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# Artificial intelligence, business intelligence, and managerial capabilities in the digital transformation of small and medium-sized enterprises.

*Artificial intelligence, Business Intelligence and managerial capability in the digital transformation of small and medium-sized enterprises*

Artificial intelligence, Business Intelligence and managerial capacity in the digital transformation of small and medium-sized companies

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**SUMMARY**

The spread of artificial intelligence (AI) and business intelligence (BI) has expanded organizations' ability to process data, automate tasks, and produce analyses at scale. However, technological availability does not, in itself, imply improved business performance. This article critically analyzes the relationship between AI, BI, analytical capacity, and managerial capacity in the digital transformation process of small and medium-sized enterprises (SMEs), paying attention to the organizational conditions that allow the conversion of technological resources into higher-quality decisions. Based on a critical-analytical narrative review of academic literature and recent institutional evidence, the role of data quality, governance, human capital, organizational learning, and dynamic capabilities in the assimilation of digital technologies is discussed.

It is argued that AI and BI produce greater value when integrated into management processes capable of identifying relevant problems, selecting indicators, interpreting results, and reconfiguring routines. In the Brazilian context, the increasing adoption of AI by businesses reinforces the need to understand digital transformation as a phenomenon that is simultaneously technological, human, and managerial. Finally, an integrated conceptual model is proposed in which data, governance, BI, analytical capabilities, and AI connect to decision-making and performance through managerial capacity.
**Keywords:** artificial intelligence; Business Intelligence; small and medium-sized enterprises; managerial capacity; digital transformation; dynamic capabilities.

**ABSTRACT**

The diffusion of artificial intelligence (AI) and Business Intelligence (BI) has expanded organizations' ability to process data, automate tasks and generate analysis at scale. However, technological availability does not, by itself, imply improved business performance. This article critically examines the relationship between AI, BI, analytical capability and managerial capability in the digital transformation of small and medium-sized enterprises (SMEs), highlighting the organizational conditions required to convert technological resources into higher-quality decisions.

Based on a critical-analytical narrative review of academic literature and recent institutional evidence, the study discusses the role of data quality, governance, human capital, organizational learning and dynamic capabilities in the assimilation of digital technologies. It argues that AI and BI create greater value when integrated into management processes capable of identifying relevant problems, selecting indicators, interpreting results and reconfiguring routines. In the Brazilian context, the growing adoption of AI by firms reinforces the need to understand digital transformation as a technological, human and managerial phenomenon. Finally, an integrated conceptual model is proposed in which data, governance, BI, analytical capability and AI are connected to decision-making and organizational performance through managerial capability.
**Keywords:** artificial intelligence; Business Intelligence; small and medium-sized enterprises; managerial capability; digital transformation; dynamic capabilities.

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## 1 INTRODUCTION

Digital transformation has changed the way organizations produce, store,
They interpret and use information. If, in previous stages of business computerization, the challenge
The central focus was on recording transactions and integrating systems, the spread of Business Intelligence,
Analytics and artificial intelligence have shifted the debate to the ability to extract meaning from large data sets.
The goal is to generate large volumes of data and incorporate that knowledge into the decision-making process. This change is...
particularly relevant for small and medium-sized enterprises, where resource constraints,
Specialization and managerial structure can make technological adoption simultaneously promising.
and complex.

Literature on digital transformation has shown that technology should not be treated as
isolated variable. Vial (2019) describes digital transformation as a process in which technologies
Digital technologies trigger significant changes in an organization's properties, requiring
strategic responses capable of altering value creation pathways. Verhoef et al. (2021), in such a way
Similarly, they emphasize that digitization, business models, organizational structure, and resources are
interdependent dimensions. Thus, acquiring tools is not equivalent to developing capacity.
digital.

This distinction becomes more important with the popularization of generative artificial intelligence.
Tools capable of producing texts, codes, analyses, and syntheses have reduced barriers to access to
functionalities previously associated with sophisticated technological structures. However, the reduction in cost
Access does not eliminate problems of data quality, goal setting, governance,
professional skills or integration between technology and processes.

In Brazil, the ICT Companies Survey recorded a 13% increase in the use of artificial intelligence.
companies in 2024 to 17% in 2025. Among the small businesses in the surveyed population,
The proportion increased from 10% to 15%, while in large companies it reached 50% in 2025 (CETIC.BR, 2026).
The numbers indicate an expansion in adoption, but also highlight differences in capacity and
Maturity among organizations of different sizes.

This reality suggests that the relevant scientific and managerial problem is not just explaining why
Companies are adopting AI, but understanding how to transform adoption into organizational capability is a challenge.
Torres, Sidorova, and Jones (2018) demonstrated that Business Intelligence and Analytics resources
These factors contribute to performance when combined with the ability to change business processes. Chen
Lin (2021), in turn, relates BI capabilities to organizational learning and efficiency.
operational. In both cases, the technology operates within a broader organizational system.

This article therefore starts from the following question: under what conditions can AI and Business Intelligence

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How can we effectively improve the quality of decision-making and the performance of small and medium-sized enterprises?
The objective is to analyze managerial capacity as a mediating element between analytical infrastructure,
artificial intelligence and organizational outcomes, integrating contributions from the theories of
dynamic capabilities, organizational learning, and technological assimilation

## 2 METHODOLOGY

The study adopts a qualitative approach, of a theoretical-conceptual nature, structured as a review.
critical-analytical narrative. This choice is appropriate for the objective of integrating perspectives from
of fields that often appear in a fragmented way, including information systems,
strategy, digital transformation, Business Intelligence, artificial intelligence and management of small and medium-sized enterprises
medium-sized companies.
Priority was given to peer-reviewed scientific articles and reference works on capabilities.
dynamics and digital transformation, empirical studies on BI, analytics and AI assimilation, in addition
based on recent institutional indicators regarding the business use of artificial intelligence in Brazil.
The selection sought to combine seminal works, necessary for theoretical construction, and recent studies.
capable of reflecting the rapid technological evolution observed between 2024 and 2026.
The analysis was organized around five categories: informational infrastructure and quality of
data; business intelligence and analytics capabilities; artificial intelligence integration;
Human skills and learning; and managerial capacity to convert information into action.
The choice of interdependent categories avoids interpreting performance as a consequence.
automatic presence of a technology.
This study does not intend to conduct meta-analyses, exhaustive systematic reviews, or independent causal estimates.
The empirical results cited should be understood within the methodological limitations of each research study.
including differences by country, sector, sample, cross-sectional or longitudinal design, and measurements used.
This precaution is especially important given the speed at which AI tools and standards are evolving.
Business adoption patterns are changing.
The Brazilian context is used as a complementary empirical reference. The indicators from Cetic.br.
allow us to observe the recent expansion of AI adoption and some of the barriers reported by
Companies, but they are not employed to infer causal relationships between technology and performance.
The purpose is to situate the theoretical discussion in an environment where SMEs represent a significant portion.
from the business sector and face challenges in training and digital maturity.
Based on this synthesis, the article proposes a conceptual model of analytical-managerial capability.
This model does not constitute a validated scale nor the result of a statistical test; it is a proposition.

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an integrative approach designed to organize relationships identified in the literature and provide a basis for future empirical investigations.

## 3. Digital Transformation and Organizational Capacity in SMEs

Digital transformation cannot be reduced to simply replacing analog processes with tools. electronics. Bharadwaj et al. (2013) already argued that digital strategy and business strategy They became progressively inseparable. In SMEs, this integration tends to occur under restrictions. more intensive in terms of capital, specialized personnel, and management time, which makes the ability to prioritization is particularly relevant.

Vial (2019) shows that digital technologies can cause disruptions and alter value propositions. and require structural changes. The effect, however, depends on the organizational response. The same This tool can generate substantial gains for one company and produce marginal results for another. when processes, skills, or objectives differ.

The perspective of dynamic capabilities helps to understand this heterogeneity. Teece, Pisano Shuen (1997) defines dynamic capabilities as the ability to integrate, build and Reconfigure internal and external competencies in the face of changing environments. Subsequently, Teece (2007) organized these capabilities into processes of perceiving opportunities and threats, Taking advantage of opportunities and transforming the resource base.

Applied to digital transformation, this perspective suggests that possessing technology is merely... part of the problem. The company needs to understand where technology is relevant, select Opportunities consistent with your strategy and reconfiguring routines to capture value. Torres, Sidorova and Jones (2018) employ similar logic when demonstrating that BI and analytics favor Performance through the ability to change business processes.

In SMEs, recent research reinforces this argument. Held, Heubeck and Meckl (2025) relate dynamic capabilities for developing digital leadership and culture. Shahzad and Ferreira (2026), A qualitative study with Finnish SMEs highlights strategic leadership and informal learning. of teams and norms of human-AI interaction as microfoundations of digital adaptation.

Therefore, digital transformation should be analyzed as a process of developing capabilities. Access to AI can reduce technical barriers, but converting that resource into capabilities... Performance depends on learning, coordination, leadership, and reconfiguration. For SMEs, whose The structure tends to be less specialized, and the managerial capacity to connect these dimensions takes on greater importance. central role.

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## 4. BUSINESS INTELLIGENCE AND THE TRANSFORMATION OF DATA INTO MANAGERIAL KNOWLEDGE

Business Intelligence refers to a set of architectures, technologies, and practices designed to collect,
To integrate, analyze, and present information relevant to the decision-making process. Its value does not lie...
not only in data visualization, but in creating conditions so that scattered information can be...
converted into usable management knowledge.

Chen, Chiang, and Storey (2012) situated BI and analytics on an evolutionary trajectory that connects banks.
data, data mining, predictive analytics, and new digital sources. This evolution has broadened the
It has improved the technical capabilities of organizations, but it has also made the task of selecting more complex.
relevant information and avoid producing indicators that are disconnected from concrete decisions.

Torres, Sidorova, and Jones (2018) offer an important contribution by interpreting BI and analytics through
From the perspective of dynamic capabilities, the authors show that analytical resources can support...
processes of perceiving and taking advantage of opportunities, but their relationship with performance is
mediated by the ability to modify processes. The result dispels the idea that dashboards or
Platforms generate value automatically.

Chen and Lin (2021) also identify mechanisms by which BI capabilities favor
learning and performance. The model developed by the authors emphasizes perceptual functions,
transform and drive growth, indicating that BI can support knowledge creation and efficiency.
Operational when integrated into organizational routines capable of utilizing its results.

This interpretation is particularly useful for SMEs. Smaller organizations can implement it.
Dashboards can be created with relative ease, including using cloud solutions, but this does not guarantee...
that the chosen indicators are strategic, comparable, or actionable. A dashboard
While technically correct, it may be of little use if it is not linked to managerial questions.
relevant.

Business intelligence (BI) should therefore be understood as an interpretation infrastructure. Its strategic function...
It emerges when indicators are defined based on objectives, and when data are of high quality.
sufficient, and when managers are able to distinguish significant noise variation. In this sense, the
Analytical maturity precedes and conditions a significant portion of the value that AI can produce.

## 5. Artificial Intelligence and the New Stage of Decision Automation

Artificial intelligence adds a new layer to the information architecture of companies because
It not only organizes or presents data, but can also classify, predict, recommend, and generate content.

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In recent applications, generative models have begun to participate in communication tasks.
Document analysis, programming, customer service, and decision support.
Adoption, however, needs to be distinguished from assimilation. The literature on information systems
Traditionally, a distinction is made between the acquisition of a technology and its effective incorporation into routines.
The distinction reappears in contemporary studies on AI. Al-Abri et al. (2024), when investigating SMEs,
They found relationships between AI assimilation, absorptive capacity, customer agility and...
performance, showing that results depend on intermediate organizational mechanisms.
Absorptive capacity, a concept developed by Cohen and Levinthal (1990), refers to the ability
to recognize the value of external knowledge, assimilate it, and apply it commercially. The idea is
This is especially relevant to AI: organizations may have access to the same tools, but differ in their capabilities.
deeply rooted in the ability to formulate relevant uses, evaluate responses, and incorporate
learnings from the processes.
Research from 2026 continues to point in this direction. Nguyen et al. (2026), in a study with SMEs
Vietnamese organizations treat AI capabilities as an organizational resource associated with innovation, an advantage.
competitive and performance, while Akaelu et al. (2026) observe that AI capabilities do not
They automatically translate into performance, highlighting the importance of adoption and capabilities.
dynamics.

In Brazil, the ICT Companies 2024 survey showed that, among companies using AI, automation...
Workflow process management was one of the most frequent applications, reported by 63% of respondents.
AI users (CETIC.BR, 2025). This data suggests that the first value perceived is frequently
It appears in operational efficiency, although analytical and predictive uses are also present.
The expansion of AI, therefore, does not eliminate the managerial logic of BI; on the contrary, it increases the need for it.
to structure it. The greater the ability to automate analyses and produce recommendations, the greater
The importance of defining criteria, responsibilities, reliable data, and validation mechanisms.

## 6. Managerial Capacity as a Mediator Between Technology and PERFORMANCE

Managerial capacity can be understood as the set of skills through which
Managers identify problems, mobilize resources, interpret information, and coordinate people.
They transform decisions into organizational action. In the digital environment, this capability incorporates a
Analytical dimension: understanding what to measure, how to interpret evidence, and when to review it.
decision.

The relationship between technology and performance is rarely straightforward. Studies on productivity in

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Information technology has already shown that benefits depend on complementary assets.
including organizational changes, skills, and management practices. Contemporary literature
AI preserves this logic, although the technologies are more powerful and accessible.
Torres, Sidorova, and Jones (2018) show that changes in processes function as a mechanism.
through which BI and analytics contribute to performance. Al-Abri et al. (2024) identify capacity
Absorptive capacity and agility as relevant mechanisms in AI assimilation. These findings converge.
supporting the idea that technology needs to be incorporated into organizational capabilities before it produces results.
sustainable effects.

In this scenario, the managerial function becomes less focused on possessing information and more geared towards...
Quality of interpretation. When systems are able to generate reports, forecasts, and texts in
Seconds, the human advantage shifts to problem formulation, context judgment,
Identifying inconsistencies, weighing risks, and choosing between alternatives.
This change doesn't mean that managers need to become data scientists. It does, however, mean that...
Data literacy and a basic understanding of the limitations of models are now integrated competencies.
Managerial. The inability to question an algorithmic recommendation can create dependency.
Technological advancements can reduce, rather than improve, the quality of decision-making.
In SMEs, this skill is even more important because strategic and operational decisions...
They often focus on a small number of people. Managerial capacity works,
Therefore, as an orchestration mechanism: it connects data, tools, people, and objectives.
determining whether AI and BI will be used as one-off resources or incorporated into learning.
organizational.

## 7. HUMAN CAPITAL, ORGANIZATIONAL LEARNING AND COMPETENCIES DIGITAL

Digital transformation is changing the skills required at different levels of an organization. The debate
It's not limited to technology professionals, as analytical and AI tools are becoming integrated.
Marketing, finance, customer service, operations, and management activities. Consequently, the capacity
Learning and adapting routines becomes part of the adoption process itself.
Cohen and Levinthal (1990) relate absorptive capacity to existing prior knowledge in
organization. The larger the base that allows for the recognition and interpretation of new knowledge, the greater the
possibility of assimilating it. In AI environments, this logic means that teams with understanding
Business professionals and those with digital literacy tend to be better at assessing when a solution is relevant and what...
Results need to be verified.

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Organizational learning also depends on the ability to transform experiments into shared knowledge. Shahzad and Ferreira (2026) identify, in SMEs, cycles of Experimentation and collective learning as elements in building dynamic capabilities. associated with AI. This contrasts with approaches in which each employee uses tools. in isolation, without standards, records, or dissemination of learned practices.

The obstacles faced by Brazil reinforce the human dimension. In the ICT Companies 2024 survey, among organizations They were not using AI, lacked skilled personnel, and lacked knowledge about the technologies. Suitable options emerged among the reported obstacles, alongside costs and incompatibility of systems and difficulties related to data (CETIC.BR, 2025).

The necessary skills should not be confused with instrumental training limited to commands. from a platform. Tools change rapidly. More enduring skills include Problem formulation, indicator reading, critical reasoning, process understanding, Evaluation of sources, data protection, and the ability to revise decisions in light of new evidence. For this reason, executive training and corporate education become components of The company's digital infrastructure. A learning organization doesn't just adopt tools; it creates... mechanisms for comparing results, documenting errors, disseminating best practices, and reconfiguring processes. This learning is one of the ways in which technology can be transformed into capacity.

## 8. DATA QUALITY, GOVERNANCE AND RELIABILITY OF DECISIONS AI-assisted

Data is the raw material for both Business Intelligence (BI) and a large portion of AI applications. However, volume does not equal quality. Incomplete, inconsistent, outdated, or

Data collected without a clear definition can generate technically sophisticated and managerially challenging analyses. mistaken.

Data governance involves responsibilities, standards, access controls, quality, and security. and defining legitimate uses. In SMEs, formal governance structures may be smaller, but The principles remain necessary. The lack of clarity regarding their origin, updating, and meaning. The absence of an indicator compromises the interpretation even before any algorithm is applied.

Generative artificial intelligence presents specific challenges. Models can produce plausible answers without a guarantee of accuracy, which requires human verification, especially in Decisions with financial, legal, reputational, or personal implications. The gain in speed. This needs to be balanced by validation procedures that are proportionate to the risk.

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Recent literature also links governance to the economic value of AI. Hasani (2026)
argues that transparency, bias control, privacy, and accountability can function as
capabilities that condition the innovation gains associated with the adoption of generative AI in SMEs.
The conclusion reinforces the idea that governance should not be viewed solely as a cost of compliance.
In the Brazilian context, concerns about data protection, legal consequences, and quality of data are key.
Data appears among the obstacles reported by companies that do not use AI (CETIC.BR, 2025).
Although the percentages do not allow us to individually explain the decisions of each company, they
They demonstrate that technological adoption occurs in an environment of technical and institutional uncertainties.
Managerial trust in AI systems must therefore be calibrated. Absolute distrust prevents...
Value capture; automatic trust increases exposure to errors. A mature analytical capability.
combines intensive use of technology with explicit criteria for validation, traceability and
accountability.

## 9. Integration between BI, AI, and Information Systems

BI and AI are often presented as distinct technological waves, but their integration is...
more productive when understood as a continuation of the evolution of information systems.
Transactional systems record events; data structures consolidate information; BI organizes.
Indicators; analytics identifies relationships and trends; AI enhances automation, prediction, and generation.
This architecture highlights dependencies. An organization with fragmented records and concepts.
Inconsistent systems will make it difficult to build reliable indicators and, subsequently, to use them.
AI applied to this data. Thus, artificial intelligence projects can reveal problems of
governance aspects that remained invisible while the organization used information only from
descriptive form.

Chen, Chiang, and Storey (2012) already described the evolution of BI and analytics towards environments of
More varied and faster data. The recent expansion of generative AI accelerates this trajectory by enabling
Natural language interfaces and automation of cognitive activities are possible, but this does not eliminate the need for...
from a consistent informational base.

For SMEs, integration can reduce operational complexity when cloud solutions are implemented.
They allow you to connect sales, marketing, finance, and customer relationship data. However, the
Technical ease of integration must be accompanied by semantic definition: what does "client" mean?
Asset value, margin, conversion rate, productivity, or retention must be consistent across all areas.
Managerial capacity reappears as a key element. The decision regarding which sources
Integrating the data, prioritizing metrics, and automating processes all depend on strategic understanding.

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A technically comprehensive architecture can be economically inadequate if it is not...
associated with the company's real priorities.
The integration between BI and AI should therefore follow a problem-oriented logic. The technology
The most advanced is not necessarily the most useful. In certain situations, a reliable indicator...
and updated produces more value than a complex model; in others, predictive models or
Generative technologies can significantly enhance responsiveness.

## 10. PRODUCTIVITY, COMPETITIVE ADVANTAGE, AND THE LIMITS OF CAUSALITY TECHNOLOGICAL

The link between technology and business performance requires analytical caution. More companies
Productive companies can adopt more technology because they have the resources, management, and human capital.
superiors; simultaneously, technology can contribute to increased productivity. Studies
Cross-cutting approaches are not always able to completely separate these directions of causality.
This limitation does not diminish the relevance of the technology, but it prevents deterministic conclusions. Al-Abri
et al. (2024) identify a positive association between AI assimilation and performance in SMEs,
mediated by organizational capabilities. Nguyen et al. (2026) also find relationships between
AI capability, innovation, competitive advantage, and performance. The results should be read.
within the contexts and designs of each study.

The literature on dynamic capabilities offers a useful explanation: advantage does not arise solely from
to possess a resource, especially when that resource becomes widely available. It depends
the way the organization combines resources, learns, and reconfigures its activities. When everyone
They may have access to similar tools, but management differences may become even more apparent.
important.
In BI, Chen and Lin (2021) show effects related to efficiency and performance through
specific capabilities. Torres, Sidorova and Jones (2018) highlight the change in processes. These
Evidence supports the thesis that results depend on complementarities between
technology and organization.
For SMEs, the pursuit of productivity needs to consider opportunity cost. Automating a
A low-impact task may produce measurable savings, but less than the value that would otherwise be obtained.
by improving a critical decision regarding pricing, inventory, customer acquisition, or capital allocation.
The prioritization criterion is therefore managerial.
The competitive advantage associated with AI tends to shift from access to the tool to the quality of its integration. As
platforms become more widespread, data becomes more valuable.

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own, accumulated knowledge, well-defined processes, speed of learning and the
The ability to transform analytical results into action.

**11 Specific Barriers Faced by Small and Medium-Sized Enterprises**

SMEs face a paradox in digital transformation. Their smaller scale may facilitate change.
They are quick and reduce bureaucracy, but they also limit financial resources, specialists, and time.
available for experimentation. The same flexibility that favors adaptation can coexist with
Excessive dependence on a few managers.
Brazilian data illustrates part of this asymmetry. By 2025, AI adoption will have reached 15% of...
small businesses among the population surveyed by ICT Business, while among large companies
reached 50% (CETIC.BR, 2026). The difference suggests that the reduction of access barriers still...
It did not eliminate inequalities in ability.
Costs are only part of the problem. Lack of qualified people, lack of knowledge of
appropriate technologies, incompatibility with existing systems, data quality and
Regulatory concerns also appear among the obstacles identified by Cetic.br. These
These factors are organizational in nature and cannot be solved solely through the acquisition of...
software.
On the other hand, SMEs can benefit from modular technologies and cloud services that
They reduce initial investments. Generative artificial intelligence also allows for experimentation.
Applications without in-house development. The risk is turning ease of experimentation into...
uncoordinated proliferation of tools, with duplication of costs, exposure of data and
absence of patterns.
A gradual strategy may be more appropriate. The company identifies high-risk decisions or processes.
impact, establishes a baseline, improves data quality, tests a solution, measures
Results are obtained, and only then is its use expanded. This cycle brings digital transformation closer to learning.
organizational, reducing the gap between adoption and assimilation.
The challenge for SMEs, therefore, is not to replicate the infrastructure of large corporations on a smaller scale. It
is to build an architecture proportionate to their needs, in which technology,
skills and governance are sufficient to improve decisions without creating complexity.
incompatible with the size of the organization.

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## 12 INTEGRATED MODEL OF ANALYTICAL AND MANAGERIAL CAPABILITY

A review of the literature allows us to propose an integrated model in which performance is not the sole result.
Directly from the adoption of AI or BI. The process begins with the existence of relevant organizational data.
and advances through the quality and governance of this information. BI acts as an organizational layer,
Visualization and analysis; analytical capabilities transform results into interpretations; and AI enhances
possibilities for automation, prediction, and generation.

Managerial ability permeates all these stages. It defines which problems deserve attention,
Which indicators are meaningful, which results require validation, and what changes should be made?
to be implemented. Therefore, in the proposed model, managerial capacity does not appear as a final stage,
but as a cross-cutting orchestration infrastructure.

Human capital, strategy, organizational learning, governance, and control constitute
Complementary mechanisms. The absence of any one of them can reduce capture capacity.
Valuable. Excellent data with low analytical capabilities may remain underutilized; AI
Advanced business intelligence with insufficient governance can amplify risks; sophisticated BI without strategic connection.
This can lead to an excess of reports.

The model also differentiates between decision-making and performance. A technology can improve speed or
Informational quality without this immediately translating into financial results. The effect
Performance depends on the implementation of decisions, competitive conditions, and other factors.
external factors. This separation is important to avoid attributing excessive causality to technology.

For future research, the model can be operationalized using measurable quality constructs.
data, BI capabilities, AI capabilities, analytical literacy, managerial skills and
Performance. Longitudinal studies would be particularly useful for observing how companies...
They evolve from experimentation to assimilation, and how process changes mediate outcomes.

From a managerial point of view, the main implication is to reverse the logic frequently observed in
market. Instead of starting by choosing the tool, the organization should begin by deciding what
It needs to improve, both in terms of the necessary data and the existing capacity to interpret and act.
Technology then becomes a selected component of a decision architecture.

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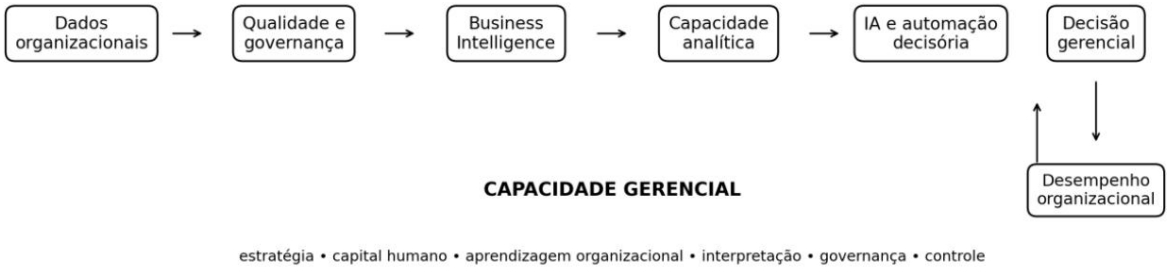
**Figure 1 – Integrated model of analytical and managerial capacity in the digital transformation of SMEs**




**Source: own elaboration, based on Teece (2007), Torres, Sidorova and Jones (2018), Chen and Lin (2021) and recent literature on AI assimilation.**

## FINAL CONSIDERATIONS

The expansion of artificial intelligence and business intelligence significantly broadens the Technical capacity available to small and medium-sized enterprises. Tools previously associated with Specialized structures have become accessible through cloud platforms and interfaces in Natural language and ready-made solutions. This democratization, however, does not make the system homogeneous. The ability of organizations to generate value.

The analysis developed demonstrates that the relationship between technology and performance is mediated by factors. Organizational. Data quality, governance, human capital, learning, capacity Analytics and process change largely determine whether a tool will be incorporated. It will either be managed or remain a peripheral resource.

The dynamic capabilities perspective offers a consistent theoretical basis for understanding this. difference. Organizations need to recognize opportunities, select coherent applications and Reconfigure processes. Technology can expand these capabilities, but it also requires them to... There must be certain conditions in place for adoption to be successful.

Business Intelligence remains relevant in this environment because it organizes the flow of data. and interpretation. Artificial intelligence does not replace this function; it expands it. Models capable of Predicting, recommending, or generating content depends on context, criteria, and reliable information. The sophistication of the tool does not compensate for conceptual ambiguities or inadequate data.

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Managerial ability thus emerges as a central element. In an environment of abundance
With information in mind, the manager ceases to be merely a receiver of reports and begins to play a role of...
Problem formulator, evidence evaluator, and orchestrator of human and technological resources.
The quality of the question becomes as important as the speed of the answer.
In the Brazilian context, the recent growth in AI adoption indicates that this discussion is likely to...
gain importance. The progress among small businesses demonstrates a reduction in barriers, but the
The difference compared to large organizations remains significant. Training policies,
Management training and the development of digital skills can be just as relevant as
Incentives for the acquisition of technology.
For SMEs, a sustainable digital transformation does not necessarily require replicating structures.
of large corporations. It requires selecting high-impact problems, organizing essential data,
Develop skills, establish controls proportionate to the risk, and measure results.
Maturity can be built up gradually.
The model proposed in this article synthesizes this logic by connecting data, governance, BI, and capacity.
Analytics, AI, decision-making, and performance under the cross-mediation of managerial capacity. Its main
The contribution is to shift the debate from simple technological adoption to capacity building.
Organizational structures that allow for the strategic use of technology.
Future research could empirically test these relationships in Brazilian SMEs, comparing
sectors, sizes, and levels of digital maturity. Longitudinal studies can also shed light on this.
At what point does experimentation with AI transform into organizational assimilation, and what practices are used?
Managerial factors either accelerate or hinder this transition.
In short, AI and Business Intelligence should be understood as components of a system.
broader decision-making. The advantage lies not only in producing more data or more answers.
Fast-paced, but focused on building organizations capable of transforming information into knowledge, knowledge into
decisions, and decisions into learning. It is in this process that technology ceases to be...
It is not just a tool, but it effectively integrates into the company's strategic capabilities.

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