks are identified (Lemay, Basnet and Doleck, 2021).

Virtual tutors and intelligent assistants complement classroom teaching by offering on-demand explanations, practice exercises, or

conversational feedback. While they generally increase student engagement, outcomes vary depending on curricular integration, teacher involvement, and the quality of the underlying AI models (Holmes, Bialik and Fadel, 2019; Chen, Chen and Lin, 2020).

Taken together, the applications presented in Table 1 demonstrate that AI does not replace teachers but rather acts as an amplifier of existing practices. Its measurable impacts are modest yet meaningful, particularly when technologies are embedded within broader pedagogical strategies and supported by professional development for teachers.

## Governance and responsible implementation

Effective governance of AI requires more than technical standards; it involves institutional readiness, ethical safeguards, and continuous evaluation. In education, this means integrating AI into existing curricula only after teachers receive adequate training and schools adopt clear procedures for monitoring outcomes. Without these elements, even well-designed platforms risk being underused or misapplied.

In state aid management, responsible implementation requires procedural transparency. Applicants must have access to clear criteria, the possibility to contest decisions, and reassurance that automated recommendations are always reviewed by human experts. AI should support administrators by improving consistency and reducing workload, not replace their judgment.

An essential aspect of governance in both domains is periodic auditing. Independent evaluations - whether of student performance metrics or of fraud detection rates - are necessary to confirm that AI tools are delivering the expected benefits. Equally important is public communication: explaining how AI is used and what safeguards exist strengthens trust and reduces resistance to adoption.

In short, responsible implementation is less about deploying the most advanced algorithms and more about creating an ecosystem of trust. This ecosystem combines human oversight, ethical guidelines, and transparent monitoring to ensure that AI contributes to policy objectives while protecting the rights and interests of those it serves.

The effective use of AI in education and state aid requires a phased and carefully monitored approach.

*Education pilots.* A first step would be to introduce adaptive mathematics platforms and automated writing feedback in a limited number of schools (20–30). The goal is to test whether these tools lead to measurable improvements such as higher exam scores, lower dropout risks, reduced teacher workload, and narrower gaps between urban and rural schools.

*State aid pilots*. In public administration, AI can be tested within an existing legal framework, for example under GD 807/2014. Here, the focus should be on pre-screening applications and anomaly detection. The main indicators to track are the reduction in processing times, the proportion of irregularities correctly identified, and the overall error rate.

Infrastructure requirements. For both domains, AI should rely on secure data pipelines, common data standards, and audit logs. These technical foundations also need to be compatible with European tools such as TAM and ARACHNE, ensuring interoperability and compliance with EU rules.

*Iteration and monitoring.* Governance must be dynamic. Quarterly evaluations, fairness dashboards, and explicit rules for updating or withdrawing underperforming models are essential. In this way, AI systems remain adaptable, transparent, and accountable throughout their life cycle.

## Conclusion

This study has several limitations that must be acknowledged. First, it relies mainly on secondary sources, since primary datasets and experimental evidence are still scarce in both education and state aid management. Second, causal evidence remains limited - particularly in public administration, where few studies isolate the effect of AI from other reforms or organisational changes. Third, although the indicators presented are promising,

they differ in methodology and scope, making comparisons across cases difficult. Finally, there is a risk of publication bias, as successful pilot projects are more likely to be reported than failures, creating an overly optimistic picture of AI's impact.

Future research should address these gaps through:

- Randomised controlled trials (RCTs) in schools to measure the direct impact of adaptive platforms on student outcomes.
- Process mining and cost-effectiveness studies in administrative workflows to assess efficiency gains in real conditions.
- Bias and fairness audits across regions and socio-economic groups to ensure equitable implementation.
- Cross-disciplinary frameworks combining insights from education science, behavioural economics, and public policy to create a more comprehensive understanding of AI's societal role.

Such approaches would strengthen the evidence base and provide more solid guidance for both policymakers and practitioners.

This article examined whether artificial intelligence can generate measurable improvements in two distinct but equally important domains: pre-university education and state aid management. The evidence shows that AI offers conditional benefits in both areas.

In education, adaptive platforms and automated assessment tools can support more personalised learning, shorten feedback cycles, and contribute to modest but consistent gains in student performance. These effects become meaningful when combined with teacher training and strategies to reduce rural–urban disparities.

In state aid management, AI strengthens transparency and efficiency by accelerating eligibility checks and improving anomaly detection. Pilot initiatives suggest measurable reductions in processing times and a higher yield of irregularities detected, though careful oversight is necessary to avoid false positives and ensure fairness.

Our hypothesis is partially confirmed: AI delivers positive outcomes when it is embedded within strong governance frameworks, transparent monitoring systems, and supported by human expertise. The key lesson is that technology alone is insufficient; success depends on a balanced ecosystem of data quality, ethical safeguards, and institutional capacity.

From a policy perspective, both education and state aid demonstrate that AI should be treated as a strategic enabler, not a replacement for human judgment. Building secure infrastructures, developing robust evaluation frameworks, and investing in professional training are critical steps to ensure that AI supports long-term public goals of equity, efficiency, and accountability.

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*"Innovation distinguishes between a leader and a follower."*
Steve Jobs

# Drivers of Transformation Management

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Abstract

*The purpose of the article is to examine the fundamental ideas of transformation management, pinpoint the primary forces behind organizational change, and assess the managerial ramifications of transformation procedures in modern businesses. Managers and professionals from a variety of businesses were given a standardized questionnaire as part of the study's quantitative research approach. The questionnaire looks at how managers see the nature of change, what drives change efforts, the role of management and leadership, and perceived difficulties and results pertaining to decision-making and organizational performance. To find trends and connections between transformation drivers, managerial techniques, and perceived results, data were examined using descriptive statistics and correlation analysis. The findings show that effective transformation processes are mostly shaped by strong managerial participation, transparent communication, and strategy alignment.*

**Keywords:** transformation management, strategic management, managerial role, organizational change

## Introduction

Organizations have been functioning in more complicated, volatile, and competitive business settings in recent years. As a result, maintaining success now needs bigger, transformative change rather than just incremental gains (ST, n.d.). Organizational transformation is linked in the management literature to significant reorganizations of strategy, structure, and organizational culture with the goal of empowering businesses to provide long-term value in quickly evolving environments (Christou, 2024).

Even though the terms "change management" and "transformation management" are frequently employed synonymously in academic and managerial discourse, previous research reveals


significant distinctions in their breadth and depth. While transformation suggests a more comprehensive repositioning of the organization in



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response to cumulative internal and external forces, planned change is usually connected with deliberate, controlled interventions targeted at transitions. Reevaluations of Kurt Lewin's seminal work highlight planned change frameworks' ongoing applicability as well as their limits in contexts characterized by discontinuity and unpredictability (Burnes, 2004; Pettigrew et al., 2001).

In this scenario, management plays an essential part. Leadership, clear communication, strategic alignment, and staff mobilization behind a common goal are all necessary for transformation processes, which go beyond the execution of discrete initiatives or projects. Large-scale transformation programs usually fail when businesses lack a compelling vision, solid coordination channels, persistent executive commitment, and a clear sense of urgency, according to existing studies. Because it highlights the managerial behaviors required to begin, steer, and institutionalize transformation, Kotter's eight-step model continues to be one of the most prominent frameworks in the industry (Kotter,1996; Kotter, 2012).

From a strategic standpoint, transformation may also be viewed as a managerial skill related to the organization's capacity for ongoing resource and competency reconfiguration. The dynamic capabilities framework posits that sustainable competitive advantage in turbulent contexts depends on the firm’s capacity to integrate, create, and reconfigure internal and external competencies in response to changing conditions (Teece, 1997). This viewpoint offers a useful prism through which to see change as a continuous strategic and management process rather than just a reactive process.

This research examines transformation management from an applied managerial viewpoint, building on these theoretical underpinnings with the goal of bridging conceptual frameworks with empirical findings from organizational practice. The study's three goals are to: (1) investigate how modern organizations conceptualize organizational transformation; (2) pinpoint the main forces behind transformation initiatives; and (3) examine the managerial ramifications of perceived transformation outcomes, paying special attention to organizational culture, leadership, communication, and employee involvement.

Consequently, the following research questions serve as a guide for the study:

*RQ1: How do modern businesses approach organizational transformation?*

*RQ2: What are the primary factors thought of setting off transformation projects?*

*RQ3: To what extent are managerial practices (involvement, communication, resource allocation, and competencies) connected with perceived transformation outcomes?*

*RQ4: How does resistance to change and corporate culture affect how successful transformation efforts are seen to be?*

The research investigation uses a standardized, cross-industry questionnaire created to capture important aspects of transformation management, including conceptual knowledge, transformation drivers, managerial responsibilities, difficulties, and outcomes, to answer these questions. By using this approach, the research offers useful insights for managers attempting to navigate organizational transformation in dynamic business contexts and adds empirical data to a body of literature that has been debated extensively but is still fragmented.

## Research Methodology

A research technique that can capture both structural patterns and subjective managing views is necessary to comprehend organizational change as a complex managerial phenomenon. Although theoretical frameworks offer important insights into nature and forces behind change, empirical research is required to look at how these ideas are understood and used in actual organizational settings. In management research, methodological rigor is crucial not just to assure the validity of findings, but also to deepen the relationship between conceptual models and managerial practice.

The method of inquiry was created to methodically record perceptions of transformation management in various organizational contexts

because of the exploratory character of this study and its emphasis on managerial viewpoints. While allowing for the examination of links between important aspects such as conceptual understanding, transformation drivers, management engagement, organizational difficulties, and perceived outcomes, emphasis was focused on making sure that responses were clear, consistent, and comparable (EDUCBA 2023). This method helps achieve the study's main goal, which is to convert abstract theoretical concepts into observable and interpretable empirical data (Figure 1).

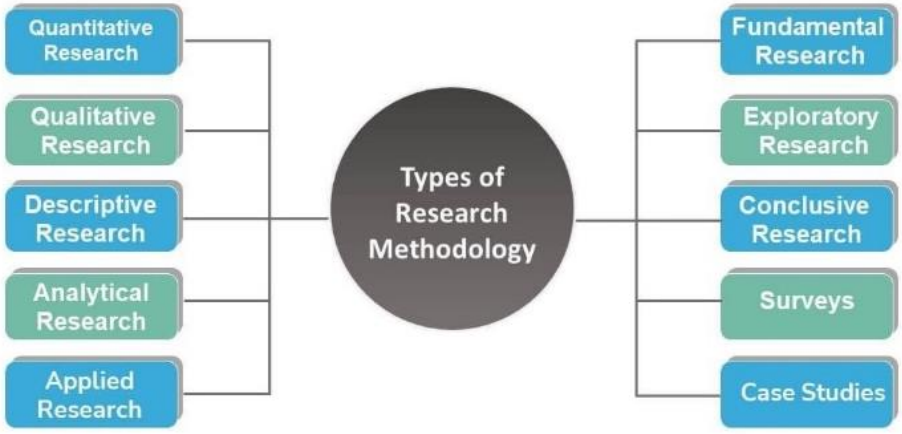


**Figure 1** – *Types of Research Methodology*
(Source: Pedamkar, 2023)

To investigate how managers see transformation management in modern firms, this study uses a quantitative research approach. A survey-based technique was used since it allows for the systematic collection of standardized data from a broad range of respondents and helps the discovery of patterns and linkages between important management factors relevant to organizational change.

The study also uses its own questionnaire available online to collect data at a specific moment in time using a cross-sectional survey approach. This method works well for exploratory and descriptive management research projects, especially when the goal is to document attitudes, experiences, and perceptions in various organizational situations. The research integrates organizational, managerial, and conceptual elements to examine transformation management as a multifaceted phenomenon.

A systematic questionnaire created especially for this study was used to gather data. The 30-item test measures important aspects of transformation management, with the first portion (Q1–Q10) addressing organizational and demographic traits and the remaining items (Q11–Q30). Four predetermined answer alternatives, ranging from low to high intensity or agreement, are used for all closed-ended analytical issues. By ensuring clarity, minimizing ambiguity, and preventing neutral midpoint bias, this design decision encouraged respondents to offer more definitive assessments on transformation-related difficulties inside their companies.

The following thematic elements of the questionnaire are used to operate the primary study constructions (Table 1).

Response choices were numerically coded on an ordinal scale ranging from 1 to 4 for analytical reasons; higher values denoted a stronger presence or intensity of the assessed feature. Each thematic dimension's composite variables were created by taking the arithmetic means of the elements that made up that dimension. This method maintains the conceptual coherence of each notion while allowing for both relational and descriptive investigations.

**Table 1** - *Operationalization of Transformation*

| Thematic Dimension | Code | Questionnaire Items | Description |
|---|---|---|---|
| Conceptual Understanding of Transformation | CU | Q11–Q15 | Measures how organizational transformation is perceived, defined, and aligned with organizational strategy. |
| Drivers of Transformation | DT | Q16–Q20 | Captures internal and external factors that trigger organizational transformation initiatives. |
| Managerial Role in Transformation | MR | Q21–Q25 | Assesses managerial involvement, communication practices, employee engagement, resource allocation, and managerial competencies during transformation processes. |
| Challenges and Organizational Context | CC | Q26–Q27 | Examines resistance to change and the extent to which organizational culture supports transformation. |
| Transformation Outcomes | TO | Q28–Q30 | Measures the perceived success of transformation initiatives and their impact on organizational performance and managerial decision-making. |

Managers and professionals employed by companies across a range of industries make up the study's target demographic. A non-probability convenience sampling strategy based on accessibility and voluntary participation was used to gather data. Respondents were able to complete the questionnaire anonymously since it was disseminated online using a survey platform. Throughout the data gathering procedure, anonymity and confidentiality were guaranteed to promote truthful and objective replies. Respondents were told that participation was completely optional and that the information would only be utilized for scholarly study.

With the use of statistical tools like IBM SPSS Statistics and Microsoft Excel, the gathered data will be evaluated using descriptive statistics and correlation analysis. Descriptive analysis will be used to describe respondent characteristics and overall trends, while correlation analysis will evaluate links between transformation drivers, managerial practices, organizational problems, and perceived results. In the part that follows, which is devoted to study findings, research hypotheses are tested.

Cronbach's alpha will be computed for every composite variable to evaluate the measurement scales' internal consistency. In management studies, an appropriate criterion for exploration research is $\alpha \geq 0.70$.

In addition to constructing the instrument around well-defined theoretical aspects, the questionnaire items are grounded in well-established literature on organizational change and transformation management, which supports content validity. The hypothesized theoretical linkages between the variables under study, such as the connection between management engagement and transformation results, further support construct validity.

From a methodological standpoint, transformation management's intrinsically perceptual, contextual, and managerial character makes it an especially good topic for survey-based empirical research. Organizational transition is perceived differently across organizational levels, industries, and institutional settings, in contrast to merely technical or operational phenomena.

As a result, documenting management perspectives offers important insights into how

transformation is seen, started, and managed in real-world situations. The emphasis on perceptions does not imply unstructured subjectivity; rather, it represents a well-recognized methodology in management research, which views managerial interpretations and decision-making logics as key explanatory factors. The technique enables a detailed analysis of change as both a strategy process and a socio-organizational phenomenon by methodically gathering answers across clearly defined dimensions—conceptual understanding, drivers, management responsibilities, organizational problems, and outcomes.

Furthermore, rather than using experimental designs to investigate causal processes, the study's exploratory goal of identifying prevalent patterns and correlations is in line with the methodological approach that was selected. In the context of transformation management, where organizational change processes develop over time and are impacted by several interrelated causes, this is especially pertinent. As a result, the technique maintains sensitivity to the complexity and diversity of actual organizational contexts while facilitating the conversion of abstract theoretical ideas into empirically observable indicators.

## Results and Discussions

The findings show that rather than being viewed as little or regular changes, organizational transformation is primarily seen as a significant and fundamental shift. Most respondents clearly identify transformation with large changes to an organization's operations, such as cultural and strategic alterations. The presence of both transformational and transitional interpretations inside companies is suggested by the smaller, but still significant, percentage that views transformation as a periodic process optimization.

Additionally, change is typically considered a planned and continual strategic process, rather than a temporary initiative or an occasional reaction. Many respondents claim the existence of a clearly expressed and actively shared transformation vision, a non-negligible fraction suggests that such a vision exists only informally or is weakly conveyed. This implies a disconnect between organizational distribution and strategic goal (Figure 2).


**Figure 2** – *Conceptual Understanding of Transformation*

Most people believe that transformation is more important for long-term sustainability and competitiveness than for immediate survival or legal compliance. The stated level of alignment between organizational strategy and transformation varies; nevertheless, many respondents reported merely a "good" alignment as opposed to a "very strong" one. This result suggests that even while change is seen as strategically significant, its incorporation into strategic planning may still be lacking. The findings show that external pressures are seen to be the main forces of transformation, especially changes in the external environment and competitive dynamics. Internal pressures are a

secondary factor, indicating that many businesses continue to initiate change in a reactive rather than proactive manner. For a significant percentage of responders, technology appears as a crucial driver, proving its function as a catalyst for change. Technology is rarely seen as the only catalyst, though, suggesting that transformation is viewed as a more comprehensive administrative issue rather than a strictly technological one (Table 2).

**Table 2** – *Transformation Drivers*

| Transformation Driver | Predominant Perception | Interpretation |
|---|---|---|
| Competitive pressure | High prevalence | External competition is perceived as a primary trigger, indicating a reactive orientation toward transformation. |
| Changes in the external environment | High prevalence | Environmental volatility is a strong catalyst, reinforcing the role of uncertainty in initiating transformation. |
| Internal organizational pressures | Moderate prevalence | Internal drivers are present but secondary, suggesting limited proactive transformation initiatives. |
| Role of technology | Important to critical | Technology is viewed as a significant enabler, but rarely as a standalone trigger of transformation. |
| Regulatory impact | Moderate to high | Regulations influence transformation, though not as strongly as market-driven factors. |
| Crises and disruptions | High prevalence | Crises are perceived as strong accelerators, highlighting transformation as a response to disruption. |
| Performance efficiency needs | Frequent | Continuous pressure for efficiency acts as a recurring transformation driver. |

While crises are commonly viewed as powerful catalysts for transformation processes, regulatory issues are typically thought to have a moderate to high influence. This supports the notion that rather than arising from stable contexts, change frequently increases under disruptive situations. Furthermore, the urge to enhance organizational performance is often mentioned as a recurrent trigger, emphasizing competition and efficiency as enduring change drivers.

The results highlight how crucial management is to transformation projects. Most of the respondents state that senior management is actively or extremely actively involved in transformation initiatives. Similarly, managerial communication during transition is primarily seen as straightforward, while fewer respondents characterize it as both clear and consistent, suggesting possible problems in sustained communication throughout time (Figure 3).

A moderate to high level of employee participation is typically recorded, indicating the existence of participatory techniques but their uneven embedding. The most common description of resource allocation for transformation is adequate rather than highly sufficient, suggesting some limitations that could restrict the depth or pace of transformation.

Most people believe that managerial skills for managing change are sufficient or well-developed. The lack of extremely good reviews, however, indicates that there is still an opportunity for improvement, especially when it comes to overseeing intricate, long-term transformation projects.


**Figure 3** – *Managerial Role in Transformation Processes*

Organizations continue to face moderate to high levels of resistance to change, demonstrating their enduring function as a roadblock to progress. However, rather than being completely in line with transformation objectives, organizational culture is more frequently seen as just somewhat helpful. This combination points to a conflict between firmly ingrained organizational norms and strategic aims.

Notably, just a small percentage of respondents say that culture is completely supportive of change, suggesting that cultural alignment is still a crucial - and sometimes underutilized - success element.

Few respondents indicated total failure or extraordinary success, while most respondents rated transformation success as moderate to high. This trend implies that, even in cases when strategic goals are lofty, change typically yields gradual outcomes (Figure 4).

While gains in executive decision-making quality are generally acknowledged, if frequently to a slightly lower level, most respondents claim that transformation has greatly enhanced organizational performance. This disparity may imply that performance increases appear earlier or more obviously than cognitive or decision-related improvements.

Overall, the findings indicate that change produces observable advantages, albeit these advantages often appear gradually and unevenly across organizational dimensions.

When combined, the results provide several significant insights. First, even though change is generally acknowledged as a strategic requirement, its implementation is sometimes hampered by cultural inertia, inadequate resources, and incomplete alignment. Second, there is a lot of managerial participation, but employee engagement and communication are inconsistent, which might have an impact on the durability of the change. Lastly, many businesses are still in transitional rather than completely transformative stages, as seen by the good but moderate transformation outcomes.

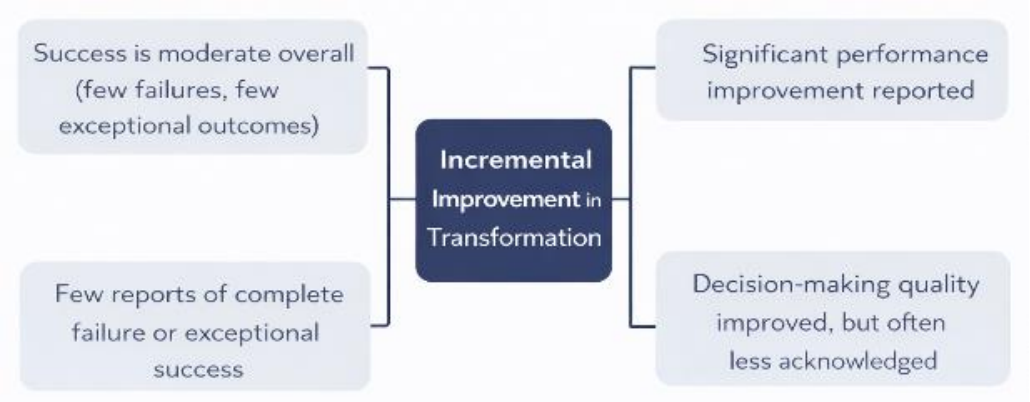


**Figure 4** – *Transformation Outcomes*

These observations highlight the necessity of consistent leadership, cultural alignment, and strategy coherence and suggest that change management is a continual managerial competency rather than a one-time endeavour (Table 3).

**Table 3** – *Observed Pattern in Managerial Implication*

| Key Insight Area | Observed Pattern | Managerial Implication |
|---|---|---|
| Strategic perception of transformation | Transformation is widely recognized as a strategic necessity | Awareness exists, but strategic recognition does not always translate into full execution. |
| Nature of transformation outcomes | Outcomes are predominantly moderate rather than radical | Organizations may be undergoing a gradual or partial transformation rather than a big change. |
| Managerial involvement | High levels of declared involvement | Strong leadership presence does not automatically ensure transformational depth. |
| Communication and engagement | Clear but not always consistent | Inconsistencies may undermine long-term transformation sustainability. |
| Organizational culture | Partially supportive | Cultural misalignment remains a significant barrier to full transformation. |
| Resource allocation | Generally adequate, rarely abundant | Resource constraints may limit the speed and scope of transformation initiatives. |
| Transformation as a capability | Emerging rather than embedded | Transformation is treated as an episodic process instead of a continuous managerial capability. |

The results of the research offer a complex view of transformation management in modern businesses, exposing trends that both support preexisting theoretical presumptions and refute some of the prevailing narratives in literature. The findings point to a more complicated, slow, and context-dependent reality rather than a linear, well-planned process propelled by visionary leadership and radical change.

The difference between strategic awareness and strategic maturity in connection to organizational change is among the most noteworthy conclusions drawn from the findings. The degree of alignment between transformation projects and organizational strategy appears to be moderate rather than ideal, even though most respondents acknowledge change as a strategic imperative, especially related to long-term competitiveness and sustainability.

According to this research, a lot of firms have adopted the language of change without completely integrating it into their strategic planning and implementation processes. To put it another way, change is recognized intellectually but not practically. This calls into question the underlying premise of a large portion of the transformation literature, which holds that acknowledging the strategic significance of transformation inevitably results in cogent execution. Rather, the findings suggest the existence of what may be called "symbolic transformation alignment," in which transformation is strategically defined at a declarative level but only partially translated into actual strategic activities.

According to the examination of transformation drivers, external pressures - such as intense competition, unstable environments, and crises - strongly outweigh internal, proactive forces. This validates past research that highlighted uncertainty and disruption as essential causes of change, but it also raises critical considerations regarding organizational agency.

The predominance of reactive transformation shows that many businesses still see transformation as a response mechanism, triggered largely under

duress, rather than as a continuous strategic competence. Dynamic capability perspectives, on the other hand, place more emphasis on proactive resource sensing, grabbing, and reconfiguration. The results suggest that change frequently emerges via cumulative external limitations that leave businesses with few options rather than with intentional long-term vision.

Crucially, technology is rarely seen as a stand-alone driver but rather as a significant or even vital facilitator. This subtlety deepens the current discussion on digital transformation by arguing that technology by itself cannot bring about change unless it is integrated with larger forces linked to competition, regulations, or performance. Therefore, transformation seems to be more of a management interpretation of contextual constraints than a technology need.

The results relating to the management job highlight a contradiction that is particularly relevant. On the one hand, strong levels of senior management participation are observed, suggesting that transformation activities are neither neglected nor delegated at the leadership level. On the other hand, managerial practices, especially communication consistency, staff engagement, and resource allocation, display unequal intensity.

This mismatch implies that management presence does not inevitably translate into managerial success in transformation environments. Even when leaders are clearly active, it seems that their capacity to maintain consistent communication, consistently inspire workers, and obtain adequate resources is limited.

This study undermines simple leadership-centric conceptions of change that equate executive engagement with transformation success. Moreover, managerial abilities are often considered as acceptable rather than exceptional, indicating that transformation management may transcend the traditional skill sets obtained via conventional managing experience. This speaks toward the need to reconceptualize change management as a unique managerial ability, rather than an extension of general leadership qualities.

Organizational culture and resistance to change show up as enduring, if frequently subtle, barriers to transformation results. The findings indicate that rather than being completely in line with transformation initiatives, culture is more often seen as moderately supportive. The limitations of structural and strategic interventions in the absence of greater cultural integration are highlighted by this crucial conclusion.

The results point to the existence of latent cultural inertia rather than overt opposition, whereby established norms and routines gently restrict the scope and speed of change rather than overtly opposing it. This contributes to the explanation of why transformation results are frequently modest rather than radical. While basic presumptions and decision logic are mostly unaffected, transformation may occur at the procedural level.

The most startling realization has to do with transformation results. Transformation success is often seen as modest, with few instances of either failure or extraordinary success, despite strong strategic narratives and executive participation. While gains in performance are readily recognized, advances in the quality of decision-making are less obvious and less frequently acknowledged.

According to this imbalance, change produces observable operational gains before benefits connected to cognition or governance. Longer time horizons and deeper learning processes are necessary for greater improvements in management decision-making, even if performance indicators may react to structural or process changes very fast.

When taken as a whole, these results contradict the prevailing narrative that portrays transformation as a swift, dramatic, and disruptive process. Rather, the findings lend credence to a different interpretation of transformation as a cumulative, iterative, and uneven process characterized by limited goals, incremental capability growth, and partial accomplishments.

When considered together, the conversation highlights the necessity of redefining change management in both theory and practice. Transformation should be viewed as continuous managerial competence that is influenced by organizational learning, cultural dynamics, and environmental forces rather than just as a project or episodic intervention.

The findings imply that future studies should move beyond success–failure dichotomies and instead focus on degrees of transformation, patterns of partial alignment, and the temporal dynamics of management learning. The findings suggest that investing in cultural alignment, communication consistency, and transformation-specific abilities may be more important for practitioners than starting new transformation projects.

## Conclusion

The present research looked at how change is seen, what motivates it, how it is managed, and what results it really yields to investigate transformation management in modern businesses. The research offers a nuanced and practice-oriented view on organizational change that enhances and expands upon current theoretical frameworks by using a cross-industry, perception-based empirical methodology.

The results show that rather than being an optional administrative decision, change is universally acknowledged as a strategic requirement. However, strategic maturity does not always follow this acknowledgment. Strategic aims, management engagement, and operational execution are all present but not fully integrated in many firms, which seem to be in a state of incomplete transition. As a result, transformation appears less as a cohesive strategy program and more as a dispersed process molded by organizational limitations, contextual pressures, and little modifications.

A fundamental finding is that external factors dominate the commencement of transformation processes. Internal strategic foresight is thought to be less significant than crises, environmental unpredictability, and competitive pressure. This implies that many firms' transformations are still essentially reactive. Organizations frequently react to cumulative forces that make transformation inevitable rather than continually reshaping their future via proactive transformation. This study emphasizes the need to reevaluate organizational agencies in change situations and undermines normative frameworks that present transformation as a purposeful, forward-looking managerial undertaking.

It becomes clear that management plays a crucial and contradictory role. Although there is typically a significant level of administrative participation in change, this involvement does not always result in robust communication continuity, high levels of employee engagement, or generous resource allocation. Thus, in transformation processes, the study makes a distinction between management presence and managerial effectiveness. Particularly in maintaining momentum, aligning culture, and handling long-term uncertainty, transformation management seems to call for a distinct set of capabilities that go beyond conventional leadership abilities.

Another key finding involves the role of corporate culture. Culture frequently acts as a hidden restriction, gently restricting the extent and speed of change rather than as a blatant facilitator or obstacle. Cultural inertia sometimes takes the shape of a slow deterioration of transformative aspirations rather than overt rejection. This realization contributes to the explanation of why, even in companies with strong strategic narratives and leadership commitment, change outcomes are often moderate rather than dramatic.

Finally, the study reveals that transformation outcomes tend to be incremental. While improvements in organizational performance are widely acknowledged, enhancements in managerial decision-making quality are less pronounced and less visible. This asymmetry suggests that operational gains materialize earlier than cognitive or governance-related improvements, reinforcing the view of transformation as a long-term learning process rather than a short-term performance intervention.

This research investigation adds to the literature on transformation management in several ways from a theoretical standpoint. It begins by outlining the differences between strategic awareness and strategic maturity, emphasizing that understanding the significance of change does not equate to mastering it. Second, it challenges prevailing narratives that highlight drastic, disruptive change by reframing transformation as a slow and uneven process. Third, it emphasizes how crucial it is to see transformation management as an ongoing

managerial skill that is influenced by organizational culture, learning dynamics, and contextual forces.

The results indicate that ambitious strategy declarations or overt leadership participation are not enough for successful transformation, according to practitioners. Increasing communication consistency, incorporating transformation goals into routine decision-making, and tackling cultural alignment directly rather than indirectly should be managers' main priorities. Furthermore, it seems that advancing beyond modest transformation outcomes requires investment in transformation-specific managerial abilities, such as managing uncertainty, maintaining engagement over time, and integrating strategic and operational viewpoints.

As with any empirical work, it is important to recognize some limitations. The cross-sectional methodology fails to capture the temporal dynamics of transformation processes, and the dependence on self-reported impressions may create bias. Longitudinal designs might be used in future studies to investigate how transformation results and perceptions change over time. Additionally, industry-specific research and comparative evaluations across organizational contexts might further improve the ideas offered here.

Overall, this study highlights that transformation management is a constant managerial problem that develops via incremental progress, contextual adaptability, and continuing learning rather than a single event or initiative. The secret to accomplishing more significant and long-lasting organizational change may lie in acknowledging and embracing this complexity.

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*"Change is inevitable.*
*Growth is optional."*
John C. Maxwell

# The Paradox of Transparency in Fashion Sustainability

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Abstract

*The fashion industry faces increasing regulatory and consumer pressure to disclose sustainability practices, yet greater transparency does not necessarily translate into substantive change. This paper examines this "transparency paradox" through the case of Louis Vuitton MH. Triangulating corporate reports (2022–2024) with independent evaluations such as the Fashion Transparency Index and Good On You, the study finds that while LVMH reports progress on climate, biodiversity, circularity, and workplace inclusion, external ratings of Louis Vuitton, its flagship brand, highlight persistent gaps in labor rights, animal welfare, and supply-chain disclosure. Theoretically, the study positions transparency as a paradoxical phenomenon that builds legitimacy while failing to resolve structural inequities. Methodologically, it underscores the value of multi-source evaluation. Without such systemic change, transparency risks remain performative rather than transformative.*

**Keywords:** sustainable fashion, transparency paradox, corporate sustainability

## Introduction

The fashion sector, a major driver of the global economy, faces growing pressure to transition toward a more sustainable business model. Transparency has become central to this shift, allowing stakeholders to assess the authenticity and effectiveness of corporate sustainability initiatives. Recent estimates value the global apparel market at $1.84 trillion by 2025, representing 1.65% of global GDP, with a projected growth rate of 2.81% between 2025 and 2028 (Uniform Market, 2025). Despite its economic importance, the industry generates severe environmental impacts: 92 million tonnes of textile waste annually, expected to rise to 134 million tonnes by 2030 if fast fashion persists; over 20% of global water pollution; and about 3% of global $CO_2$ emissions, largely from energy-


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intensive dyeing, finishing, and fiber production (Igini, 2023). Cotton cultivation alone requires about 20,000 liters of water per kilogram, and without major intervention, emissions could rise by 50% by 2030 (Igini, 2023). Transparency is now a central pillar of corporate sustainability strategies, yet it does not always translate into change. Selective disclosure from companies, rapid turnover of fashion trends and consumers' appetite for novelty continue to fuel overconsumption, limiting the transformative potential of such initiatives. This study develops the Transparency Paradox Framework, conceptualizing the coexistence of rising levels of corporate disclosure with persistent sustainability gaps. It synthesizes drivers of transparency, consumption accelerators, and structural barriers to highlight paradoxical outcomes, while outlining potential pathways forward. The framework is illustrated through a case study of Louis Vuitton Moët Hennessy (LVMH), a French luxury conglomerate and one of the most influential actors in global fashion.

## Research methodology

This study adopts a qualitative, conceptual research design, grounded in secondary data analysis and case study methodology. It is situated within an interpretivist epistemological framework, which prioritizes the understanding of social, environmental, and economic phenomena through the critical interpretation of existing knowledge sources, rather than primary data collection. Secondary data were gathered from academic literature, corporate sustainability reports, industry analyses, official communications, and global transparency assessments, including the Fashion Transparency Index and independent sustainability ratings such as Good On You.

Conceptual analysis was used to examine the paradox between corporate sustainability commitments, transparency practices, and persistent trend-driven overconsumption. A focused case study of Louis Vuitton Moët Hennessy (LVMH), was undertaken, selected for its economic significance and role as a leading actor in the luxury fashion sector. Triangulating corporate disclosures with independent evaluations enabled the identification of both convergences and gaps in sustainability reporting.

This combined approach offers a holistic understanding of the relationship between transparency, consumer behavior, and sustainability in fashion. While the findings are illustrative rather than generalizable, this approach provides valuable insights into the structural tensions underpinning the transparency paradox.

Transparency is increasingly recognized as a cornerstone of sustainability in fashion, enabling stakeholders to assess and compare efforts. A lack of transparency limits informed decision-making and slows progress. Transparency allows tracing material origins to assess social, environmental, and animal welfare impacts, while traceability supports recalls, early-warning detection, and consumer response monitoring (Agrawal and Pal, 2019, p.12). Weak traceability fosters unethical labor practices, counterfeiting, and erodes trust, undermining sustainability and accountability (Agrawal and Pal, 2019, p. 1, 5).

Empirical studies confirm that transparency and traceability can strengthen supply chain sustainability. Alves et al. (2024, p. 1) propose a blockchain tool to monitor environmental, economic, and social impacts, supporting informed decisions and transition to circularity. In fashion, where challenges are acute, transparency enables stakeholders to assess ESG practices. Genuine transparency is vital for combating greenwashing, defined as misleading stakeholders about environmental benefits (Delmas and Burbano, 2011, p. 66). De Freitas Netto et al. (2020, p. 2) argue greenwashing undermines trust and hinders sustainability. An emerging phenomenon, greenhushing, further complicates the landscape, as companies withhold sustainability information (Font, Elgammal and Lamond, 2016, p. 1007). Both phenomena show that transparency must be actively managed, not assumed, and require robust verification to align communication with performance. Together, these studies suggest that while transparency enhances accountability and traceability, it also creates vulnerabilities, particularly through greenwashing and greenhushing, complicating its role in driving

sustainability. This contradiction provides the theoretical foundation for the Transparency Paradox Framework.

According to the Fashion Transparency Index (Fashion Revolution, 2023), many of the world's 250 largest fashion companies withhold critical information on carbon emissions, waste, deforestation, chemicals, wages, production volumes and resulting textile waste. Transparency reflects disclosure rather than performance, yet it can drive change by fostering accountability and enabling informed decision-making. The Index evaluates disclosure across policies and commitments, governance, supply chain traceability, working conditions, equality, sustainable materials, overconsumption and waste, water and chemical management, and climate impacts.

Although luxury brands have traditionally been secretive, 2023 showed improvements among some players (e.g., Gucci, Armani, Prada, Jil Sander, Miu Miu), largely through broader supplier disclosures. Yet transparency scores varied widely, from 11% to 83%, with Louis Vuitton and Chanel remaining below 30%. This disparity highlights how disclosure practices remain uneven across the industry.

At the policy level, recent European Union initiatives seek to standardize and enforce transparency. The Corporate Sustainability Reporting Directive (CSRD), effective from 2024, requires large companies to disclose information on environmental and social impacts under the European Sustainability Reporting Standards (ESRS) (European Commission, 2023). Similarly, the proposed Green Claims Directive aims to prevent greenwashing by requiring firms to substantiate environmental claims with verifiable evidence (European Parliament, 2024b). These measures make transparency a legal obligation, shaping how brands approach sustainability strategies and reporting.

Nevertheless, systemic dynamics within the fashion sector continue to challenge progress. Rapid trend cycles, driven by social media, fuel consumerism and undermine environmental goals. Thus, even as regulatory frameworks expand reporting requirements, transparency alone does not guarantee substantive improvements in sustainability performance. This tension underscores the paradox at the heart of the fashion industry: more disclosure does not automatically translate into more sustainable outcomes.

## The Influence of Trends on Consumer Behavior

The cyclical and accelerated nature of fashion trends is a key driver of consumerism, encouraging frequent purchases and garment disposal. Fast fashion is amplified by replicating luxury houses' designs for mass diffusion. As DuBreuil and Lu (2020, p. 68) note, anticipating and responding to trends is essential for brand competitiveness, making trend forecasting integral to marketing strategy and positioning.

Social media platforms, particularly TikTok, have intensified this process by accelerating trend cycles and shaping consumer aspirations. The "It Girl" phenomenon in 2022, alongside the later "Clean Girl Aesthetic" (Resnick, 2022) and "Quiet Luxury" (Comroe, 2023), collectively promoted curated luxury and minimalism, but paradoxically fueled wardrobe turnover. As novelty faded, contrasts emerged, notably the "Mob Wife" trend (Francombe, 2024), with fur coats, bold makeup, and animal prints. This illustrates a sustainability issue: both natural and synthetic fur impose heavy environmental costs (Humane Society International, 2023; Ramchandani and Coste-Maniere, 2017, p. 57).

Rapidly shifting trends also affect psychological well-being, driving wardrobe renewal, especially among those lacking clear style or seeking belonging. This raises concerns for self-esteem, authenticity, and sustainability (Muturi, 2024, p. 29), reinforcing luxury consumption as a means of recognition and belonging, as theorized by Veblen's conspicuous consumption (Mao, McAleer and Bai, 2017, p. 296). Louis Vuitton exemplifies this,

succeeding on both product quality and its ability to project cultural identity and status.

The intersection of social media influence, consumer psychology, and luxury branding fuels overconsumption and hinders sustainability. Even as transparency grows, trend-driven behavior undermines change, intensifying the industry's paradox.

**The Transparency Paradox Framework.** Building on preceding literature and industry dynamics, this study develops the Transparency Paradox Framework (Figure 1). The framework conceptualizes how transparency in fashion functions both as a driver of accountability and as a source of systemic contradictions. Transparency drivers include regulatory initiatives such as the Corporate Sustainability Reporting Directive (CSRD), the Green Claims Directive, and the forthcoming Digital Product Passport (DPP), as well as corporate strategies (e.g., LVMH's LIFE 360) and growing consumer demand for responsible brands. Together, these drivers pressure firms toward disclosure, standardization, and supply chain visibility.

Counterbalancing these efforts are consumption accelerators: fast-changing trends amplified by social media platforms like TikTok, the diffusion of aesthetics such as "Quiet Luxury" and "Mob Wife" into fast fashion, and consumer psychology shaped by identity signaling and status competition, as theorized by Veblen's notion of conspicuous consumption. These dynamics reinforce overconsumption, even as transparency expands. The interaction of these forces produces a paradox zone, where transparency is promoted as a path to sustainability, yet disclosure does not necessarily equate to performance. Barriers such as greenwashing, greenhushing, and weak reporting standards undermine the credibility of sustainability communication. The paradoxical outcome is that more transparency does not automatically lead to greater sustainability.

The framework highlights pathways forward: linking transparency with circular innovation, strengthening labor and animal welfare standards, and fostering systemic collaboration among policymakers, brands, and consumers. These interconnections show that transparency alone is insufficient: only when combined with systemic change can it deliver meaningful sustainability outcomes. Figure 1 synthesizes these dynamics, illustrating how drivers of transparency are counterbalanced by consumption accelerators, producing paradoxical outcomes while also pointing to potential pathways forward.

## Louis Vuitton and the Transparency Paradox

Louis Vuitton Moët Hennessy (LVMH), a leading luxury goods conglomerate, provides a key case for examining the transparency paradox in fashion. In 2024, Louis Vuitton, part of LVMH, ranked as the world's most valuable fashion brand (Brand Finance, 2024), making it a benchmark for testing how corporate sustainability strategies align or conflict with independent evaluations.

LVMH's sustainability strategy, LIFE 360, launched in 2020, rests on four pillars: climate, circularity, biodiversity, and traceability, with intermediate targets for 2023 and 2026 and long-term goals for 2030. Between 2022–2024, LVMH reported major progress under its LIFE 360 strategy: Scope 1 & 2 emissions fell 55,1%, exceeding the 2026 target and Scope 3 nearly 33%, renewable energy rose to 71%, circular initiatives expanded with 41% recycled packaging and 290,000 meters of fabrics reused, biodiversity projects restored 3.8 million hectares, and traceability reached 98–99% for leather and exotic skins. Social indicators also advanced, with 48% of leadership roles held by women and Fair Wage Network audits covering ~25% of the workforce, alongside a Group claim that all employees receive at least adequate local compensation (Table 1; LVMH, n.d.a; LVMH, n.d.b; LVMH, n.d.c; LVMH, 2022; LVMH, 2023 - note: the 2023 Responsibility Report appears to mislabel one column as 2022, though it clearly reports 2023 data, p.82).

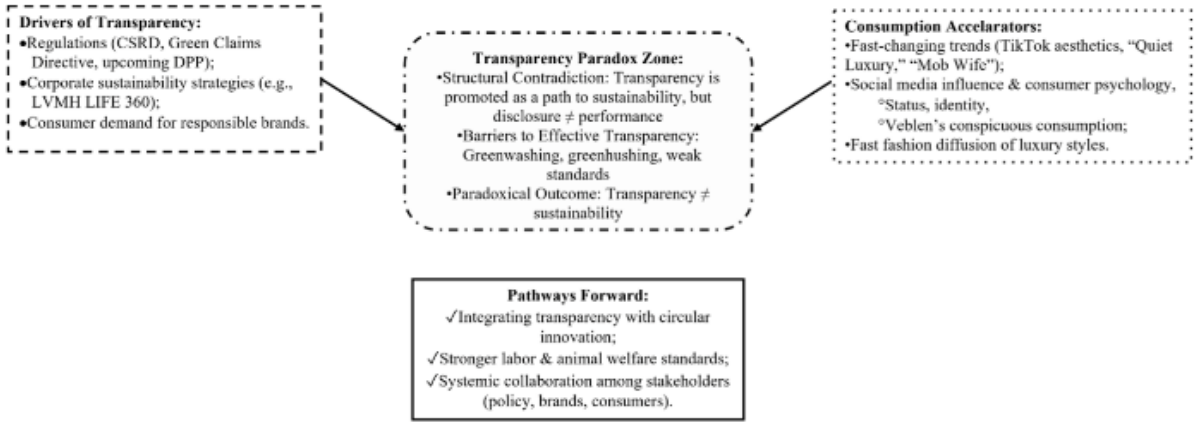


**Figure 1** - *The Transparency Paradox Framework in the Fashion Industry*

However, independent assessments suggest that while traceability and employee safeguards have improved, systemic issues persist. The Fashion Transparency Index (FTI, 2023) scored Louis Vuitton only 29%, with 1% disclosure on supply-chain traceability despite higher scores in policies (76%) and governance (64%). Similarly, Good On You (GOY, 2023) rated Louis Vuitton "Not Good Enough," citing ongoing use of leather and exotic skins and limited living-wage evidence, despite LVMH's biodiversity projects on bees, reefs, and habitat restoration. Together, these findings show that group commitments are inconsistently reflected at brand level, limiting accountability.

The paradox emerges clearly: LVMH shows tangible progress, sometimes surpassing interim targets, while prioritizing high-visibility initiatives like biodiversity and gender diversity. Yet socially sensitive metrics: wages, working conditions, and supply chain equity remain under-disclosed. Triangulating corporate and independent evidence reveals that LVMH pairs visible environmental achievements with persistent blind spots, underscoring the contradictions at the core of the transparency paradox in luxury fashion.

**Table 1** - *LVMH LIFE 360 progress, compared with independent evaluations*

| Pillar | 2022 Results **vs 2019 baseline (LVMH, 2022)** | 2023 Results **vs 2019 baseline (LVMH, 2023)** | 2024 Results **vs 2019 baseline (LVMH, n.d.a; LVMH, n.d.b; LVMH, n.d.c)** | % of Target **Actions** | Independent Evaluations **(Louis Vuitton) GOY (2023), FTI (2023)** | Gap/Paradox |
|---|---|---|---|---|---|---|
| Climate | -11% S1&2; -15% S3; 47% renewables | -28% S1&2; -29.9% S3; 63% renewables | -55.1% S1&2; -32.8% S3; 71% renewables | S1&2: 100% met 2026 goal); S3: 60% of 2030 goal; Renewables: 71% of 2026 goal | GOY: 3/5 supplier evidence. FTI: strong policies (76%), governance (64%), 1% supply-chain traceability | Emission reduction vs limited supplier-level transparency |
| Circularity | 190k m upcycled; 39% recycled packaging; 7,942t virgin plastic | 97% circular services; 280k m recycled; 43% recycled packaging | 290k m recycled; 41% packaging; 7,224t virgin plastic | Packaging: 41% of 2026 goal; Circular services: 97% of 2023 goal (3pp below target ) | GOY: recycled use, but vague disclosure. FTI: minimal waste/ overproduction; 1% traceability | Circular service expansion vs limited waste and overproduction disclosure |

| | | | | | | |
|---|---|---|---|---|---|---|
| Biodiversity/ Animals | 1.37mln ha preserved; 71% cotton, 91% leather, 94% vineyards cert.; SBTN, reforestation, UNESCO partnerships | 3.1mln ha preserved (mislabeled as 2022 in report); 75%cotton, 96% leather certified; biodiversity (bees, reefs) | 3.8mln ha restored; 96% grapes certified; 10% industrial reduction; expanded Amazon/Mauritius, reefs, bees projects | Cotton: 75% toward 2026 goal; Leather: 96% toward 2026 goal; Habitats: 76% of 2030 goal | GOY: 1/5, use of fur, exotic skins, silk; weak welfare policy. FTI: No animal welfare scoring | Biodiversity initiatives vs continued reliance on animal-derived materials |
| Traceability | 9,5k products in info system; leather origin traceability 86%, wool 64% | 30k prod. with info system; 100% exotic leathers' origin; 96% leather traceability | 31k products with info system; 99% exotic leather traceability; 98% leather traceability | Near full traceability: 98–99% vs 100% target (by 2026) | GOY: weak supplier transparency; no supplier wage guarantees. FTI: 1% traceability | Near-complete group traceability vs minimal LV public disclosure |
| People | 45% women in leadership; 1.4% disabilities; 24% U.S. BIPOC leaders; 81% health & safety (H&S); no formal living wage policy | 46% women leaders; 1.6% disabilities; 28% U.S. BIPOC lead.; 86% H&S(42% risk-prevention); living wages for 3k artisans) | 48% women leaders; 1.9% disabilities; 92% H&S (62% risk-prevention); Fair Wage Network audits (~25% workforce); supplier Code of Conduct extended | Women leaders 48%=96% of 2025 goal; disability workforce: 1.9%=95% of 2025 goal; H&S: 92–97% (near 100% 2025 goal) | GOY: 2/5 weak wage protection, limited supplier diversity, FTI: 31% in "Know, Show & Fix," no living wage evidence | Group wage and diversity commitments vs limited verifiable supplier wage data |

## Discussion

The findings confirm that rising corporate disclosure, as shown in the LVMH case, does not automatically translate into robust sustainability outcomes. While frameworks such as LIFE 360 report progress across climate, circularity, biodiversity, and traceability, independent assessments of Louis Vuitton, the group's flagship brand, reveal blind spots in labor rights, animal welfare, and supply-chain disclosure. This gap shows a structural paradox: ambitious corporate policies coexist with brand-level outcomes that fall short.

The LVMH case illustrates this structural tension. Corporate reporting emphasizes biodiversity projects, gender diversity, and renewable energy achievements, framing progress, while external reviews highlight omissions, particularly on living wages, working conditions, and animal-derived materials. Thus, transparency can enhance reputation and trust, but risks becoming performative without verifiable supply-chain improvements.

The Transparency Paradox Framework links corporate and regulatory drivers of transparency with cultural and economic accelerators of consumption. While initiatives like LIFE 360 foster disclosure, rapid trend cycles and status-driven consumption perpetuate unsustainable behaviors. Transparency thus functions less as a catalyst of change and more as a paradox where visibility coexists with inertia.

Looking ahead, the paradox may persist even under upcoming EU regulations. The Digital Product Passport (DPP), the Corporate

Sustainability Reporting Directive (CSRD), and the Green Claims Directive (GCD) will expand disclosure obligations, embedding product-level data on composition, environmental impact, and supply chains (European Commission, 2023; European Parliament, 2024a; European Parliament, 2024b). These measures advance transparency, yet do not ensure systemic change. Without shifts in consumption patterns, business model innovation, and independent verification, companies may comply while continuing unsustainable practices. Thus, regulatory progress risks reinforcing the transparency paradox: more reporting without deeper transformation.

## Limitations and Future Research

This study has several limitations. First, it contrasts LVMH Group reporting with external ratings that primarily evaluate Louis Vuitton. This asymmetry arises because conglomerates report at the group level, whereas independent evaluations frequently focus on flagship brands. Second, the analysis relies on publicly available data, which is inherently selective: corporate reports emphasize achievements, while independent ratings may overlook progress not explicitly disclosed. Third, the case study offers depth but limits generalizability, as LVMH's scale and visibility differ from smaller actors.

Future research should extend the analysis to other fashion groups and segments beyond luxury, testing how the transparency paradox framework operates in fast fashion, premium, and mid-market contexts. Complementary evidence from suppliers, workers, or auditors would help verify reported outcomes, while longitudinal studies tracking the implementation of EU regulations (CSRD, DPP, GCD) will clarify whether expanded disclosure can narrow the persistent gap between transparency and systemic change.

## Conclusions

This paper examined the transparency paradox in fashion through LVMH and developed a conceptual framework linking corporate disclosure, consumer dynamics, and systemic barriers. The analysis showed that while LVMH reports measurable progress on climate, circularity, biodiversity, traceability, and workplace inclusion, with some goals surpassed and others ongoing, independent evaluations, focused primarily on Louis Vuitton, highlight persistent gaps in labor rights, animal welfare, and supply-chain disclosure. This asymmetry underscores that rising transparency does not automatically yield substantive sustainability outcomes.

Theoretically, the study frames transparency as a paradoxical phenomenon: it may strengthen legitimacy and consumer trust while leaving deeper structural issues unresolved. Methodologically, triangulating corporate reports with external ratings illustrates the value of multi-source evaluation in sustainability research. Practically, the findings suggest that brands must complement transparency with verifiable supply-chain data, living-wage guarantees, and systemic innovations to ensure disclosure aligns with genuine transformation.

Ultimately, the transparency paradox shows that disclosure risks serving as a reputational tool rather than a driver of structural change. To overcome this, transparency must be embedded in systemic reforms that combine regulatory enforcement, independent verification, and shifts in consumption culture. Only under these conditions can transparency move from performance to genuine sustainability.

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" *Transformation begins with awareness."*
Daniel Goleman

# Managing Workforce Transformation in the Age of Artificial Intelligence

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**Abstract**

*This qualitative exploratory study employed semi-structured interviews with 20 employees and employers across multiple sectors, and the resulting data were analyzed using thematic analysis to examine participants' perceptions of the challenges and opportunities associated with AI adoption. The analysis identified several prominent themes, including limited adaptability and openness to change among workers, shifting demands for skills and competencies, the potential displacement of existing jobs alongside the emergence of new roles, and the insufficient involvement of key stakeholders in facilitating effective transitions. Participants expressed overall optimism about the Romanian labor market's future, while also voicing uncertainty regarding the scope of upcoming changes, the skills that will be required, and their own ability to adapt effectively.*

**Keywords:** AI, HR, workforce, organizational change

## Introduction

In light of the fourth industrial revolution (Rotatori et al., 2020), along with globalization and recent advancements in the digitalization of organizations, the adoption of artificial intelligence (AI) has emerged as a crucial topic in the field of organizational management. This subject has gained the attention of both specialists and researchers in the field.

The fourth industrial revolution is defined by the rise of increasingly complex technologies that merge the physical, digital, and biological realms (such as 3D printing, robotics, and the Internet of Things) (Rotatori et al., 2020). AI is one of the most significant technological branches under discussion due to the consequences, both positive and negative, that it generates in contemporary society and the changes it is expected to produce in the near future. It refers to "the ability of a digital computer or a computer-controlled robot to perform tasks




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normally associated with humans" (Chen et al., 2021, as cited in Li, 2022, p.4). Today's society is characterized by a widespread use of AI across various sectors, introducing a range of important changes to the functioning of organizations, which will be further addressed.

Routine tasks that were once performed by humans can now be automated, leading to increased efficiency and customer satisfaction (Pereira et al., 2023). The impact of AI adoption in HR includes enhancing workplace safety and comfort. Additionally, it has been linked to improvements in employee performance, organizational commitment, retention, and overall company success (Murugesan et al., 2023). According to Murugesan et al. (2023), although "*Artificial Intelligence can improve efficiency, accuracy and decision-making*" (p.2) in HR processes, it can generate negative effects, such as layoffs or biases, due to a lack of empathy and emotional intelligence. In this context, the role of HRM "*can be vital in understanding how organizations can effectively adopt artificial intelligence while mitigating risks and supporting positive outcomes for employees*" (Pereira et al., 2023, p.3). Nevertheless, while there are projections for job declines in sectors such as manufacturing and services, new job opportunities are also expected to arise (Li, 2022). However, the current workforce may lack the skills needed to meet the demands of these new roles.

The World Economic Forum (2020) predicted that, by 2025, approximately half of current employees will be forced to retrain, especially those with low or medium training, already at risk of exclusion. These imbalances should also be examined in the context of an education system lagging behind the job market (Rotatori et al.2020), Schwab and Samans (2016) estimating that approximately 65% of children currently enrolled in primary education will enter the labor force in roles that do not yet exist today (as cited in Li, 2022). This conclusion highlights a notable misalignment between the skills organizations require and those acquired by students in the educational system (Rotatori et al. 2020).

A study conducted by Rotatori et al. (2020) explored stakeholders' viewpoints and proposed solutions regarding the changes brought about by the fourth industrial revolution. The upcoming societal transformation is regarded as enhancing the quality of life by reducing repetitive tasks and fostering human–technology collaboration to maximize organizational impact. Nevertheless, concerns are rising related to an insufficient level of collaboration among the stakeholders involved and the ability of global leaders to address these changes, since many indicate that they do not fully grasp the urgency of the situation and neglect to prioritize the development of effective strategies to respond to these technological advancements. Additionally, employees often lack agency and fail to adapt their skills to evolving industry demands.

Given existing skills imbalances, the vision of Industry 4.0 (Li, 2022) emphasizes lifelong learning as a key mechanism for preparing the future workforce. It recognizes that emerging roles will require different competencies, such as critical thinking and problem-solving, while many currently valued skills are expected to become obsolete (World Economic Forum, 2020). In this context, Industry 4.0 represents an intelligent production system integrating traditional manufacturing with cyber-physical systems, the Internet of Things, and AI-based technologies. Beyond digitalization, the paradigm highlights continuous skills development as essential for workforce adaptability, supporting job transformation, requalification, and the creation of new employment opportunities rather than increased unemployment.

Romania is in the early stages of adapting to the fourth industrial revolution. As Iuga (2021) notes, the country has not yet created an environment that encourages embracing new technological trends. This is evident in various indicators, including low levels of digitalization, limited proficiency in digital and software skills, few IT specialists (Eurostat, 2023b; Fotea et al., 2019), and a small percentage of companies offering training in these areas (Eurostat, 2023a). Since the current digital transition is increasing the demand for jobs requiring digital skills by up to 90% (Eurostat, 2023b), low awareness of these skills and an unprepared workforce.

Employees tend to express cautious optimism regarding future developments, while also voicing

uncertainty about how these changes will affect their roles and their capacity to adapt (Fotea et al., 2019). Job displacement is widely expected (Iuga, 2021), and uncertainty about future skill requirements is particularly pronounced among employees in non-managerial positions and those with lower levels of specialization (PWC, 2023). At the same time, many employees recognize that competencies associated with future roles—such as critical thinking, adaptability, leadership, and digital skills - are already relevant in their current work contexts (PWC, 2023). Despite this awareness, a key challenge remains the limited sense of individual agency, reflected in a low awareness of the need for ongoing upskilling and reskilling (INS, 2023).

AI adoption must be understood within the broader context of the Romanian labor market. In 2022, Romania recorded an employment rate below 70%, particularly among young people, and the highest NEET rate in the EU (Eurostat, 2023c), reflecting a persistent mismatch between the education system and labor market needs (Eurostat, 2023f). In parallel, job-hopping - defined as frequent voluntary job changes (Lake et al., 2018)—has become increasingly common among younger generations (Hall et al., 2022). This trend signals a shift in employer loyalty and growing emphasis on professional development, training, and adaptability. In the context of Industry 4.0, job-hopping can be interpreted as a response to professional shocks and labor market uncertainty, serving as a strategy through which individuals navigate an increasingly dynamic and skill-driven employment landscape (Nalis et al., 2021).

Previous studies have identified a range of solutions. To mitigate the skills deficit and adapt to the changes resulting from the AI adoption, employers emphasize skills over formal qualifications (PWC, 2023). Furthermore, they highlight the importance of collaboration among all stakeholders and the continuous professional development of employees, particularly in the area of soft skills, and for less specialized employees. Additionally, the individual's agency is crucial; individuals must enhance their skills and knowledge to prepare for roles that may not resemble those of today (Iuga, 2021).

Although research on AI adoption and its implications for work has expanded in recent years, existing studies predominantly focus on organizational outcomes and technological efficiency, paying limited attention to the lived experiences of labor market actors and their adaptive strategies. Qualitative evidence capturing how candidates, employees, employers, and HR professionals interpret AI-driven changes within organizational processes remains scarce. This gap is particularly evident in the Romanian context, where both AI adoption and scholarly research on its labor market implications are still at an early and uneven stage. To address these limitations in the literature, the present study explores the changes and challenges associated with AI adoption in Romanian organizations from the perspectives of key labor market actors and is guided by the following research questions:

- *What are the main changes and challenges driven by the adoption of AI at the organizational level for both candidates/employees and employers/HR professionals?*
- *What are the solutions proposed by the main actors to face the challenges in the labor market?*

## Research methods

***Research Design.*** This study applied a qualitative, explorative research method. A sample of 20 individuals, both employees and employers from Romania, was recruited using purposeful sampling.

A semi-structured interview was used to identify the perceptions regarding the challenges and concerns faced by employers on the labor market in Romania, as well as the new procedures for recruitment and training of the workforce, but also general procedures within the organizational framework. On the other hand, in order to provide a complete picture of the phenomenon, changes in the experience of the candidate in the recruitment process, as well as of the employee in relation to aspects such as procedures, labor relations, and job description, were also tracked. All the aspects listed

above have been studied against the backdrop of technological developments and the adoption of AI. Inductive reasoning was used to suggest possible challenges and fears in the labor market in Romania, starting from the presentation of the participants' opinions and experiences in relation to the main trends in the labor market.

***Recruitment and Participants.*** A sample of 20 participants, who met the conditions of the study at the time of the interviews, were either employed or had a decision-making position in the company regarding the workforce (managers and recruiters), was selected through purposive sampling.

The interview subjects were chosen in relation to the need to select people from various fields of activity (with different degrees of adoption and use of AI), as well as from organizations with a different geographical distribution of operations (local, regional, national, global), both for employees and employers (you can find data regarding participants in Table 1-2).

**Table 1 –** *General description of the employees participating in the study*

| No | Label | Age | Gender | Position | Geographical distribution of operations | Field/Type of organization |
|---|---|---|---|---|---|---|
| **1** | AB | 25 | F | Training specialist | National | Recruitment agency – elderly caretaking |
| **2** | GS | 35 | F | Programmer | Global | Automation Company-Software Robots |
| **3** | EM | 40 | F | HR ADMIN | Local | Electric appliance production factory |
| **4** | EC | 26 | M | Marketing specialist | Global | Marketing and advertising company |
| **5** | AT | 26 | F | European project specialist | National | NGO European projects |
| **6** | AD | 28 | M | Software engineer | International | Outsourced IT services company |
| **7** | DT | 26 | F | Junior Social media | National | Bottled water production company |
| **8** | RH | 26 | F | Customer support officer | International | Online sales website |
| **9** | RI | 31 | F | Backoffice officer | National | Banking services organization |
| **10** | ST | 45 | F | Recruitment specialist | International | Recruitment agency |

**Table 2** – *General description of the employers participating in the study*

| No | Label | Gender | Age | Position | Field of activity | Geographical distribution of operations | Recruited positions |
|---|---|---|---|---|---|---|---|
| **1** | TA | F | 26 | Recruiter | Banking services | Local (branches in Bucharest) | - Middle/top management<br>- white collar positions: accountants, consultants, analysts, etc. |
| **2** | GP | F | 26 | Recruitment specialist | Online retailer of cosmetic products (26 physical stores) | International | - Middle/top management<br>- blue/white collar positions: tore manager, assistants, manager, trainer, sales consultants, warehouse worker and sales director and regional director. |
| **3** | LU | F | 37 | Regional recruitment manager | Personal recruitment - home care for the elderly | International (Romania, Bulgaria, Polonia) - with over 800 employees in Romania | - blue collar positions. |
| **4** | RM | F | 26 | Recruitment specialist | Outsourced services company: HR, customer support, financial services, AI-based solutions | International (4500 employees) | - White collars: entry/middle/senior – financial-accounting field, IT, foreign language speakers, customer support. |
| **5** | VC | F | 26 | Recruitment specialist | Outsourced services company: accounting, invoicing, money collection, payroll, including recruitment | Branch of a global company with headquarters in Romania. | - White collars: accounting/financial, human resources |
| **6** | FI | F | 26 | Recruitment specialist | Production and marketing of professional nicotine products. | International | White collars: accounting/financial, human resources |
| **7** | AS | M | 40 | General manager | Advertising, marketing | Small agency (boutique) | - Freelancers: marketing specialists, designers,communication/advertising specialists, etc. |
| **8** | DA | M | 29 | Regional Manger Romania | Telecommunications company | International company with agencies all over Romania | -Sales consultants |
| **9** | CP | F | 45 | General manager | Recrutiment agency | National | - White collars: the financial-accounting field, pharmaceuticals, sales, design, construction, human resources<br>- Middle Manangement positions |
| **10** | NA | F | 48 | Recruitment specialist | National transportation company | National | - White collars: engineers, accountants, specialists (recruitment, financial etc.)<br>- Blue collars: Unskilled, semi-skilled, skilled workers. |

Initially, were approached the author's personal contacts who worked in both types of positions (employee, employer) in fields such as IT, human resources, marketing, advertising, training, and they were introduced to the theme and objectives of the study. The sample intentionally included both individuals with limited prior involvement in AI adoption and those directly engaged in the development or implementation of AI-based solutions, in order to capture a diversity of perspectives. Subsequently, to obtain more informed perspectives, individuals with direct experience in using or researching AI and active in online debates on the topic were identified and contacted via email and LinkedIn. Although several expressed initial interest, only one ultimately participated, primarily due to time constraints and confidentiality concerns. Regarding the sample size, the decision to conduct 20 interviews followed Guest et al. (2006), ending when participant responses became repetitive regarding opinions, fears, causes, and effects of AI adoption.

***Instrument and Procedure.*** Two semi-structured interview guides were created to investigate perceptions of AI adoption's impact on the Romanian workforce at the organizational level. The decision to use two separate interview guides was made to capture the different perspectives and experiences of the two categories of subjects: employees and employers. This approach aims to provide a comprehensive understanding of the current challenges in the organizational environment and the Romanian labor market, particularly in the context of AI.

The interview began with an invitation to discuss two main topics: for employees, the evolution of their professional careers; and for employers, the organizational specifics along with key operating principles and strategies. The following open-ended questions were designed to explore key themes relevant to this study, including the extent of AI adoption, the specific technologies involved, and the organizational changes and challenges it generated. The investigation examined modifications in recruitment processes, shifts in workplace roles and responsibilities, as well as the skills and competencies employees needed to navigate emerging roles. Additionally, a series of questions addressed participants' concerns related to professional development and success in the labor market, specifically aiming to understand how participants evaluated and responded to professional shocks.

The interviews were conducted with the participants' informed consent. They received a comprehensive overview of the study's objectives and themes, were assured of confidentiality and anonymity, and provided verbal consent for audio recording. Interviews conducted in Romanian between May 15 and June 15, 2024, included both in-person sessions at participants' homes or offices and online sessions due to significant distances or scheduling conflicts. Each interview lasted between 50 and 110 minutes, depending on the participants' verbal fluency, knowledge, and experience with AI-based technologies. All sessions were audio recorded and transcribed for analysis to ensure accuracy and detail in the findings. Transcripts were not provided to participants for comments or corrections. The interview questions can be found in the *Supplementary Material.*

***Data analysis.*** A thematic analysis was conducted to examine the qualitative interview data. Following the framework established by Braun and Clarke (2006), the analysis aimed to identify patterns and relationships among emerging themes, thereby addressing the research questions. The procedure was structured into several distinct steps to ensure a systematic and rigorous evaluation.

Initially, the interview transcript was reviewed to gain a comprehensive understanding of the discussions. Participants' responses were then examined in relation to the research questions and objectives, focusing on key terms, phrases, and interpretations concerning the causes and effects of AI adoption, as well as broader trends in the Romanian labor market. Responses were categorized according to favorable, unfavorable, and neutral perspectives. A comparative approach was employed to identify similarities and differences within these evaluations.

This systematic analysis formed the basis for developing distinct categories and sub-themes. The thematic analysis ultimately revealed several

interrelated themes, providing a structured understanding of participants' perceptions of AI adoption at the organizational level. These findings offer a foundation for interpreting the broader implications of AI on the Romanian workforce.

## Research results

Tehnological advancements in Romania are transforming daily activities and interactions, especially in the workplace. Interview participants, including employees and employers, have shared their insights on these changes from two distinct perspectives. To provide a thorough overview, the impact of AI on the labor market has been examined in the context of current trends, including labor and skills shortages, workforce fluctuations, and job-hopping. By understanding these dynamics, businesses can adapt and thrive in an increasingly competitive and technologized landscape

***Key Trends Shaping the Labor Market in Romania***. Among the study participants, the ten employees' career paths reveal important similarities highlighting labor market challenges. Many reported difficulties in finding jobs due to employers' expectations for experience, which early-career employees often lack (AB: employers asked for experience, even though we as students didn't have any), while also highlighting that a person's occupation does not always perfectly match their profession, partly because college preparation may not fully reflect actual job demands (GS: We assumed our future would involve programming, not realizing other career paths existed).

Employers also identified these factors as contributing to the labor force deficit, making it difficult to find skilled specialists and often leading to mismatches between candidates and roles, while technological advancements demand essential digital skills. Sectors such as industry and transportation face shortages due to declining vocational schools and limited practical experience. This deficit is further reinforced by a shift in recruitment practices, with organizations favoring candidates who already closely match the role's requirements rather than providing training from the ground up (CP: *no more training them from scratch*).

High turnover rates, alongside ongoing labor shortages in certain sectors, represent a significant concern for organizations, where labor remains a vital resource. Turnover encompasses both employees' intentions to change jobs and the recurring practice of job-hopping, which is particularly prevalent among Generation Z entering roles such as management assistants and service positions. Key challenges include competition for blue-collar jobs and difficulties in retaining young professionals, who often prioritize immediate rewards over long-term commitments. Employees cited two main reasons for leaving: the need for continuous learning and development, and feelings of stagnation resulting from repetitive tasks (AB: *I think you can reach a point where there's nothing left to learn, and... that makes me feel like I'm stagnating*).

Regarding job-hopping, employees highlighted its impact on career development, while employers emphasized effects on candidates' reputations and the value they bring to the organization. Generational differences were noted, with younger individuals more open to changing jobs. Key motivations include misalignment with the organization, difficulty adapting to its culture, and a lack of passion for the role (GS: *they didn't find what they liked to do or they simply didn't find the right employer*). Participants also expressed concerns about job stability, limited skill development, and perceptions questioning their commitment.

***Perceptions of the changes and challenges associated with the adoption of AI in Romanian organizations***.

*Insights into the understanding, adoption and utilization of AI technologies*. Employee understanding of AI-based technologies is often limited and lacks nuance, with many defining them in broad terms without clear areas of applicability (AT: *artificial mechanisms that mimic human functions*). This assessment appears to rely more on hearsay and information gathered from various sources rather than on direct, hands-on experience with AI, which prevailing conspiracy theories may

influence*: it is a small war now, whether or not robots will replace us* (AB). Conversely, IT professionals (2) highlighted rather the positive aspects of the phenomenon, noting its potential for effective solutions.

The degree of AI adoption varies among organizations, influenced by factors such as industry, size and global dynamics. Employers from sectors where AI integration is essential for market survival - such as marketing, recruitment, and IT - are more likely to adopt AI proactively. This tendency is particularly evident in organizations with a global presence, where awareness of emerging trends and best practices is higher. As one participant put it: *It is business as usual for us* (GS). Employers in small companies often face challenges such as limited access to advanced technology, reliance on traditional practices, resistance to change, and the perception that AI does not significantly outperform human workers. Some participants emphasized collaboration among employees as an important strategy in managing these challenges (LU: *working with people alongside people*).

Employees often describe the software they use in daily tasks according to the level of AI adoption, while employers provide a broader perspective, highlighting its implications across departments, processes, and organizational actors. Some employers (4 out of 10) have automated recruitment, whereas others, particularly in telecommunications and transportation, prioritize AI to enhance customer satisfaction through tools such as online purchasing, chatbots, and answering machines, focusing more on service quality than employee efficiency. Retail participants addressed both employee and customer needs by implementing activity management software to boost productivity alongside AI technologies to improve the customer experience.

*The perceived impact of the use of AI software on employees' skills and performance*. The new significance of time in organizational settings. AI-based technologies have raised diverse concerns among both employees and employers, while also highlighting opportunities for their effective application in the workplace.

Participants reported that although technology facilitates their tasks, overreliance on these tools can weaken their sense of autonomy and confidence in working independently. Skills affected include memory, math, communication, logic, creativity, and authenticity (AB*:I feel like I can't do math anymore. It's like I'm addicted to my phone*). Employers identified problem-solving, producing quality work, and authenticity as skills at risk. One participant expressed concern that increasing reliance on technology may undermine individuals' ability to manage basic tasks independently (ST).

Participants identified time management as a recurring theme in relation to technological advancements and work performance. Both employees and employers noted that digital tools can support more efficient use of time, particularly by reducing routine tasks and enabling greater focus on core work activities, which was perceived as having the potential to improve work quality and productivity.

From the perspective of employers acting as non-participative agents, AI was seen as increasing process automation and efficiency (5 out of 10). Participants reported that tools such as mobile apps, specialized software, and robotics reduce repetitive tasks and allow employees to focus on more complex responsibilities. They also noted that new tasks often emerge to replace automated ones, and frequent use of these tools may create a sense of time pressure rather than genuine time savings.

*The integration of AI in human resource processes.* The integration of AI in organizations has significantly impacted not only task types and completion times, but also various functions within the human resources department, leading to deeper organizational transformations. These changes, discussed by both employees and management, focus on two key areas: the transformation of individual experiences in the recruitment process and a renewed approach to employee integration, development and collaboration, reflecting enhancements in organizational culture.

The recruitment process was frequently cited as central to these changes, being increasingly conducted online. However, participants perceived online recruitment as less suitable for roles

requiring strong human interaction or digital skills, particularly in sales, healthcare, logistics, and manual occupations: *if you interview online, it's much harder to notice certain things* (CP). Similarly, AI adoption has influenced new candidate integration through *acceleration* - shortening training periods and prioritizing adaptable employees - and technologizing, shifting training to specialized platforms accessible retroactively.

During discussions focused on the technological advancements in the recruitment process, participants addressed ethical concerns regarding the use of ChatGPT software for rewriting CVs, letters of recommendation and responding to competency assessments—practices common in online recruitment. This practice is regarded unfavorably by respondents, as it is perceived as misleading, creating a disparity between the information, skills, and competencies detailed on the CV and those that candidates truly possess*: If you use a tool to generate this for you* (the CV), *I don't think you have a personal note (GS), it seems to me like a fraud (EC)*. Consequently, this misalignment can lead to erroneous recruitment decisions.

***Assessment of Changes Driven by Future Developments in the Labor Market.***

*Automation: Impact on Skills Demand and Occupational Structure.* Interview participants acknowledge that the automation of certain procedures will significantly alter the skills and qualifications needed in the job market, though there is often less focus on the disappearance of certain jobs or the emergence of new ones.

The areas identified as most vulnerable to automation include banking, telecommunications, IT, roles that require physical labor (transportation, factories, supermarkets, couriers, warehouses) and also specific functions within human resources (*GS: I would feel a bit in danger as a junior accountant and would have to do what a robot is doing for me now*). In contrast, roles such as field sales and recruitment are considered to rely heavily on interpersonal interaction, persuasion, and human presence, which minimizes their susceptibility to technological advancements. Participants suggested that blue-collar workers could be among the most affected if AI technologies were to replace certain tasks (AD: *ChatGPT or other AI software will be able to do the work of a junior).*

Both employees and employers expressed limited concern about job stability. The discussion emphasized the importance of the *human touch* - qualities unlikely to be replicated by robots - such as authenticity, creativity, and emotional intelligence highlighted by employees, and intuition, adaptability, and information filtering emphasized by employers *(*AD*: Soft skills. I mean a robot... can't understand a customer's emotions).*

*Concerns about future labor market changes and adaptability levels. Transitioning to automated work.* Addressing the concerns of employees and employers about current changes, expected developments, and the potential for a smooth transition was deemed essential for a comprehensive analysis of the impact of AI adoption.

Key factors in the discussions included limited adaptability, resistance to change, uncertainties about the required skills for upcoming changes (EC*: It's quite difficult to approximate what skills will be needed... you will acquire them when needed*) and managing potential layoffs. Other concerns suggested include challenges in differentiating between fiction and reality, an increasing reliance on technology, and the potential erosion of individuals' skills and competencies. Feedback from employees indicates considerable uncertainty regarding these indicators. They tend to view their own situations more optimistically compared to their perceptions of others in different roles or sectors.

Participants highlighted generational differences in attitudes toward change. Some described older individuals as panicking when faced with unfamiliar procedures: *they were taught to hit, so to speak, with a hammer* (NA), *they would panic... because they wouldn't exactly understand these procedures* (DT). Those most apprehensive about AI often have limited experience and reluctance to learn, fearing that engaging with AI could threaten their job security (VC: *a fear that their job might change if they help with this process*). These

participants frequently view the relationship between people and technology as adversarial. Employers noted that employees generally possess higher digital skills but lower AI skills, particularly among blue-collar workers.

The emergence of new jobs is also expected, although not to the same extent, thus posing challenges for organizations to reskill or upskill displaced employees. Some participants link the risk of layoffs to generational differences and resistance to change, others to job types and specialization levels, while some of them consider that the transition will likely be gradual, allowing individuals to adapt naturally, as they have in past evolutionary stages. They also highlight a potential shift in job security perceptions, noting that technological advancements may increase uncertainty about long-term job or employer stability.

***Contribution of key stakeholders in facilitating a successful transition to organizational changes driven by AI.***

In addition to analyzing the changes and challenges of AI adoption in organizations, the study also emphasizes participants' views on the roles of stakeholders - employers, the education system, and public institutions - in facilitating a successful transition. The analysis of their involvement examined past and present actions, along with the potential for future involvement or, when applicable, its absence.

Participants noted that in AI-adopting organizations, transitions are generally smooth and supported by ongoing training (AD: "My company… scaled organically"). In moderately digitalized organizations, adaptation may be slower due to trial-and-error approaches (EC: "it's just like with a new, inexperienced employee… he will make mistakes and learn from them"). Training is often tailored to generational and individual needs, helping to minimize professional shock. In organizations with limited AI adoption, participants reported that challenges are linked to resistance to change, financial concerns, or the perceived importance of the human element in roles such as recruitment.

Participants perceived the role of state institutions in supporting an effective transition to AI as minimal, citing insufficient resources and infrastructure to adapt to market trends (EM*: our institutions are somewhere 50 years behind the rest of the world).* Moreover, The lack of relevance of public institutions to education is noted, highlighting a skills mismatch between recent graduates and job market demands, especially from non-technical programs, alongside a shortage of specialists and an outdated system. As DT stated: *Education, somehow, doesn't prepare you for the first job you're going to have*. Participants link these issues to weak collaboration between business and education, with current partnerships benefiting few students.

***Proposed strategies and measures aimed at addressing the challenges present in the Romanian labor market.***

*Proposed Solutions for Addressing the General Challenges within the Romanian Labor Market.* The study highlights key challenges in labor market integration identified by participants, including labor and skills shortages, a disconnect between educational outcomes and business needs, and evolving views on employee loyalty and retention. To address these issues, participants proposed various solutions operating at different levels.

Addressing imbalances in education and workforce systems:

- Updating educational programs to better reflect current industry needs, along with career counseling programs, open courses;
- Facilitating students' engagement with the business environment through open courses;
- Encouraging students with practical aptitudes to consider vocational schools, while actively working to reduce the associated stigma;
- Strengthening collaboration among key stakeholders, including the business community, employers and the education system;

Managing staff fluctuations and evolving employee loyalty:

- Promoting a work-life balance.
- Offering flexibility in work arrangements.
- Expanding international recruitment.
- Developing employee loyalty programs.

•Facilitating vertical migration for career advancement.

•Fostering an organizational culture that prioritizes employee needs and supports their development.

*Proposed solutions for the challenges associated with AI adoption at the organizational level.* In response to the perceived challenges and fears related to AI adoption, participants proposed several measures to address these issues.

To reduce reliance on technology and counter skill decline, participants proposed thoughtful approaches emphasizing critical evaluation of AI and its use as a supportive tool. As RH noted, *"When I'm looking for information, I don't fully trust AI."* Interviews indicated consensus that AI's impact on employees' skills depends largely on how the software is used.

In relation to the predicted changes in the demand for skills, participants suggest the need for continuous skill updates and AI proficiency, along with flexibility and adaptability to navigate future uncertainties as well as the implementation of measures to enhance employee development. The discussion underscores the importance of individual agency in professional development, emphasizing that employees should stay motivated, regardless of employer awareness.

In discussions with employers about developing essential workplace skills, two effective strategies have emerged. For hard skills - such as digital technologies, AI, and specific industry expertise—employers typically engage external collaborators for high-quality training. In contrast, for soft skills, employers find that in-house training and workshops are the most effective approaches. However, due to significant uncertainty about future developments, participants feel they cannot accurately predict the necessary skills. Therefore, they suggested that focusing on experiential learning is likely to be more effective than relying solely on predictive approaches.

To enhance adaptability, participants stress effective AI adoption through digital and AI training, flexible recruitment, and development of transferable skills. For employees with lower adaptability, they propose a gradual transition plan (FI: *management must intervene to announce these changes in advance and provide the necessary training*). No less important, some employers (4 out of 10) view adaptation as a choice rather than an essential skill, highlighting employees' contributions as agents of change.

Participants express optimism that most roles, especially those requiring human intervention, will remain unaffected by job changes. Some employers (5 out of 10) commonly reassign employees to different positions; however, these new roles *may differ significantly or offer lower pay* (NA), prompting some employees to leave. Discussions highlighted the importance of individual approaches, upskilling, reskilling, and a supportive organizational culture.

## Discussions

Participants' perspectives reveal a nuanced landscape, reflecting both firsthand experience and gaps in understanding. This duality is expressed as a coexistence of fear - arising from uncertainty and from awareness of AI's significant impact on the labor market - and optimism, driven by a willingness to adapt and embrace change, yet tempered by limited familiarity with the technology. These contrasting perceptions raise important questions for further investigation. Is there a direct relationship between the amount of information available and individuals' levels of optimism? Furthermore, do feelings of fear stem primarily from misinformation or from a lack of knowledge? Addressing these questions would require more extensive quantitative analysis.

The qualitative findings allow for a tentative interpretation of these questions. Participants noted lower adaptability among older employees; however, the analysis indicates that adaptability is more closely related to knowledge, experience, and willingness to change rather than chronological age. Individuals most concerned about AI tend to have limited experience with digital tools and a reluctance to engage in learning, while the anticipated correlation between fear of AI and expertise is not consistently observed; in fact, individuals with AI experience may also express apprehension, likely reflecting their acute

awareness of AI's transformative impact. Variability in employee optimism concerning emerging challenges and career implications can be interpreted through the lens of professional shock theory (Nalis et al., 2021), which asserts that, while individuals lack control over phenomena such as digitalization, job transitions, or displacement, their subjective interpretations and coping resources generate divergent professional trajectories. Consequently, individual agency constitutes a pivotal element (Rotatori et al., 2020), and interventions aimed at improving AI literacy, providing hands-on experience, and fostering a positive learning culture may be more effective in reducing apprehension than targeting specific age groups.

Drawing on professional shock theory (Nalis et al., 2021), an alternative interpretation of adaptability emerges that warrants further exploration. In the context of anticipated changes in job structures and stability (Stefanco, 2017), adaptability and openness to change become increasingly important. From this perspective, individuals who engage in job-hopping - often viewed negatively by employers - may, in fact, display higher adaptive capacity, precisely due to the flexibility, openness, and lower organizational attachment associated with more fluid career trajectories.

The perceived low level of AI-related knowledge and experience among participating employees - reflected both in self-assessments and employers' feedback - aligns with previous findings indicating that Romania ranks among the lowest in Europe in terms of digital and software skills, as well as access to training opportunities (Eurostat, 2023b). Prior research also suggests that advanced AI-related knowledge remains largely concentrated among IT specialists (Fotea et al., 2019, as cited in Iuga, 2021). In the context of increasing demand for roles requiring such competencies, these gaps raise concerns regarding individuals' capacity to adapt effectively to AI-driven change. Moreover, the skills deficit identified may help explain the apprehension toward AI observed among participants, reinforcing the link between limited knowledge and heightened uncertainty.

The following observations are drawn from participants' responses, with supporting references to previous studies. Employees highlighted the AI tools and software they use daily, varying by role, department, and experience (Fotea et al., 2019; PWC, 2023). Employers emphasized broader organizational implications, noting differences in AI adoption across industries. Some automated recruitment, while others, particularly in telecommunications and transportation, focused on customer experience through chatbots, online platforms, or activity management software (Half, 2018, as cited in Hall et al., 2022; Sanyang & Othman, 2019). Retail participants implemented AI to support both productivity and customer satisfaction. Participants reported a low level of AI-related knowledge and experience, highlighting gaps in digital and software competencies (Eurostat, 2023b; Fotea et al., 2019, as cited in Iuga, 2021). Employers noted that, despite generational differences, employees generally have higher digital skills but lower AI-specific skills, particularly among blue-collar workers. Overall, AI adoption appears linked to competencies and organizational readiness, with smaller or less technologically mature companies facing challenges such as limited infrastructure, resistance to change, or reliance on traditional practices (Eurostat, 2023c; INS, 2023). Consequently, participants perceive that AI integration may not provide significant value, highlighting barriers related to skills, autonomy, and task management.

Participants' reflections suggest that increasing reliance on AI-based tools has implications not only for skill development but also for how time is experienced and managed in the workplace. Employees and employers expressed concerns that excessive dependence on technology may undermine fundamental human abilities, particularly memory, creativity, analytical thinking, and problem-solving skills. This raised a broader, reflexive question among participants: *what would be the consequences if technology were to vanish?* Such considerations point to fears of reduced autonomy and diminished capacity to perform tasks independently in highly digitalized environments. While automation is commonly associated with

efficiency gains, participants emphasized that time saved through AI does not automatically translate into higher-quality work if cognitive engagement and skill use are reduced. In this respect, the relationship between procedure automation, reduced time expenditure, and enhanced employee performance is consistent with Pereira et al.'s (2023) findings, which underline that productivity gains depend on appropriate and purposeful implementation of technology rather than on automation alone. Theoretically, adoption models should distinguish between effective and ineffective usage, and practically, organizations should provide guidance and training to ensure AI tools are used appropriately, minimizing dependence and maximizing benefits.

Building on this perspective, discussions about time management extended beyond whether technology merely saves time to whether it fundamentally reshapes how employees allocate attention and effort. Participants questioned whether technological advancements genuinely allow employees to focus on more meaningful tasks or instead accelerate work rhythms and encourage superficial task execution. Although some perceived improved time management as contributing to higher-quality outcomes—aligning with broader debates on technology-mediated productivity—others warned that increasing technological dependence may erode essential competencies and reduce opportunities to actively engage critical thinking and independent judgment. Taken together, these insights suggest that the positive outcomes identified by Pereira et al. (2023) are conditional: efficiency gains are most likely when AI supports, rather than replaces, human skills, preserving both purposeful use of time and long-term employability.

In discussing the potential disappearance or emergence of jobs, participants emphasized not only uncertainty regarding employment stability, but also ambiguity surrounding the competencies that will be required in an increasingly automated environment. While this scenario remains largely hypothetical and neither employers nor employees anticipate widespread job losses in the near future, these concerns reveal how individuals position themselves in relation to anticipated change.

Participants frequently associated automation with a growing emphasis on distinctly human competencies, or the *human touch*, such as emotional intelligence, authenticity, creativity, and interpersonal skills. However, the findings indicate that confidence in possessing these future-oriented skills is unevenly distributed. Employees, particularly those in lower organizational positions, expressed significantly lower confidence in their future skillsets, whereas individuals in higher-level roles demonstrated greater certainty regarding evolving competency requirements. This asymmetry suggests that uncertainty about job continuity is closely linked not only to structural changes, but also to perceived preparedness for emerging skill demands.

These perceptions help explain why lower-level employees appear more vulnerable to concerns about job displacement, despite the absence of immediate organizational plans for workforce reductions. From an interpretative standpoint, this pattern highlights the role of perceived skill adequacy as a mediating factor between automation-related change and employment-related anxiety. n this context, participants' accounts suggest that targeted upskilling, mentorship, and development initiatives focused on human-centric competencies may be particularly relevant for supporting adaptation to the evolving demands of Industry 4.0 (Li, 2022). Practically, this implies that organizations could prioritize training and upskilling programs to enhance employees' AI-related and human-centric skills, while future research might evaluate the effectiveness of such interventions in improving workforce readiness.

In the context of a forced digital transition (Council of the European Union, 2023), participants highlighted that low digitalization in institutions and poor alignment between education and business (Schwab & Samans, 2016, as cited in Li, 2022; Rotatori et al., 2020) risk disadvantaging individuals with limited AI and digital skills. Enhancing collaboration among the business sector, the education system, and public institutions was

considered crucial to address skill gaps and support an effective digital transition (Rotatori et al., 2020). These perceptions indicate that, in practice, underdeveloped digital infrastructure and limited institutional support may hinder broader AI adoption, particularly when compared to larger, more proactive organizations (EM: *Our institutions are somewhere 50 years behind the rest of the world*).

Regarding the perceived negative consequences of adopting AI, a series of solutions have been proposed whose efficiency and applicability are worth discussing. To reduce dependency and prevent the dulling of employee skills, they advocated using AI cautiously and critically as a tool rather than a complete substitute for tasks. But are these solutions applicable in fields like IT, where certain procedures require a task to be completed entirely with the help of AI software and tools? Extensive research and future case studies could clarify the answer to this question.

To adapt to changes in skill demand and job losses, participants supported the importance of developing soft skills, transferable and AI-related skills, as well as promoting a high level of adaptability and flexibility, solutions that are in line with previous studies (Rotatori et al., 2020; Li, 2022). To foster flexibility and openness to ongoing and future changes, training in the field of AI is deemed important. This includes assessing these traits starting from the recruitment stage and developing an organizational culture that prioritizes employee development through upskilling and reskilling. Additionally, it is essential to implement a gradual transition that aligns with employees' adaptation to these changes as stated also by Wang et al. 2020 (as cited in Pereira et al., 2023).

Both the solutions proposed in this research and those in prior studies emphasize a critical point: regardless of employers' and the education system's awareness and efforts to facilitate a smooth transition, as well as employees' skills and competencies, the paramount factor remains the individual's willingness and readiness to adapt. This reiterates the centrality of individual agency in the process. As noted by Rotatori et al. (2020), within the context of the Fourth Industrial Revolution, those most at risk of being left behind are individuals who neither understand nor embrace the emerging trends of AI.

The conclusions and recommendations of this study should be approached with caution due to certain limitations. Firstly, the analysis relies on self-reported data, which may not fully represent reality. Furthermore, certain questions and observed patterns—such as the relationship between information availability and optimism—cannot be empirically validated without complementary quantitative analysis. Secondly, there was no distinction made between employers from an organization's HR department and those from employment agencies during the analysis of interview responses, which most likely did not allow for the study and understanding of contextual experiential perspectives.

This exploratory study provides an overview of the changes and challenges associated with the adoption of AI. Future quantitative studies could further clarify, confirm, or challenge these initial findings. Therefore, future research should focus on case studies and also analyze the impact of AI adoption on the activities, efficiency, and career prospects of recruiters, who play a crucial role in connecting technology with the workforce.

## Conclusions

This study highlights the changes and challenges arising from the Fourth Industrial Revolution and AI adoption in Romania, including workforce readiness, evolving job market dynamics, and limited collaboration among stakeholders. Despite these challenges, participants remained generally optimistic about adapting to future developments. The findings provide practical guidance for HR leaders and organizations in preparing the workforce for upcoming technological and organizational changes. As an exploratory study, the results should be interpreted cautiously, and further research is needed to validate and expand these insights.

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*"To improve is to change;*
*to be perfect is to change often."*
Winston Churchill

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***Errata***

***The paper*: Data-Driven Optimization of Research Team Human Resources, FAIMA Business & Management Journal, Volume 13, Issue 4 – December 2025, p.130, becomes:**

## Data-Driven Optimization of Research Team Human Resources

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