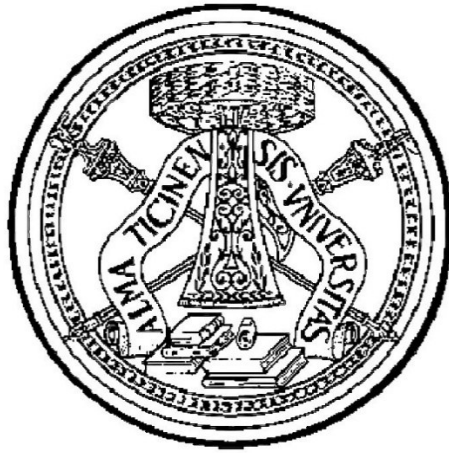




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ENTREPRENEURSHIP

Exploring the role of Organizational Factors in Business Experimentation Effectiveness: an Empirical Study

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Abstract

Business Experimentation represents an increasingly relevant approach for organizations making decisions under conditions of uncertainty. Testing an idea before committing significant resources allows organizations to gather evidence, challenge initial assumptions, and guide subsequent decisions. However, conducting experiments does not necessarily mean being able to use them effectively. Experimentation takes place within an organizational context characterized by different levels of management support, openness to failure and learning, structures, and capabilities. Understanding these conditions is therefore important to explain why Business Experimentation may be more effective in some contexts than in others. The literature has identified several relevant organizational factors, often examining them separately or within specific contexts.

This research investigates the relationship between Business Experimentation Effectiveness and Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities, Artificial Intelligence, and Regulatory Constraints. The quantitative analysis is based on a questionnaire that collected 58 responses, 49 of which came from organizations using Business Experimentation. The data were analyzed through descriptive statistics, correlation analysis, and multiple linear regression.

The findings show that all six factors are positively and significantly associated with Effectiveness when considered individually, with Organizational Culture and Management Support showing the strongest relationships. When analyzed simultaneously, Organizational Culture emerges as the only statistically significant predictor. This finding highlights that Business Experimentation Effectiveness is associated not only with resources, structures, and support, but also with an organizational context capable of embracing experimentation, learning from its outcomes, and using the evidence generated to inform decision-making.

Keywords: *Business Experimentation; Organizational Culture; Management Support; Organizational Capabilities; Innovation Management.*

La Business Experimentation rappresenta un approccio sempre più rilevante per le organizzazioni che devono prendere decisioni in condizioni di incertezza. Testare un'idea prima di investire risorse significative permette di raccogliere evidenze, mettere alla prova le assunzioni iniziali e orientare le decisioni successive. Tuttavia, condurre esperimenti non implica necessariamente riuscire a utilizzarli in modo efficace. La sperimentazione avviene infatti all'interno di un contesto organizzativo caratterizzato da diversi livelli di supporto manageriale, apertura verso l'errore e l'apprendimento, strutture e capacità. Comprendere queste condizioni è quindi importante per capire perché la Business Experimentation possa risultare più efficace in alcuni contesti rispetto ad altri. La letteratura ha evidenziato diversi fattori organizzativi rilevanti, spesso analizzandoli separatamente o in contesti specifici.

La ricerca analizza la relazione tra Business Experimentation Effectiveness e Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities, Artificial Intelligence e Regulatory Constraints. L'analisi quantitativa si basa su un questionario che ha raccolto 58 risposte, di cui 49 provenienti da organizzazioni che utilizzano la Business Experimentation. I dati sono stati analizzati attraverso statistiche descrittive, correlazioni e regressione lineare multipla.

I risultati mostrano che tutti e sei i fattori sono positivamente e significativamente associati all'Effectiveness quando considerati singolarmente, con Organizational Culture e Management Support che presentano le relazioni più forti. Quando analizzati simultaneamente, Organizational Culture emerge come l'unico predittore statisticamente significativo. Il risultato evidenzia come l'efficacia della Business Experimentation sia associata non solo a risorse, strutture e supporto, ma anche a un contesto organizzativo capace di accogliere la sperimentazione, apprendere dai risultati e utilizzare le evidenze prodotte nei processi decisionali.

Parole chiave: *Business Experimentation; Organizational Culture; Management Support; Organizational Capabilities; Innovation Management.*

Introduction

Organizations are increasingly required to make strategic decisions under conditions of uncertainty. Rapid technological change, evolving customer needs, digital transformation, and growing competitive pressure have made it more difficult for firms to rely exclusively on traditional planning approaches when developing new products, services, or business models. Instead, organizations are expected to continuously test assumptions, gather evidence, and adapt their decisions as new information becomes available.

Within this context, business experimentation has emerged as an increasingly important approach for managing uncertainty and supporting innovation. Rather than relying solely on forecasts or managerial intuition, organizations use experimentation to evaluate ideas, collect market feedback, reduce uncertainty, and progressively refine products, services, and business models before committing substantial resources. As a result, business experimentation has become a central element of innovation management, entrepreneurship, and business model development.

The growing relevance of business experimentation has attracted increasing attention from researchers over the last decade. However, despite this expanding body of research, the literature remains fragmented. Existing studies investigate business experimentation from different theoretical perspectives and emphasize different objectives, making it difficult to obtain a comprehensive understanding of the phenomenon. Some authors primarily describe experimentation as a mechanism for organizational learning, while others focus on its role in validating assumptions, enabling organizational agility, or building legitimacy among external stakeholders. Although these perspectives are closely related, they are often examined independently, resulting in a fragmented view of business experimentation.

This fragmentation creates the need for a structured synthesis of existing literature. Bringing together these different perspectives makes it possible to better understand not only what business experimentation is, but also the different roles it plays within organizations and the organizational challenges associated with its implementation. Examining these perspectives together provides an opportunity to identify common themes, areas of convergence, and aspects that remain insufficiently explored.

This literature review therefore aims to provide an integrated overview of the existing research on business experimentation by organizing the literature into four main streams: experimentation as a learning process, as a validation process, as an enabler of organizational agility, and as a legitimation process. Building on this synthesis, the review identifies the main research gaps emerging from the current literature and proposes directions for future research, with particular attention to the organizational factors that may be associated with the effectiveness of business experimentation, the relationship between learning and legitimation, and the measurement of the value generated through experimentation.

1. Literature Review

1.1 Business Experimentation as a Learning Process

Literature consistently identifies learning as one of the main purposes of business experimentation. Although authors approach the topic from different perspectives, they share the view that experimentation enables organizations to generate knowledge, refine business models, and support decision-making through continuous interaction with the market. This makes learning one of the core mechanisms through which firms adapt and innovate over time.

This perspective is particularly evident during the early stages of entrepreneurship, when startups still need to understand how to create and deliver value. Bortolini et al. (2021), for example, define learning as a "key concept and goal in the early stages of a startup", emphasizing that startups continuously acquire knowledge to develop and refine their business models. Similarly, Silva et al. (2019) describe the Lean Startup approach as being "centered on a learning process for business model innovation", explaining how experimentation, customer feedback, and continuous interaction with the market allow firms to test assumptions, better understand customer needs, and progressively adapt their business models. Although these studies focus on different aspects of experimentation, they all describe learning as the process through which organizations improve their understanding of customers and business models over time.

The link between learning and innovation also emerges consistently throughout the literature. Aminoff and Pihlajamaa (2020), for instance, identify organizational learning as a "key antecedent of innovation", arguing that firms need to develop new knowledge to explore opportunities and respond to uncertain environments. From this perspective, learning does not simply support innovation but represents one of the mechanisms through which innovation develops. As organizations experiment with new ideas and alternative solutions, they gradually understand what works in practice and use this knowledge to improve future decisions.

The literature further explains that learning develops through experimentation rather than through planning alone. Instead of relying exclusively on intuition, startups generate knowledge by testing assumptions, collecting feedback, and comparing their expectations with evidence gathered from the market. Bocken et al. (2020), for example, explicitly

state that "experimentation can produce learning", highlighting its role in generating knowledge, particularly in uncertain and complex contexts. Bojovic et al. (2018) similarly describe learning as an "inherent role" of experimentation, showing that firms experiment not only to test ideas but also to better understand their business models and the environments in which they operate.

A similar perspective is offered by Aminoff and Pihlajamaa (2020), who describe experiments as "a method for learning", emphasizing that experimentation enables organizations to continuously develop new knowledge. Along the same line, Aagaard et al. (2021) identify learning as "a key element of business experimentation", highlighting its contribution to the development of organizational capabilities and new insights. Rather than representing separate concepts, learning and experimentation emerge as complementary processes in which each experiment contributes to a deeper understanding of customers, markets, and business models.

This becomes even more evident when looking at how learning takes place during experimentation. Rather than emerging from a single activity, learning develops progressively as firms test assumptions, observe market reactions, and continuously adapt their decisions according to the evidence collected. Silva et al. (2020), for example, explain that experimentation is based on "falsifiable hypotheses", while Ghezzi and Cavallo (2018) describe Lean Startup as a "hypothesis-driven" approach. Bojovic et al. (2018) reach similar conclusions, explaining that firms experiment with different elements of the business model in order to understand whether their assumptions actually hold in practice. Learning therefore develops through repeated cycles of testing, observation, and adaptation rather than through detailed planning before entering the market.

Learning develops through a continuous cycle of hypothesis testing and evidence collection. Rather than validating ideas through extensive planning, firms formulate assumptions about different aspects of their business model and confront them with empirical evidence generated through experiments. This approach allows organizations to replace intuition with data and to progressively improve their understanding of both the problems they are addressing and the solution they are developing. In this sense, experimentation becomes a mechanism through which knowledge is continuously generated and refined.

This logic is reflected in the Build–Measure–Learn cycle proposed by Ries (2011), which is frequently discussed in the business experimentation literature. Silva et al. (2020) explain that startups build a minimum viable product, expose it to customers, collect feedback, and transform the information gathered into new knowledge that informs subsequent decisions. Rather than representing a linear sequence of activities, this cycle is iterative, allowing firms to continuously revise their assumptions as new evidence becomes available. Bojovic et al. (2018) describe a similar process, emphasizing that experiments should be repeated until sufficient evidence is collected to support or reject a business hypothesis. From this perspective, learning is cumulative, with each iteration contributing to a more accurate understanding of the business model.

The role of customers is central throughout this process. Rather than being passive recipients of innovation, customers actively contribute to organizational learning by providing feedback that helps firms understand whether their assumptions are consistent with market needs. Silva et al. (2020) highlight that customer interaction enables startups to validate or reject hypotheses while simultaneously revealing new insights that would not emerge through internal analysis alone. Bortolini et al. (2021) similarly argue that customer feedback supports the refinement of both products and business models, allowing organizations to adapt their value proposition according to the evidence collected during experimentation.

Learning, however, is not limited to validating individual assumptions. The literature suggests that experimentation often generates unexpected knowledge, leading organizations to question initial beliefs and identify opportunities that were not anticipated when the experiment was designed. Because experiments expose firms to real market conditions, they frequently reveal information that extends beyond the original objective of the test. As a result, experimentation contributes not only to confirming or rejecting hypotheses but also to broadening the organization's understanding of customers, markets, and business opportunities.

For this reason, learning is increasingly described as an iterative process rather than a single outcome. Each experiment produces evidence that informs the next one, creating a continuous cycle in which organizations gradually improve their knowledge and reduce uncertainty. Instead of seeking immediate validation, firms progressively accumulate

insights that strengthen subsequent decisions and support the evolution of their business models.

Another aspect that emerges consistently from the literature is that learning does not occur exclusively at the individual level. Although entrepreneurial intuition often initiates experimentation, the knowledge generated through experiments gradually becomes part of the organization. Aminoff and Pihlajamaa (2020), for example, argue that experimentation contributes to the development of organizational capabilities by enabling firms to create, share, and integrate new knowledge. In a similar way, Aagaard et al. (2021) describe business experimentation as a process that strengthens organizational learning through the continuous accumulation of experience and evidence. This suggests that the value of experimentation extends beyond the outcome of individual tests, contributing to the development of capabilities that support future innovation activities.

The literature also recognizes that failure represents an important source of learning. Since experiments are designed to challenge assumptions, negative outcomes should not necessarily be interpreted as unsuccessful results. Instead, they provide evidence that allows firms to abandon ineffective solutions before committing significant resources. From this perspective, unsuccessful experiments still generate valuable knowledge because they reduce uncertainty and redirect future experimentation toward more promising alternatives.

One of the main contributions of experimentation is therefore its ability to transform uncertainty into actionable knowledge. Rather than attempting to eliminate uncertainty before acting, organizations progressively reduce it by confronting assumptions with empirical evidence. Each experiment provides new information that enables firms to make more informed decisions, while simultaneously identifying new questions that require further investigation. Learning is therefore not a final objective but an ongoing process that accompanies the evolution of the business model throughout its development. This perspective suggests that the effectiveness of experimentation should not be evaluated solely according to whether an experiment succeeds or fails. Instead, its value depends on the quality of the knowledge generated and on the organization's ability to incorporate that knowledge into future decisions. Experiments that invalidate an initial assumption can be just as valuable as those that confirm it, since both outcomes contribute to a more accurate understanding of customers, markets, and business opportunities. The

literature therefore shifts the focus from the outcome of individual experiments to the learning process that they enable.

Because learning accumulates over time, experimentation gradually becomes embedded in organizational decision-making. Rather than being used only during the early stages of a startup, several studies suggest that experimentation evolves into a recurring managerial practice through which firms continuously evaluate opportunities, adapt business models, and refine strategic choices. In this sense, experimentation is not simply a technique for testing ideas but a broader capability that supports organizational adaptation in changing environments (Aagaard et al., 2021; Aminoff & Pihlajamaa, 2020).

The literature also recognizes that learning generated through experimentation can occur at different levels. Some experiments produce incremental knowledge that helps organizations refine existing products or business models, whereas others generate more fundamental insights that lead firms to reconsider their initial assumptions or even redefine their strategic direction. The value of experimentation is therefore related not only to the evidence collected but also to how organizations interpret and use that evidence during subsequent decision-making processes.

This distinction highlights another important characteristic of experimentation: knowledge is not automatically created by conducting experiments. Evidence only becomes valuable when organizations are able to interpret the results, integrate them with existing knowledge, and translate them into concrete actions. As a consequence, learning depends not only on experimentation itself but also on the organizational processes that enable firms to capture, share, and apply the insights generated throughout successive experimentation cycles.

From this perspective, experimentation can be understood as a continuous process of organizational adaptation. Experiments can generate evidence, this evidence can contribute to learning, and the resulting insights can inform subsequent experiments. Rather than following a linear sequence, experimentation develops through repeated cycles in which organizations progressively improve their understanding of both the problem they seek to solve and the solutions they propose to the market. This cumulative nature of learning explains why experimentation has become one of the central mechanisms through which firms manage uncertainty and support innovation.

Although the literature consistently recognizes learning as a fundamental outcome of business experimentation, the studies reviewed primarily explain how organizations generate knowledge through experimentation and why learning contributes to innovation. Considerably less attention is devoted to understanding the organizational conditions that enable this learning process to be effective or to examining how learning interacts with other dimensions of business experimentation, such as validation and legitimation. As a result, while learning is widely acknowledged as a core purpose of experimentation, its role within the broader experimentation process remains only partially explored.

1.2 Business Experimentation as a Validation Process

Although learning represents one of the most established perspectives on business experimentation, it does not fully explain why organizations experiment. Learning allows firms to acquire knowledge and improve their understanding of customers, markets, and business models, but experimentation is also expected to assess whether entrepreneurial assumptions are actually supported by evidence. For this reason, a second stream of the literature describes business experimentation primarily as a validation process, emphasizing its role in assessing the viability of ideas, products, and business models before significant resources are committed.

Rather than relying exclusively on intuition or detailed planning, organizations progressively validate their assumptions through continuous interaction with the market. Validation therefore becomes the process through which firms compare their initial expectations with empirical evidence, allowing them to understand whether a particular direction should be confirmed, modified, or abandoned. Instead of representing a single phase within the innovation process, validation develops gradually as organizations collect information from experiments and use it to refine subsequent decisions.

This perspective is particularly evident in the startup literature, where the search for a viable business model is considered one of the primary objectives of entrepreneurial activity. Bortolini et al. (2021), for example, argue that the main goal of a startup is to identify a viable business model, while Silva et al. (2020) explain that Customer Development supports this objective by enabling firms to understand whether their business model should be confirmed or adapted over time. Although these studies focus on different aspects of entrepreneurial development, they converge in describing

validation as an evidence-based process through which organizations evaluate the effectiveness of their value creation logic under real market conditions.

The literature also consistently highlights the role of hypothesis testing within validation processes. Rather than treating entrepreneurial ideas as fixed assumptions, firms progressively transform them into hypotheses that can be empirically assessed. Several studies describe experimentation as a hypothesis-driven process in which organizations formulate assumptions regarding customers, markets, or value propositions and then confront them with evidence collected during experimentation (Bojovic et al., 2018; Ghezzi & Cavallo, 2020; Silva et al., 2020). Validation therefore depends on the ability to replace assumptions with evidence, allowing entrepreneurial decisions to become progressively more informed.

This process relies heavily on interaction with customers and the market. Rather than validating ideas internally, organizations expose products, services, and business models to real users in order to observe behaviours, collect feedback, and identify potential improvements. From this perspective, customer interaction is not simply a source of information but the mechanism through which organizations determine whether their assumptions accurately reflect market needs. As firms repeatedly compare their expectations with customer responses, validation progressively supports the refinement of both products and business models while moving organizations closer to achieving product-market fit.

Validation, however, is not limited to market acceptance alone. The literature also recognizes that experimentation may be used to assess technical feasibility, operational viability, and compatibility with regulatory requirements, particularly in industries characterized by high technological complexity. In these contexts, organizations must validate not only whether customers value an innovation but also whether it can realistically be developed and implemented within existing technical and institutional constraints.

The literature further shows that validation relies on a variety of tools and practices that enable organizations to collect evidence before committing substantial resources. Although these approaches differ in terms of application and complexity, they share the same objective: reducing uncertainty by evaluating whether entrepreneurial assumptions are supported by real market evidence. Rather than representing different views of

experimentation, these tools can be interpreted as complementary mechanisms that support the validation process under different organizational and industrial conditions.

Among the approaches most frequently discussed is the Minimum Viable Product (MVP), which is presented as one of the main instruments through which organizations validate ideas at an early stage. Instead of developing a complete product before entering the market, firms introduce a simplified version that is sufficiently functional to test key assumptions and observe customer reactions. Silva et al. (2021) define the MVP as "a version of the product with minimum amount of effort", while Ghezzi and Cavallo (2020) explain that it enables entrepreneurs to collect feedback before making significant investments. From this perspective, the value of the MVP does not lie in the product itself, but in the evidence that it generates to support entrepreneurial decision-making.

The same logic characterizes other validation practices discussed in the literature. A/B testing, for example, allows firms to compare alternative versions of products, features, or value propositions by directly observing customer behaviour (Silva et al., 2021). Instead of relying on subjective preferences, organizations evaluate which solution performs better according to measurable market responses. Similarly, usability testing enables firms to observe how customers interact with a product or service, helping identify usability issues and opportunities for improvement before a wider market launch. Although these tools differ in their implementation, they all contribute to transforming customer interaction into actionable evidence that supports subsequent decisions.

Validation is also supported by the systematic collection of quantitative and qualitative information. Several studies highlight the role of surveys, performance indicators, and customer metrics in providing structured evidence on market reactions, making entrepreneurial decisions increasingly data-driven. At the same time, the literature recognizes that startups frequently complement formal metrics with informal feedback collected through conversations, observations, and direct interaction with customers and stakeholders. While this type of information can provide valuable insights, some authors also point out that informal feedback may be incomplete or affected by subjective interpretations, suggesting that organizations often need to combine different sources of evidence throughout the experimentation process.

The way validation is conducted also appears to depend on the context in which experimentation takes place. In highly regulated or technologically complex industries,

rapid experimentation alone is often insufficient to assess the viability of an innovation. Silva et al. (2021), for example, explain that biotechnology and engineering startups frequently integrate Lean Startup practices with more structured approaches such as stage-gate processes or business planning. In these contexts, validation extends beyond customer acceptance, requiring organizations to demonstrate technical feasibility, regulatory compliance, and operational reliability before innovations can reach the market. This suggests that validation does not follow a single approach but adapts to the characteristics and constraints of different industries.

Rather than being completed through a single experiment, validation develops progressively as organizations accumulate evidence over time. Every experiment provides information that either reinforces or challenges previous assumptions, allowing firms to refine their understanding of customers, products, and business models. In this sense, validation should not be interpreted as a final decision regarding the success or failure of an idea, but as a continuous process through which organizations gradually increase their confidence in entrepreneurial choices.

This iterative perspective is closely related to the Build–Measure–Learn cycle, where every round of experimentation produces new evidence that informs the next one. Instead of seeking definitive answers from individual experiments, organizations continuously revise their assumptions according to the information collected from the market. As evidence accumulates, decisions become progressively less dependent on intuition and increasingly supported by empirical observations, allowing firms to improve both the quality of their experiments and the robustness of their business models.

Another recurring theme concerns the importance of speed. The literature consistently argues that organizations benefit from testing ideas as early as possible, limiting investments until sufficient evidence has been collected. The fail fast principle discussed by Silva et al. (2021) reflects this perspective, suggesting that unsuccessful ideas should be identified quickly so that resources can be redirected towards more promising alternatives. Rapid experimentation therefore does not simply accelerate innovation but improves the efficiency of the validation process by reducing the cost of incorrect assumptions.

Although validation is often associated with the evaluation of individual products or business models, the literature suggests that its contribution extends beyond single

experimentation activities. As organizations repeatedly test assumptions, collect evidence, and refine their decisions, validation gradually becomes embedded within broader decision-making processes. Rather than supporting isolated entrepreneurial choices, it contributes to the development of a more systematic approach to experimentation, where every experiment builds upon the evidence generated by previous ones.

This perspective also highlights that validation is closely linked to organizational learning. While learning focuses on generating new knowledge, validation is concerned with assessing the reliability of that knowledge by confronting assumptions with empirical evidence. The two processes therefore develop simultaneously throughout experimentation: organizations learn by conducting experiments, but they also validate whether the knowledge generated is sufficiently robust to support future decisions. Rather than representing alternative perspectives, learning and validation appear as complementary dimensions of the same experimentation process.

The literature also emphasizes that validation is strongly influenced by the quality of the evidence collected. Reliable customer feedback, measurable performance indicators, and repeated experimentation increase confidence in entrepreneurial decisions, whereas limited or ambiguous evidence makes validation considerably more challenging. For this reason, organizations rarely rely on a single experiment before making strategic decisions. Instead, they progressively accumulate different sources of evidence until they reach a sufficient level of confidence to continue, modify, or abandon a particular course of action.

Another important aspect emerging from the literature concerns the dynamic nature of validation. Market conditions, customer preferences, and technological opportunities continuously evolve, meaning that assumptions previously considered valid may no longer hold over time. As a consequence, validation cannot be interpreted as a one-time activity completed during the early stages of innovation. Instead, organizations continuously reassess previous decisions as new evidence becomes available, allowing experimentation to remain aligned with changing environmental conditions.

This continuous reassessment reinforces the idea that experimentation is not simply a sequence of isolated tests but an ongoing organizational process. As firms accumulate evidence over time, validation becomes integrated into broader strategic decision-

making, enabling organizations to respond more effectively to uncertainty while continuously adapting their products, business models, and innovation activities. From this perspective, the value of validation lies not only in confirming entrepreneurial assumptions but also in supporting the organization's ability to make informed decisions throughout the innovation process.

Despite the broad agreement on the importance of validation, the literature mainly focuses on explaining how organizations validate assumptions and which tools support this process. Comparatively less attention is devoted to understanding why validation practices appear to be more effective in some organizations than in others or how organizational characteristics influence the way validation is conducted across different contexts. This suggests that, although validation represents one of the most established dimensions of business experimentation, several aspects concerning its organizational implementation remain only partially explored.

1.3 Business Experimentation as an Agile Process

The literature suggests that the role of business experimentation extends beyond learning and validation. While the previous streams explain how organizations generate knowledge and assess the validity of their assumptions, a growing body of research argues that experimentation also enables firms to continuously adapt to changing environments. From this perspective, experimentation is no longer interpreted simply as a tool for supporting individual decisions but as an organizational capability that allows firms to remain flexible, responsive, and adaptive throughout the innovation process.

This perspective has become increasingly important in the literature on innovation, entrepreneurship, and business model development, particularly in contexts characterized by uncertainty, rapid technological change, and continuously evolving markets. In these environments, organizations rarely operate under stable conditions. Customer needs, technologies, and competitive dynamics evolve continuously, making it difficult to rely exclusively on detailed plans established at the beginning of an innovation process. Rather than attempting to predict every future development, firms are therefore encouraged to continuously adapt their decisions as new information becomes available. Several studies associate this adaptive capability with the concept of organizational agility. Ghezzi and Cavallo (2020), for example, explain that Agile Development "takes

dynamism and uncertainty into fair account within the product innovation process", highlighting how agile approaches emerge precisely in situations where markets and technologies evolve rapidly. Along the same line, Silva et al. (2020) argue that Agile Methodologies seek to eliminate unnecessary time and resource waste by relying on iterative and incremental product development rather than long and rigid planning processes. Although these studies examine agility from different perspectives, they converge in describing it as an approach that enables organizations to continuously adjust their activities while innovation is still taking place.

Rather than treating change as an unexpected event that interrupts development, agile approaches consider change as a natural component of innovation. This represents one of the main differences compared with more traditional management approaches, where products, priorities, and development activities are often defined extensively before implementation begins. The literature instead suggests that organizations should progressively modify products, priorities, and even strategic decisions according to the evidence generated throughout the development process. In this sense, adaptation becomes an integral part of innovation rather than a corrective action introduced only when problems arise.

This interpretation is reflected in the characteristics most frequently associated with agility. Several authors describe agile organizations as being flexible, responsive, and capable of rapidly adapting to environmental change. Silva et al. (2020), for instance, define Agile Development as a set of iterative and incremental development methods that promote adaptive planning, evolutionary development, and a rapid response to change. Similarly, Ghezzi and Cavallo (2020) define agility as "the ability to accommodate and adapt to changes in a dynamic environment", associating it with flexibility, responsiveness, velocity, and leanness. Rather than emphasizing speed alone, these studies suggest that agility depends on an organization's ability to continuously reorganize activities, resources, and priorities according to changing circumstances.

This adaptive perspective also changes the role traditionally assigned to experimentation. Instead of being used only to evaluate specific ideas or business models, experimentation becomes the mechanism through which organizations continuously interpret new information and translate it into action. Every experiment provides evidence that supports subsequent decisions, allowing firms to progressively refine products, services, and

business models while remaining responsive to market evolution. As experimentation becomes embedded within organizational routines, adaptation gradually evolves from an occasional activity into a continuous organizational capability.

The literature also highlights that this capability has become increasingly relevant in contexts characterized by digital transformation and rapid environmental change. Florek-Paszkowska et al. (2021), for example, argue that agility and resilience represent two of the most important capabilities required to address future challenges, emphasizing the need for organizations to continuously reorganize resources and competencies when operating in uncertain environments. Geissdoerfer et al. (2022) similarly explain that practices such as prototyping, experimentation, and piloting enable organizations to explore innovation and business model transformation in a more gradual and flexible way. Rather than requiring firms to fully commit from the beginning, these practices allow organizations to "test new waters without compromising their operations", reducing risk while maintaining the ability to adapt throughout the innovation process.

One of the main characteristics of agile approaches is the emphasis placed on continuous development rather than sequential execution. Instead of defining products, services, or business models in detail before implementation begins, organizations progressively develop and refine them through short iterative cycles. This allows firms to incorporate new information throughout the innovation process, making continuous adjustment an integral part of product and business model development rather than an activity performed only at the end of the project.

For this reason, the literature frequently associates agility with iterative and incremental development. Silva et al. (2020), for example, describe Agile Methodologies as approaches in which products, services, and business models evolve through repeated cycles of development and revision. Similarly, Ghezzi and Cavallo (2020) explain that Agile Development relies on short execution cycles supported by continuous testing activities, enabling organizations to modify and refine what they are developing while the innovation process is still ongoing. Rather than treating development as a linear sequence of predefined phases, agile approaches encourage organizations to continuously evaluate results and adjust future activities according to the evidence collected.

This iterative logic is closely connected with continuous experimentation. Rather than testing ideas only after development has been completed, organizations integrate

experimentation throughout the innovation process, allowing assumptions to be verified while products and business models are still evolving. Every iteration therefore becomes an opportunity to generate new evidence, improve previous decisions, and identify possible weaknesses before larger investments are made. As experimentation is repeated over successive cycles, organizations progressively strengthen both their knowledge and their ability to respond to changing conditions.

Within this context, practices such as prototyping, experimentation, and piloting assume a central role. Although they differ in their implementation, they share the objective of allowing organizations to explore new ideas gradually while limiting the risks associated with uncertainty. Geissdoerfer et al. (2022), for example, explain that prototyping enables firms to communicate, test, and refine ideas before moving towards full implementation, creating opportunities to identify weaknesses and improve solutions in relatively low-risk environments. Similarly, experimentation is described as a systematic process through which organizations test key assumptions and identify opportunities or bottlenecks before committing larger investments.

Piloting follows the same logic. Instead of introducing innovations immediately on a large scale, organizations initially implement products, services, or business concepts in smaller and more controlled contexts. This enables firms to evaluate feasibility, costs, operational implications, and market reactions before extending implementation more broadly. In this way, piloting contributes to reducing uncertainty while maintaining the flexibility needed to continuously adjust decisions during innovation activities.

Rather than representing isolated practices, prototyping, experimentation, and piloting appear throughout the literature as complementary mechanisms supporting the same adaptive logic. Together, they allow organizations to progressively develop innovations, generate evidence at different stages of the process, and refine products or business models without requiring full commitment from the outset. Their contribution therefore extends beyond individual projects, reinforcing the organization's ability to continuously adapt while innovation is still taking place.

The literature also highlights that agile approaches should not be interpreted as a single methodology but rather as a combination of different practices that organizations adopt according to the characteristics of the project, the industry, and the type of innovation being developed. Ghezzi and Cavallo (2020), for example, explain that several startups

combine Lean Startup with agile methods such as Scrum and Feature Driven Development (FDD). These approaches are based on teamwork, short development cycles, continuous revision, and progressive improvement, showing that organizations frequently integrate different agile practices instead of relying on a single framework.

This integration becomes particularly evident in the relationship between Agile Development and Lean Startup. Rather than representing two independent methodologies, several studies suggest that Lean Startup extends many principles originally developed within Agile Development beyond the software industry and applies them to entrepreneurship, experimentation, and business model innovation. Silva et al. (2020), for example, identify Agile Methodologies as one of the main foundations of Lean Startup together with Customer Development, explaining that principles such as iterative development, rapid feedback, and continuous adaptation become central not only for product development but also for entrepreneurial decision-making. Ghezzi and Cavallo (2020) reach similar conclusions, arguing that Lean Startup can be interpreted as a form of Agile Development applied to products, services, value propositions, and business models.

This close relationship explains why both approaches rely on the same underlying logic. Rather than attempting to predict every aspect of innovation from the beginning, organizations continuously develop ideas, collect evidence, revise assumptions, and modify strategic decisions according to what emerges during experimentation. Customer feedback therefore becomes a shared element across both approaches, supporting learning, validation, and continuous adaptation throughout the innovation process.

Customer involvement is another recurring theme in the literature on agile approaches. Rather than engaging customers only after product development has been completed, organizations are encouraged to involve them throughout the entire innovation process. In this way, customer feedback is not treated as a final evaluation of the product but as a continuous source of information that supports experimentation, learning, and decision-making while development is still taking place.

Continuous interaction with customers allows organizations to identify emerging needs more rapidly and to modify products or business models before substantial resources have been committed. Several studies describe customer involvement as a fundamental component of Agile Development, emphasizing that interaction with users should begin

during the earliest stages of development and continue throughout the innovation process (Ghezzi & Cavallo, 2020; Silva et al., 2020). Customer feedback therefore becomes part of the experimentation process itself, providing the evidence organizations need to refine solutions progressively rather than evaluating them only once development has been completed.

This continuous exchange of information also reinforces the iterative nature of agile approaches. Every interaction with customers generates new evidence that can be incorporated into subsequent development cycles, allowing firms to progressively improve products, services, and business models. Experimentation, customer collaboration, and adaptation therefore evolve together, creating a process in which each iteration supports the next one through the knowledge generated from previous activities. The literature also shows that collaboration is not limited to customers alone. Agile approaches frequently involve multidisciplinary teams, stakeholders, and external partners who contribute different competencies and perspectives during experimentation activities. Communication and knowledge sharing therefore become essential for coordinating iterative development and ensuring that the evidence generated through experimentation is effectively translated into organizational decisions. Collaboration is consequently presented not simply as a way to improve teamwork, but as one of the conditions that enables organizations to continuously adapt throughout the innovation process.

The importance of collaboration becomes even more evident when agility is considered at the organizational level rather than within individual projects. Several studies argue that agile organizations continuously reorganize resources, competencies, and internal processes in response to changing environmental conditions. Florek-Paszkowska et al. (2021), for example, explain that organizations operating in turbulent environments need to develop both agility and resilience by continuously reconfiguring resources and organizational capabilities as circumstances evolve. Agility therefore extends beyond product development and becomes part of the organization's broader ability to respond to uncertainty and change.

This broader perspective has also led several authors to describe Agile not only as a development methodology but as an organizational mindset. Practices such as prototyping, Scrum, iterative development, and continuous experimentation undoubtedly

support agile ways of working; however, the literature suggests that their effectiveness largely depends on the organizational environment in which they are implemented. As a result, agility is increasingly associated with organizational characteristics such as trust, openness, communication, collaboration, and employee empowerment rather than with technical practices alone.

Florek-Paszkowska et al. (2021) argue that these organizational characteristics are essential for creating an environment in which experimentation can be carried out continuously, knowledge can be shared effectively, and teams are encouraged to adapt their decisions as new evidence becomes available. In this sense, trust, empathy, leadership, communication, and employee empowerment are not simply complementary aspects of Agile Development but represent important conditions that allow experimentation to be sustained over time.

Leadership is also frequently identified as a key element supporting agile organizations. In rapidly changing environments, managers are expected to coordinate experimentation activities, facilitate collaboration, and support continuous adaptation rather than relying on rigid planning or centralized decision-making. The literature therefore suggests that the success of agile approaches depends not only on the adoption of specific tools and practices but also on leadership capabilities that encourage experimentation, knowledge sharing, and collaboration across the organization.

The studies reviewed therefore describe agility as more than a collection of development practices. While methods such as Scrum, iterative development, or prototyping provide organizations with operational tools to support experimentation, their effectiveness ultimately depends on broader organizational conditions. Collaboration, communication, leadership, trust, and an organizational culture that encourages continuous learning and adaptation consistently emerge as the elements that allow experimentation to become a sustained organizational capability rather than a series of isolated activities.

Despite the widespread adoption of agile approaches, the literature also recognizes that implementing agility is not always straightforward. Although Agile is frequently associated with flexibility, rapid adaptation, and continuous change, several studies suggest that these characteristics alone are not sufficient to guarantee successful experimentation. The effectiveness of agile approaches appears to depend on the context in which organizations operate, including the characteristics of the industry, the

organizational structure, internal culture, and the ability to coordinate experimentation over time.

One recurring theme concerns the relationship between flexibility and organizational structure. Agile approaches move away from rigid planning models, yet they do not eliminate the need for coordination. On the contrary, several studies suggest that continuous experimentation requires clearly defined processes that allow organizations to coordinate iterative activities without compromising flexibility. Geissdoerfer et al. (2022), for example, explain that experimentation benefits from "a well established, standardised process", highlighting that activities such as prototyping, experimentation, and piloting still require organizational coordination in order to generate reliable evidence. Rather than representing opposite concepts, flexibility and structure appear to complement one another, allowing organizations to adapt continuously while maintaining coherence throughout the innovation process.

The importance of context becomes even more evident in industries characterized by high technological complexity or strict regulatory requirements. Much of the literature on Agile Development and Lean Startup originates from software and digital entrepreneurship, where rapid iterations and continuous experimentation can be implemented relatively easily. However, several studies suggest that these approaches become more challenging in sectors such as biotechnology or healthcare, where organizations must comply with long approval procedures, safety requirements, high development costs, and limited tolerance for failure. In these environments, experimentation cannot always rely exclusively on rapid iterations, leading organizations to combine agile practices with more structured approaches that provide greater control throughout the innovation process.

Another issue frequently discussed concerns customer involvement. Agile approaches strongly rely on continuous interaction with users, yet identifying the most appropriate customers and collecting reliable feedback is not always straightforward. Silva et al. (2020), for example, observe that Agile Methodologies "leave the issue of how to identify and engage with such customers virtually unsolved." This suggests that the quality of customer feedback depends not only on the willingness to involve users but also on the organization's ability to identify relevant participants and correctly interpret the information collected during experimentation. The challenge becomes even greater in

highly innovative contexts, where customers themselves may struggle to anticipate future needs or evaluate solutions that have no direct market equivalent.

The literature also points out that organizations do not always adopt Agile or Lean Startup practices in a systematic way. Instead, firms often implement only selected tools or principles according to specific project requirements, resulting in different levels of maturity in the way experimentation is managed. Silva et al. (2020) note that agile practices are frequently applied only partially, suggesting that experimentation may become fragmented when organizations adopt individual techniques without developing a broader organizational approach capable of coordinating continuous adaptation.

Taken as a whole, the studies reviewed suggest that agility should be understood as an organizational capability rather than merely a development methodology. Iterative development, prototyping, customer feedback, and continuous experimentation provide organizations with operational mechanisms that support adaptation, but their effectiveness ultimately depends on the organizational conditions in which these practices are embedded. Elements such as leadership, organizational culture, collaboration, communication, and coordination consistently emerge throughout the literature as factors that influence the way organizations experiment and adapt over time.

This broader organizational perspective also creates a natural link with another stream of the literature. While agility explains how organizations continuously adapt through experimentation, innovation processes rarely take place in isolation. Organizations must also maintain the confidence of customers, investors, partners, regulators, and other stakeholders while experimenting and changing their products, services, or business models. This introduces a further dimension of business experimentation, where organizations are expected not only to learn, validate, and adapt, but also to preserve legitimacy throughout the innovation process.

Research has extensively examined how experimentation supports organizational agility through iterative development, continuous adaptation, and rapid feedback. Considerably less attention has been devoted to explaining why these practices enable some organizations to adapt more effectively than others or which organizational characteristics sustain agile experimentation over time. Understanding these organizational conditions appears particularly relevant, as agility depends not only on experimentation itself but also on the context in which experimentation takes place.

1.4 Business Experimentation as a Legitimation Process

The literature suggests that the role of business experimentation extends beyond learning, validation, and organizational adaptation. While the previous streams explain how organizations generate knowledge, assess entrepreneurial assumptions, and continuously adapt through experimentation, innovation processes rarely take place in isolation. Organizations introducing new products, services, or business models must also gain the confidence of customers, investors, partners, regulators, and other stakeholders while innovation is still unfolding. For this reason, an increasing number of studies describe experimentation not only as a process that supports innovation but also as a mechanism through which organizations build and maintain legitimacy.

The importance of legitimacy becomes particularly evident in entrepreneurial contexts. Unlike established firms, startups usually operate without a strong reputation, proven experience, or established relationships with external stakeholders. As a result, they often need to demonstrate that their ideas are credible, their business model is viable, and their organization is capable of delivering value despite operating under conditions of uncertainty. The literature therefore frequently associates entrepreneurship with the challenge of overcoming the liability of newness, highlighting that young ventures must progressively build trust, credibility, and recognition before they can secure resources and broader stakeholder support.

These challenges become even more pronounced when organizations introduce highly innovative or sustainability-oriented solutions. In these contexts, firms are not only expected to demonstrate that their business model is economically viable but also that the value they intend to create is realistic, meaningful, and achievable. Aagaard et al. (2021), for example, explain that sustainability-oriented ventures face "extra legitimization challenges" because they often operate in contexts where both the underlying technologies and the sustainability value proposition remain unfamiliar to stakeholders. Building legitimacy therefore becomes essential for reducing skepticism and encouraging stakeholders to engage with innovations whose potential benefits are not yet fully established.

Within this perspective, experimentation assumes a broader role than the one discussed in the previous sections. Rather than supporting learning or validating assumptions alone,

experimentation also enables organizations to make their ideas visible, tangible, and understandable to external audiences. Bojovic et al. (2018), for instance, describe experimentation as a "strategic legitimation process", arguing that experimental activities allow firms to demonstrate technical competence, communicate the feasibility of their ideas, and make their business models more concrete. Prototypes, Minimum Viable Products, pilot projects, and demonstrations therefore become mechanisms through which organizations transform abstract concepts into observable evidence that stakeholders can directly evaluate.

This broader interpretation changes the purpose traditionally associated with experimentation. Instead of generating evidence exclusively for internal decision-making, experiments also provide evidence that can be communicated externally. By showing that ideas can be translated into concrete solutions, organizations progressively strengthen their credibility and reduce the uncertainty perceived by customers, investors, and other stakeholders. Experimentation therefore contributes not only to improving innovation internally but also to building confidence around the venture as it develops.

One of the aspects most frequently discussed in the literature is the role of signaling within experimentation processes. Since startups generally lack an established reputation or a proven track record, they need to continuously communicate that they are capable of creating value and successfully transforming innovative ideas into viable businesses. Experimentation contributes to this process by providing observable evidence that reduces information asymmetries between the organization and its stakeholders. Rather than relying solely on promises or business plans, startups can demonstrate progress through concrete activities that external audiences are able to evaluate directly.

Several studies describe signaling as one of the main functions of experimentation. Bojovic et al. (2018), for example, explain that experimentation contributes to "signaling value or intention" to external stakeholders. Experimental activities therefore serve a dual purpose. Internally, they support learning and the refinement of business models; externally, they communicate commitment, competence, and the willingness to continuously improve proposed solutions. Through prototypes, pilot projects, demonstrations, and other experimentation activities, organizations make innovation more visible and easier for stakeholders to understand, reducing uncertainty surrounding the venture.

This signaling function is closely connected to the symbolic dimension of experimentation. The literature suggests that experiments communicate more than technical results, as they also influence how organizations are perceived by external audiences. Bojovic et al. (2018) describe experimentation as having a "symbolic nature", explaining that prototypes, demonstrations, and pilot projects help organizations make their activities visible while communicating commitment, progress, and future potential. In this sense, experimentation becomes a mechanism through which organizations shape stakeholder perceptions before products or business models have reached full maturity. A similar perspective emerges in sustainability-oriented entrepreneurship. Aagaard et al. (2021) argue that experimentation enables organizations to communicate technical competence, learning capability, and commitment to sustainability objectives. This becomes particularly important when organizations introduce solutions that stakeholders may initially perceive as unfamiliar or difficult to evaluate. Rather than relying exclusively on sustainability claims, firms use experimentation to demonstrate that their proposed value can be translated into concrete and observable outcomes. Experiments therefore strengthen legitimacy by making sustainability ambitions more credible through tangible actions.

Beyond communicating competence, experimentation also supports the broader process of convincing stakeholders to engage with the venture. In highly uncertain environments, innovative ideas often appear risky, difficult to evaluate, or disconnected from existing market practices. Organizations therefore need to demonstrate not only that their solutions are technically feasible but also that they are capable of generating value in practice. Experimentation contributes to this objective by allowing customers, partners, and investors to directly observe, experience, and evaluate emerging solutions rather than relying exclusively on theoretical descriptions.

Bojovic et al. (2018) describe this process as one through which experimentation helps organizations "convincing them to embrace the business model." Through prototypes, demonstrations, pilot projects, and other experimentation activities, stakeholders become progressively involved in the innovation process and gain opportunities to better understand how the proposed business model creates value. The same authors also explain that experimentation contributes to "persuading partners and customers to engage with the company," showing that experiments are not only technical exercises but also

mechanisms for building stakeholder commitment throughout the development of the venture.

From this perspective, experimentation gradually reduces skepticism by replacing abstract promises with observable evidence. Customers, investors, and partners are no longer asked to evaluate only an entrepreneurial vision but are given opportunities to interact with concrete manifestations of that vision. As organizations repeatedly demonstrate progress through experimentation, legitimacy develops progressively alongside innovation, strengthening stakeholder confidence while products, services, and business models continue to evolve.

Interaction with external actors also plays an essential role in this process. The literature consistently shows that legitimation rarely develops through internal organizational activities alone. Instead, experimentation frequently involves customers, universities, research institutions, businesses, public organizations, NGOs, and other stakeholders who contribute knowledge, resources, and different perspectives throughout innovation activities. Bocken et al. (2021), for example, explain that experimentation often develops through the participation of "different actors, such as citizens, business, science, NGOs and governments," highlighting the collaborative nature of many experimentation processes.

This collaborative dimension further strengthens legitimacy because it demonstrates openness, transparency, and a willingness to improve through dialogue with external stakeholders. Organizations do not simply present completed solutions to the market; they involve external actors while innovations are still being developed, creating opportunities to receive feedback, strengthen relationships, and build confidence progressively throughout the experimentation process. Legitimacy therefore emerges not only from successful experimentation outcomes but also from the collaborative relationships established while experimentation is taking place.

The literature therefore suggests that legitimacy is built through continuous interaction rather than through isolated experimentation activities. Every experiment provides organizations with opportunities to strengthen relationships, demonstrate competence, and increase stakeholder confidence while innovation is still taking shape. Rather than being achieved once a product has reached the market, legitimacy develops progressively

as organizations repeatedly engage with external actors and translate entrepreneurial ideas into observable actions.

This perspective also broadens the role traditionally assigned to experimentation. While the previous streams describe experimentation as a mechanism for generating knowledge, validating assumptions, and supporting organizational adaptation, the legitimacy perspective emphasizes its relational dimension. Experimentation enables organizations not only to improve their innovations but also to communicate progress, create transparency, and strengthen stakeholder confidence throughout the innovation process. Learning, validation, and adaptation therefore remain essential outcomes of experimentation, but they are accompanied by the need to demonstrate that these activities generate credible and trustworthy innovations.

Several studies also show that legitimacy is closely connected to the broader ecosystem in which experimentation takes place. Rather than experimenting in isolation, organizations frequently involve customers, suppliers, universities, public institutions, NGOs, investors, and other external actors who contribute knowledge, resources, and different perspectives during innovation activities. This collaborative dimension is particularly evident in sustainability-oriented contexts, where experimentation often develops through partnerships that allow organizations to combine complementary competencies while simultaneously strengthening the credibility of the venture (Aagaard et al., 2021; Bocken et al., 2020).

The involvement of external actors also reinforces the visibility of experimentation. As organizations openly test ideas, share intermediate results, and collaborate with different stakeholders, experimentation becomes a process through which relationships are gradually strengthened alongside the innovation itself. Legitimacy therefore emerges not only from successful outcomes but also from the openness, transparency, and continuous dialogue that characterize experimentation activities. In this sense, stakeholder engagement is not simply a consequence of experimentation but one of the mechanisms through which legitimacy is progressively established.

This interpretation highlights an important distinction from the previous streams. Learning focuses on generating knowledge, validation on assessing the reliability of entrepreneurial assumptions, and agility on enabling organizations to adapt to changing conditions. Legitimation, instead, shifts the attention towards how experimentation is

perceived by external audiences. The same experimentation activities that support learning and validation also communicate competence, commitment, and credibility, showing that experimentation simultaneously fulfils both internal and external organizational objectives.

For this reason, legitimacy cannot be considered an outcome that develops independently from the other dimensions of business experimentation. Instead, it evolves alongside learning, validation, and adaptation, accompanying organizations throughout the innovation process rather than appearing only once innovation has been completed. This suggests that experimentation should be understood not only as a technical process for improving business models but also as a relational process through which organizations progressively gain recognition and stakeholder support while innovation is still unfolding. Although the literature increasingly recognizes legitimacy as an important dimension of business experimentation, existing studies primarily explain how experimentation contributes to building credibility, strengthening stakeholder relationships, and reducing uncertainty surrounding entrepreneurial ventures. Considerable attention has also been devoted to describing the signaling role of prototypes, demonstrations, pilot projects, and other experimentation activities, particularly in startup and sustainability-oriented contexts. These studies consistently show that experimentation helps organizations make innovative ideas more visible, understandable, and credible to external audiences.

At the same time, the literature provides a more limited understanding of how legitimacy interacts with the other dimensions of business experimentation. Learning, validation, agility, and legitimation are generally discussed as complementary outcomes of experimentation, yet they are often examined separately and from different theoretical perspectives. As a result, relatively little attention has been devoted to understanding how organizations simultaneously pursue these objectives while experimentation is still taking place.

This aspect appears particularly relevant because experimentation requires organizations to continuously revise assumptions, modify products, adapt business models, and respond to new evidence. While these activities support learning and adaptation, they may also generate uncertainty among customers, investors, partners, and other stakeholders who expect organizations to appear reliable and credible throughout the innovation process.

Maintaining legitimacy while continuously changing therefore represents a challenge that has received comparatively limited attention within the existing literature.

A similar observation can be made with regard to the organizational dimension of business experimentation. Across the four streams discussed in this review, several organizational characteristics, including leadership, communication, collaboration, trust, employee empowerment, and organizational culture, are repeatedly identified as important elements supporting experimentation. However, these factors are generally presented as contextual conditions or supporting elements rather than as the primary focus of investigation. Consequently, the literature provides only limited evidence regarding how these organizational characteristics are associated with the effectiveness of business experimentation across different organizational contexts.

These observations suggest that business experimentation should not be interpreted simply as a collection of independent activities aimed at learning, validating ideas, adapting to uncertainty, or building legitimacy. Instead, experimentation appears to be a broader organizational process in which these dimensions continuously interact. Understanding how organizations manage these interactions, and which organizational conditions enable experimentation to remain effective over time, therefore represents an important opportunity for further research.

1.5 Additional Perspectives on Business Experimentation

Besides the main streams of literature discussed so far, the review also highlights some additional perspectives that, although receiving less attention, contribute to providing a broader understanding of business experimentation. In particular, some studies connect experimentation to sustainability-related objectives, human and organizational factors, and ecosystem dynamics. While these themes are not as extensively developed as learning, validation, agility, or legitimation, they show how business experimentation can influence different dimensions of organizational life and can therefore contribute to a more comprehensive understanding of the phenomenon.

One of these perspectives concerns the relationship between business experimentation and sustainability. Some authors suggest that experimentation can support the development of more sustainable business models and solutions, helping organizations deal with the uncertainty that often characterizes sustainability-oriented innovation. In

these situations, firms are not only concerned with creating economic value, but also with generating environmental and social benefits. Experimentation can therefore help organizations test sustainability-oriented value propositions, explore alternative business model configurations, and evaluate the potential impact of new initiatives before making significant investments. The literature also suggests that experimentation can support broader sustainability transitions through pilots, prototypes, and small-scale tests that allow firms to gradually move towards more sustainable ways of creating and delivering value. At the same time, this stream of research remains relatively limited and still provides only a partial understanding of how business experimentation contributes to sustainability outcomes.

Another aspect that emerges from the literature concerns the role of people in experimentation processes. Although business experimentation is often associated with tools and methodologies, several studies suggest that its success also depends on human and organizational factors. Experimentation requires individuals who are willing to challenge assumptions, accept uncertainty, learn from feedback, and adapt their decisions when necessary. Elements such as leadership, trust, communication, collaboration, and employee empowerment therefore appear to play an important role in supporting experimentation activities. This suggests that experimentation is not only a technical process but also a social and organizational one. The effectiveness of experimentation may depend not only on the tools adopted by firms, but also on the organizational environment in which these tools are applied. However, these aspects are often discussed as supporting elements rather than as a central focus of the literature.

Finally, some studies adopt a broader ecosystem perspective and highlight how experimentation often extends beyond the boundaries of a single organization. In many cases, experimentation involves customers, suppliers, partners, universities, public institutions, NGOs, and other stakeholders who contribute with knowledge, feedback, and different perspectives. This becomes particularly important in complex and uncertain environments where organizations may not possess all the resources and competencies required to innovate independently. Through collaboration with external actors, firms can access new knowledge, identify opportunities, test solutions, and improve their initiatives before implementing them on a larger scale. From this perspective, experimentation becomes not only a tool for testing ideas but also a mechanism for generating shared

knowledge and strengthening relationships within a broader ecosystem. Nevertheless, compared to the main streams of literature, ecosystem-oriented perspectives remain relatively underexplored.

Taken together, these additional perspectives further highlight the multifaceted nature of business experimentation. Beyond its role in learning, validation, agility, and legitimation, experimentation also appears connected to sustainability objectives, human and organizational dynamics, and collaboration within broader ecosystems. Although these themes have received less attention in the literature, they contribute to showing the variety of ways in which business experimentation can be understood and applied within organizations.

2. Research Gaps

The literature reviewed shows that business experimentation is a broad concept that can play different roles within organizations. The studies analyzed describe experimentation as a tool that can support learning, validation, organizational agility, and legitimacy building. At the same time, some authors also connect experimentation to topics such as sustainable innovation, stakeholder engagement, business development, and organizational growth.

What emerges from the literature is that business experimentation is much more than a way to test ideas or products. It can play a role in how organizations learn, make decisions, innovate, interact with stakeholders, and respond to uncertainty. However, while the existing studies provide valuable insights into the benefits and applications of experimentation, some aspects still appear to be only partially understood.

For this reason, four main research gaps emerged from the literature review. The first concerns the factors that may be associated with the effectiveness of business experimentation and that may facilitate or limit its success in different contexts, such as more structured organizations, highly regulated industries, or firms that make use of artificial intelligence. The second relates to the relationship between learning and legitimation, two functions often associated with business experimentation but usually analyzed separately, despite the potential tensions that may exist between them. A third gap concerns the role of business experimentation in identifying and developing new business opportunities, since it remains unclear how experimentation can support business development activities, market exploration, partnership development, and the identification of growth opportunities. Finally, the literature still provides limited understanding of the actual value generated by business experimentation, particularly in terms of its quantitative impact and the costs associated with its implementation.

2.1 Organizational Factors Associated with the Effectiveness of Business Experimentation

The first gap concerns the organizational factors that may be associated with the effectiveness of Business Experimentation.

Although business experimentation is often associated with positive outcomes such as learning, validation, innovation, and adaptation, it seems that not all organizations are able to obtain the same benefits from experimentation. While some firms successfully use experimentation to improve and innovate, others struggle to translate experimentation activities into concrete outcomes.

Reading the different studies, it is possible to notice that most of the attention is placed on the benefits of experimentation and on the tools used to implement it. Less attention is instead dedicated to understanding why business experimentation appears to work better in some situations than in others. This suggests that there may be specific conditions that support or limit its effectiveness, but these factors are still not fully understood.

One possible explanation could be related to the context in which firms operate. Most studies focus on digital startups, which are usually characterized by flexibility, rapid decision-making, and the ability to quickly adapt based on new information. It is therefore difficult to understand whether business experimentation works in the same way in larger and more structured organizations, where formal procedures, hierarchies, and slower decision-making processes may be associated with differences in the ability to experiment and react to new insights.

A similar question can be raised for highly regulated industries. Sectors such as healthcare, biotechnology, pharmaceuticals, or cosmetics are characterized by strict regulations, approval procedures, and safety requirements. In these contexts, firms may not be able to experiment with the same speed and freedom often described in the Lean Startup literature. For this reason, it would be interesting to understand whether regulation limits the effectiveness of business experimentation or whether organizations are able to adapt experimentation practices to these environments and still achieve positive results.

Another aspect that could be associated with the effectiveness of Business Experimentation is the increasing use of Artificial Intelligence. Today, many organizations rely on AI tools to collect information, analyze data, and support decision-making. However, it is still unclear whether these technologies actually improve experimentation processes and outcomes and, if so, which applications create the greatest value. For example, AI could support hypothesis generation, data analysis, or the identification of patterns that managers might otherwise overlook.

The role of managers and entrepreneurs may also be particularly important. Experimentation often requires people to question their initial assumptions, accept unexpected results, and sometimes change direction based on the evidence collected. Because of this, the attitude of the CEO or management team may be particularly relevant to the success of experimentation activities. Leaders who are more open to change may be more willing to learn from experiments and adapt their decisions, while those who remain strongly attached to their original ideas may find it more difficult to benefit from experimentation.

Despite the growing interest in business experimentation, there is still limited understanding of the conditions that make it truly effective. Different contexts, technologies, and managerial characteristics may be associated with the results that firms are able to achieve, but these aspects have received relatively little attention in existing literature. Exploring these factors could help explain why some organizations benefit more from experimentation than others and identify the conditions that act as enablers of successful business experimentation.

2.2 Balancing Learning and Legitimation During Business Experimentation

Beyond understanding the factors associated with the effectiveness of business experimentation, another important issue concerns the different objectives that experimentation is expected to support. In particular, business experimentation is frequently associated with both learning and legitimation. On the one hand, firms use experimentation to test ideas, collect feedback, reduce uncertainty, and improve products, services, or business models. On the other hand, experimentation can also help organizations build legitimacy by demonstrating competence, reliability, and value creation to external stakeholders.

However, these two aspects are usually discussed separately in the literature. This is interesting because learning and legitimation do not always seem to go hand in hand. Learning often requires organizations to test uncertain ideas, accept that some experiments may not work, and sometimes change direction when the evidence suggests it. In many cases, some of the most valuable lessons come from mistakes, unexpected results, or failed experiments. At the same time, firms need to appear competent and

trustworthy in the eyes of stakeholders, who may expect positive results and clear signs of progress.

For this reason, it is not always clear how organizations manage these two objectives at the same time. If experimentation is used to learn, firms must be willing to accept uncertainty and possible failure. If experimentation is also used to build legitimacy, firms need to demonstrate competence and credibility. This creates a potential tension that has received limited attention in the existing literature.

Another interesting aspect concerns the context in which firms operate. It is possible that the relationship between learning and legitimation changes across different cultural and entrepreneurial environments. In some contexts, trying, failing, and changing direction may be considered a normal part of innovation and entrepreneurship. In others, failure may be perceived more negatively and could potentially damage the organization's credibility. If this is the case, firms may face different challenges when trying to balance learning and legitimation through experimentation.

The literature therefore provides only limited understanding of how organizations manage this relationship in practice. While experimentation is expected to support both learning and legitimation, it remains unclear how firms are able to pursue these two objectives simultaneously and whether this challenge differs across different cultural and entrepreneurial environments.

2.3 The Role of Business Experimentation in Business Development

Beyond its well-established role in learning, validation, and legitimation, Business Experimentation may also represent an important strategic tool for supporting business development activities. Organizations continuously face decisions regarding market expansion, the identification of new customer segments, the development of strategic partnerships, and the exploration of new business opportunities. In these situations, experimentation can provide evidence that supports managerial decision-making, allowing firms to test assumptions before committing substantial resources and reducing the uncertainty typically associated with strategic growth initiatives.

Although this potential appears increasingly relevant in today's dynamic and uncertain business environment, the existing literature has predominantly examined Business Experimentation as a mechanism for validating business models, generating

organizational learning, and reducing uncertainty during innovation processes. Considerably less attention has been devoted to understanding how experimentation contributes to broader business development activities, such as opportunity recognition, market selection, customer acquisition, or strategic growth decisions.

This represents an important gap, as business development often requires organizations to make decisions under conditions of uncertainty, where reliable information is limited and incorrect decisions may lead to significant financial and strategic consequences. In this context, Business Experimentation could provide organizations with a structured approach to evaluating opportunities before large-scale implementation. However, empirical evidence explaining how experimentation supports these strategic processes remains limited.

Future research should therefore investigate the role of Business Experimentation beyond innovation and validation activities, exploring whether and how experimentation contributes to business development, opportunity identification, and strategic decision-making. Expanding the literature in this direction would provide a more comprehensive understanding of the strategic value of Business Experimentation throughout the organizational growth process.

2.4 Measuring the Value of Business Experimentation

The existing literature consistently presents Business Experimentation as a valuable approach for fostering learning, supporting innovation, reducing uncertainty, and improving organizational adaptability. These benefits are widely recognized across both academic research and managerial practice, contributing to the growing interest in experimentation as a key capability for organizations operating in uncertain environments. Nevertheless, while the potential advantages of Business Experimentation have been extensively discussed, considerably less attention has been devoted to evaluating the actual value generated by these activities in practice.

Most previous studies describe the benefits of Business Experimentation from a conceptual or qualitative perspective, emphasizing how experimentation promotes learning, facilitates innovation, or improves decision-making. However, limited empirical evidence is available regarding the extent to which these benefits translate into tangible organizational outcomes. For example, it remains unclear whether organizations that

invest more extensively in Business Experimentation achieve higher levels of innovation performance, stronger business growth, improved strategic decisions, or greater competitive advantage compared with organizations that experiment less frequently. As a result, the actual organizational value generated through Business Experimentation remains only partially understood.

This limitation becomes even more relevant when considering that experimentation is not a cost-free activity. Designing, implementing, and evaluating experiments requires organizations to allocate financial resources, managerial attention, employee time, technological capabilities, and specialized skills. In many cases, experimentation also involves accepting uncertainty and the possibility that individual experiments may fail without producing immediate positive results. Consequently, organizations must continuously balance the potential benefits of experimentation against the resources required to conduct it.

Despite the importance of this trade-off, the literature has largely focused on the positive outcomes of Business Experimentation while paying comparatively little attention to its associated costs or to the relationship between investments and generated value. This creates an incomplete understanding of the phenomenon, as organizations are ultimately required not only to experiment effectively but also to justify whether experimentation represents an efficient use of organizational resources.

A more comprehensive evaluation of Business Experimentation should therefore move beyond simply asking whether organizations experiment. Future research should instead investigate when, under which organizational conditions, and to what extent experimentation creates value that justifies the investments required for its implementation. Such evidence would not only strengthen the theoretical understanding of Business Experimentation but would also provide managers with practical guidance for evaluating the return on experimentation activities and making more informed decisions about the allocation of organizational resources.

2.5 Research Question

The literature review highlighted the growing importance of Business Experimentation as a managerial approach for reducing uncertainty, supporting innovation, and enabling more informed decision-making in increasingly dynamic and uncertain business environments. Over the years, the literature has explored Business Experimentation from different perspectives, emphasizing its role in organizational learning, the validation of business assumptions, the development of organizational agility, and the achievement of organizational legitimacy. Although these streams of research have significantly contributed to advancing the understanding of Business Experimentation, they also reveal that several aspects remain only partially explored.

More specifically, the review identified four main research gaps. The first concerns the organizational factors associated with the effectiveness of Business Experimentation across different organizational contexts. The second relates to the relationship between learning and legitimation, which are frequently associated with experimentation but are generally examined separately. The third concerns the potential contribution of Business Experimentation to business development activities, such as opportunity identification and strategic growth. Finally, limited empirical evidence is available regarding the value generated by experimentation in relation to the resources required for its implementation. Each of these research gaps represents a promising direction for future research. However, addressing all of them within a single study would require different theoretical perspectives, research designs, and empirical approaches. Consequently, it was necessary to identify the gap that appeared most consistent with both the existing literature and the objectives of the present research.

The first research gap emerged as the most appropriate focus for this study. Throughout the literature review, organizational factors repeatedly appeared as important elements associated with the adoption, implementation, and outcomes of Business Experimentation.

Although different authors emphasized different aspects, a common pattern consistently emerged across all the literature streams considered.

For example, studies focusing on organizational learning highlighted the importance of leadership commitment, knowledge sharing, organizational capabilities, and learning-oriented cultures in supporting experimentation. Similarly, the literature on validation

emphasized the role of managerial support, organizational resources, and structured experimentation processes. Research on organizational agility also identified factors such as collaboration, flexibility, trust, and decentralized decision-making as key conditions enabling experimentation. Finally, studies investigating legitimation stressed the importance of organizational support, governance mechanisms, stakeholder involvement, and internal alignment in ensuring that experimentation activities become accepted and integrated within organizations.

Although these factors have frequently been discussed in previous studies, they have generally been analysed individually or within specific research contexts. As a result, the literature still lacks an integrated understanding of how different organizational factors are related to the effectiveness of Business Experimentation across organizations operating in different industries and organizational environments.

This observation naturally led to the identification of the main focus of the present research. Rather than investigating Business Experimentation from a single perspective, this study aims to adopt a broader organizational view by examining the organizational conditions associated with the effective implementation of experimentation. In particular, attention is devoted to organizational factors that consistently emerged throughout the literature review, including management support, organizational culture, organizational structure, organizational capabilities, together with two additional factors, Artificial Intelligence and regulatory constraints, which, despite receiving increasing attention in recent years, remain relatively underexplored within the Business Experimentation literature.

Building upon these considerations, the following research question was formulated:

“Which organizational factors are associated with Business Experimentation Effectiveness across different organizational contexts?”

To answer this research question, the study pursues several research objectives. First, it seeks to identify the organizational factors that the literature associates with successful Business Experimentation. Second, it aims to examine the relationships between Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities and the perceived effectiveness of Business Experimentation. Third, the

study extends the existing literature by exploring the potential relationships between Artificial Intelligence, Regulatory Constraints and Business Experimentation Effectiveness. Finally, by comparing organizations operating in different industries and organizational contexts, the research aims to provide a broader understanding of the conditions that facilitate effective Business Experimentation.

The research question and the related objectives provide the foundation for the empirical analysis presented in the following chapter. To investigate these relationships, a quantitative research design based on a structured survey was developed, allowing the organizational factors identified in the literature to be operationalized into measurable variables and empirically analysed across different organizations.

3. Methodology

Following the identification of the research gap and the formulation of the research question, this chapter outlines the methodological approach adopted to conduct the empirical analysis. As discussed in the previous chapter, the aim of this study is to investigate the organizational factors that may be associated with Business Experimentation Effectiveness and to understand how these factors are related to the differences observed across organizations.

Selecting an appropriate research methodology is a crucial step, as it must be aligned with both the objectives of the study and the research question it seeks to address. The chosen methodological approach shapes not only how data are collected and analyzed, but also the extent to which the findings can provide reliable evidence to answer the research question. Therefore, before describing the specific data collection method adopted in this study, it is useful to briefly introduce the main research approaches commonly employed in management research and explain the rationale behind the choice of a quantitative approach.

3.1 Research Method

In management and business research, two main methodological approaches are commonly adopted: qualitative research and quantitative research. Although both aim to investigate and better understand a specific phenomenon, they differ in terms of their objectives, the type of data collected and the methods used to analyse them. The choice between the two approaches depends on the research question and on the type of evidence needed to address it.

Qualitative research is generally used when the objective is to gain an in-depth understanding of a phenomenon by exploring people's experiences, perceptions and behaviours. It is particularly suitable when a topic is still relatively unexplored or when the researcher seeks to understand why and how a particular phenomenon occurs within organizations. Common qualitative methods include interviews, focus groups, case studies and document analysis. The main strength of this approach lies in its ability to

provide rich and detailed insights. However, because it usually involves a limited number of cases, its findings are often less generalizable.

By contrast, quantitative research focuses on measuring phenomena through numerical data and analysing the relationships between variables using statistical techniques. Data are typically collected through standardized instruments, such as surveys or structured questionnaires, allowing researchers to compare organizations and identify recurring patterns across a larger sample. While this approach generally provides less detailed information about individual experiences, it enables more systematic comparisons and supports the identification of statistically significant relationships between variables.

Considering the objectives of the present study, a quantitative research approach was considered the most appropriate methodological choice. Rather than providing an in-depth analysis of a single organization, this research aims to examine the relationships between different organizational factors and Business Experimentation Effectiveness across organizations operating in different contexts.

More specifically, the study focuses on organizational dimensions such as Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities, Artificial Intelligence and Regulatory Constraints. Analysing the role of these factors requires collecting comparable information from multiple organizations and examining the relationships between these variables and Business Experimentation Effectiveness.

A quantitative approach therefore provides the most suitable framework for achieving the objectives of this research. It makes it possible to operationalize the organizational factors identified in the literature into measurable variables, compare them across organizations and analyse their relationship with Business Experimentation Effectiveness using statistical techniques.

3.2 Data Collection Method

Once the quantitative research approach had been established, it was necessary to identify the most appropriate method for collecting the data. Several quantitative data collection methods are available, each characterized by different strengths and limitations. The choice therefore depends on the objectives of the study, the variables under investigation, and the type of information required to answer the research question.

One possible method is the experimental approach, which allows researchers to examine causal relationships by manipulating specific variables under controlled conditions. However, applying this methodology to the present study would have required intervening directly in the organizational context of multiple companies by modifying factors such as leadership, organizational structure or culture. Besides being difficult to implement in real organizational settings, such an approach would also raise practical and ethical challenges.

Another option is the use of secondary data, such as company databases or financial information. These sources provide objective information on organizational characteristics, including industry, company size or firm age. However, they do not capture many of the variables investigated in this study, such as Management Support, Organizational Culture, Organizational Capabilities or the use of Artificial Intelligence in Business Experimentation. Relying exclusively on secondary data would therefore not provide the information needed to answer the research question.

For these reasons, a structured questionnaire was selected as the primary data collection method. Surveys make it possible to collect standardized information directly from individuals with knowledge of their organization's innovation and experimentation activities. Using the same questions and response scales for all participants allows the data to be compared across organizations and subsequently analysed using statistical techniques.

The questionnaire was designed to collect both general organizational information and more specific data related to Business Experimentation. The first section gathers background information about the respondent and the organization, such as industry, company size, organizational role and the presence of an Innovation or Research and Development function. The following sections investigate Business Experimentation practices, the organizational factors that may facilitate or hinder them, and their perceived effectiveness.

Using an online questionnaire also made it possible to reach organizations operating in different industries and geographical areas while allowing respondents to complete the survey independently and at their convenience.

Like any survey-based research, this approach has some limitations. The responses reflect participants' perceptions and may therefore be influenced by their role within the

organization or by their knowledge of internal processes. In addition, the use of mainly closed-ended questions limits the possibility of exploring respondents' answers in greater depth. Nevertheless, a structured questionnaire was considered the most appropriate data collection method, as it provides standardized and comparable data that are suitable for analysing the relationships between the organizational factors identified in the literature and Business Experimentation Effectiveness.

3.3 Survey Development

3.3.1 Questionnaire Development

The development of the questionnaire represented a key stage of the present research, as it enabled the theoretical framework developed in the previous chapters to be translated into an empirical instrument capable of collecting comparable data across different organizations. Rather than developing a generic survey on innovation practices, the objective was to design a questionnaire specifically aimed at investigating Business Experimentation and examining how different organizational factors may be associated with its effectiveness.

The questionnaire was developed by building directly on the conceptual framework established throughout this study. The literature review not only identified the main characteristics of Business Experimentation, but also highlighted the organizational conditions that, according to previous research, can either facilitate or hinder the successful implementation of experimentation activities. In addition, it revealed several aspects that remain only partially explored, leading to the formulation of the research question and the related hypotheses. The questionnaire was therefore conceived as the empirical counterpart of the theoretical framework, with the purpose of collecting evidence capable of addressing the identified research gap.

The development process followed a structured and systematic approach. Each section was designed to capture one or more theoretical constructs that emerged from the literature as particularly relevant to the phenomenon under investigation. This ensured a close alignment between the theoretical and empirical components of the research, allowing every question included in the survey to contribute directly to the objectives of the study.

Wherever possible, the questionnaire drew inspiration from constructs and measurement approaches previously adopted in studies on Business Experimentation, Innovation Management, and Organizational Learning. Building on existing research strengthens the consistency of the measurement instrument and facilitates the comparison of future findings with those reported in the literature. Nevertheless, the questionnaire does not simply combine existing scales. Several items were adapted to better reflect the specific objectives of this research, while others were developed specifically to investigate dimensions that emerged during the literature review as particularly relevant but still relatively underexplored from an empirical perspective. This applies especially to topics such as the use of Artificial Intelligence to support experimentation activities and the relationship between regulatory constraints and Business Experimentation processes.

Beyond ensuring theoretical consistency, particular attention was devoted to the wording of the questionnaire. Although the survey is grounded in concepts discussed within the academic literature, it was intended for professionals working in organizations operating across different industries and occupying a variety of managerial positions. Consequently, the questions were formulated using clear and accessible language, avoiding unnecessarily technical terminology or excessively academic expressions that could generate ambiguity or make the questionnaire more difficult to complete. The intention was to allow respondents to answer on the basis of their own professional experience, without requiring them to interpret complex theoretical concepts.

Another aspect carefully considered during the development process was the overall length of the questionnaire. A survey that is excessively long may discourage participation or reduce respondents' attention, particularly towards the final sections. Conversely, an overly concise questionnaire may fail to capture the complexity of the phenomenon being investigated. To balance these two aspects, only the items considered most relevant to the objectives of the study were retained, while redundant questions were avoided whenever possible. The final version was designed to require approximately ten to twelve minutes to complete, a duration considered sufficiently short to encourage participation while still allowing the collection of comprehensive information.

Before the questionnaire was distributed, a review and preliminary testing phase was conducted to evaluate its overall quality. A pilot test was carried out to assess the clarity of the questions, the logical sequence of the different sections, the correct functioning of

the questionnaire's navigation logic, and the estimated completion time. This preliminary stage also made it possible to identify minor issues and refine the initial version of the survey before launching the data collection process, ultimately improving both its clarity and usability.

Taken together, the development process reflects the effort to create a questionnaire that is both methodologically rigorous and practically accessible. Every design decision was made to maintain consistency with the theoretical framework while ensuring that respondents could complete the survey easily and accurately. The resulting instrument provides standardized and comparable data that support the empirical investigation and contribute to answering the research question developed in this study.

3.3.2 Questionnaire Design and Structure

The questionnaire was organized into a series of sections, each designed to investigate a specific aspect of the research. The sequence guides respondents from general organizational information to more specific aspects of Business Experimentation, while maintaining consistency with the conceptual framework developed throughout the literature review. An overview of the questionnaire structure is presented in Table 3.1.

Table 3.1 – Questionnaire Structure

Section	Purpose	Main topics
Company Profile	To gather general information about the organization and the respondent.	Company characteristics, respondent profile, innovation activities and validation practices.
Business Experimentation Adoption	To determine whether the organization currently adopts Business Experimentation.	Definition of Business Experimentation and adoption of the approach.
Organizational Factors	To assess the organizational factors included in the research model.	Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities, Artificial Intelligence and Regulatory Constraints.
Business Experimentation Capability	To assess how Business Experimentation is implemented within the organization.	Experimentation processes, routines and decision-making practices.

Learning and Legitimation	To explore the relationship between Business Experimentation, learning and legitimation.	Learning processes and organizational legitimation.
Business Experimentation Outcomes	To assess the perceived outcomes of Business Experimentation.	Decision-making, innovation performance, business performance and customer satisfaction.
Final Questions	To collect additional information about Business Experimentation.	Performance measurement, organizational arrangements, barriers, future adoption and experimentation maturity.

A key feature of the questionnaire is the use of skip logic. After respondents are introduced to the definition of Business Experimentation, they are asked whether their organization currently adopts this approach. Based on their answer, they are automatically directed to the set of questions relevant to their experience. This design choice was intended to avoid collecting speculative responses from organizations with no direct experience of Business Experimentation, thereby improving the overall quality and reliability of the data.

The questionnaire therefore follows a logical and progressive structure, with each section building on the previous one. This organization reflects the conceptual framework developed throughout the literature review and ensures consistency between the theoretical framework and the empirical investigation.

3.3.3 Questionnaire Design Choices

The questionnaire was designed with the objective of collecting reliable and comparable data while ensuring that respondents could complete the survey as easily as possible. To achieve this, particular attention was paid not only to the content of the questions but also to the overall structure of the questionnaire and the response format.

The survey was developed using an online survey platform, which allowed responses to be collected automatically and organized in a structured dataset, facilitating the subsequent analysis. The platform also supported the implementation of skip logic, ensuring that respondents were asked only questions relevant to their organizational experience.

To facilitate comparison across organizations, the questionnaire was composed almost entirely of closed-ended questions. This choice made it possible to standardize responses, reduce ambiguity and simplify the quantitative analysis of the collected data.

Most items were measured using a five-point Likert scale, ranging from Strongly Disagree to Strongly Agree. This response format was selected because it offers an effective balance between measurement precision and ease of completion, allowing respondents to express different levels of agreement without making the questionnaire unnecessarily complex. In addition, a Not Applicable (N/A) option was included to allow respondents to indicate when a statement was not relevant to their organizational context or when they did not have sufficient knowledge to provide an informed evaluation. This helped reduce the likelihood of collecting inaccurate or forced responses.

To further improve the respondent experience, similar response formats were maintained throughout the questionnaire whenever possible, making the survey easier to complete and reducing the risk of response errors. Together with the logical progression of the different sections and the use of skip logic, these design choices were intended to encourage participation while improving the overall consistency and quality of the collected data.

3.4 Sampling Strategy and Participant Selection

Defining an appropriate sampling strategy is a fundamental step in empirical research, as it directly influences the quality and relevance of the data collected. The selection of participants should therefore be consistent with the objectives of the study, ensuring that respondents are able to provide meaningful insights into the phenomenon under investigation.

Sampling strategies are generally classified into two main categories: probability sampling and non-probability sampling. In probability sampling, participants are selected randomly, meaning that each member of the population has a known probability of being included in the sample. This approach is typically adopted when the objective is to obtain a statistically representative sample. In contrast, non-probability sampling involves selecting participants according to criteria established by the researcher. Among the most common techniques are purposive sampling, which consists of intentionally selecting respondents with the knowledge and experience required to provide relevant information

on the research topic, and convenience sampling, which involves recruiting participants who are more readily accessible to the researchers. While purposive sampling ensures that respondents are suitable for the study, convenience sampling facilitates access to a broader range of potential participants within the practical constraints of the research.

Considering the objectives of the present study, a combination of purposive sampling and convenience sampling was considered the most appropriate approach. The aim of the research is not to estimate how widespread Business Experimentation is across the business population, but rather to examine the relationship between different organizational factors and Business Experimentation Effectiveness. For this reason, priority was given to involving organizations capable of providing informed and relevant insights into the research topic.

The questionnaire was intentionally distributed to organizations operating in different industries, of different sizes and located in different geographical areas. This choice is consistent with the research question, which seeks to investigate the relationships between the organizational factors identified in the literature and Business Experimentation Effectiveness across different organizational contexts.

The questionnaire was distributed through the researchers' personal and professional networks, as well as through professional networking platforms, allowing the study to reach organizations from a wide variety of sectors and organizational contexts.

Particular attention was also paid to selecting respondents with direct knowledge of their organization's innovation activities and Business Experimentation practices. For this reason, the questionnaire was addressed to professionals involved in innovation and strategic decision-making. Respondents were also asked to indicate their organizational role at the beginning of the questionnaire to verify the consistency of the sample.

Although statistical representativeness was not the primary objective of the study, obtaining a sufficiently large and diverse sample remained important to support the subsequent quantitative analyses and to compare organizations operating in different contexts.

The adopted sampling strategy therefore reflects the exploratory nature of the research and is consistent with its objective of examining the relationship between organizational factors and Business Experimentation Effectiveness across organizations with different characteristics.

3.5 Variables and Measurement

3.5.1 Construct Development

Following the definition of the research design, the data collection method and the sampling strategy, the next step is to describe the variables included in the empirical model and how they were measured. Since the objective of this study is to investigate the relationship between organizational factors and Business Experimentation Effectiveness, the concepts identified in the Literature Review were operationalized into measurable variables.

The empirical model includes one dependent variable, representing Business Experimentation Effectiveness, and a set of independent variables corresponding to the main organizational factors identified in the Literature Review. Given the complexity of these constructs, each variable was measured through multiple questionnaire items in order to capture its different dimensions and improve the reliability of the measurement. The following sections describe the dependent and independent variables included in the study, explaining how each construct was measured within the questionnaire.

3.5.2 Dependent Variable

The dependent variable considered in this study is Business Experimentation Effectiveness, as the research aims to investigate its relationship with different organizational factors across different organizational contexts.

Rather than focusing on the mere adoption of experimentation practices, the study examines the outcomes that organizations achieve through Business Experimentation. As discussed in the Literature Review, experimentation can support innovation, improve decision-making and reduce uncertainty, but organizations do not all benefit from these activities to the same extent. For this reason, Business Experimentation Effectiveness was selected as the dependent variable.

In this study, Business Experimentation Effectiveness is considered a multidimensional construct, reflecting the overall contribution of experimentation activities to organizational performance. To capture this complexity, the construct was measured through multiple questionnaire items. More specifically, respondents were asked to evaluate the extent to which Business Experimentation contributes to improving decision-

making, accelerating innovation processes, reducing innovation-related risks, enhancing overall business performance and increasing customer satisfaction.

Considering these different outcomes provides a more comprehensive assessment of Business Experimentation Effectiveness than relying on a single performance indicator and is consistent with the objective of the research.

3.5.3 Independent Variables

As anticipated in the previous section, the empirical model includes a set of independent variables representing the main organizational factors that, according to the literature, may be associated with the effectiveness of Business Experimentation. Their selection is directly linked to the Literature Review and reflects the factors that emerged most consistently across the different research streams analysed throughout this study.

More specifically, the model considers six organizational factors: Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities, Artificial Intelligence, and Regulatory Constraints. Although each variable captures a different aspect of the organizational environment, they all contribute to explaining the conditions under which Business Experimentation can be implemented more effectively.

The following sections describe each variable individually, outlining its theoretical relevance and explaining how it was measured within the questionnaire.

Management Support

Among the organizational factors discussed throughout the Literature Review, management support emerged as one of the most important conditions for the successful implementation of Business Experimentation. Although experimentation involves different areas of the organization, its success largely depends on the ability of senior management to promote a vision focused on innovation, continuous learning, and evidence-based decision-making.

Introducing Business Experimentation often requires organizations to rethink the way decisions are made and uncertainty is managed. In this context, the role of leadership goes beyond simply approving new initiatives. Senior managers are expected to create an environment in which experimentation is regarded as an integral part of everyday organizational activities. This means encouraging employees to test new ideas, supporting

experimentation even when outcomes do not immediately meet expectations, and recognizing the value of evidence generated through experiments as a basis for strategic decisions.

Another important aspect concerns the availability of resources. For Business Experimentation to become a systematic organizational practice, management must ensure that employees have access to adequate time, skills, and financial resources. At the same time, leadership is responsible for setting clear priorities, coordinating experimentation activities across the organization, and ensuring that experimentation remains aligned with broader strategic objectives. Management support therefore plays a crucial role not only in initiating experimentation activities, but also in sustaining them over time and integrating them into the organization's way of working.

In the present study, Management Support refers to the extent to which senior management actively encourages and supports Business Experimentation within the organization. The construct was measured through a set of items assessing respondents' perceptions of management's commitment to experimentation, the availability of adequate resources, the encouragement of new experimentation initiatives, and the extent to which experimental evidence is incorporated into managerial decision-making.

Organizational Culture

Organizational culture represents another key factor that may be associated with the effectiveness of Business Experimentation. While management support provides strategic direction and resources, experimentation can only become a consistent organizational practice if it is embedded within a culture that encourages learning, curiosity, and continuous improvement.

Business Experimentation inevitably involves uncertainty. Not every experiment produces the expected results, and many initiatives may lead to outcomes that differ from the initial assumptions. For this reason, organizations need to create an environment in which unsuccessful experiments are not automatically perceived as failures, but as opportunities to generate new knowledge and support future decision-making. A culture that values learning and accepts uncertainty is therefore more likely to encourage employees to test new ideas, question existing assumptions, and use evidence to guide decisions.

At the same time, organizational culture also shapes how people collaborate and share knowledge throughout the experimentation process. Openness to new perspectives, cross-functional collaboration, and the willingness to learn from both successful and unsuccessful experiences contribute to creating an environment in which experimentation can be carried out more effectively and become part of everyday organizational activities. In the present study, Organizational Culture refers to the extent to which the organizational environment supports learning, openness to experimentation, collaboration, and the acceptance of uncertainty as part of the innovation process. The construct was measured through a set of items assessing respondents' perceptions of the organization's attitude towards experimentation, learning, knowledge sharing, and the possibility of testing new ideas without fear of negative consequences.

Organizational Structure

Besides leadership and organizational culture, the way an organization is structured may also be related to the effectiveness of Business Experimentation. Even when employees are encouraged to experiment and supported by management, rigid organizational structures, complex decision-making processes, or poor coordination between departments may limit the organization's ability to carry out experimentation activities effectively.

Business Experimentation often requires collaboration across different functions, rapid decision-making, and the ability to adapt initiatives as new evidence emerges. Organizations characterized by flexible structures, clear responsibilities, and effective communication are generally better positioned to support experimentation than organizations where activities are highly centralized or fragmented. In this sense, organizational structure should not be seen simply as a formal hierarchy, but as the set of mechanisms that facilitate coordination, information sharing, and the implementation of new initiatives.

Another important aspect concerns the level of autonomy given to employees and teams. Experimentation frequently requires quick decisions and continuous adjustments throughout the process. Allowing individuals and teams an appropriate degree of autonomy can therefore facilitate the design, execution, and evaluation of experiments,

while excessive bureaucracy or lengthy approval procedures may slow down or discourage experimentation activities.

In the present study, Organizational Structure refers to the extent to which the organization's structure supports the implementation of Business Experimentation through clear processes, effective coordination, communication, and an appropriate level of autonomy. The construct was measured through a set of items assessing respondents' perceptions of how the organizational structure facilitates experimentation activities and the integration of experimentation into everyday organizational processes.

Organizational Capabilities

Unlike the previous factors, which mainly describe the organizational environment in which Business Experimentation takes place, Organizational Capabilities refer to the organization's actual ability to carry out experimentation activities effectively. A supportive culture or committed leadership can certainly encourage experimentation, but they are not sufficient if the organization lacks the capabilities needed to design, execute, and learn from experiments.

Developing these capabilities requires more than technical expertise. Organizations need people with the appropriate skills to formulate hypotheses, design experiments, collect and interpret data, and translate the evidence generated into actionable decisions. At the same time, experimentation should not remain an isolated initiative driven by a few individuals. To become a consistent organizational practice, it needs to be supported by processes that allow knowledge to be shared, accumulated, and reused over time.

From this perspective, Organizational Capabilities also reflect the extent to which experimentation is embedded in the organization's daily activities. Organizations with stronger capabilities are generally better equipped to conduct experiments systematically, learn from previous initiatives, and continuously improve the way experimentation is performed. As a result, experimentation becomes part of the organization's broader learning process rather than a one-off activity.

Within this study, Organizational Capabilities capture the organization's ability to manage Business Experimentation throughout its different stages, from planning and execution to data interpretation and organizational learning. The construct was measured through a set

of items evaluating respondents' perceptions of the organization's skills, processes, and overall capability to conduct experimentation in a structured and continuous manner.

Artificial Intelligence

Recent technological developments have significantly changed the way organizations collect, analyse, and use information to support decision-making. Among these developments, Artificial Intelligence (AI) has attracted growing attention because of its potential to improve different stages of the Business Experimentation process. Although its application in this field is still evolving, AI is increasingly viewed as a tool capable of supporting organizations throughout the design, execution, and evaluation of experiments.

The contribution of Artificial Intelligence extends beyond data analysis. AI can assist organizations in generating hypotheses, identifying patterns within large datasets, predicting potential outcomes, and providing faster insights from experimental results. These capabilities may reduce the time required to conduct experiments, improve the quality of decisions, and help organizations allocate resources more efficiently. As a result, AI has the potential to strengthen experimentation activities and make them more systematic and evidence-based.

Despite this potential, the integration of Artificial Intelligence into Business Experimentation remains relatively unexplored. As discussed in the Literature Review, most existing studies continue to focus on more traditional organizational factors, while only a limited number of contributions have examined the relationship between AI and experimentation processes. For this reason, Artificial Intelligence was included in the empirical model as an emerging organizational factor whose role deserves further investigation.

In the present study, Artificial Intelligence refers to the extent to which AI-based tools support Business Experimentation activities within the organization. The construct was measured through a single item assessing the extent to which AI-based tools are used to support Business Experimentation activities.

Regulatory Constraints

Business Experimentation does not take place in a context where organizations are free to test any idea without limitations. Every experimentation activity takes place within a regulatory environment that may shape how experiments are designed, implemented, and evaluated. Legal requirements, industry-specific regulations, and compliance obligations can all shape the way experiments are designed, implemented, and evaluated.

The relationship between regulation and experimentation is not necessarily negative. In some situations, regulatory requirements may reduce the flexibility needed to test new products, services, or business models, making experimentation more complex and slowing down innovation processes. In other cases, clear regulatory frameworks can encourage organizations to adopt more structured experimentation practices, improve risk management, and ensure that new initiatives are developed responsibly and in compliance with existing legislation.

The role of regulation may also differ across organizations. Companies operating in highly regulated industries, such as healthcare, finance, or pharmaceuticals, may face very different constraints from those operating in less regulated sectors. Similarly, the increasing adoption of digital technologies and Artificial Intelligence has introduced new regulatory challenges that organizations must consider when designing and conducting experimentation activities.

These considerations suggest that the regulatory environment should not be regarded simply as an external constraint, but as a contextual factor that may be related to how Business Experimentation is carried out and to its perceived effectiveness. For this reason, Regulatory Constraints were included among the independent variables of the empirical model. The variable was derived from the questionnaire item asking respondents to identify the main barriers preventing or limiting Business Experimentation within their organization, where Regulatory Constraints were included among the available response options. For the empirical analysis, the variable will be coded as a binary variable, taking the value of 1 when Regulatory Constraints are selected among the main barriers and 0 otherwise.

3.6 Data Analysis

Following the data collection process, the responses will be prepared and analysed using Python. The analysis will follow a series of consecutive steps, moving from the preparation of the dataset and the description of the sample to the examination of the relationships between the variables included in the empirical model.

The main objective of the analysis will be to investigate whether the organizational factors identified in the Literature Review are associated with the outcomes generated through Business Experimentation. More specifically, the analysis will examine the relationship between Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities, Artificial Intelligence and Regulatory Constraints and the dependent variable, Business Experimentation Effectiveness, measured through the outcomes generated by Business Experimentation

Data Preparation and Cleaning

The first step will consist of preparing the dataset for the statistical analysis. Once the responses have been collected, the dataset will be imported into Python and reviewed to identify possible incomplete questionnaires, duplicated observations, missing values or inconsistencies that could affect the subsequent analyses.

Particular attention will also be paid to the coding of the responses. The questionnaire mainly relies on five-point Likert scales, and the answers will therefore be converted into numerical values suitable for statistical analysis. Responses indicated as Not Applicable will be treated as missing values rather than as an additional point of the scale, since they do not represent a specific level of agreement or disagreement.

The direction of the items will also be checked before creating the final variables. If any item is formulated in the opposite direction compared with the construct it measures, its values will be reverse-coded to ensure that higher scores consistently indicate higher levels of the corresponding construct.

This preliminary stage will provide a clean and consistent dataset for the subsequent analyses.

Sample Description

Before examining the relationships between the variables, the characteristics of the sample will be described using the information collected in the first part of the questionnaire.

The analysis will consider characteristics such as industry, company size, the organizational role of the respondent, the presence of a dedicated Innovation or R&D function, and the level of innovation orientation reported by the organization. The adoption of Business Experimentation will also be considered in order to provide an overview of the organizations included in the study.

Categorical variables will mainly be described through frequencies and percentages. These results may also be represented graphically where this facilitates the interpretation of the sample composition.

This first descriptive analysis will make it possible to understand the characteristics of the respondents and organizations included in the study before moving to the analysis of the variables included in the empirical model.

Reliability Analysis

Before creating the final scores for the variables, the internal consistency of the constructs measured through multiple questionnaire items will be assessed.

More specifically, the independent variables are measured through the following items:

- Management Support: Q12–Q13;
- Organizational Culture: Q14–Q16;
- Organizational Structure: Q17–Q18;
- Organizational Capabilities: Q19–Q21;
- Artificial Intelligence: Q22;
- Regulatory Constraints: Q43.

The dependent variable, Business Experimentation Effectiveness, will be measured through the Business Experimentation Outcomes items (Q35–Q39). These items capture different outcomes associated with experimentation, including improvements in decision-making, innovation speed, innovation-related risk reduction, business performance and customer satisfaction.

For the constructs measured through multiple items, internal consistency will be evaluated using Cronbach's Alpha:

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum_{i=1}^k \sigma_i^2}{\sigma_T^2} \right)$$

where k represents the number of items included in the scale, σ_i^2 represents the variance of each individual item, and σ_T^2 represents the variance of the total score obtained by combining all items in the scale.

In general, a Cronbach's Alpha equal to or above 0.70 will be considered an indication of acceptable internal consistency. If a lower value is obtained, the individual items will be examined before constructing the final variable.

Cronbach's Alpha will therefore be calculated for Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities and Business Experimentation Effectiveness. Artificial Intelligence is measured through a single questionnaire item, while Regulatory Constraints is derived from the question concerning the main barriers to Business Experimentation. Consequently, Cronbach's Alpha will not be calculated for these variables, and they will be included directly in the subsequent analyses.

Creation of the Variable Scores

Once the reliability of the multi-item constructs has been assessed, a single score will be created for each variable.

For constructs measured through multiple items, the score will be calculated as the average of the responses to the corresponding questions. In general, the score for construct can be expressed as:

$$X_I = \frac{1}{K} \sum_{j=1}^k x_{ij}$$

where represents the score of respondents for a specific construct, represents the number of items used to measure the construct, and represents the response of respondent to item.

For example, Management Support will be calculated as the average of Q12 and Q13. The same procedure will be applied to Organizational Culture, Organizational Structure, Organizational Capabilities and Business Experimentation Effectiveness. Artificial Intelligence will retain its original single-item score, while Regulatory Constraints will be coded as a binary variable, taking the value of 1 when selected among the main barriers to Business Experimentation and 0 otherwise.

This procedure will result in one value for each variable and each respondent, which will then be used in the subsequent statistical analyses.

Correlation Analysis

The next stage will examine the relationships between the variables through a correlation analysis.

The correlation coefficient will indicate both the direction and the strength of the association between two variables. A positive coefficient will indicate that higher values of one variable tend to be associated with higher values of the other, while a negative coefficient will indicate an inverse relationship.

For example, the analysis will make it possible to determine whether organizations reporting higher levels of Management Support also tend to report higher Business Experimentation Effectiveness. The same relationship will be examined for the other organizational factors included in the model.

The results will be presented through a correlation matrix, allowing the relationships among all variables to be observed simultaneously. This analysis will also provide an initial indication of whether some independent variables are strongly correlated with each other, which will be relevant when evaluating potential multicollinearity before conducting the regression analysis.

However, correlations will only be interpreted as statistical associations and will not be considered evidence of a causal relationship between the variables.

Multiple Linear Regression

The main statistical analysis will consist of a multiple linear regression, which will be used to examine the relationship between the organizational factors identified in the Literature Review and Business Experimentation Effectiveness.

Unlike the correlation analysis, which considers the relationship between two variables at a time, multiple regression makes it possible to examine all the independent variables simultaneously. This allows the association between each organizational factor and the dependent variable to be estimated while taking the other factors included in the model into account.

The empirical model can be represented as follows:

$$BEO_i = \beta_0 + \beta_1 MS_i + \beta_2 OC_i + \beta_3 OS_i + \beta_4 CAP_i + \beta_5 AI_i + \beta_6 RC_i + \sum_{k=1}^m \gamma_k Control_{ki} + \varepsilon_i$$

where BEO_i represents Business Experimentation Effectiveness for organization I ; MS_i represents Management Support; OC_i Organizational Culture; OS_i Organizational Structure; CAP_i Organizational Capabilities; AI_i Artificial Intelligence; and RC_i Regulatory Constraints. The term β_0 represents the intercept, the coefficients β_1 to β_6 represent the estimated relationships between the independent variables and Business Experimentation Effectiveness, and ε_i represents the error term.

The interpretation of the regression will focus primarily on the estimated coefficients and their statistical significance. A positive coefficient will indicate that higher levels of the corresponding organizational factor are associated with higher Business Experimentation Effectiveness, whereas a negative coefficient will indicate an inverse relationship.

Statistical significance will be evaluated through the p-value, using a significance level of 0.05. A p-value below this threshold will be interpreted as evidence of a statistically significant association between the corresponding variable and Business Experimentation Effectiveness.

The explanatory power of the overall model will be evaluated using R^2 , which indicates the proportion of variation in Business Experimentation Effectiveness explained collectively by the variables included in the regression:

The Adjusted R^2 , will also be considered, as it adjusts the measure according to the number of predictors included in the model and therefore provides a more conservative assessment of its explanatory power.

Before interpreting the regression results, the main assumptions underlying the model will also be examined, including linearity, homoscedasticity, the behaviour of the residuals and the absence of excessive multicollinearity among the independent variables. This analytical procedure will make it possible to identify which organizational factors are significantly associated with Business Experimentation Effectiveness and to assess their relative contribution while controlling for the other factors included in the model. The results will therefore provide the empirical basis for answering the Research Question developed in the previous chapter.

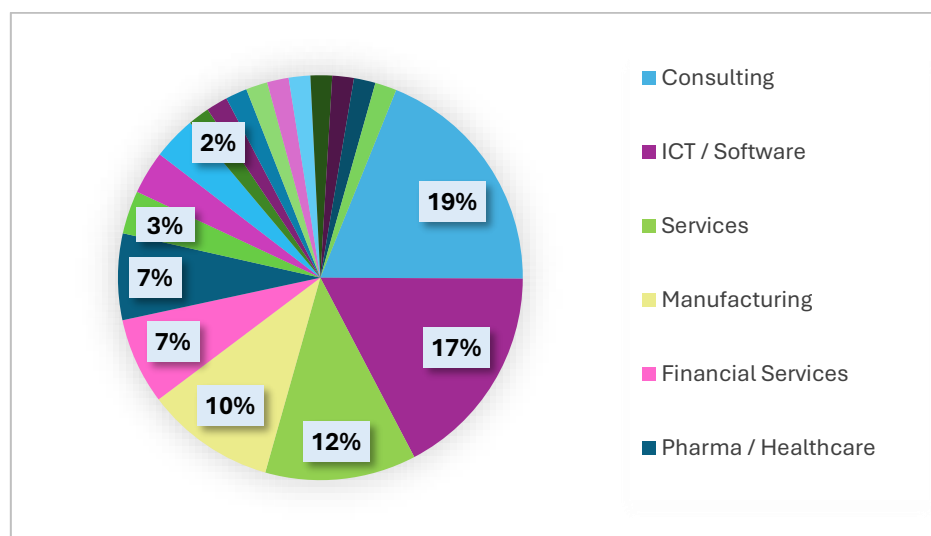
4. Findings

4.1 Sample Description

The survey collected a total of 58 responses from individuals working in organizations characterized by different industries, company sizes, professional roles, geographical scopes, and levels of innovation orientation. The composition of the sample therefore provides a heterogeneous representation of organizational contexts, which is consistent with the cross-industry perspective adopted in this study.

Regarding industry distribution, the sample includes organizations operating across a wide range of sectors. The most represented sector is Consulting, with 11 respondents (19.0%), followed by ICT/Software, with 10 respondents (17.2%), Services, with 7 (12.1%), and Manufacturing, with 6 (10.3%). Financial Services and Pharma/Healthcare account for 4 respondents each (6.9%). The remaining responses are distributed across several other industries, including Retail, Energy & Utilities, Automotive, Food & Beverage, Consumer Goods, Semiconductor, E-commerce, Public Sector, Automation, and other specialized activities. Overall, the distribution indicates that the sample is not concentrated within a single industry and captures organizations operating in substantially different business environments.

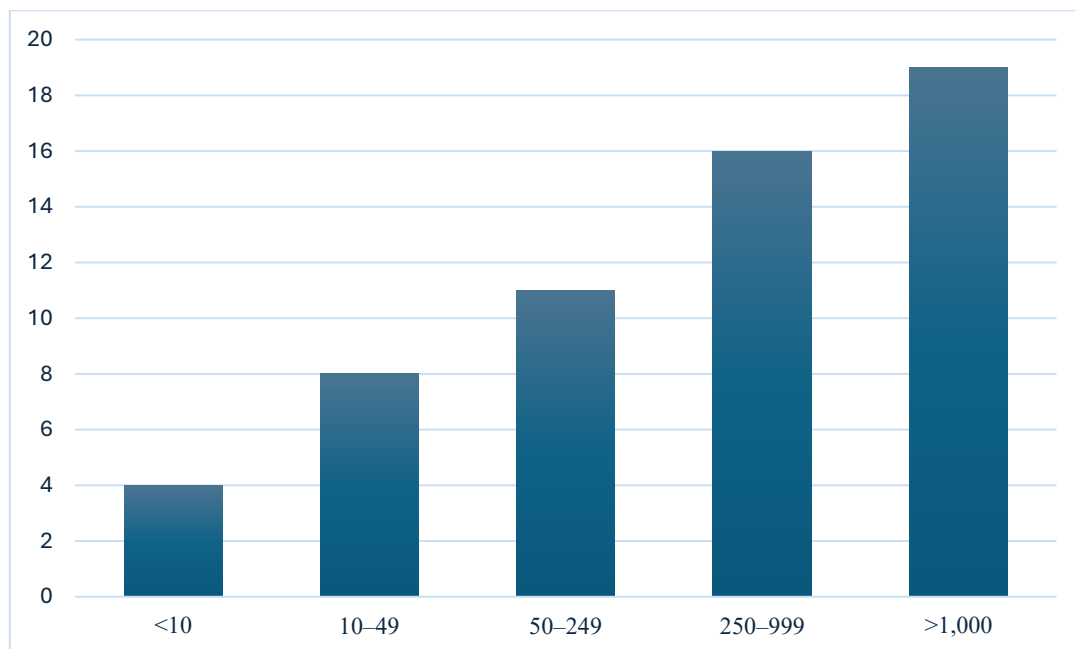
Figure 4.1 – Industry Distribution of Respondents



Note. Based on data collected through the questionnaire developed for this study (N = 58).

Similarly heterogeneous distribution emerges in terms of company size. Large organizations with more than 1,000 employees represent the largest individual category, accounting for 19 respondents (32.8%). At the same time, 16 respondents (27.6%) work in organizations with fewer than 10 employees. Medium-sized organizations are also represented: 11 respondents (19.0%) belong to companies with 50–249 employees and 8 (13.8%) to companies with 250–999 employees, while 4 respondents (6.9%) work in organizations with 10–49 employees. The sample therefore includes both very small organizations and large corporations, rather than being concentrated around a specific organizational size.

Figure 4.2 – Company Size Distribution

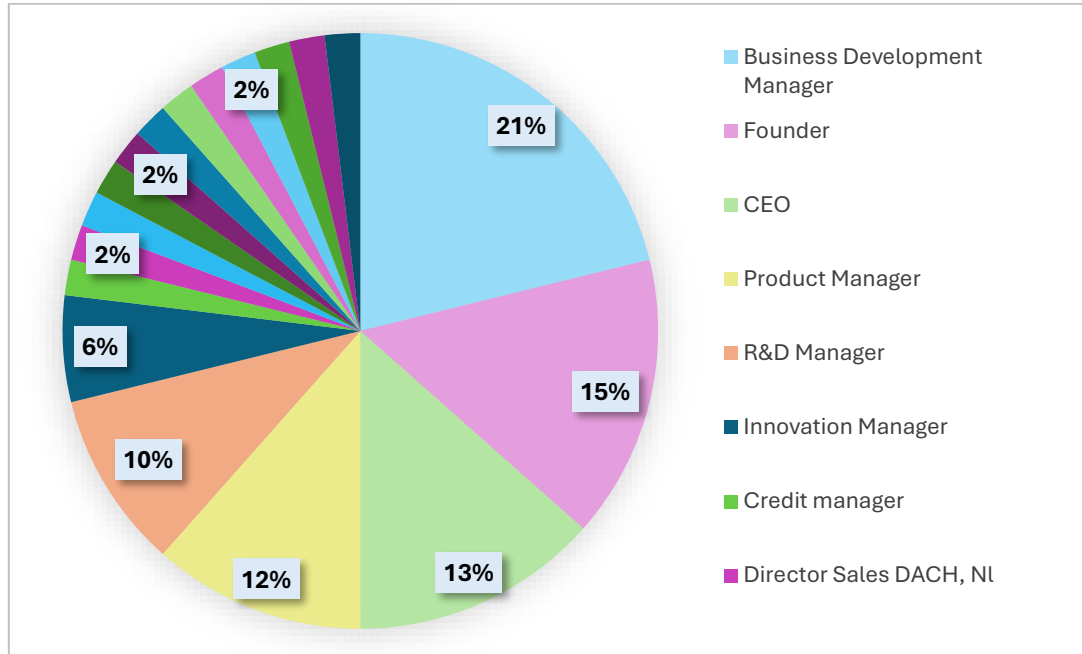


Note. Based on data collected through the questionnaire developed for this study (N = 58).

The respondents also hold a broad range of professional positions. The most represented role is Business Development Manager, reported by 11 respondents (19.0%), followed by Founder, with 8 respondents (13.8%), and CEO, with 7 (12.1%). Product Managers account for 6 respondents (10.3%), while 5 respondents (8.6%) are R&D Managers and 3 (5.2%) are Innovation Managers. The remaining participants hold a variety of positions in areas such as sales, business intelligence, software engineering, legal, consulting, data, and management. This diversity provides perspectives from respondents occupying

different organizational functions and levels of responsibility, including both entrepreneurial and managerial roles.

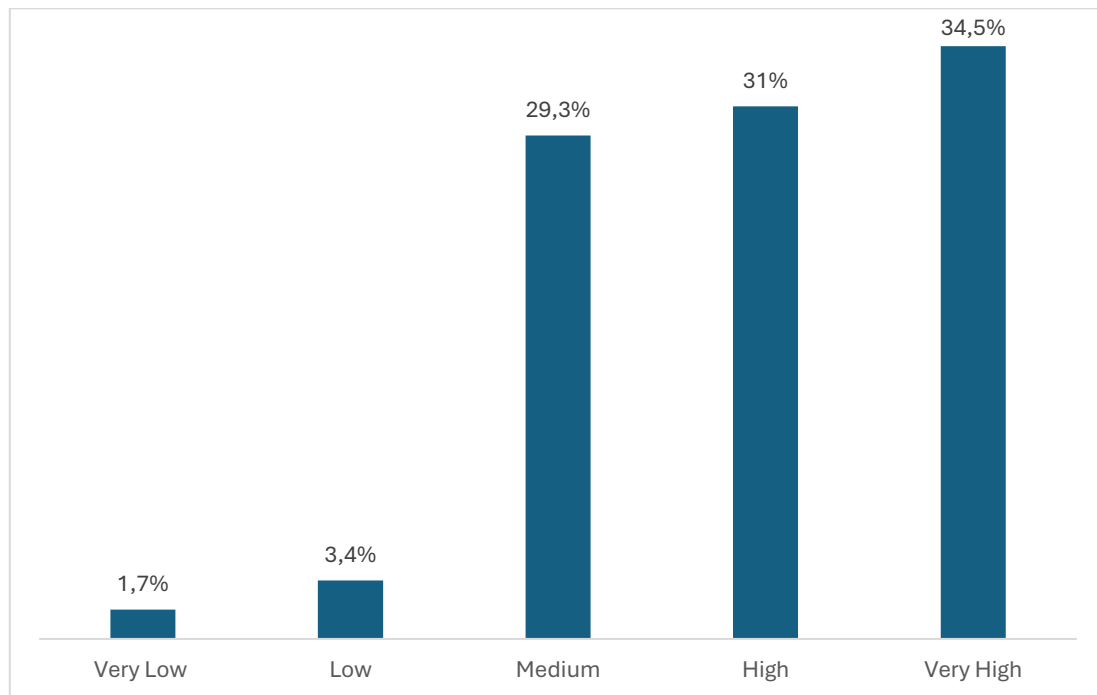
Figure 4.3 – Respondents' Current Positions



Note. Based on data collected through the questionnaire developed for this study (N = 58).

The sample is characterized by a relatively strong orientation toward innovation. On the five-point scale used in the questionnaire, 20 respondents (34.5%) assigned their organization the highest score of 5, while 18 (31.0%) selected 4. A further 17 respondents (29.3%) selected the intermediate value of 3. Only 3 respondents provided a score below the midpoint: 2 respondents (3.4%) selected 2 and 1 respondent (1.7%) selected 1. Overall, 65.5% of the sample rated their organization's innovation orientation as either 4 or 5, suggesting that the majority of respondents operate in organizational environments characterized by a relatively high orientation toward innovation.

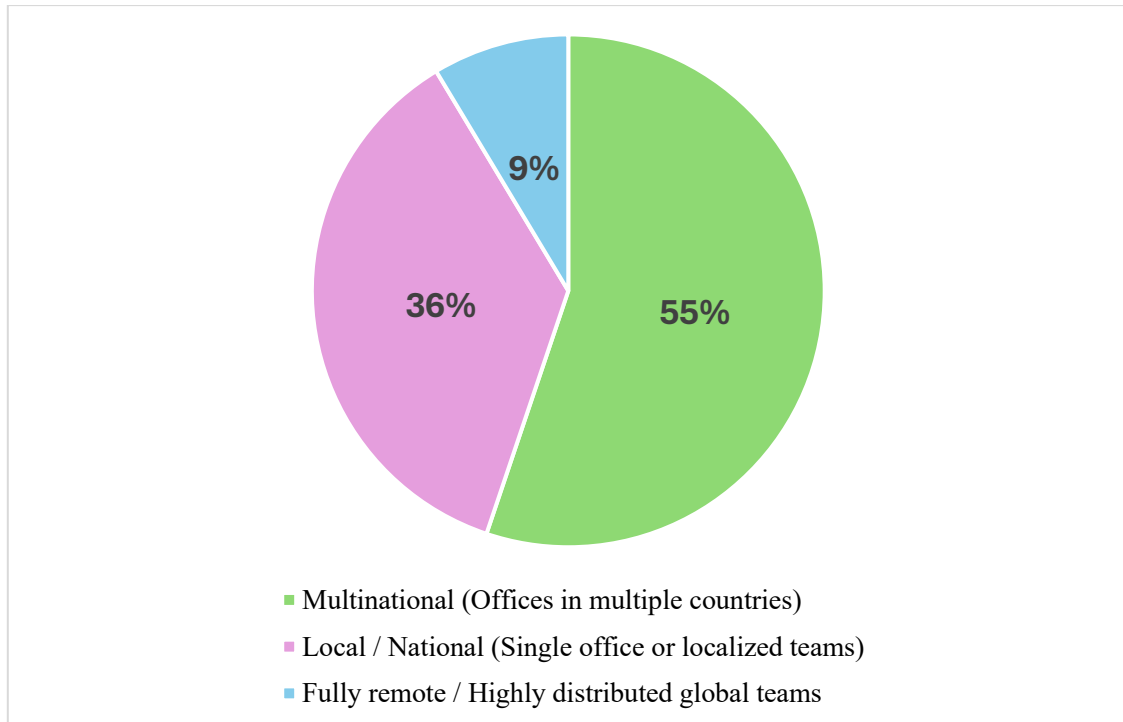
Figure 4.4 – Organizational Orientation toward Innovation



Note. Based on data collected through the questionnaire developed for this study (N = 58).

The organizations included in the sample also differ in terms of their geographical scope and team structure. More than half of the respondents, 32 out of 58 (55.2%), work in multinational organizations with offices in multiple countries. Local or national organizations with a single office or localized teams account for 21 respondents (36.2%), while 5 respondents (8.6%) work in organizations characterized by fully remote or highly distributed global teams. The sample therefore includes both organizations operating primarily within national boundaries and organizations characterized by an international or geographically distributed structure.

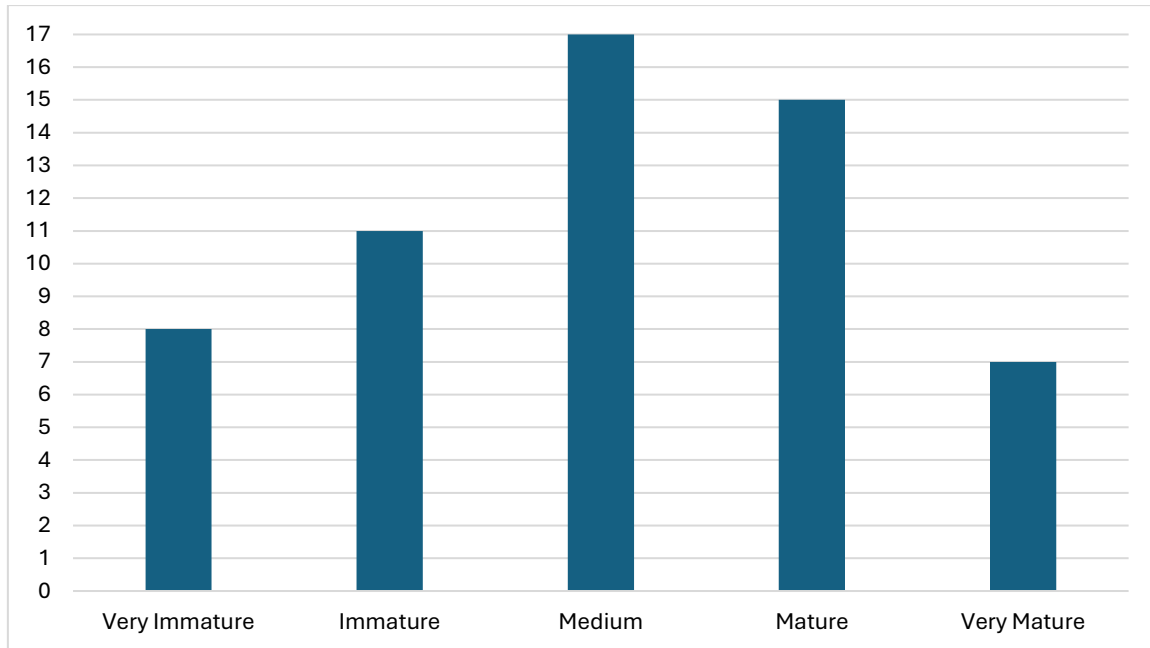
Figure 4.5 – Geographical Scope and Team Structure



Note. Based on data collected through the questionnaire developed for this study (N = 58).

Respondents were asked also to provide an overall assessment of their organization's Business Experimentation maturity on a five-point scale. The responses are distributed across all five levels, indicating considerable variation within the sample. The most frequent rating is 3, selected by 17 respondents (29.3%), followed by 4, selected by 15 respondents (25.9%). Eleven respondents (19.0%) rated their organization's maturity at level 2, while 8 (13.8%) selected the lowest level and 7 (12.1%) selected the highest level. Unlike innovation orientation, which is relatively concentrated toward the upper end of the scale, Business Experimentation maturity shows a more dispersed distribution. This suggests that the organizations represented in the sample differ substantially in the extent to which experimentation has developed into an established organizational practice.

Figure 4.6 – Business Experimentation Maturity



Note. Based on data collected through the questionnaire developed for this study (N = 58).

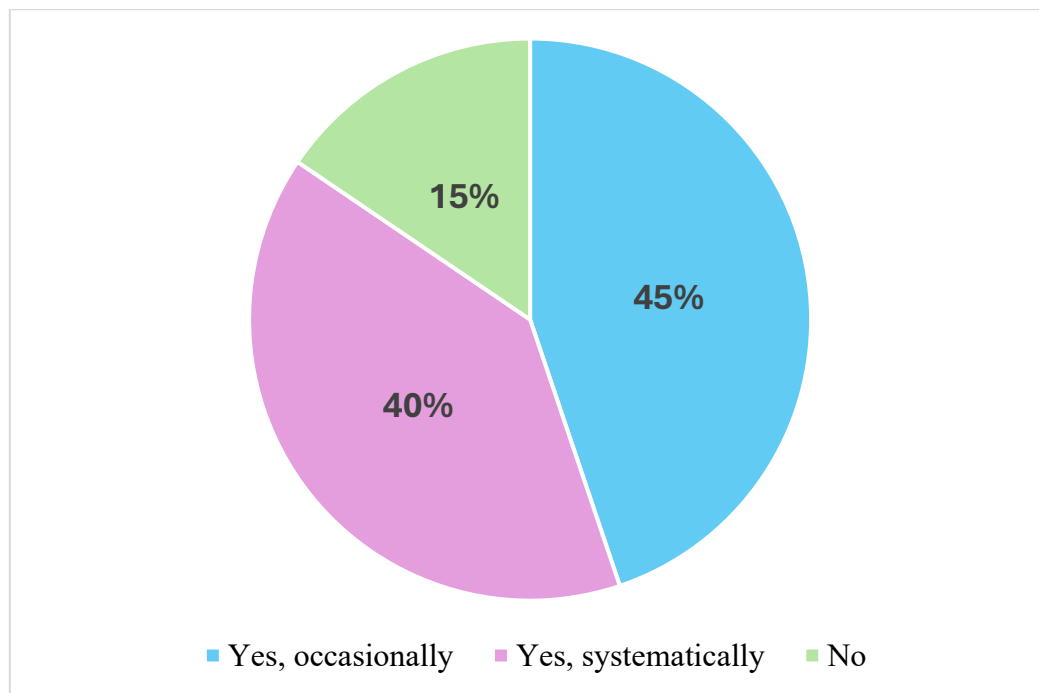
The descriptive analysis shows that the 58 respondents come from organizations with different characteristics in terms of industry, company size, professional role, geographical scope, innovation orientation, and Business Experimentation maturity. The sample therefore includes a range of organizational profiles, which provides useful context for the subsequent analysis of Business Experimentation and its relationship with organizational factors.

Respondents were subsequently asked whether their organizations currently apply Business Experimentation, based on the definition provided in the questionnaire. As shown in Figure 4.7, the majority of the organizations included in the sample reported using Business Experimentation to some extent. More specifically, 23 respondents (39.7%) indicated that Business Experimentation is applied systematically within their organization, while 26 respondents (44.8%) reported using it occasionally. The remaining 9 respondents (15.5%) stated that their organization does not currently apply Business Experimentation.

Therefore, 49 out of the 58 organizations (84.5%) reported some degree of Business Experimentation adoption. Since the subsequent sections of the questionnaire focused specifically on how Business Experimentation is implemented and on the organizational

factors associated with its effectiveness, these 49 respondents constitute the relevant sample for the subsequent empirical analyses. The 9 respondents who reported not using Business Experimentation were not included in analyses requiring direct experience with experimentation practices.

Figure 4.7 – Adoption of Business Experimentation



Note. Based on data collected through the questionnaire developed for this study (N = 58).

4.2 Reliability Analysis

The reliability analysis was conducted on the multi-item constructs included in the empirical model. Table 4.1 reports the Cronbach's Alpha values obtained for Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities, and Business Experimentation Effectiveness, together with the number of valid observations available for each construct.

Table 4.1 – Cronbach's Alpha

	N° of items	Valid N	Cronbach's Alpha
Management Support	2	46	0.818
Organizational Culture	3	46	0.867
Organizational Structure	2	47	0.831
Organizational Capabilities	3	46	0.857
Business Experimentation Effectiveness	5	45	0.904

Values were calculated using Python.

The results show satisfactory levels of internal consistency across all the constructs included in the analysis. Business Experimentation Effectiveness presents the highest Cronbach's Alpha ($\alpha = 0.904$), followed by Organizational Culture ($\alpha = 0.867$), Organizational Capabilities ($\alpha = 0.857$), Organizational Structure ($\alpha = 0.831$), and Management Support ($\alpha = 0.818$). All coefficients exceed the conventional threshold of 0.70, supporting the internal consistency of the items used to measure each construct.

The number of valid observations varies slightly across constructs due to missing or Not Applicable responses, which were excluded from the reliability calculation for the corresponding construct. Based on these results, all five multi-item constructs were retained for the subsequent analyses.

Artificial Intelligence and Regulatory Constraints were not included in the reliability analysis, as they were not measured through multi-item scales. Artificial Intelligence was measured through a single Likert-scale item, while Regulatory Constraints were derived from the multiple-choice question concerning the main barriers to Business Experimentation.

4.3 Construction of Variables and Descriptive Statistics

After identifying the organizations that use Business Experimentation and assessing the reliability of the multi-item scales, the next step consisted of constructing the variables used in the empirical analysis. As discussed in the previous section, the analysis from this

point onwards focuses on the 49 organizations that reported using Business Experimentation, either systematically or occasionally.

The variables included in the model were constructed based on the responses to the different questionnaire items. Most items were measured using a five-point Likert scale, ranging from 1 (“Strongly disagree”) to 5 (“Strongly agree”). Since several dimensions were measured through more than one question, a single score was first calculated for each respondent and for each construct.

The score was obtained by calculating the mean of the items belonging to the same dimension.

More specifically, Management Support was calculated as the mean of Q12 and Q13, while Organizational Culture was based on Q14, Q15 and Q16. Organizational Structure was calculated using Q17 and Q18, and Organizational Capabilities using Q19, Q20 and Q21. The dependent variable, Business Experimentation Effectiveness, was calculated as the mean of Q35–Q39. These five items capture the main outcomes associated with Business Experimentation considered in this study: improvement in managerial decision-making quality, acceleration of innovation, reduction of innovation risk, positive impact on business performance, and improvement in customer satisfaction. Artificial Intelligence, corresponding to Q22, was instead measured through a single item and was therefore used directly without calculating a composite score.

Regulatory Constraints required a different approach because the variable was derived from Q43, where respondents could select the main barriers preventing or limiting Business Experimentation. A binary variable was therefore created, assigning a value of 1 when “Regulatory constraints” was selected and 0 when it was not selected.

Particular attention was also given to the treatment of N/A responses. These responses were considered missing values and were not replaced with zero or any other value, in order to avoid introducing information that was not actually provided by the respondents. At the same time, respondents were not automatically excluded when sufficient information was still available to calculate a construct. For Management Support and Organizational Structure, which are both based on two items, both answers were required to calculate the score. If one of the two answers was N/A, the corresponding construct was therefore treated as missing for that respondent. For Organizational Culture and

Organizational Capabilities, which consist of three items, the score was calculated when at least two out of three responses were available. For example, if a respondent reported values of 4 and 5 for two items and N/A for the third, the resulting score was calculated using the two available responses and was therefore equal to 4.5. Finally, for Business Experimentation Effectiveness, which consists of five items, at least three valid responses out of five were required.

This approach made it possible to use the information available in the dataset without assigning arbitrary values to missing responses and, at the same time, without unnecessarily removing respondents from the analysis. As a result, the number of valid observations differs slightly across variables: 46 for Management Support, 47 for Organizational Culture, 47 for Organizational Structure, 49 for Organizational Capabilities, 48 for Artificial Intelligence, and 49 for both Regulatory Constraints and Business Experimentation Effectiveness. These variable-specific valid observations were used in the descriptive and correlation analyses, while the multiple regression was subsequently based on complete cases across all variables included in the model.

Once an individual score had been obtained for each variable and each organization, descriptive statistics were calculated to provide an initial overview of the data. Table 4.2 reports the number of valid observations, the mean, the standard deviation, and the minimum and maximum values observed for each variable. The mean represents the average value of each variable across the organizations included in the analysis, while the standard deviation indicates how much the individual scores differ around that average. A higher standard deviation therefore indicates greater differences among organizations. Minimum and maximum values show the lowest and highest scores observed in the sample.

Table 4.2 Descriptive Statistics of the Analysis Variables

Variable	Valid N	Mean	SD	Min	Max
Management Support	46	4.00	0.95	1	5
Organizational Culture	47	3.76	0.93	1	5
Organizational Structure	47	3.60	1.12	1	5
Organizational Capabilities	49	3.57	0.95	1	5
Artificial Intelligence	48	3.71	1.25	1	5
Regulatory Constraints	49	0.16	0.37	0	1
Business Experimentation Effectiveness	49	4.00	0.82	1	5

Note: Regulatory Constraints is a binary variable coded as 0 = not selected and 1 = selected. All other variables are measured on a scale ranging from 1 to 5. Values were calculated using Python.

The descriptive results show that the four organizational dimensions included in the model have average values above the midpoint of the scale, although some differences can be observed. Management Support has the highest mean among the organizational factors ($M = 4.00$; $SD = 0.95$). This indicates that respondents generally perceive a relatively high level of management support for experimentation and evidence-based decision making. At the same time, the standard deviation shows that the level of support is not the same across all organizations.

Organizational Culture has a mean of 3.76 ($SD = 0.93$), also indicating a generally positive assessment. This suggests that elements such as learning from failure, psychological safety, and encouragement of experimentation are relatively present within the organizations analyzed. However, its mean is slightly lower than that of Management Support. At a descriptive level, this may suggest that management support for experimentation is somewhat stronger than the extent to which an experimentation-oriented culture is spread throughout the organization. This difference should, however, be interpreted only descriptively at this stage and does not by itself indicate a statistically significant difference.

Organizational Structure has a mean of 3.60 ($SD = 1.12$). The result suggests that structured experimentation processes and systematic practices for documenting and sharing results are present in the sample, although to a lower extent than Management Support and Organizational Culture. The relatively higher standard deviation also shows

greater differences among organizations. In other words, some organizations appear to have highly structured Business Experimentation processes, while others seem to conduct experimentation in a less formalized way. Organizational Capabilities shows the lowest mean among the four organizational factors ($M = 3.57$; $SD = 0.95$). This dimension includes employee competencies, data availability, and the support provided by digital technologies. Although the mean remains above the midpoint of the scale, these capabilities appear, on average, to be somewhat less developed than management support and organizational culture.

Considering the four organizational dimensions together, an interesting descriptive pattern therefore emerges. Management Support has the highest average score (4.00), followed by Organizational Culture (3.76), Organizational Structure (3.60), and Organizational Capabilities (3.57). This suggests that support for Business Experimentation is particularly strong at the management level, while the dimensions related to its implementation through organizational processes and capabilities show slightly lower average values. At this stage, these results simply describe the characteristics of the sample; the subsequent analyses will examine whether these organizational dimensions are actually related to Business Experimentation Effectiveness.

A particularly interesting result concerns Artificial Intelligence, which has a mean of 3.71 and a standard deviation of 1.25. The average value suggests a relatively high use of AI to support Business Experimentation activities. However, AI also has the highest standard deviation among all variables measured on the five-point scale. This means that its use differs considerably across the organizations in the sample: while some respondents report high levels of AI use, others report much lower levels. This variation is particularly relevant for the following analyses, which will examine whether different levels of AI use are associated with different levels of Business Experimentation Effectiveness.

The dependent variable, Business Experimentation Effectiveness, has a mean of 4.00 ($SD = 0.82$). Overall, respondents therefore report a positive assessment of the outcomes associated with Business Experimentation. This score considers the combined evaluation of its contribution to managerial decision making, innovation, innovation risk reduction, business performance, and customer satisfaction. The standard deviation is relatively lower than for the other variables, suggesting that respondents are more similar in their

assessment of Business Experimentation Effectiveness. Nevertheless, the observed values range from 1 to 5, showing that differences in perceived effectiveness still exist across organizations.

Regulatory Constraints requires a different interpretation, as it is a binary variable rather than a five-point scale. Its mean of 0.16 reflects the proportion of organizations coded as 1 and should therefore not be interpreted as an average “level” of regulatory constraints. More specifically, 8 out of 49 organizations (16.3%) selected Regulatory Constraints among the barriers to Business Experimentation, while 41 organizations (83.7%) did not select this option. Regulatory Constraints therefore represent an explicitly identified barrier for a minority of the organizations in the sample. However, not selecting this option does not necessarily mean that regulation has no influence on the organization; it only indicates that the respondent did not identify Regulatory Constraints among the barriers included in the question.

The descriptive statistics provide an initial overview of the variables included in the empirical analysis. Management Support shows the highest average level among the organizational factors, while Organizational Structure and Organizational Capabilities present slightly lower values. Artificial Intelligence is characterized by the greatest variation across organizations, while Business Experimentation Effectiveness shows a relatively high average score and a more limited dispersion. These results describe the main characteristics of the sample but do not yet show whether the different factors are related to Business Experimentation Effectiveness. The next step of the analysis therefore examines the relationships among the variables through correlation analysis.

4.4 Correlation Analysis

Following the descriptive analysis, a correlation analysis was conducted to examine the relationships between the different factors considered in the study and Business Experimentation Effectiveness. Pearson’s correlation coefficient (r) was used, as it measures both the direction and the strength of the linear relationship between two variables. The coefficient ranges from -1 to $+1$: positive values indicate that the variables tend to move in the same direction, while negative values indicate an opposite relationship. The closer the coefficient is to either $+1$ or -1 , the stronger the relationship. The corresponding p-values were also considered to assess statistical significance, using

a significance level of 5%. It is important to note that correlation identifies an association between variables, but does not establish a cause-and-effect relationship.

Table 4.3 Pearson Correlation Matrix

Variable	1	2	3	4	5	6	7
1.Management Support	1						
2.Organizational Culture	.750***	1					
3.Organizational Structure	.564***	.692***	1				
4.Organizational Capabilities	.560***	.626***	.839***	1			
5.Artificial Intelligence	.292*	.411**	.578***	.547***	1		
6.Regulatory Constraints	.242	.201	.371*	.243	.048	1	
7.Business Experimentation Effectiveness	.705***	.766***	.577***	.614***	.324*	.354*	1

*Note: Pearson's correlation coefficients are reported. Pairwise deletion was used for missing values; therefore, the number of observations may vary across correlations. * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed). Values were calculated using Python.*

As shown in Table 4.3, all the factors considered are positively and statistically significantly associated with Business Experimentation Effectiveness, although with different levels of strength. The strongest relationship is found for Organizational Culture ($r = .766$, $p < .001$, $N = 47$), suggesting that organizations with a culture that is more supportive of experimentation also tend to report higher levels of Business Experimentation Effectiveness. Management Support also shows a strong positive relationship ($r = .705$, $p < .001$, $N = 46$), indicating that organizations in which management provides greater support tend to achieve higher levels of experimentation effectiveness. This may reflect the importance of management in supporting new initiatives, providing the necessary resources and creating an environment that is open to

experimentation. Positive relationships are also found for Organizational Capabilities ($r = .614, p < .001, N = 49$) and Organizational Structure ($r = .577, p < .001, N = 47$). Therefore, although their correlations are slightly weaker than those of Culture and Management Support, both dimensions appear to be clearly associated with Business Experimentation Effectiveness.

A different result emerges for Artificial Intelligence. AI is positively and significantly associated with Business Experimentation Effectiveness, but the relationship is weaker than for the main organizational factors ($r = .324, p = .025, N = 48$). One possible explanation may be that simply adopting or using AI does not necessarily mean that firms are already able to integrate it effectively into their experimentation processes. Mikalef and Gupta (2021) highlight that generating value from AI does not depend only on the availability of the technology itself, but also on the ability of an organization to combine different resources and develop an actual AI capability. From this perspective, some firms may already use AI tools without having fully developed the capabilities needed to apply them effectively to Business Experimentation. AI also covers a very broad range of technologies and applications, and its use specifically for experimentation may still be relatively unexplored for many organizations. This could help explain why its relationship with Business Experimentation Effectiveness is positive but weaker than the relationships observed for the organizational factors. However, this remains a possible interpretation of the result rather than something that can be directly demonstrated through the correlation analysis.

An interesting result is also found for Regulatory Constraints ($r = .354, p = .013, N = 49$). This variable requires a slightly different interpretation because it was coded as a binary variable: 1 indicates that the organization identified Regulatory Constraints as a barrier to Business Experimentation, while 0 indicates that it did not. In the sample, 8 organizations reported Regulatory Constraints and 41 did not. When a binary variable coded as 0/1 is correlated with a quantitative variable, Pearson's correlation is mathematically equivalent to a point-biserial correlation, meaning that no additional test was required. In practical terms, the positive coefficient indicates that the organizations that reported Regulatory Constraints tend to have higher levels of Business

Experimentation Effectiveness than those that did not report them. This result may seem unexpected, but it does not mean that regulatory constraints directly improve experimentation effectiveness, nor that firms facing more constraints perform better, since the variable only captures whether this barrier was selected or not. One possible explanation is that firms operating in more regulated contexts may need to follow more structured procedures when introducing new products, processes or solutions. In these situations, Business Experimentation may become particularly useful because it allows firms to test new solutions in a controlled way before implementing them on a larger scale. These organizations may therefore be more likely to develop more structured and formalised experimentation processes. However, this interpretation remains exploratory, as the result could also be related to other characteristics of the organizations, such as their industry, size or level of organizational maturity.

The matrix also shows several significant relationships among the organizational factors themselves. Management Support and Organizational Culture are strongly correlated ($r = .750$, $p < .001$), suggesting that organizations where management is more supportive of Business Experimentation also tend to have a culture that is more favourable to experimentation. Organizational Culture is also positively related to Organizational Structure ($r = .692$, $p < .001$) and Organizational Capabilities ($r = .626$, $p < .001$). This suggests that a culture that supports experimentation tends to be associated with organizational structures and capabilities that are also more favourable to this type of activity. In other words, these organizational conditions do not appear to be completely separate but tend to coexist within the organizations in the sample.

The strongest correlation among the organizational factors is found between Organizational Structure and Organizational Capabilities ($r = .839$, $p < .001$). This indicates that organizations with structures that are more supportive of Business Experimentation also tend to report stronger capabilities for carrying it out. The particularly high correlation suggests that these two dimensions are closely connected in practice: having an organizational structure that facilitates experimentation may often go together with having the capabilities needed to manage and support experimentation effectively. However, the correlation does not indicate that one dimension causes the

other, and the two variables continue to represent different aspects of the organizational context considered in this study.

Sensitivity Analysis

Two observations, 11 and 40, showed values that were particularly distant from most of the sample for some of the variables considered. These observations were not removed from the main analysis, as they represent valid responses and their values fall within the possible range of the scales used. However, since they could influence the strength of the correlations, a sensitivity analysis was conducted by temporarily excluding observations 11 and 40 and recalculating Pearson's correlations. The purpose of this analysis was to assess whether the relationships observed in the full sample remained similar when these two observations were excluded.

Table 4.4 Sensitivity Analysis of Pearson Correlations

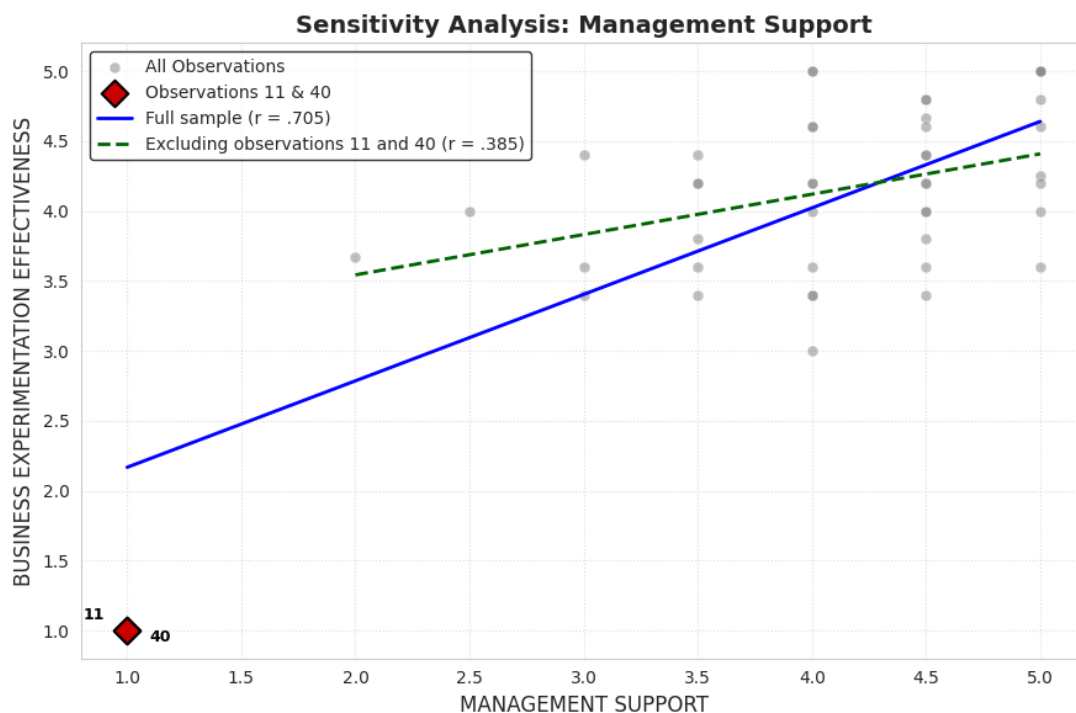
Predictor	Full sample			Excluding Observations 11 and 40		
	Pearson's R	P-Value	N	Pearson's R	P-Value	N
Management Support	.705	< .001	46	.385	.010	44
Organizational Culture	.766	< .001	47	.563	< .001	45
Organizational Structure	.577	< .001	47	.354	.017	45
Organizational Capabilities	.614	< .001	49	.342	.019	47
Artificial Intelligence	.324	.025	48	.156	.299	46
Regulatory Constraints	.354	.013	49	.442	.002	47

Note. Correlations are calculated with Business Experimentation Effectiveness. Observations 11 and 40 were excluded only for the sensitivity analysis and were retained in the main analysis. Values were calculated using Python.

As shown in Table 4.4, excluding the two observations reduces the strength of the correlations for the main organizational factors. Management Support decreases from $r = .705$ to $r = .385$, Organizational Culture from $r = .766$ to $r = .563$, Organizational Structure from $r = .577$ to $r = .354$, and Organizational Capabilities from $r = .614$ to $r = .342$. Despite this reduction, all four relationships remain positive and statistically significant. Therefore, observations 11 and 40 affect the strength of these correlations, but do not change the general conclusion regarding these organizational factors.

The effect can be seen particularly clearly for Management Support, as shown in Figure 4.8. Observations 11 and 40 have low values for both Management Support and Business Experimentation Effectiveness and are positioned away from most of the other observations. With the full sample, the relationship is relatively strong ($r = .705$), while after temporarily excluding the two observations it remains positive but becomes weaker ($r = .385$).

Figure 4.8 – Sensitivity Analysis of the Relationship between Management Support and Business Experimentation Effectiveness



Note. The figure compares the relationship using the full sample and after excluding observations 11 and 40. Python output.

The result for Artificial Intelligence requires greater caution. In the full sample, its relationship with Business Experimentation Effectiveness is positive and statistically significant ($r = .324$, $p = .025$). After excluding observations 11 and 40, the coefficient decreases to $r = .156$ and is no longer statistically significant ($p = .299$). The association involving Artificial Intelligence therefore appears to be more sensitive to these two observations and should be interpreted with greater caution.

Regulatory Constraints shows a different pattern. After excluding the two observations, the correlation increases from $r = .354$ to $r = .442$ and remains statistically significant ($p = .002$). This suggests that the positive association found in the main analysis is not driven by observations 11 and 40 and, in fact, becomes somewhat stronger when they are excluded.

The sensitivity analysis therefore shows that observations 11 and 40 mainly affect the strength of some correlations rather than their direction. Since these observations represent valid data rather than errors, they were retained in the main analysis. The sensitivity analysis is used as an additional check to provide a more transparent interpretation of the results, particularly for Artificial Intelligence, whose association appears less stable.

4.5 Multiple Linear Regression Analysis

Following the correlation analysis, a multiple linear regression was conducted to assess the simultaneous contribution of the six predictors to Business Experimentation Effectiveness. While the Pearson correlation analysis examined the relationship between each predictor and Business Experimentation Effectiveness separately, multiple regression allows the unique contribution of each variable to be evaluated while controlling for the remaining predictors.

The model included Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities, Artificial Intelligence, and Regulatory Constraints as independent variables, with Business Experimentation Effectiveness as the dependent variable. The regression analysis was based on the 49 organizations that reported using Business Experimentation. However, since multiple regression requires complete information for all variables included in the model, five observations were excluded

because of missing or Not Applicable values in at least one of the variables. The regression was therefore estimated using 44 complete observations.

Multicollinearity Assessment

Before interpreting the regression results, multicollinearity among the independent variables was assessed through the Variance Inflation Factor (VIF). Multicollinearity occurs when predictors are strongly related to one another and therefore contain overlapping information. High levels of multicollinearity can make it difficult to distinguish the unique contribution of individual predictors within a multiple regression model.

Table 4.5 – Multicollinearity Assessment

Predictor	VIF
Management Support	2.86
Organizational Culture	3.50
Organizational Structure	4.73
Organizational Capabilities	4.30
Artificial Intelligence	1.66
Regulatory Constraints	1.27

VIF = Variance Inflation Factor. Values were calculated using Python.

All VIF values remained below the adopted threshold of 5, suggesting that multicollinearity did not reach a critical level that would prevent the interpretation of the regression model. Nevertheless, Organizational Structure (VIF = 4.73) and Organizational Capabilities (VIF = 4.30) showed comparatively higher values. This finding is consistent with the strong bivariate correlation previously observed between these two constructs ($r = .839$), indicating a relatively high degree of overlap between these organizational dimensions. Therefore, while no critical multicollinearity issue emerged according to the adopted criterion, this overlap should be considered when interpreting their individual regression coefficients.

Overall Model Fit

The overall results of the multiple regression model are presented in Table 4.6.

Table 4.6 – Multiple Linear Regression Model Summary

Model Statistic	Value
N	44
R ²	.702
Adjusted R ²	.654
F-Statistic	14.52
DF	(6, 37)
P-Value	< .001

Note. Dependent variable: Business Experimentation Effectiveness. Results obtained using Python.

The model showed an R^2 of .702, meaning that the six predictors, when considered together, accounted for approximately 70.2% of the observed variance in Business Experimentation Effectiveness within the sample. This indicates a substantial overall model fit, although the remaining variation may be associated with other factors not included in the analysis or with unexplained variation. The remaining variance may be related to other factors not included in the analysis or to unexplained variation.

The Adjusted R^2 was .654. Since this measure takes into account both the number of predictors and the sample size, it provides a more conservative estimate of the model's explanatory power. Even after this adjustment, the model accounted for approximately 65.4% of the variance in Business Experimentation Effectiveness, confirming that its explanatory power remains substantial.

The regression model was also statistically significant overall, $F(6, 37) = 14.52$, $p < .001$. This means that the six predictors, considered together, provide meaningful information for explaining differences in Business Experimentation Effectiveness. More specifically, the model including Management Support, Organizational Culture, Organizational Structure, Organizational Capabilities, Artificial Intelligence, and Regulatory Constraints explains the observed variation in Business Experimentation Effectiveness significantly better than a model in which none of these predictors is considered.

Therefore, although not all predictors were individually statistically significant, the model as a whole showed a strong and statistically significant relationship with Business Experimentation Effectiveness.

The next step was to examine the individual regression coefficients. While the predictors jointly contribute to the overall model, the coefficients allow us to determine which factors make a statistically significant unique contribution when the other variables are taken into account.

Regression Coefficients

Table 4.7 reports the regression coefficients for the six predictors. The unstandardised coefficient (B) indicates the estimated change in Business Experimentation Effectiveness associated with a one-unit increase in a predictor, holding all other predictors constant. The standardised coefficient (β) expresses this relationship on a common scale, allowing the relative contribution of the predictors to be compared more directly.

Table 4.7 – Multiple Linear Regression Coefficients Predicting Business Experimentation Effectiveness

Predictor	B	SE	β	T	P	95% Ci
Management Support	.218	.135	.246	1.619	.114	[-.055, .492]
Organizational Culture	.487	.154	.532	3.167	.003	[.176, .799]
Organizational Structure	-.154	.151	-.199	-	.315	[-.461, .152]
				1.020		
Organizational Capabilities	.225	.165	.255	1.369	.179	[-.108, .559]
Artificial Intelligence	-.011	.101	-.013	-.113	.910	[-.216, .194]
Regulatory Constraints	.393	.221	.180	1.778	.084	[-.055, .841]

Note. B = unstandardized regression coefficient; SE = standard error; β = standardised regression coefficient; CI = 95% confidence interval. Dependent variable: Business Experimentation Effectiveness. N = 44. Results obtained using Python.

The regression results show a different picture from the correlation analysis. While all six predictors were positively and significantly correlated with Business Experimentation

Effectiveness when considered separately, Organizational Culture was the only predictor that remained statistically significant when all six factors were included in the regression model. This difference is important because correlation captures the bivariate association between each factor and Business Experimentation Effectiveness, whereas multiple regression estimates the unique association of each predictor after accounting for the relationships shared with the other variables in the model.

Organizational Culture showed a positive and significant relationship with Business Experimentation Effectiveness ($B = .487$, $SE = .154$, $\beta = .532$, $t = 3.167$, $p = .003$, 95% CI [.176, .799]). More specifically, when the other predictors are held constant, a one-unit increase in Organizational Culture is associated with an estimated .487-unit increase in Business Experimentation Effectiveness. The confidence interval is also entirely above zero, further supporting the significance of this relationship.

Organizational Culture also had the largest positive standardised coefficient ($\beta = .532$) among the predictors. This suggests that, once the different measurement scales are taken into account, Culture shows the strongest positive unique association with Business Experimentation Effectiveness within the model. Together with its p-value of .003, this makes Organizational Culture the clearest individual predictor emerging from the regression analysis.

The other organizational factors showed less clear results. Management Support had a positive coefficient ($B = .218$, $\beta = .246$), but the relationship was not statistically significant ($p = .114$). The same applies to Organizational Capabilities, which also showed a positive coefficient ($B = .225$, $\beta = .255$) but did not reach statistical significance ($p = .179$). This means that, once the other factors are considered at the same time, there is not enough statistical evidence to identify an independent contribution of either variable to Business Experimentation Effectiveness.

Organizational Structure showed a negative coefficient ($B = -.154$, $\beta = -.199$), but this result was also not significant ($p = .315$). The negative coefficient should therefore be interpreted with caution and cannot be taken as evidence of a negative relationship with Business Experimentation Effectiveness. It is also worth considering the strong overlap previously observed between Organizational Structure and Organizational Capabilities, which may make their individual contributions more difficult to separate.

Artificial Intelligence showed almost no unique association with Business Experimentation Effectiveness in the regression model ($B = -.011$, $\beta = -.013$, $p = .910$). This is particularly interesting when compared with the correlation analysis, where AI had a small but significant positive relationship with Business Experimentation Effectiveness ($r = .324$, $p = .025$). The difference suggests that the relationship observed at the correlation level does not remain once the other organizational factors are considered simultaneously.

Regulatory Constraints showed a positive coefficient ($B = .393$, $\beta = .180$), with a p-value of .084. Since this value is above the .05 threshold, the relationship cannot be considered statistically significant in the main model. Nevertheless, the result is relatively close to the conventional significance threshold and can therefore be noted as a possible pattern, although it should be interpreted with caution.

Taken together, these results help clarify what emerged from the previous correlation analysis. The regression model is statistically significant when the six predictors are considered jointly, but Organizational Culture is the only factor that shows a statistically significant unique positive relationship with Business Experimentation Effectiveness when the other predictors are taken into account. The fact that several variables were significant in the correlation analysis but not in the regression suggests that some of their initial relationships with Business Experimentation Effectiveness may be connected to information they share with the other organizational factors. The relatively high correlations among some of the organizational predictors, together with the higher VIF values observed for Organizational Structure and Organizational Capabilities, may therefore help explain why some variables that showed significant bivariate associations did not retain a statistically significant unique contribution in the multiple regression model.

4.6 Discussion

The results show that the organizational context is closely related to Business Experimentation Effectiveness. All six factors were positively and significantly associated with Effectiveness when considered individually, with the strongest relationships found for Organizational Culture and Management Support. The regression analysis, however, gives a more detailed picture. When the factors were considered simultaneously, Organizational Culture emerged as the only statistically significant predictor of Business Experimentation Effectiveness. This does not mean that the other organizational factors are not relevant. Management Support, Structure and Capabilities were all significantly associated with Effectiveness in the correlation analysis and were also strongly related to one another. The difference between the correlation and regression results therefore suggests that these dimensions share part of the same information and may represent interconnected elements of the organizational environment rather than completely independent factors.

Among these dimensions, the result for Organizational Culture is particularly important. Business Experimentation involves testing assumptions without knowing the result in advance. An experiment may confirm an initial idea, but it may also show that the organization was wrong. In this case, the experiment can still be valuable because it provides information that may prevent a wrong decision or further investment in an idea that does not work. The value of experimentation may therefore be associated not only with the ability to conduct experiments, but also with the organization's ability to accept and learn from their results. This helps explain the role of Organizational Culture. A company may have resources, data, technologies and formal processes for experimentation, but employees may still hesitate to test uncertain ideas if unsuccessful experiments are perceived negatively. They may also be less willing to communicate unexpected results or question assumptions already supported by managers. In contrast, when experimentation is encouraged and failure can be treated as an opportunity for learning, employees may feel safer testing ideas and sharing the evidence they obtain. The result for Organizational Culture may therefore reflect the distinction between simply having experimentation tools and using experimentation as part of an organizational learning process. This interpretation is consistent with the Literature Review, where

learning-oriented cultures, trust, collaboration, knowledge sharing and openness to experimentation emerged as important conditions for Business Experimentation.

The findings for Management Support, Organizational Structure and Organizational Capabilities should be interpreted in relation to this broader picture. Their positive correlations with Effectiveness show that they remain relevant, while their strong relationships with one another suggest that they may often develop together. Management Support, appropriate structures and experimentation capabilities are all associated with an organizational environment that supports experimentation, but their individual relationships become more difficult to distinguish when they are considered simultaneously. Culture, instead, remains the clearest unique factor associated with Effectiveness. This suggests that Business Experimentation Effectiveness may be associated not only with the resources and processes available within the organization, but also with the extent to which experimentation is genuinely accepted as part of the way the organization learns and makes decisions.

Artificial Intelligence shows a different pattern. AI was positively associated with Business Experimentation Effectiveness in the correlation analysis, but the relationship was weaker than for the main organizational factors and almost disappeared in the regression. The sensitivity analysis also showed that this relationship was not particularly robust. Mikalef and Gupta (2021) offer a possible interpretation, arguing that generating value from AI does not depend simply on having access to the technology, but also on the organization's ability to combine resources and develop an actual AI capability. In the present study, the AI variable captures the extent to which AI supports Business Experimentation, but not how effectively it is integrated into experimentation processes. Some organizations may therefore use AI without having developed the skills, data or capabilities needed to obtain its full value. This remains a possible interpretation rather than something that can be directly demonstrated by the analysis.

Regulatory Constraints also produced an unexpected result. Rather than showing a negative relationship, organizations that identified regulation as a barrier tended to report higher levels of Business Experimentation Effectiveness. This finding needs to be interpreted carefully, since Regulatory Constraints were measured as a binary variable

and only eight organizations selected this barrier. The result therefore does not mean that regulation improves experimentation. One possible explanation is that organizations operating in regulated environments need to develop more structured and controlled procedures for testing new solutions before wider implementation. This interpretation is consistent with previous research showing that organizations in highly regulated or technologically complex environments may combine Lean and Agile approaches with more structured processes. Other characteristics, such as industry, company size or organizational maturity, may also be involved, so this result remains exploratory.

The findings answer the Research Question by showing that Business Experimentation Effectiveness is associated with several organizational conditions, but also that these conditions are strongly interconnected. When their shared relationships are considered, Organizational Culture emerges as the clearest unique factor associated with Effectiveness. At the same time, the regression model is statistically significant as a whole and the six factors jointly account for a substantial proportion of the observed variation in Effectiveness. The results therefore suggest that Business Experimentation should not be considered only as a set of methods or tools that an organization can introduce. Its effectiveness appears to be connected to the wider organizational environment in which experimentation takes place.

In particular, the findings highlight the difference between being able to run experiments and being able to learn from experiments. Resources, structures, capabilities and technologies may support experimentation, while a culture that accepts uncertainty and is open to unexpected results may be particularly relevant for learning from experiments and using the evidence they produce in decision-making. Business Experimentation can therefore be understood not only as a way of testing ideas, but as an organizational practice whose effectiveness is closely related to the organization's ability to learn from the evidence it produces.

5. Conclusion

Business Experimentation has become increasingly relevant for organizations that need to make decisions in uncertain and rapidly changing environments. Rather than relying only on assumptions or committing substantial resources to ideas whose outcomes are still uncertain, organizations can use experimentation to test ideas, collect evidence and learn before moving towards wider implementation. The literature reviewed in this study shows that this approach has been examined from different perspectives, particularly as a way to support organizational learning, validate business assumptions, increase adaptability and support decision-making. At the same time, the literature also makes clear that conducting experiments is only one part of the process. The way experimentation is used and the value organizations are able to obtain from it appear to be closely connected to the organizational context in which it takes place. Across the different streams of literature, factors related to management, culture, organizational structures and capabilities repeatedly emerged as relevant to experimentation, although they were often examined separately or within specific settings. This created the starting point for the present research, which aimed to bring these elements together. Based on this gap, the study addressed the following Research Question:

“Which organizational factors are associated with Business Experimentation Effectiveness across different organizational contexts?”

The findings provide an answer to the Research Question and show that Business Experimentation Effectiveness is associated with several aspects of the organizational context. When the factors were considered individually, all six variables included in the analysis showed a positive and statistically significant association with Effectiveness, although these relationships differed in strength. Organizational Culture and Management Support showed the strongest associations, while Organizational Structure and Organizational Capabilities were also positively and significantly related to Effectiveness. This means that higher levels of Business Experimentation Effectiveness tended to be found in organizations where experimentation received greater support, was

more accepted as part of the organizational culture, and was accompanied by appropriate structures and capabilities.

The regression analysis provided a more specific picture of these relationships. When all the factors were considered at the same time, Organizational Culture emerged as the only statistically significant predictor of Business Experimentation Effectiveness. This does not mean that Management Support, Organizational Structure and Organizational Capabilities are not relevant. Their significant relationships with Effectiveness in the correlation analysis, together with the strong relationships found among the organizational factors themselves, indicate that these dimensions are closely interconnected. They may therefore represent different but related aspects of the organizational environment surrounding experimentation, making their individual relationships with Effectiveness more difficult to distinguish when they are considered simultaneously. Within this broader context, Organizational Culture was the only factor that maintained a statistically significant unique relationship with Effectiveness.

The sensitivity analysis also helped to understand how stable these relationships were. After temporarily excluding the two potentially influential observations, the associations of Management Support, Organizational Culture, Organizational Structure and Organizational Capabilities with Effectiveness became weaker but remained positive and statistically significant. The main relationships identified for these organizational factors therefore appear relatively stable within the sample. Artificial Intelligence showed a different pattern. Although it was initially positively associated with Effectiveness, this relationship was weaker than those observed for the main organizational factors and was no longer statistically significant after the two observations were excluded. The association between Artificial Intelligence and Business Experimentation Effectiveness therefore appears to be less robust and more sensitive to individual observations. Regulatory Constraints also produced an unexpected positive association with Effectiveness. Rather than suggesting that regulation itself improves experimentation, this result may reflect the more structured and controlled experimentation processes that organizations operating in regulated environments may need to develop.

These findings also provide a broader perspective on how Business Experimentation can be understood within organizations. Experimentation is often discussed in terms of

methods, tools and processes that allow organizations to test assumptions and collect evidence before making larger commitments. The results of this study show that looking only at these operational aspects may provide an incomplete picture. Business Experimentation takes place within an organizational environment, and its effectiveness is associated with the conditions that surround the experimentation process. This is particularly relevant when considering the role of Organizational Culture. Experimentation involves uncertainty and the possibility of obtaining results that do not confirm what the organization initially expected. For this evidence to be useful, organizations need to be able to discuss unexpected results, reconsider previous assumptions and learn from experiments that do not produce the desired outcome. The findings therefore reinforce the idea that the value of Business Experimentation is connected not only to the ability to conduct experiments, but also to how organizations use the evidence they produce to support learning and decision-making.

The findings of this study should also be considered in light of some limitations. First, the empirical analysis was based on a relatively small sample of organizations, which limits the possibility of generalising the results to the wider population of firms. The use of a survey also means that the analysis is based on respondents' perceptions of their organizations and experimentation practices rather than on objective measures of experimentation outcomes. In addition, the data were collected at a single point in time. The relationships identified in this study should therefore be interpreted as associations and do not provide evidence of causal relationships between the organizational factors and Business Experimentation Effectiveness.

These limitations also create opportunities for future research. A larger and more diverse sample could provide a stronger basis for examining whether the relationships identified in this study remain consistent across different industries, organizational sizes and geographical contexts. Future studies could also follow organizations over time or combine survey data with more objective measures of experimentation outcomes, providing a more complete understanding of how Business Experimentation develops within organizations. Some of the findings also deserve further investigation. In particular, the role of Artificial Intelligence could be examined through more detailed measures that distinguish between the simple use of AI and the development of

capabilities that allow organizations to integrate it effectively into experimentation processes. The unexpected result for Regulatory Constraints could also be explored across different industries and regulatory environments to better understand whether more regulated contexts are associated with different ways of organising and managing experimentation.

Further research could also examine more closely the relationships among Management Support, Organizational Culture, Organizational Structure and Organizational Capabilities. The strong associations found among these factors in the present study suggest that they may represent interconnected dimensions of the organizational environment rather than completely separate conditions. Understanding how these elements relate to one another could provide a more complete picture of the organizational context surrounding Business Experimentation and help clarify the particular role that culture plays within it.

Despite these limitations, this study contributes to the understanding of Business Experimentation by examining within the same analysis a set of organizational factors that previous research has often considered separately. The findings show that Business Experimentation Effectiveness is associated with a broader organizational environment and identify Organizational Culture as the clearest unique factor associated with Effectiveness when the different organizational factors are considered together. In this sense, the study highlights the importance of looking beyond the adoption of experimentation methods and considering the organizational conditions in which experimentation becomes part of how organizations learn and make decisions.

References

- Aagaard, A.; Saari, U.A. and Mäkinen, S.J. (2021) Mapping the types of business experimentation in creating sustainable value: A case study of cleantech start-ups. *Journal of Cleaner Production* 279: 123182.
- Aminoff, A. and Pihlajamaa, M. (2020) Business experimentation for a circular economy – Learning in the front end of innovation. *Journal of Cleaner Production* 275: 124051.
- Baldassarre, B.; Konietzko, J.; Brown, P.; Calabretta, G.; Bocken, N.; Karpen, I.O. and Hultink, E.J. (2020) Addressing the design-implementation gap of sustainable business models by prototyping: A tool for planning and executing small-scale pilots. *Journal of Cleaner Production* 255: 120295.
- Bocken , N.; Boons, F. and Baldassarre, B. (2019) Sustainable business model experimentation by understanding ecologies of business models. *Journal of Cleaner Production* 208: 1498–1512.
- Bocken , N.; Weissbrod, I. and Antikainen, M. (2021) Business experimentation for sustainability: Emerging perspectives. *Journal of Cleaner Production* 281: 124904.
- Bojovic, N.; Genet, C. and Sabatier, V. (2018) Learning, signaling, and convincing: The role of experimentation in the business modeling process. *Long Range Planning* 51.1: 141–157.
- Boons, F. and Lüdeke-Freund, F. (2013) Business models for sustainable innovation: State-of-the-art and steps towards a research agenda. *Journal of Cleaner Production* 45: 9–19.
- Boons, F.; Montalvo, C.; Quist, J. and Wagner, M. (2013) Sustainable innovation, business models and economic performance: An overview. *Journal of Cleaner Production* 45: 1–8.
- Bortolini, R.F.; Cortimiglia, M.N.; Danilevycz, A.M.F. and , A. (2021) Lean Startup: A comprehensive historical review. *Management Decision* 59.8: 1765–1783.
- Burcharth, A.L.L.A.; Lettl, C. and Ulhøi, J.P. (2015) Extending organizational antecedents of absorptive capacity: Organizational characteristics that encourage experimentation. *Technological Forecasting and Social Change* 90: 269–284.
- Burnell, D.; Fisher, G.; Stevenson, R. and Kuratko, D.F. (2026) Entrepreneurial Experimentation: Conceptual Foundations, Integrative Theoretical Framework, and Research Agenda. *Entrepreneurship Theory and Practice* 50.1: 275–312.

- Burnell, D.; Stevenson, R. and Fisher, G. (2023) Early-stage business model experimentation and pivoting. *Journal of Business Venturing* 38.4: 106314.
- Chesbrough, H. (2020) Open Innovation: Accomplishments and Prospects for the Next 20 Years. *California Management Review* 62.3: 5–13.
- Das, A. and Bocken, N. (2024) Regenerative business strategies: A database and typology to inspire business experimentation towards sustainability. *Sustainable Production and Consumption* 49: 529–544.
- Felin, T.; Gambardella, A.; Stern, S. and Zenger, T. (2020) Lean startup and the business model: Experimentation revisited. *Long Range Planning* 53.4: 101889.
- Felin, T. and Singell, M. (2026) Technology: Theory-driven experimentation and combinatorial salience. *European Economic Review* 181: 105186.
- Florek-Paszkowska, A.; Ujwary-Gil, A. and Godlewska-Dzioboń, B. (2021) Business innovation and critical success factors in the era of digital transformation and turbulent times. *Journal of Entrepreneurship, Management and Innovation* 17.4: 7–28.
- Geissdoerfer, M.; Savaget, P.; Bocken, N. and Hultink, E.J. (2022) Prototyping, experimentation, and piloting in the business model context. *Industrial Marketing Management* 102: 564–575.
- Geraldi, J.; Stjerne, I. and Wenzel, M. (2025) Projectification without projects? Theorizing temporal structures of agile-based organizing. *International Journal of Project Management* 43.8: 102786.
- Ghezzi, A. and Cavallo, A. (2020) Agile Business Model Innovation in Digital Entrepreneurship: Lean Startup Approaches. *Journal of Business Research* 110: 519–537.
- Ghezzi, A.; Sanasi, S. and Cavallo, A. (2020) Business Model Adaptation: Evidence of Lean Experimentation in Digital Startups. *Proceedings of the 53rd Hawaii International Conference on System Sciences*: 4731–4740.
- Konietzko, J.; Baldassarre, B.; Brown, P.; Bocken, N. and Hultink, E.J. (2020) Circular business model experimentation: Demystifying assumptions. *Journal of Cleaner Production* 277: 122596.
- Lago, N.C.; de Abreu Pereira Uhr, D.; Duarte Ribeiro, J.L.; Olteanu, Y. and Fichter, K. (2026) The impact of artificial intelligence on startup business model innovation: Exploring conditional effects of different strategic goals. *Technology in Society* 85: 103215.
- Lange, K.P.H.; Korevaar, G.; Oskam, I.; Nikolic, I. and Herder, P.M. (2021) Agent-based modelling and simulation for circular business model experimentation. *Resources, Conservation & Recycling Advances* 12: 200055.

Marvel, M.R.; Wolfe, M.T.; Kuratko, D.F. and Fisher, G. (2022) Examining entrepreneurial experience in relation to pre-launch and post-launch learning activities affecting venture performance. *Journal of Small Business Management* 60.4: 759–785.

Mikalef, P. and Gupta, M. (2021) Artificial intelligence capability: Conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance. *Information & Management* 58.3: 103434.

Paust, S.; Korsgaard, S. and Thrane, C. (2025) Entrepreneurial prototyping: The role of purpose, prototype recycling, and skills bricolage. *Small Business Economics* 64.2: 407–431.

Paust, S.; Thrane, C. and Korsgaard, S. (2025) An integrative literature review of prototyping in management research: Definition and research agenda. *Journal of Business Venturing Design* 4: 100026.

Ries, E. (2011) *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. New York: Crown Business

Silva, D.S.; Ghezzi, A.; de Aguiar, R.B.; Cortimiglia, M.N. and ten Caten, C.S. (2020) Lean Startup, Agile Methodologies and Customer Development for business model innovation: A systematic review and research agenda. *International Journal of Entrepreneurial Behavior & Research* 26.4: 595–628.

Silva, D.S.; Ghezzi, A.; de Aguiar, R.B. and ten Caten, C.S. (2021) Lean startup for opportunity exploitation: Adoption constraints and strategies in technology new ventures. *International Journal of Entrepreneurial Behavior & Research* 27.4: 944–969.

Stevenson, R.; Burnell, D. and Fisher, G. (2024) The Minimum Viable Product (MVP): Theory and Practice. *Journal of Management* 50.8: 2809–2835.

Talvinko, M.; van den Broek, A. and Koria, M. (2025) Experimentation in “everyday” small business ventures. *International Journal of Entrepreneurial Behavior & Research* 31.11: 67–91.

Vukadinovic, S.; Djapan, M. and Macuzic, I. (2017) Education for lean & lean for education: A literature review. *International Journal for Quality Research* 11.1: 35–50.

Weissbrod, I. and Bocken, N. (2017) Developing sustainable business experimentation capability – A case study. *Journal of Cleaner Production* 142.4: 2663–2676.

Yaman, S.G.; Munezero, M.; Münch, J.; Fagerholm, F.; Syd, O.; Aaltola, M.; Palmu, C. and Männistö, T. (2017) Introducing continuous experimentation in large software-intensive product and service organizations. *Journal of Systems and Software* 133: 195–211.

Yang, J.; Chesbrough, H. and Hurmelinna-Laukkanen, P. (2022) How to Appropriately Value from General-Purpose Technology by Applying Open Innovation. *California Management Review* 64.3: 24–48.

Appendices

Appendix A – Survey Questionnaire

Innovation Validation Practices and Business Experimentation in Organizations

Introduction

Dear Participant,

Thank you for taking part in this research.

This survey aims to investigate how organizations validate new ideas, products, services and business initiatives under conditions of uncertainty. In particular, the study explores the organizational factors that support experimentation, how experimentation contributes to organizational learning and legitimacy, and how companies assess the effectiveness of their experimentation activities.

The questionnaire is anonymous and confidential. The collected data will be analyzed only in aggregated form for academic research purposes.

The questionnaire requires approximately **10–12 minutes** to complete.

Section 1 – Company Profile

Q2. Which industry does your company primarily operate in?

- ☐ Manufacturing
- ☐ Services
- ☐ ICT / Software
- ☐ Financial Services
- ☐ Healthcare
- ☐ Retail
- ☐ Public Sector
- ☐ Other _____

Q3. Company size

- ☐ Fewer than 10 employees
- ☐ 10–49
- ☐ 50–249
- ☐ 250–999
- ☐ More than 1,000

Q4. Your current position

- ☐ CEO
- ☐ Founder
- ☐ Innovation Manager
- ☐ R&D Manager
- ☐ Product Manager
- ☐ Marketing Manager
- ☐ Business Development Manager
- ☐ Other _____

Q5. Does your company have a dedicated Innovation or R&D function?

- ☐ Yes
- ☐ No

Q6. Overall, how would you rate your company's orientation toward innovation?

1 = Very low

5 = Very high

Section 2 – Innovation Validation Practices

Q7. When developing new products, services or business initiatives, how often does your company test assumptions before making significant investments?

1 Never

2

3

4

5 Always

Q8. Which of the following validation practices are currently used in your organization?

(Check all that apply)

- ☐ Customer interviews
- ☐ Customer surveys
- ☐ Prototype testing
- ☐ Pilot projects
- ☐ Minimum Viable Products (MVPs)
- ☐ A/B testing
- ☐ Proof of Concept (PoC)
- ☐ Business Model Pilots
- ☐ Other _____
- ☐ None of the above

Q9. Approximately how many validation activities has your company conducted during the last 12 months?

- ☐ None
- ☐ 1–5
- ☐ 6–10
- ☐ 11–20
- ☐ More than 20

Q10. At which stage are validation activities mainly conducted?

- ☐ Opportunity identification
- ☐ Product or service development
- ☐ Market launch
- ☐ Scaling and growth
- ☐ Continuous improvement

Q11. For the purpose of this survey, **Business Experimentation** is defined as:

"The systematic testing of ideas, products, services or business initiatives through structured experiments aimed at reducing uncertainty before committing significant investments."

Based on the definition above, does your organization currently apply Business Experimentation?

Yes, systematically

Yes, occasionally

No

Section 3 – Organizational Enabling Factors

Please indicate your level of agreement with the following statements.

1 = Strongly disagree

5 = Strongly agree

Leadership

Q12. Top management actively supports experimentation.

Q13. Managers encourage evidence-based decision making.

Organizational Culture

Q14. Failure is considered an opportunity for learning.

Q15. Employees feel psychologically safe challenging existing assumptions.

Q16. Experimentation is encouraged throughout the organization.

Governance

Q17. Experimentation follows a structured process.

Q18. Experimental results are systematically documented and shared.

Organizational Capabilities

Q19. Employees possess adequate experimentation skills.

Q20. Relevant data are readily available to support experimentation.

Q21. Digital technologies effectively support experimentation activities.

Q22. AI is used to support Business Experimentation activities.

Section 4 – Business Experimentation Capability

Again, using the same scale:

1 = Strongly disagree

5 = Strongly agree

Q23. Experiments are based on clearly formulated hypotheses.

Q24. Success criteria are defined before experiments begin.

Q25. Experimental evidence significantly influences managerial decisions.

Q26. Experiments are continuously refined through iteration.

Q27. Experimentation is embedded within our innovation processes.

Q28. Knowledge generated through experimentation is systematically shared across the organization.

Section 5 – Learning and Legitimation

Learning Orientation

Q29. Experiments primarily generate new organizational knowledge.

Q30. Reducing uncertainty is the primary objective of experimentation.

Q31. Negative experimental results are considered valuable learning opportunities.

Legitimation Orientation

Q32. Experimental evidence increases stakeholders' confidence in innovation initiatives.

Q33. Experimental evidence facilitates managerial approval of innovation projects.

Q34. Experimentation strengthens the credibility of strategic initiatives within the organization.

Section 6 – Outcomes and Performance Measurement

Using the same scale:

Q35. Experimentation improves the quality of managerial decision making.

Q36. Experimentation accelerates innovation.

Q37. Experimentation reduces innovation risk.

Q38. Experimentation positively impacts business performance.

Q39. Experimentation improves customer satisfaction.

Q40. Does your company formally monitor the performance of Business Experimentation activities?

- ☐ Yes
- ☐ No

Q41. Which of the following KPIs are currently monitored?

(Check all that apply)

- ☐ Number of experiments
- ☐ Learning achieved
- ☐ Time-to-learning
- ☐ Time-to-market
- ☐ Customer Satisfaction
- ☐ Conversion Rate
- ☐ Innovation Success Rate
- ☐ Return on Investment (ROI)
- ☐ Revenue Impact
- ☐ Other _____

Q42. What is your organization's geographical scope and team structure?

- ☐ Local / National (Single office or localized teams)
- ☐ Multinational (Offices in multiple countries)
- ☐ Fully remote / Highly distributed global teams

Section 7 – Barriers to Business Experimentation

(To be completed by all respondents)

Q43. What are the main barriers preventing or limiting Business Experimentation in your organization?

(Select up to three.)

- ☐ Lack of management support
- ☐ Lack of organizational culture
- ☐ Lack of employee competencies
- ☐ Limited financial resources
- ☐ Lack of time
- ☐ Difficulty measuring results
- ☐ Regulatory constraints
- ☐ Organizational resistance to change
- ☐ Fear of failure
- ☐ Other _____

Q44. Would your organization be interested in adopting a more structured experimentation approach?

- ☐ Yes
- ☐ No
- ☐ Maybe

Section 8 – Final Questions

Q45. Overall, how would you assess your organization's Business Experimentation maturity?

1 = Very immature

5 = Very mature

Closing Statement

Thank you for your valuable contribution.

Your participation will help advance research on Business Experimentation and innovation management and contribute to a better understanding of how organizations manage uncertainty through evidence-based decision making.

Appendix B – Statistical Analysis Outputs

This appendix reports the main Python outputs obtained from the statistical analyses conducted in Chapter 4. The outputs are included to provide additional documentation of the correlation and multiple regression analyses.

Figure B.1 - Pearson Correlation Analysis Output

Publication-Ready Lower-Triangular Pearson Correlation Matrix:

	MANAGEMENT SUPPORT	ORGANISATIONAL CULTURE	ORGANISATIONAL STRUCTURE	ORGANISATIONAL CAPABILITIES	ARTIFICIAL INTELLIGENCE	REGULATORY CONSTRAINTS	BUSINESS EXPERIMENTATION EFFECTIVENESS
MANAGEMENT SUPPORT	1.000						
ORGANISATIONAL CULTURE	0.750***	1.000					
ORGANISATIONAL STRUCTURE	0.564***	0.692***	1.000				
ORGANISATIONAL CAPABILITIES	0.560***	0.626***	0.839***	1.000			
ARTIFICIAL INTELLIGENCE	0.292*	0.411**	0.578***	0.547***	1.000		
REGULATORY CONSTRAINTS	0.243	0.201	0.371*	0.243	0.048	1.000	
BUSINESS EXPERIMENTATION EFFECTIVENESS	0.705***	0.766***	0.577***	0.614***	0.324*	0.354*	1.000

*p < .05, **p < .01, ***p < .001 (two-tailed).

Detailed Correlations with BUSINESS EXPERIMENTATION EFFECTIVENESS:

	Predictor	Pearson's r	p-value	Valid N
0	MANAGEMENT SUPPORT	0.705	0.000	46
1	ORGANISATIONAL CULTURE	0.766	0.000	47
2	ORGANISATIONAL STRUCTURE	0.577	0.000	47
3	ORGANISATIONAL CAPABILITIES	0.614	0.000	49
4	ARTIFICIAL INTELLIGENCE	0.324	0.025	48
5	REGULATORY CONSTRAINTS	0.354	0.013	49

Source: Python output.

B.2 - Multiple Linear Regression

Figure B.2 - OLS Regression Model Output

Number of complete cases for regression: 44

OLS Regression Results

Dep. Variable:	Q('BUSINESS EXPERIMENTATION EFFECTIVENESS')	R-squared:	0.702
Model:	OLS	Adj. R-squared:	0.654
Method:	Least Squares	F-statistic:	14.52
Date:	Thu, 20 Aug 2026	Prob (F-statistic):	1.94e-08
Time:	09:51:08	Log-Likelihood:	-28.325
No. Observations:	44	AIC:	70.65
Df Residuals:	37	BIC:	83.14
Df Model:	6		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
Intercept	1.0582	0.378	2.797	0.008	0.292	1.825
Q('MANAGEMENT SUPPORT')	0.2183	0.135	1.619	0.114	-0.055	0.492
Q('ORGANISATIONAL CULTURE')	0.4873	0.154	3.167	0.003	0.176	0.799
Q('ORGANISATIONAL STRUCTURE')	-0.1544	0.151	-1.020	0.315	-0.461	0.152
Q('ORGANISATIONAL CAPABILITIES')	0.2254	0.165	1.369	0.179	-0.108	0.559
Q('ARTIFICIAL INTELLIGENCE')	-0.0115	0.101	-0.113	0.910	-0.216	0.194
Q('REGULATORY CONSTRAINTS')	0.3933	0.221	1.778	0.084	-0.055	0.841

Omnibus:	0.075	Durbin-Watson:	2.195
Prob(Omnibus):	0.963	Jarque-Bera (JB):	0.221
Skew:	-0.084	Prob(JB):	0.895
Kurtosis:	2.697	Cond. No.	43.0

Source: Python output.

Figure B.3 - Multiple Linear Regression Coefficients Output

```

--- Multiple Linear Regression Results ---
Number of observations (N): 44
R^2: 0.702
Adjusted R^2: 0.654
F-statistic: 14.52 (p-value: 1.9350899584006996e-08)

```

	Predictor	B	Std. Error	Beta	t	p-value	Lower CI (95%)	Upper CI (95%)	Tolerance	VIF
0	MANAGEMENT SUPPORT	0.218	0.135	0.246	1.619	0.114	-0.055	0.492	0.349	2.861
1	ORGANISATIONAL CULTURE	0.487	0.154	0.532	3.167	0.003	0.176	0.799	0.286	3.497
2	ORGANISATIONAL STRUCTURE	-0.154	0.151	-0.199	-1.020	0.315	-0.461	0.152	0.211	4.731
3	ORGANISATIONAL CAPABILITIES	0.225	0.165	0.255	1.369	0.179	-0.108	0.559	0.233	4.298
4	ARTIFICIAL INTELLIGENCE	-0.011	0.101	-0.013	-0.113	0.910	-0.216	0.194	0.604	1.655
5	REGULATORY CONSTRAINTS	0.393	0.221	0.180	1.778	0.084	-0.055	0.841	0.788	1.269

Source: Python output.