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Universidade de Lisboa

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MANAGEMENT AND INDUSTRIAL STRATEGY

MASTER´S FINAL WORK

DISSERTATION

HOW AND WHY NEW BUSINESSES ENGAGE IN COLLABORATIVE INNOVATION PROJECTS: A CASE STUDY ON THE PORTUGUESE AERONAUTIC SECTOR

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SUPERVISION:
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Abstract

This dissertation investigates how and why new businesses engage in collaborative innovation projects, focusing on the dynamics of partner selection, relationship development, and competence building within inter-organizational networks. The research question addresses the gap in understanding how emerging firms integrate into complex, multi-stakeholder innovation projects, particularly in sectors characterized by high technological uncertainty and institutional coordination. To understand this, the research examines three organizations: Tekever, a Portuguese technology company specializing in UAVs and aerospace systems; CEiiA, a research and development institution; and CODI, a manufacturing partner with expertise in additive prototyping. By using a qualitative, multi-case study design, the research used structured questionnaires to gather in-depth data on collaborative mechanisms and decision-making processes. The data analysis was conducted to identify patterns across three core constructs: business networks, partner selection, and competence development. The study contributes to the literature by extending partner selection and business network theories to the context of small and mid-sized firms operating in innovation consortia. This investigation gives insights for managers and policy makers on the relational and strategic factors that facilitate innovation-driven collaboration. It also highlights the importance of institutional ecosystems in supporting new business participation in R&D partnerships.

Keywords: collaborative innovation, business networks, partner selection, competence development, ecosystems.

Resumo

Esta dissertação investiga como e porque novas empresas se envolvem em projetos de inovação colaborativa, com foco na dinâmica da seleção de parceiros, desenvolvimento de relacionamentos e construção de competências dentro de redes transorganizacional. A questão de pesquisa aborda a lacuna no entendimento de como empresas emergentes se integram em projetos de inovação complexos e com múltiplas partes interessadas, particularmente em setores caracterizados por alta incerteza tecnológica e coordenação institucional. Para compreender isso, a pesquisa examina três empresas: a Tekever, uma empresa tecnológica portuguesa especializada em UAVs e sistemas aeroespaciais; a CEiiA, uma instituição de investigação e desenvolvimento; e a CODI, um parceiro de fabrico com experiência em prototipagem aditiva. Utilizando a metodologia de estudo qualitativo de múltiplos casos, a com questionários estruturados para recolher dados aprofundados sobre mecanismos colaborativos e processos de tomada de decisão. A análise dos dados foi realizada para identificar padrões em três conceitos centrais: redes de negócios, seleção de parceiros e desenvolvimento de competências. O estudo contribui para a literatura ao estender as teorias de seleção de parceiros e redes de negócios ao contexto de pequenas e médias empresas que operam em consórcios de inovação. Esta investigação fornece *insights* para gestores e formuladores de políticas sobre os fatores relacionais e estratégicos que facilitam a colaboração impulsionada pela inovação. Também destaca a importância dos ecossistemas institucionais no apoio à participação de novas empresas em parcerias de R&D.

Palavras-chave: inovação colaborativa, redes empresariais, seleção de parceiros, desenvolvimento de competências, ecossistemas.

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1 Introduction

In today's increasingly interconnected innovation projects are a fundamental strategy for businesses seeking to develop advanced technologies, access external knowledge, and accelerate product development. This research investigates how and why new businesses integrate into collaborative innovation projects, with a particular emphasis on understanding the relational, organizational, and strategic factors that enable such integration. European institutions, national agencies, and clusters like AED (Aeronautics, Space, and Defence) play a central role in establishing frameworks that regulate and support collaborative innovation. This aligns with Mazzucato's (2018) concept of mission-oriented innovation policy, which argues that public actors should not only correct market failures but actively shape innovation directions through bold, challenge-driven frameworks. Such mission-led approaches are particularly relevant in complex, high-tech sectors like aerospace, where institutional coordination is essential to foster experimentation and long-term collaboration.

The empirical focus of the dissertation is a multi-case analysis of Tekever a Portuguese technology company specializing in UAVs, space systems, and software and two of its long-standing strategic partners: CEiiA (Centre of Engineering and Product Development) and CODI (an industrial firm specializing in additive manufacturing and prototyping). These cases were selected because they exemplify effective collaborative integration and distinct but also complementary roles within their consortia. By analysing the mechanisms, motivations, and outcomes of their collaboration, it returns deeper insight into how smaller or less resource-rich firms

position themselves within complex networks to co-develop technology and deliver innovative solutions.

The three core concepts build the frame of this research: Business networks are conceptualized as systems of interdependent actors whose sustained relationships enable the exchange of knowledge, resources, and capabilities. Partner selection enables the understanding of process in companies choose other entities to be part of their projects Competence development is defined as the process by which firms expand their organizational knowledge, technical skills, and capacity through engagement with external partners. Each of these constructs plays a central role in understanding how partnerships are not only formed but also maintained and leveraged for strategic benefit.

To develop the literature review, the research on business networks and relationships, by Holm, Eriksson, and Johanson (1996, 1999), explains the importance of mutual commitment, interdependence, and network embeddedness in creating value through cooperation. For partner selection in innovation contexts, from Tsou, Cheng, and Hsu (2015) research paper identifies reliability, complementarity, and strategic alignment as the more important partner attributes that influence collaborative outcomes. Drejer (2000) and Bassellier and Benbasat (2004) research papers of competence development highlight how firms build internal capabilities through knowledge transfer and cross-organizational learning.

While the role of collaboration in innovation has been widely acknowledged, existing research often emphasizes large firms, formalized alliances, or sector-level ecosystems. What remains underexplored is how new or smaller businesses successfully enter and navigate collaborative innovation projects, particularly in environments where institutional credibility, technical specialization, and long-term

relationships are crucial. This gap in the literature is particularly relevant in regions like Southern Europe, where public R&D programs are structured around consortia and access to these networks may be uneven.

Knowing this, this dissertation seeks to address that gap by answering three central questions: how new businesses integrate into collaborative innovation projects, why they choose partners and what selection criteria they use, and what mechanisms support the long-term success of these partnerships. The objectives of the research are to identify the relational and strategic factors that support project integration, to examine how partner selection decisions are made in complex settings, and to assess the extent to which collaboration contributes to capability development within participating firms. This research contributes to an improved understanding of collaborative innovation in the context of SMEs and less hierarchical ecosystems. It refines existing models of business networks and competence development by examining their application in smaller, agile organizations. All this research provides actionable insights for entrepreneurs, R&D managers, and policy makers engaged in innovation strategy, particularly in institutional environments where success depends not only on technical capability but also on trust, flexibility, and strategic fit. By focusing on the real case studies of Tekever, CEiiA, and CODI, the research shows how collaborative innovation is driven not solely by contracts or resources, but by long-standing relationships, shared risk-taking, and the ability to adapt roles in response to evolving project demands.

2 Literature Review

2.1 Relationships and networks

Given the importance of business networks and their relationship works, in this research theme, to try to understand how businesses integrate projects, it is important to start understanding this thematic to give theoretical background. There is clear lack of research in understanding how networks and relationships between businesses affect their choice in partners to integrate projects. To understand better the concepts of relationships and networks Holm, Eriksson and Johanson (1996) paper discusses that cooperative relationships between firms can be better understood if they are examined in the context of a network of connected business relationships. In their research on business relationships and business networks, they a formulated model that analysed cooperation in international business relationships between suppliers and customer firms. They suggested that cooperation can raise the value of business relationships, and that business network connections have an impact on cooperation. When they analysed their findings, it shows that relationship profitability was directly affected by relationship commitment and, indirectly through commitment, by business network connections.

Holm, Eriksson and Johanson (1999) presents an interesting view evolution of their business relationship and its impact on value creation. emphasizing the importance of mutual commitment and dependence for value creation. Their research explores how interdependence between firms in a business network can lead to increased value creation through coordinated activities. They presented a case study of Ericsson Radio Systems and Tokyo Digital Phone (TDP), where it illustrates the evolution of their business relationship and its impact on value

creation. In this research the main findings were that the mutual commitment in business relationships leads to an increased mutual dependence and value creation, that there is a causal chain from network connection through mutual commitment and mutual dependence to value creation in the relationship, and the interdependence in business relationships is critical for developing systems of workflow interdependence that enhance value creation. Overall, their findings suggest that firms in business markets organize and share an unbounded structure of interdependent activities through their interactions in business network relationships, achieving greater value than if they did not engage in relationship development.

Holm, Eriksson and Johanson (1999) provide valuable insights into the dynamics of international business networks. They emphasize the importance of understanding and commitment within business relationships and how these factors contribute to the profitability and success of international business engagements. Their findings integrate well with existing literature on cooperative strategies, such as strategic alliances and joint ventures, highlighting the critical role of relationship development processes. This aligns with the work of Madhok (1995) and others who have underscored the significance of managing relationship evolution rather than merely focusing on entry mode selection or contractual agreements. A key contribution of this study is the identification of 'network infusion' - the process by which business network connections influence the development of cooperative behaviour within focal relationships. This concept extends the understanding of value creation beyond individual partnerships to encompass the broader network context, supporting the notion of business networks as value creation networks. The article's findings have practical implications for firms engaging in international

business. They suggest that successful foreign market entry and cooperative strategy implementation depend on the ability to manage and coordinate relationship development processes within the context of the wider business network. This paper opens avenues for future research, in to understanding how firms select partners across different cultural contexts. It also invites further exploration of international business networks' emergence and development, contributing to the theoretical foundation of international business studies. In short, Holm, Eriksson, and Johanson (1999) significantly contribute to the literature on international business networks, offering a nuanced understanding of the factors that drive the profitability and sustainability of international business relationships. It bridges the gap between theory and practice, providing actionable insights for businesses operating in the global marketplace. The concept of network infusion offers a fresh perspective on the interplay between individual relationships and the wider business network, highlighting the collective strategy's role in enhancing joint performance. The study's findings underscore the importance of relationship management and network coordination as key determinants of success in international business endeavours.

The importance of mutual commitment in business network relationships, explained by Holm, Eriksson, and Johanson (1996) demonstrates a causal chain from business network connection to mutual commitment, mutual dependence, and ultimately, value creation. The findings from their empirical research suggests that companies that engage in mutual commitments can develop interfirm systems of workflow interdependence, leading to enhanced value creation. This aligns with the concept that through partnerships and exchange of competences, companies can transform a partnership relationship into one with strong interdependence, fostering joint productivity and economic performance. The research highlights the role of

interdependence within business networks, where firms are not isolated but connected through various relationships. The case of Ericsson and Tokyo Digital Phone (TDP) illustrates how interdependence evolved through mutual adjustments and commitments, resulting in a valuable business relationship. The study extends the understanding of interdependence by considering both resource and workflow interdependencies, suggesting that coordination of activities across firms can lead to efficient joint workflow systems. The paper discusses how the business network context influences the development of interdependence and value creation in dyadic business relationships. It proposes that the surrounding network of relationships provides opportunities for coordination and support, which can enhance mutual commitment and, consequently, mutual dependence. This perspective challenges traditional views that firms should avoid engagements leading to workflow interdependence due to potential opportunism, instead advocating for the benefits of such engagements in creating value. The findings contribute to the academic discourse on cooperative relationships and interdependence in business markets. They provide empirical evidence supporting the notion that mutual commitment and interdependence within business networks can lead to significant value creation. Practically, the study offers insights for managers on the importance of developing and nurturing business network relationships, highlighting the potential for long-term benefits and improved economic performance through mutual commitments, which offers more insight into understanding the dynamics in business networks and relationships in partnerships. Holm, Eriksson, and Johanson (1996) provide a comprehensive analysis of how mutual commitment and interdependence within business networks contribute to value creation. It challenges traditional views on interfirm relationships and offers both theoretical and practical insights into the

development of valuable business partnerships. The significance of these findings lies in their potential to guide firms in strategically managing their network relationships to achieve greater value and success in the market.

Holm, Eriksson, and Johanson (1996) concept of business networks and cooperation in international business relationships, focusing on how cooperative relationships between firms can be better understood, that highlights that the development of cooperative relationships is a process involving social exchange between firms, leading to mutual commitment, and increased joint productivity.

The study is based on a sample of international business relationships that are considered important by the partners, which may not be large enough for comparative studies across different countries. The empirical analysis is conducted on cross-section data, which limits the ability to draw conclusions about causal direction. Although their research focused more on an international. The analysis is conducted on cross-section data, which limits the ability to draw conclusions about causal direction, which limits the ability to capture dynamic changes over time.

The study shows great for other researchers highlighting that the development of cooperative relationships as a process involving social exchange between firms, leading to mutual commitment, and increased joint productivity and with the emphasis on network context and the process view suggests that further research could explore the dynamic aspects of partner selection within interconnected business networks.

Holm, Eriksson, and Johanson (1999) present a well-formulated structural model that examines the causal chain from business network connection through mutual commitment and mutual dependence to value creation in relationships. It leverages data from the European International Marketing and Purchasing (IMP) project,

providing empirical backing to the theoretical model. The paper delves deeply into the dynamics of business relationships, particularly focusing on the interdependence and value creation, which are critical aspects of strategic management. The case study of Ericsson and Tokyo Digital Phone (TDP) is a practical example that illustrates the theoretical concepts, making the research relevant and applicable to real-world scenarios.

The paper relies on data from a specific project (IMP), which may not fully represent the broader spectrum of business relationships across different industries and cultural contexts. The focus on long-lasting relationships might overlook the dynamics and value creation in shorter-term or less formalized business interactions. While the paper provides a thorough analysis from a network perspective, it may benefit from incorporating alternative viewpoints, such as the impact of digital transformation on business relationships. This evaluation highlights the paper's significant contribution to understanding business network relationships while also acknowledging areas where further research could be beneficial.

2.2 Selecting partners

Tsou, Cheng, and Hsu (2015) try to understand the impact of business partner selection on service delivery co-innovation and competitive advantage. It builds on Resource Dependence Theory (RDT) and the input-process-output model to explore how selecting business partners based on reliability, complementarity, expertise, and compatibility can enhance co-innovation in service delivery, subsequently improving competitive advantage. Co-innovation with business partners is crucial for developing new products/services. It enables firms to access new knowledge,

share resources, and acquire complementary capabilities, leading to sustainable market success. However, selecting the right business partners is a significant challenge that has not been thoroughly addressed in existing literature. To conduct their research a survey was conducted among 600 IT service firms in Taiwan, targeting senior marketing managers responsible for collaborative new service development. The study draws on RDT, which explains how an organization's strategy and structure depend on its inter-organizational relationships. It also utilizes the input-process-output model to support the conceptual model linking business partner selection, service delivery co-innovation, and competitive advantage. The paper proposes hypotheses to examine the influence of business partner selection on service delivery co-innovation and how it affects competitive advantage. It defines partner reliability, complementarity, expertise, and compatibility as key criteria for partner selection. Service delivery co-innovation refers to a firm's innovative activities involving collaboration with business partners to create value for customers through new service delivery mechanisms. It includes new communication, usage, and service encounters. It also mentioned in their paper that there is a difference in competitive advantage into market-based and employee-based. Market-based advantage is achieved through differentiated goods/services, while employee-based advantage is gained through unique skills and capabilities of service employees. In short, this research explains that appropriate business partner selection is crucial for successful service delivery co-innovation, which is instrumental in achieving competitive advantage. It emphasizes the need for managers to be aware of the criteria for selecting business partners to develop service delivery co-innovation effectively.

The findings align with Resource Dependence Theory (RDT), supporting the idea that selecting the right business partners based on reliability, complementarity, expertise, and compatibility can enhance service delivery co-innovation and competitive advantage. This research confirms the input-process-output model, demonstrating that the input (business partner selection) positively affects the process (service delivery co-innovation), which in turn leads to a significant output (competitive advantage).

The results have practical implications for managers emphasizing the importance of selecting business partners based on criteria such as reliability, complementarity, expertise, and compatibility to develop service delivery co-innovation. Businesses should also commit to service delivery co-innovation by investing in compatible partners with complementary expertise and fostering relationships that go beyond contractual agreements. Finally, a proper allocation of resources is crucial for implementing effective business partner selection and achieving successful service delivery co-innovation.

This literature contributes to the service innovation literature by providing empirical evidence that appropriate partner selection criteria are crucial for effective service delivery co-innovation and for gaining competitive advantages, both market-based and employee-based. It enriches the understanding of co-innovation beyond traditional third-party involvement, highlighting the role of business partners in co-creating value.

Tsou, Cheng, and Hsu (2015) offer valuable insights into the role of partner selection in co-innovation but would benefit from broader industry and geographical representation to enhance its applicability. The research is grounded in resource dependence theory (RDT) and the input-process-output model, providing a strong

theoretical basis for the research, with empirical evidence from a survey of 600 IT service firms in Taiwan, enhancing the study's credibility. Also, the findings have clear practical implications, advising managers on the importance of selecting business partners based on specific criteria to foster co-innovation.

Although it has strong foundation, this paper has several gaps in understanding of how selecting business partners based on specific criteria like reliability, complementarity, expertise, and compatibility can enhance service delivery co-innovation and competitive advantage. There is barely any effort in understanding the distinction between market-based and employee-based competitive advantages in the context of service delivery co-innovation which needs further exploration to understand their unique contributions to firms' success. In terms of the application of RDT to service delivery co-innovation research is limited, and there is a need for empirical testing of models that incorporate RDT to explain inter-firm collaboration strategies and performance.

2.3 Competences Development

The complexity of competence development and the necessity for ongoing research to understand and manage this process effectively can raise questions about the stability of the proposed model and the dynamics of competence development in various conditions.

Drejer (2000) proposes a model for understanding and researching competence development, emphasizing the need for management practice and research in this area. In his paper, he critiques the lack of specificity in the structural characteristics

of competencies in existing literature and offers a definition that includes technology, people, organizational structure, and culture.

This research challenges the assumption that core competencies cannot be imitated, suggesting that due to technological advancements and employee mobility, competencies need continual development. In it, there is an introduction of concept of competence shifts, which can be either sustainable or disruptive, and the need for firms to adapt their competence development strategies accordingly.

Bassellier, G. and Benbasat, I. (2004) provides a comprehensive understanding of the business competence necessary for IT professionals to foster successful collaborations with business clients, ultimately contributing to the strategic use of IT in organizations, which may serve as to understand the competences development in the overall business partnerships.

There is emphasize in this paper to explain how business competence in IT professionals encompasses both business and interpersonal knowledge and skills, enabling them to understand the business domain and interact effectively with business partners. There is included an understanding of the organization's environment, goals, capabilities, and critical success factors, as well as knowledge about different organizational units, their interdependencies, and the integration of IT with business objectives. With effective communication, leadership, and knowledge networking provided IT professionals to manage projects, lead teams, and leverage knowledge within and outside the organization.

Their research hypothesizes that business competence significantly influences IT professionals' intentions to develop and strengthen relationships with their business clients, which is crucial for organizational success. To prove this Bassellier, G. and

Benbasat, I. (2004) developed a scale to measure business competence and tests the model relating competence to intentions to form IT-business partnerships.

Drejer (2000) challenges the notion that core competencies are inimitable, suggesting that the rapid spread of technology and the mobility of key personnel make competencies increasingly imitable, thus necessitating their development. With this he argues for a dynamic approach to competence development, considering the impact of environmental changes and technological shifts on the firm's competencies, and proposes a model for competence development stages. His research contributes significantly by providing a structured approach to analyse competencies beyond their functional effects, considering their structural elements and interactions. It also highlights the importance of adapting to technological advancements and market shifts, which is crucial for maintaining a competitive edge. The paper's critique of the imitability of competencies and the proposed dynamic model for competence development offer valuable insights for both researchers and practitioners in strategic management and organizational development. The framework can serve as a foundation for future research on competence-based strategies and their practical implementation within firms. Overall, the paper underscores the necessity for firms to continually evolve and adapt their competencies in a rapidly changing business environment.

The contribution of Bassellier, G. and Benbasat, I. (2004) in the development of a scale to measure the business competence of IT professionals is as an important l tool for assessing the non-technical skills that are increasingly crucial in the evolving role of IT professionals. In their findings, it is affirmed that the proposed scale to measure for business competence demonstrates that such competence significantly influences IT professionals' intentions to develop partnerships with

business clients. This underscores the strategic value of business acumen in IT roles. The implications of their findings suggest that organizations should prioritize business competence in their IT staff to enhance IT-business integration. This could lead to more entrepreneurial IT roles focused on innovation and strategic alignment with business objectives. In relation to competence development, this study bridges a gap by providing a clear structure for business competence and empirically testing its effect on IT-business partnerships or any other. It reinforces the notion that technical skills alone are insufficient for IT professionals in the current business landscape. The research supports a shift towards a more holistic view of the collaborator's roles, integrating business savvy with technical knowledge to drive the business success.

Overall, both studies underscore the strategic importance of adapting competencies in response to technological advancements and market shifts. Drejer (2000) proposes a model for competence development stages, while Bassellier, G. and Benbasat, I. (2004) provide a structured approach to assess business competence in IT roles.

Drejer (2000) proposes a detailed model for competence development, which includes technology, people, organizational structure, and culture as key elements. It offers valuable insights for management practice in firms, emphasizing the importance of continual competence development in response to technological and market changes. The paper lays a solid foundation for future research by raising pertinent questions about competence development and shifts.

Although the model includes technology, people, organizational structure, and culture as key elements, it can raise its complexity which can pose challenges for practical implementation and measurement within organizations. There was also no

consideration on how competencies must evolve over time to adapt to changes in technology and market demands, making the model's application harder in a continuous and dynamic process.

Some of the assumptions made in the paper, such as the uniformity of group knowledge, may not hold true in all organizational contexts. In cases where individuals in a group often have varied levels of expertise and experience, which can lead to asynchronous learning and development. Each person has a unique learning pace, which means that group members may reach different levels of understanding at different times. Also, the effectiveness of knowledge sharing within the group can impact how uniformly the group's competence develops.

In the research done by Bassellier, G. and Benbasat, I. (2004) there is a more detailed taxonomy of business competence, including organization-specific knowledge and interpersonal and management knowledge. Their research addresses the changing role of IT professionals towards a more collaborative and business-oriented approach and offers practical implications for IT education and training, focusing on non-technical skills.

On the other hand, the study is limited to two organizations, which may affect the generalizability of the findings, in which it relies on self-assessment of competence, which could introduce bias. The paper does not discuss the long-term impact of business competence on actual business partnership success.

Overall, Drejer (2000) presents a detailed model for competence development, giving emphasizes continual development in response to changes, and raising questions for future research. However, the model's complexity may challenge implementation, and with lacks consideration for evolving competencies over time. Bassellier, G. and Benbasat, I. (2004) provides a more detailed classification of

business competence, focussing on collaborative roles of IT professionals. They become limit their research in only two organizations, having a certain bias in their research due to self-assessment, while also not addressing the long-term impact on a partnership success.

3 Methodology

This research aims at understanding how and why new businesses integrate collaborative innovation projects by adopting a qualitative case study approach to explore how and why new businesses integrate into collaborative innovation projects. Given the research objective to understand relational and strategic dynamics in real-world organizational settings qualitative methods offer the most appropriate means for capturing context-specific insights and rich, experiential data (Yin, 2018).

A multiple-case study design was chosen, focusing on Tekever and two of its strategic partners CEiiA and CODI. This design enables an in-depth exploration of each case individually, while allowing for cross-case analysis of shared mechanisms and distinct patterns. The case study method is particularly effective for understanding complex inter-organizational phenomena where the boundaries between the phenomenon and its context are blurred (Yin, 2018).

Data were collected using two primary instruments. First, a structured questionnaire was used for Tekever project manager. This instrument was designed to ensure consistency across responses and focused on key themes such as coordination processes, selection rationale, trust development, and technical alignment. Second, semi-structured interviews were conducted with CODI and CEiiA. The semi-structured format provided the flexibility to probe emergent themes while remaining aligned with the conceptual framework. The open-ended nature of the interviews enabled richer explanations and respondent-led elaboration, offering detailed insights into the collaborative dynamics under study (Kvale & Brinkmann, 2009). This dual approach enabled data triangulation, enhancing the

validity of findings and offering a more complete understanding of the innovation partnership dynamics (Patton, 2015).

The three focal organizations were selected based on their central role in national R&D collaborations and their complementary technical capabilities. Tekever leads multiple innovation consortia; CEiiA contributes systems and mobility engineering expertise; and CODI brings advanced manufacturing capacity. All partners are part of the AED cluster, which facilitates institutional collaboration and strategic alignment. Their inclusion was guided by purposive sampling to ensure relevance, diversity, and depth of insight.

Data was analysed through thematic analysis, following a hybrid coding strategy. Initial codes were derived from the conceptual framework (e.g., business networks and relationship, partner selection, competence development) and refined iteratively as new themes emerged during coding. The analysis was conducted manually, with cross-case comparison used to identify recurring patterns and contrasts across organizations. This process followed a structured approach to enhance credibility, dependability, and confirmability of findings (Patton, 2015).

All research activities adhered to ethical standards for qualitative inquiry. Prior to data collection, participants were informed of the study's purpose, data handling procedures, and their right to withdraw at any time. Direct quotations were anonymized to preserve confidentiality and organizational identity, in line with academic standards (Silverman, 2016).

4 Findings

Tekever is a Portuguese technology company specializing in software, space systems, and unmanned aerial vehicles (UAVs), and serves as a lead coordinator in numerous publicly funded innovation projects. CEiiA (Centre of Engineering and Product Development) is a non-profit R&D institution with deep expertise in mobility systems and aerospace engineering, often bridging the gap between academia and industry. CODI is an industrial partner with over 30 years of experience in additive manufacturing, 3D prototyping, and technical consultancy, playing a critical role in delivering functional components and supporting product development in complex projects. The chapter is organised according to the three central themes identified in the conceptual framework: relationships and networks, partner selection, and competence development.

4.1 Relationships and Networks

4.1.1 Value Creation through Mutual Commitment

The interview and questionnaire responses from Tekever reveal that mutual commitment plays a foundational role in building long-term, value-creating partnerships across its innovation projects. According to the project manager, these collaborations allow the company to better understand partner capabilities and create future opportunities that would otherwise be difficult to establish, thereby enabling new strategic relationships beyond contractual arrangements (Tekever Interviewee, 2025). One illustrative example cited was the PRR initiative, where Tekever required access to large-scale infrastructure such as certified airspace and extended

runways to test a new aircraft. These resources, which were not available in-house, were secured through collaborative partnerships within the consortium. The interviewee noted that “to certify this aircraft, we will require infrastructure that is not easy to obtain… the partnerships we are developing will enable us to secure these” (Tekever Interviewee, 2025), highlighting how mutual dependence facilitates resource access and project feasibility.

Interdependence in these networks was further reflected in Tekever’s approach to leveraging partner capabilities to complement its own. The project manager emphasized that past collaborations create a more established working foundation, reducing friction in future joint projects: “It is easier when working with partners we have collaborated with in previous projects, as the network is already more established” (Tekever Interviewee, 2025). This suggests that institutional memory and prior working experience streamline communication, decision-making, and trust.

The Tekever respondent also underlined the importance of collective responsibility in publicly funded projects. Success was framed not in terms of individual partner outputs but in achieving the overall goals set out in the funding agreement. As explained, “what truly matters in the end is delivering what we initially committed to, especially since these are funded projects. The funding entity will evaluate the project, not just the contributions of individual partners” (Tekever Interviewee, 2025).

4.1.2 Coordination Mechanisms in Relationship Development

The Tekever interviewee described a well-structured approach to managing and coordinating inter-organisational relationships within collaborative projects. Coordination mechanisms are formalised at the beginning of each initiative, particularly in projects where Tekever assumes the role of consortium leader. According to the respondent, an initial meeting is always held at the project's launch, where milestones, rules, obligations, and responsibilities are clearly defined (Tekever Interviewee, 2025). These planning sessions establish escalation procedures and contact points for communication, forming a framework that evolves based on the type of project and partner composition.

The management plan developed in these early stages includes protocols not only for goal alignment but also for ongoing risk monitoring and strategy reassessment. The interviewee noted that although these frameworks are set early, they are not rigid; Tekever allows for flexibility and adaptive management throughout the lifecycle of the project to account for changes in technical scope or partner dynamics (Tekever Interviewee, 2025).

Familiarity with existing partners was highlighted as a facilitator of coordination. Tekever's history of collaborating with certain entities was reported to reduce friction in communication and operational planning. The interviewee explained that when working with partners from previous projects, "the network is already more established," and necessary contacts are already in place, which streamlines the onboarding and cooperation process (Tekever Interviewee, 2025). This institutional memory reduces the need to establish trust from scratch and allows for more immediate and effective governance in complex technical environments.

In addition, the project manager stressed that, based on prior experience, the company has learned to implement what they referred to as "best project management practices" to maintain alignment between all parties. These include regular check-ins, risk assessments, and iterative planning adjustments. The emphasis is not solely on managing deliverables but also on ensuring that coordination is sustained at both operational and strategic levels (Tekever Interviewee, 2025).

4.1.3 Synergy and Digital Collaboration

The interview with Tekever revealed that synergy both technical and strategic is a defining feature of the company's innovation partnerships, particularly within consortium-led projects. The project manager explained that co-development with academic institutions and private sector partners frequently results in outcomes that no single entity could achieve independently. For example, in the ARX project, Tekever collaborated with universities to develop drone swarming capabilities. The respondent noted that the universities brought specialised research knowledge, while Tekever provided the operational drone platform necessary for implementation, describing the result as a partnership that “creates synergy… bringing value to all parties” (Tekever Interviewee, 2025).

This integration of complementary strengths was positioned as essential to achieving shared innovation goals. The same project was highlighted as an example of how academic–industrial collaboration generates mutual benefits, with universities gaining access to real-world systems and Tekever enhancing its product capabilities through advanced research inputs (Tekever Interviewee, 2025). The co-development of swarm control systems using Tekever’s aircraft platform was

described as a two-way knowledge exchange where both entities expanded their capabilities through active collaboration.

The interviewee also emphasized that digital transformation plays a critical role in enabling this synergy. Tekever's work spans three main domains, such as software, space systems, unmanned aerial vehicles (UAVs) and digital tools are used extensively to integrate these disciplines and coordinate with external partners. According to the project manager, digital collaboration tools improve internal workflow and facilitate external communications with suppliers and research institutions, especially when projects involve geographically distributed teams (Tekever Interviewee, 2025).

Beyond communication, digital platforms are used for project management, system integration, and engineering collaboration. These tools help Tekever manage multiple layers of interdependency, ensuring that complex systems, such as swarming drones or hybrid vehicle platforms, are developed in synchrony across technical domains. The use of digital infrastructure also supports version control, documentation, and progress tracking across partner organisations (Tekever Interviewee, 2025).

4.1.4 Workflow Interdependence: Benefits and Challenges

The interview with Tekever's project manager revealed that workflow interdependence is both a necessity and a challenge in large-scale collaborative innovation projects. This interdependence often arises from the diverse and highly specialised roles that different partners play in delivering complex technical outcomes. According to the interviewee, shared project ownership means that no

single partner can operate in isolation; instead, each is dependent on others to deliver components that are critical for overall success (Tekever Interviewee, 2025).

The respondent noted that many of these partnerships involve joint responsibilities in areas such as infrastructure access, component design, and certification. In the context of the PRR initiative, for instance, the ability to test Tekever's largest aircraft to date was entirely reliant on infrastructure provided by other partners resources Tekever could not access alone. This type of workflow interdependence, where physical assets and technological capabilities must align across firms, was described as essential to achieving project goals (Tekever Interviewee, 2025).

However, while the benefits of such interdependence include faster innovation, shared risk, and integrated capabilities, the project manager also identified significant challenges, particularly around timing and alignment. He explained that in many publicly funded R&D projects, strict deadlines (often less than three years) create pressure on all partners to deliver simultaneously, even if their internal development cycles differ. Synchronising these timelines especially for components that require longer maturation or specific personnel was described as one of the most persistent difficulties (Tekever Interviewee, 2025).

Another challenge highlighted was the coordination of diverse partner objectives. While each organisation may have specific goals, such as developing new technology or testing a subsystem, the overall project is evaluated by the funding entity. This creates a need for shared focus and commitment to a common final deliverable, rather than isolated achievements (Tekever Interviewee, 2025). The project manager emphasized that misalignment at any stage can put the entire

initiative at risk, underscoring the importance of strong leadership and clear governance frameworks.

Despite these issues, the Tekever representative acknowledged that the benefits of workflow interdependence outweigh the drawbacks. It enables the pooling of knowledge, the acceleration of technological validation, and often leads to deeper collaboration and future project continuity with the same partners (Tekever Interviewee, 2025).

4.2 Partner Selection

4.2.1 Strategic Selection Criteria

The findings from the interview with Tekever's project manager reveal that the selection of business partners is a strategic and deliberate process, strongly aligned with the specific technical and operational goals of each project. In publicly funded initiatives, such as those under PRR or PT2020, the interviewee noted that every partner must bring demonstrable value to the consortium. The ability to strengthen the project proposal submitted to funding entities is a core consideration in this process (Tekever Interviewee, 2025).

Partner selection is primarily based on technical complementarity, proven expertise, and a track record of reliability. For instance, in the FLY.PT project, CEiiA was selected to lead development of the skate module due to its extensive engineering experience in mobility systems. Similarly, CODI was chosen for its advanced capabilities in additive manufacturing and product prototyping, clearly demonstrating how specific competencies are matched to defined work packages (Tekever Interviewee, 2025). The interviewee emphasized that the selection process

is not ad hoc or opportunistic. Instead, it is informed by a pre-existing understanding of each partner's capabilities, often gained through years of prior collaboration. Tekever evaluates whether a potential partner can contribute unique technical assets, integrate efficiently into the consortium, and help meet strict project deadlines. This approach ensures that the final team includes non-overlapping skill sets that collectively cover all critical project areas (Tekever Interviewee, 2025). Additionally, the project manager highlighted that partner selection often extends beyond technical fit to include strategic alignment. Partners are not only chosen for their ability to deliver a specific component but also for their potential to collaborate long-term and support innovation scalability beyond the immediate project (Tekever Interviewee, 2025). The goal is to build a team that supports not only project execution but future joint ventures.

4.2.2 Importance of Reliability and Complementarity

The interviewee from Tekever emphasized that reliability is considered the single most important criterion when selecting partners for collaborative innovation projects. Reliability was described as very essential to ensuring that each partner can successfully deliver their assigned work packages. According to the project manager, in large, publicly funded projects, failure by one partner to meet commitments can jeopardise the outcomes of the entire consortium. This is particularly critical when each work package is closely interdependent with others in terms of sequencing, validation, and integration (Tekever Interviewee, 2025).

The interviewee explained that a reliable partner is not only technically competent but also committed enough to invest their own financial and human resources in the initiative. These partners are expected to manage their scope

independently while maintaining alignment with the overarching timeline and objectives. A breakdown in reliability whether in delivery, communication, or coordination was identified as one of the main risks to project success (Tekever Interviewee, 2025).

Complementarity was also considered important and highlighted as a key driver for effective collaboration. The project manager clarified that bringing together partners with non-overlapping expertise enhances the value of the consortium by allowing each entity to focus on what they do best. For example, in the ARX project, Tekever took responsibility for aircraft development, while partners contributed specific complementary expertise in systems such as command-and-control, swarm behaviour, and communications. This structure enabled each partner to add distinct value that would have been costly or time-consuming for Tekever to develop internally (Tekever Interviewee, 2025).

The interviewee noted that complementarity not only ensures coverage of the technical scope but also contributes to team learning. By working with diverse partners, team members at Tekever are exposed to new methods and knowledge areas, leading to indirect human resource development over the course of the project (Tekever Interviewee, 2025).

4.2.3 Role of Trust and Cluster Membership

The findings clearly indicate that trust and institutional alignment, particularly through industry clusters, play a decisive role in Tekever's partner selection and project integration processes. According to the Tekever interviewee, many of the company's strategic collaborators, including CEiiA and CODI, were not selected

through open calls or competitive applications but through long-standing relationships built over more than a decade of consistent joint work (Tekever Interviewee, 2025).

The inclusion of CEiiA in the FLY.PT project exemplifies this pattern. Although the original project lead, Caetano, later withdrew, CEiiA continued its involvement and led two major work packages due to its long-established trust with Tekever and its demonstrated competence in complex, multi-sector engineering initiatives. Their collaboration is rooted in shared participation in the AED cluster and overlapping project histories across aerospace and mobility systems (Tekever Interviewee, 2025). Similarly, CODI's entry into the FLY.PT consortium was not a spontaneous development but a result of institutional familiarity and an evolving relationship that began with CODI acting as a 3D printing supplier to Tekever in the mid-2000s. This early commercial relationship gradually expanded into strategic collaboration based on mutual respect, proven delivery capability, and alignment with the technical demands of joint innovation projects (Tekever Interviewee, 2025). The AED cluster (Aeronautics, Space and Defence) was cited as a critical enabler of these relationships. It provides a platform for regular engagement, capability mapping, and project ideation, which allows organisations to identify partners not only by technical profile but also by history of successful cooperation. According to the Tekever representative, participation in such clusters streamlines partner selection by narrowing the field to trusted actors with known capacities and collaborative behaviours (Tekever Interviewee, 2025).

Trust was also described as essential for managing uncertainty. In long-term, high-stakes innovation projects, Tekever relies on partners that have consistently demonstrated communication effectiveness, accountability, and flexibility under

changing project conditions. The interviewee stressed that these relational qualities are as important as technical competence when forming consortia for national or European R&D programmes (Tekever Interviewee, 2025).

4.2.4 Challenges in Alignment

Despite benefits, aligning partners within tight timelines presents challenges. Some respondents noted difficulties in synchronising development cycles, particularly for components with longer maturation times.

"Sometimes, projects must be completed in less than three years… it can be difficult to develop certain components or ensure that the necessary personnel are available at the right time" (Tekever Interviewee, 2025).

4.2.5 Partner Flexibility and Role Adaptation

Another important insight was the value placed on partner adaptability. Large R&D projects are often subject to timeline shifts, leadership changes, and funding amendments. In such scenarios, partner organisations that can pivot quickly are more likely to be retained in future initiatives. One respondent explained how the FLY.PT project underwent leadership restructuring when the original lead, Caetano, exited the project. "When Caetano withdrew, we [Tekever] had to take over leadership. CEiiA continued without disruption they just adapted. That's the kind of partner we need" (Tekever Interviewee, 2025). This adaptability is particularly valuable in publicly funded, multi-stakeholder environments where strategic realignment is often necessary. Partners that demonstrate organisational agility both in technical tasks and in coordination responsibilities are considered indispensable.

4.3 Competence Development

4.3.1 Learning through Collaboration

The interview data reveal that collaborative learning is a core outcome of Tekever's participation in innovation consortia. The project manager explained that the company does not rely solely on internal training programs for competence development; instead, it leverages cross-organisational collaboration as a primary mechanism for knowledge exchange and skill enhancement (Tekever Interviewee, 2025). In joint projects, particularly those involving academic and industrial partners, learning takes place organically through day-to-day cooperation. According to the interviewee, being embedded in multidisciplinary teams exposes Tekever's staff to new technologies, methods, and perspectives that are often outside their formal areas of expertise. This was seen as a significant benefit of participating in publicly funded research and development initiatives (Tekever Interviewee, 2025).

The interviewee also emphasized that many collaborative projects include dedicated training components. These may involve formal technical workshops, mentoring sessions, or knowledge-sharing events led by other consortium members. Tekever views these engagements as integral to its organisational learning strategy, enabling employees to develop new competencies while actively contributing to innovation outcomes (Tekever Interviewee, 2025).

In addition, the interviewee noted that access to external knowledge bases particularly from universities and research centres is one of the most valuable aspects of consortium work. This access often results in the transfer of cutting-edge

knowledge from academia into Tekever's commercial development cycles, accelerating product development and ensuring alignment with emerging industry standards (Tekever Interviewee, 2025).

The interviewee further explained that such collaborative learning also enhances Tekever's adaptive capacity. As industry requirements and technologies evolve, the organisation is better prepared to pivot or re-skill thanks to prior exposure to new domains through its network of partners (Tekever Interviewee, 2025).

4.3.2 Technological Alignment

The interview data reveal that collaborative learning is a core outcome of Tekever's participation in innovation consortia. The project manager explained that the company does not rely solely on internal training programs for competence development; instead, it leverages cross-organisational collaboration as a primary mechanism for knowledge exchange and skill enhancement (Tekever Interviewee, 2025).

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4.3.3 Barriers to Development

The findings reveal that while Tekever places high strategic priority on competence development, there are persistent barriers that affect implementation, particularly related to time management and integration within project workflows. According to the project manager, one of the main difficulties is balancing ongoing training and upskilling with the demanding timelines and deliverables of innovation projects (Tekever Interviewee, 2025).

The interviewee explained that although the organisation is committed to developing competencies whether technical, leadership, or language-related there is limited space within day-to-day operations to accommodate structured training

sessions. Projects typically operate under tight schedules, often tied to national or EU funding frameworks, which leaves little room for extended learning without disrupting technical output (Tekever Interviewee, 2025).

As the interviewee stated, *"The main challenge in developing competencies within our organisation is time management… coordinating closely with the HR team is essential"* (Tekever Interviewee, 2025). This coordination is needed to integrate learning activities into operational timelines without compromising delivery quality or compliance with funding deadlines.

In addition to time-related constraints, the findings also suggest that resource prioritisation is a challenge. While Tekever encourages participation in international events, conferences, and cross-organisational learning initiatives, such engagements often compete with other pressing project obligations. The project manager noted that although these activities contribute significantly to team development, they are sometimes deprioritised in favour of immediate project needs (Tekever Interviewee, 2025). Despite these barriers, the interviewee maintained that the long-term benefits of competence development are evident, contributing to both individual growth and organisational performance. However, unlocking these benefits requires ongoing effort to embed development processes into project frameworks from the outset and to ensure buy-in from all departments involved in project execution (Tekever Interviewee, 2025).

4.4 CEiiA and CODI

The integration of CEiiA and CODI into the FLY.PT project illustrates how Tekever forms strategic partnerships rooted in trust, technical alignment, and

institutional connectivity. Both partners were selected not through open solicitation but via longstanding collaborative relationships and consistent participation in the AED cluster, which serves as a key platform for industry coordination and capability mapping.

CEiiA's involvement in FLY.PT originated during the project's inception. Although Tekever only assumed leadership after the withdrawal of Caetano, CEiiA retained its role as a lead on two critical work packages, including the development of the skate module. When asked about the selection rationale, CEiiA stated, *"Our inclusion centred around long-standing partnership and mutual trust with Tekever"* (CEiiA Interviewee, 2025). This trust was built on over 15 years of joint work across mobility systems, drones, and satellite programmes, underpinned by both organisational familiarity and shared engineering language.

CEiiA's value extended beyond technical expertise to include its ability to connect academic institutions with industrial applications. According to the interviewee, *"CEiiA demonstrated a strong capability in multi-sector engineering development… it also played a unique role in connecting academic institutions with industrial applications"* (CEiiA Interviewee, 2025). This bridging role enhanced the consortium's knowledge base and facilitated access to research-oriented resources.

Similarly, CODI's inclusion in FLY.PT was based on its longstanding collaboration with Tekever and its active participation in the AED cluster. CODI's leadership explained that their entry into the project was not due to an application process, but because *"CODI was naturally invited to join the consortium… selection was the outcome of strategic and institutional alignment rather than a spontaneous or external request"* (CODI Interviewee, 2025). The partnership began in the early

2000s through 3D printing support and evolved into strategic collaboration through repeated engagements in national R&D projects.

CODI's differentiating factor was its hands-on manufacturing capacity, particularly in industrial-grade additive manufacturing. As noted during the interview, *"CODI's ability to physically produce project components using advanced 3D printing technology set it apart… this relationship evolved from a supplier agreement into strategic collaboration"* (CODI Interviewee, 2025). This adaptability made it possible for CODI to contribute beyond production stepping into the design and prototyping processes as needed during FLY.PT's execution.

Both cases reinforce the role of institutional clusters like AED in forming high-performing consortia. These ecosystems do not rely on open calls but on reputation, strategic fit, and collaborative track record. CEiiA and CODI were both well-positioned through years of trusted collaboration, allowing them to adapt their roles as project needs evolved. This adaptive capacity was a key factor in ensuring project continuity, especially as leadership and technical scopes shifted during the life of the initiative.

5 Discussion

5.1 Business Relationships and Network Dynamics

The empirical findings from Tekever and its strategic partners provide compelling evidence that business networks grounded in trust, mutual commitment, and strategic alignment significantly influence innovation success. This section synthesizes the most salient insights under three key themes.

Mutual commitment emerged as a central mechanism for unlocking long-term value within Tekever's collaborative projects. These relationships go beyond contractual necessity, forming the basis for strategic cooperation and capability exchange. The PRR initiative vividly illustrates this dynamic: Tekever gained access to essential infrastructure, such as certified airspace and testing runways not through direct ownership, but through established relationships with trusted partners. This aligns directly with Holm, Eriksson, and Johanson's (1999) model, which posits a causal chain from network connection, mutual commitment, interdependence, and finally value creation. Tekever's experience confirms that mutual commitment enables firms to leverage external capabilities, reduce uncertainty, and co-create outcomes that surpass individual capacities. This type of embedded collaboration not only improves operational efficiency but also extends strategic reach turning each relationship into a platform for innovation scalability.

Workflow interdependence is both a defining strength and a critical challenge within Tekever's network-based projects. Interview data show that each partner's contribution is intrinsically linked to others, necessitating high levels of coordination. This structure reflects Holm et al.'s (1996) emphasis on interfirm systems of workflow interdependence as value-creating mechanisms. Tekever

mitigates the inherent risks of such interdependence through structured project governance including clear role definition, escalation procedures, and adaptive management. The reuse of partners from past collaborations further enhances coordination, as familiarity reduces onboarding time and streamlines communication. Ultimately, the Tekever case demonstrates that well-managed interdependence fosters both innovation agility and execution reliability, especially in complex R&D environments.

Beyond individual partnerships, Tekever's innovation model is embedded in a wider institutional ecosystem, particularly through its active role in the AED cluster. This cluster serves not just as a networking hub but as a platform for long-term relationship formation, capability mapping, and strategic partner alignment. The inclusion of CEiiA and CODI in the FLY.PT project exemplifies this pattern where selection was based not on open calls, but on relational credibility, technical reputation, and shared project history. This approach reflects a shift from traditional dyadic partnerships toward ecosystem-based collaboration, where institutional trust accelerates integration and reduces coordination costs. It highlights that innovation value is increasingly derived not just from firm-specific assets, but from strategic positioning within trusted networks of co-developers, researchers, and system integrators.

5.2 Partner Selection as Strategic Fit

Partner selection in collaborative innovation projects is not a one-off tactical decision, but a deliberate and strategic process shaped by alignment project timelines, and long-term relational capital. Tekever's approach to partner selection

reveals how technical fit, reliability, and institutional familiarity converge to form resilient, high-performing consortia. These findings resonate strongly with the frameworks proposed by Tsou, Cheng, and Hsu (2015), especially concerning how partner characteristics influence co-innovation success.

Tekever consistently prioritizes reliability and technical complementarity as top criteria when selecting partners. Reliability is considered as the most critical factor due to the project structure where each partner manages a distinct work package. As noted by the project manager, failure by a single partner could jeopardize the success of the entire initiative a risk Tekever mitigates by working with partners who have a proven ability to deliver under pressure. Complementarity, likewise, is highly valued. Tekever ensures that each partner brings a distinct capability that complements its own, creating a synergistic structure where each entity focuses on its area of expertise. For example, CEiiA contributed expertise in mobility systems, while CODI for its specialized capabilities in additive manufacturing and industrial prototyping. This strategy ensures skill diversification without redundancy, which not only enhances efficiency but also reduces coordination complexity. The findings support Tsou, Cheng, and Hsu (2015) view that co-innovation is strongest when partner capabilities are distinct yet integrative.

The role of institutional proximity and trust, particularly through the AED cluster, emerges as a crucial filter in Tekever's partner selection. Entities like CEiiA and CODI were not selected through open tenders but were invited based on longstanding relationships and consistent prior collaboration. This relationship-based selection reflects a deeper logic of institutional embeddedness, where shared norms, sectoral familiarity, and mutual confidence significantly reduce the risks of misalignment. This reinforces the theoretical insight that partner selection is not

only about competence, but also about relational credibility. Tekever's reliance on the AED cluster as a coordination space demonstrates how institutional ecosystems serve as informal governance structures that support co-development, align values, and create a ready pool of vetted collaborators. This model reflects a shift from market-based to network-based partner acquisition, where trust accelerates integration and reduces onboarding friction.

A less explicit but highly significant criterion in Tekever's partner strategy is flexibility the ability of partners to adapt to shifting roles, leadership changes, and evolving project scopes. In the FLY.PT case, when Caetano withdrew, CEiiA seamlessly adapted to changes without operational disruption. This agility in response to uncertainty was highlighted as a marker of strategic value, distinguishing partners likely to be retained in future consortia. Additionally, Tekever selects partners not only for current project fit but also for their potential in future collaborations. This reflects a long-term alignment perspective, where each engagement is part of a broader roadmap of innovation and capability co-evolution. The empirical findings affirm that adaptability, shared vision, and the capacity to evolve roles are just as important as initial expertise an insight that extends Tsou et al.'s static model toward a more dynamic, iterative view of partner fit.

5.3 Competence Development as a Collaborative Strategy

Tekever's innovation strategy demonstrates that competence development is not a siloed, internal HR process but a collaborative and strategic function embedded within project networks. Rather than depending solely on traditional training models, the company builds its capabilities dynamically through cross-

organizational learning, project-driven exposure, and access to external knowledge ecosystems. These insights closely align with the competence development frameworks proposed by Drejer (2000) and Bassellier & Benbasat (2004) but also point to refinements needed for real-world implementation.

Tekever views collaborative learning as a primary vehicle for competence development. As observed in the ARX and PRR projects, employees acquire new skills organically by working alongside universities, research centers, and specialized industrial partners. These partnerships expose teams to emerging technologies, such as swarm behavior algorithms or hydrogen propulsion systems which extend far beyond their original areas of expertise. This learning-by-doing approach echoes Drejer's (2000) assertion that competencies must evolve dynamically in response to environmental shifts. However, the Tekever case adds nuance by showing that these competencies are co-created within joint project ecosystems, rather than internally generated. The company's emphasis on embedded training workshops, mentoring, and technical exchanges with partners affirms that project participation itself becomes a development platform, transforming traditional learning models into real-time, applied competence building.

Access to external knowledge bases is a defining advantage of Tekever's consortium participation. University partnerships provide exposure to cutting-edge research, while industrial partners contribute practical insights and prototyping capabilities. This two-way knowledge exchange mirrors Bassellier & Benbasat's (2004) concept of business competence in hybrid professional roles where individuals must combine domain-specific knowledge with interpersonal and integrative skills to support strategic alignment. At Tekever, this integrative capability is nurtured through active exposure to interdisciplinary teams, allowing

project members to absorb unfamiliar methods, tools, and frameworks. The benefit is twofold: not only does the company advance its own innovation roadmap, but it also upskills its workforce in strategic alignment, enabling smoother project execution and market-oriented thinking. In addition, Tekever's Human Resources team plays a coordinating role by identifying technical and soft-skill gaps such as foreign language fluency or project management and providing targeted support. These internal mechanisms reinforce the external learning loops, creating a hybrid model of competence development that is both proactive and reactive to project realities.

Despite the clear strategic value of competence development, Tekever's case also illustrates its operational constraints. Time management emerged as the most persistent barrier, with tight project timelines leaving limited room for formal upskilling. Although many initiatives include training components, their implementation often competes with technical deadlines, deliverables, and budget compliance especially in high-stakes, publicly funded environments. This reality challenges Drejer's model, which tends to underemphasize the temporal friction between learning and delivery. In practice, embedding competence development into fast-paced innovation cycles requires early integration into project planning and stronger coordination between technical leads and HR teams. Tekever addresses this by aligning skill-building activities with milestone planning and by leveraging informal learning formats such as cross-team collaboration and conference participation as substitutes for traditional training. While these adaptations mitigate the challenge, they do not fully resolve it. The findings suggest that for competence development to achieve its full potential, firms must move beyond opportunistic

learning and institutionalize it within their strategic project frameworks from the outset.

5.4 The Role of Institutional Ecosystems

One of the most distinctive contributions of this research lies in highlighting the strategic importance of institutional ecosystems specifically, the AED cluster. Both CEiiA and CODI were integrated into the FLY.PT project through long-standing relationships cultivated within this ecosystem. These findings demonstrate how institutional proximity accelerates partner trust, facilitates coordination, and reduces integration costs factors not extensively addressed in existing frameworks. This suggests that beyond individual relationships, network-level mechanisms such as sectoral clusters play a foundational role in shaping the success of collaborative innovation. It highlights how networks are seen as resources and how formalized cluster structures that act as institutions that facilitate project ideation, partner matching, and adaptive role assignment.

6 Conclusion

This research set out to understand how and why new businesses integrate collaborative innovation projects, focusing on the case of Tekever and its partnerships with CEiiA and CODI. In detail this research addresses three questions: how new businesses integrate into collaborative innovation projects, why they choose partners and what selection criteria they use, and what mechanisms support the long-term success of these partnerships.

The findings reveal that successful project integration is not simply a matter of signing formal agreements or securing contractual roles; instead, it is fundamentally shaped by the quality and depth of relational dynamics developed over time. For new businesses, which often lack extensive legacy systems or market dominance, the ability to enter and thrive within complex innovation networks hinges on their capacity to establish trust with experienced partners, demonstrate reliability in delivery, and align strategically with the collective goals of a consortium. Trust emerges as a foundational pillar built not overnight but through repeated collaboration, shared risks, and transparent communication. Moreover, mutual commitment evident in joint investment of resources, time, and expertise reinforces relational stability and encourages workflow interdependence, enabling businesses to contribute meaningfully despite limited standalone capabilities. Long-term strategic alignment, particularly when embedded in institutional structures like the AED cluster, further strengthens these relationships by providing platforms for visibility, capability mapping, and partner matching. Through these mechanisms, new businesses like Tekever position themselves not just as technical contributors but as collaborative innovators capable of co-driving complex R&D initiatives. The

study underscores that network integration is a relational process, where informal and formal relationships, shared histories, and adaptability are as critical as competence or technological assets.

The study directly responds to the investigation problem by showing that new businesses integrate into networks primarily through building trust-based relationships, leveraging institutional ecosystems (e.g., AED), and demonstrating reliability and unique technical capabilities. These businesses strategically form alliances that not only provide immediate resource access, such as infrastructure, manufacturing, or R&D expertise but also enable long-term innovation scalability. Integration is facilitated through repeated collaboration, workflow interdependence, and digital coordination mechanisms, allowing these businesses to position themselves as valuable, adaptable, and dependable partners in complex innovation ecosystems.

Despite these insights, the research has limitations. First, it is based on a limited number of qualitative interviews within a specific national and sectoral context Portugal's aerospace and mobility innovation ecosystem restricting broader generalizability. Second, the study focuses on ongoing or successful collaborations, leaving out potentially valuable lessons from failed or non-integrated attempts. Third, while the research highlights dynamic competence development, it captures only a snapshot rather than the full evolution of such capabilities over time.

Future investigations should explore how new businesses in other industries and countries navigate network entry and project integration, especially in sectors with lower institutional support. Longitudinal studies could better track how early-stage relationships evolve into strategic partnerships and how competence development unfolds across project cycles. Additionally, further research should examine the role

of digital infrastructures, remote collaboration, and relational capital in enabling new businesses to embed themselves within established innovation networks.

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Appendix

Tekever Interview Script

1. Can you provide examples of how mutual commitment and interdependence within your business network have led to value creation?
2. How has the surrounding network of relationships provided opportunities for coordination and support in your business, enhancing mutual commitment and consequently, mutual dependence?
3. How do you manage and coordinate relationship development processes within the context of your wider business network for successful strategy implementation?
4. In your experience, how has the development of cooperative relationships involving social exchange between firms led to increased joint productivity?
5. Can you discuss any challenges or benefits you've experienced in developing systems of workflow interdependence within your business network?
6. How do you strategically manage your network relationships to achieve greater value and success in the market?
7. How do you see the role of digital transformation impacting your business relationships and networks?
8. Can you provide an example of a business relationship in your network that evolved through mutual adjustments and commitments, resulting in a valuable partnership?
9. How has the selection of business partners affected your competitive advantage?
10. Can you discuss any challenges or benefits you've experienced in developing projects with your business partners?

11. Can you provide an example of a business relationship in your network that evolved through mutual adjustments and commitments, resulting in a valuable partnership?
12. How important is reliability when selecting a business partner?
13. How important is complementarity when selecting a business partner?
14. How important is expertise when selecting a business partner? I would rate
15. How important is compatibility when selecting a business partner
16. Can you provide examples of how your organization has adapted its competencies in response to technological advancements and market shifts?
17. In your experience, did the continual development of competencies influenced your organization's success?
18. How do you manage and coordinate the process of competence development within your organization?
19. Can you discuss any challenges or benefits you've experienced in developing competencies within your organization?
20. How do you strategically manage your organization's competencies to achieve greater value and success in the market?

CEiiA Interview Script

1. What is CEiiA?
2. How was CEiiA selected for the FLY.PT project? Did they proactively join the initiative?
3. Through what channels did CEiiA and Tekever become acquainted? (e.g., recommendations, online platforms, events)

4. What were the main selection criteria? (e.g., training, experience, technical skills)
5. Was there a specific differentiator that made CEiiA stand out?
6. Has CEiiA previously been selected for projects in a similar way?

CODI Interview Script

1. What is CODI?
2. How were you selected for the Tekever (FLY.PT) project. Did you apply independently or were they invited?
3. Through which channels or means did they become known to Tekever (e.g. recommendation, online platforms, events)?
4. What were the key criteria for selection (e.g. qualifications, experience, skills)?
5. Was there any specific differentiator that made them stand out?
6. Did they have any previous experience with similar selection processes in past projects?