

Article

An Analysis of the Generational Succession Procedures for Retaining Organizational Knowledge in Companies Within the Basque Autonomous Community (Spain)

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Abstract: The retention of organizational knowledge is increasingly challenging for companies given the aging workforce, high turnover rates, and declining birth rates. This study explores the knowledge transfer processes during generational transitions and examines how digital transformation facilitates business model innovation. Specifically, it examines the knowledge transfer procedures implemented in companies in the Autonomous Community of the Basque Country, a competitive industrial region in Europe. Using a quantitative approach, 168 individuals in key leadership positions were surveyed on the mechanisms used for knowledge retention and their effectiveness. The results reveal that while companies prioritize knowledge transfer, most lack effective protocols. Organizations employing both digital and analog strategies are perceived as more efficient in retaining knowledge. Only half of the companies integrate knowledge transfer processes into their management strategies, with no observed differences in employee knowledge-sharing behaviors based on company size. This study concludes that a lack of structured procedures may harm long-term competitiveness, recommending that companies invest more in developing formal generational handover protocols. This research underscores the vital importance of knowledge retention for organizational sustainability and highlights the need for further exploration to address this issue.

Keywords: knowledge retention; knowledge transfer; generational handover; organizational competitiveness; autonomous community of the Basque country



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1. Introduction

A fundamental challenge that western companies are facing is knowledge retention (Levallet & Chan, 2019). This term refers to the various strategies that organizations implement to ensure that the knowledge generated internally by employees remains within the organization (Levy, 2011). These strategies aim to retain knowledge even in the face of staff departures due to turnover or retirement processes (Sumbal et al., 2020). The United Nations (2023) warns that organizations in the world's major economies are not replenishing their workforces quickly enough to avoid future talent shortages in key sectors. In this context, digital transformation emerges as an essential component of knowledge retention, enabling companies to create innovative business models that efficiently safeguard and transfer organizational knowledge through advanced technological tools. Investment in employee training will be a crucial element in retaining both talent and knowledge within organizations (Tlaiss et al., 2017). The International Labor Organization noted that the

pandemic exacerbated this situation for many organizations, accelerating early retirements and altering migration patterns (Lisa et al., 2024). In recent years, employee turnover rates have increased (Ferguson & Hoover, 2024), driven by workers seeking a better work–life balance (Kampkötter et al., 2018). This shift reflects a changing perspective on the role of work within people’s lives (Sánchez-Hernández et al., 2019).

Organizations must implement strategies to address knowledge retention challenges (Papa et al., 2020). At the European level, similar concerns have been raised by the European Region Development Fund (2020), emphasizing the importance of knowledge transfer strategies, particularly for SMEs, given their prevalence across Europe. SMEs represent approximately 99% of all companies in the European Union, playing a central role in the economy by generating around 67% of private-sector employment and contributing significantly to GDP (Ramírez, 2023; Bernal et al., 2022). SMEs foster innovation and employment, with their flexibility enabling rapid responses to market demands (Moura-Leite, 2011). Moreover, digital transformation enhances this flexibility by allowing SMEs to adopt hybrid knowledge transfer methods, thus promoting a continuous flow of critical organizational knowledge in line with modern business models. Additionally, they play a key role in regional development, being more integrated into local communities and contributing to sustainable economic growth (Moura-Leite, 2011; Jiménez & Amaya, 2014).

The European Union promotes knowledge transfer strategies to enhance the competitiveness and sustainability of organizations, including the development of succession models (European Union, 2020). Confederations such as the CECOP (2013) analyze successful cases of companies that have retained organizational knowledge through effective transfer processes. The integration of digital resources into these processes is increasingly seen as a pathway to innovation, enabling companies to scale and secure their knowledge transfer protocols in a rapidly evolving market. The Bank of Spain has also highlighted the urgency of addressing this issue within national companies, particularly in light of aging workforces and declining birth rates, which pose a threat to the retention of organizational knowledge (Gavilán, 2024). Despite these warnings, few exhaustive analyses have been conducted on the state of knowledge retention in companies, making it vital to investigate the situation in regions like the Basque Country. This research is important because it provides a comprehensive analysis of how digital transformation can enhance knowledge retention practices, thereby fostering both innovation and competitiveness.

Specifically, this study focuses on companies in the Basque Country, a region recognized for its industrial strength (del Castillo et al., 2017) and its designation as one of the 151 Regional Innovation Valleys under the European Commission’s New European Innovation Agenda (European Commission, 2024). The Basque Country is also notable for its high GDP, with strong contributions from industry (24%) and services (67%), ranking it as the second wealthiest region in Spain (Eustat, 2024; Instituto Nacional de Estadística (INE), 2023). The Basque Country has demonstrated resilience in the face of crises and has recovered remarkably, although its current economic growth aligns with the broader European context. This reflects its strength as an industrial and economic hub within both Spain and Europe (Figure 1).

However, the Basque Business Confederation (2023) warns that demographic challenges and difficulties in attracting talent are jeopardizing knowledge retention within organizations. In response, the Basque Innovation Agency has launched several initiatives that leverage digital tools to streamline generational handover processes, helping businesses in the region develop forward-looking business models (European Commission, 2024). Nevertheless, companies still consider their situation regarding knowledge retention to be critical, with long-term consequences for their competitiveness (Ramona & Alexandra, 2019). This study is pioneering, as it explores the role of digital transformation

in supporting knowledge transfer within this unique European region, highlighting how these tools drive innovation and sustain competitive advantage. The results highlight the importance of having strategies to retain knowledge, maintain business performance, and drive innovation.

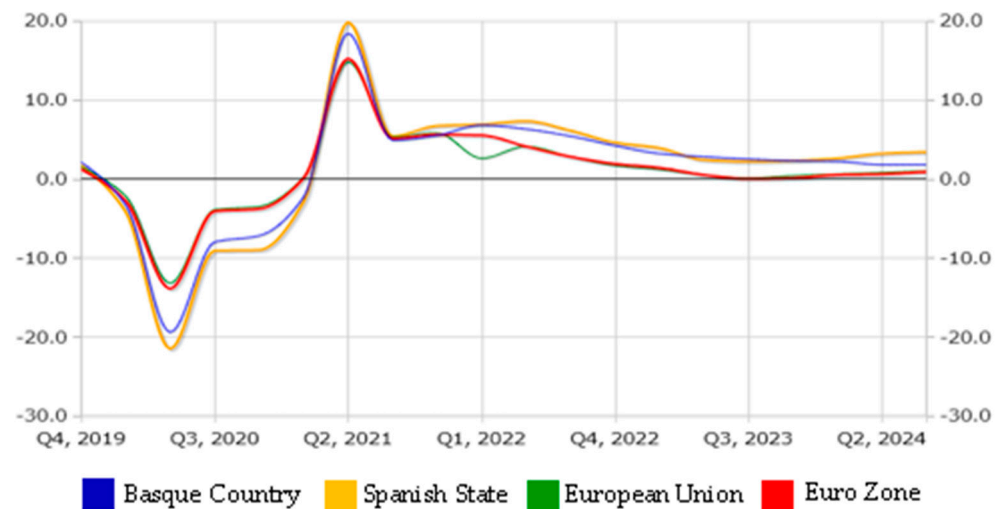


Figure 1. Year-on-year variation rates for the GDP (%). Source: Eustat. Quarterly economic accounts.

Knowledge retention is influenced by both external labor market factors and internal organizational dynamics (Martins & Meyer, 2012). One major challenge is attracting talent (Whysall et al., 2019), as it now takes much more time and effort to find candidates with the right profiles (Adeosun & Ohiani, 2020). Compounding this is the exponential increase in staff turnover, which makes talent retention even more difficult (Battiston et al., 2024). The integration of digital solutions within knowledge transfer processes offers a way to mitigate the challenges posed by turnover, creating more resilient and adaptable business models (Battistella et al., 2016; Chen et al., 2024). This situation represents a significant investment for companies, as time and resources are required to train each new employee (Rodríguez-Sánchez et al., 2020). Losing organizational knowledge due to staff departures results in a loss of competitiveness (Massingham, 2018). In addition, the declining birth rate in western countries further shrinks the labor pool (Cerna & Czaika, 2016), making it harder to find the right candidates (Kwok, 2022). At the same time, new generations are transforming the way they perceive work (Urlick et al., 2017), and organizations must now attract personnel through incentives, build employee commitment, and retain them to ensure knowledge continuity (Kossyva et al., 2024; Maheshwari et al., 2017).

Retirement processes are also accelerating due to the aging workforce, particularly in terms of the baby boom generation, which comprises a large proportion of employees (Boveda & Metz, 2016). Since many from this generation stayed with the same company throughout their careers (Guerrero et al., 2021), organizations were slow to perceive the impending knowledge gap until key employees began to retire (Cox & Overbey, 2022). As these employees retire, companies find that vital knowledge is lost unless specific transfer processes are implemented (Lissitsa & Laor, 2021; Burmeister & Deller, 2016). The shift toward digital transformation enables companies to address these generational changes more effectively, establishing comprehensive knowledge transfer systems that bridge the gap left by retiring experts. To implement these processes, it is essential to identify the key positions and the specific knowledge needed for each role (Levy, 2011). However, most organizations have not conducted this identification process, complicating efforts to build effective knowledge retention strategies (Asrar-ul-Haq & Anwar, 2016).

Knowledge retention is crucial for companies, not only because a lack of transfer protocols affects short-term efficiency (Castellano et al., 2017) but also because it influences long-term competitiveness (Latilla et al., 2018). The absence of protocols also hampers employee performance, as they lack clear guidelines for their roles (Singh et al., 2021). Additionally, without structured procedures to identify key knowledge and positions, companies lose their ability to innovate and maintain a competitive edge (Ganguly et al., 2019). Digital transformation has become a central component of these protocols, enhancing not only efficiency but also facilitating the development of adaptive and innovative business models. Given the significant consequences of inadequate knowledge retention processes, it is crucial to conduct comprehensive research on the knowledge transfer practices in Basque organizations. This study aims to assess whether companies in the Basque Country have addressed generational handover processes and, if so, which procedures they are using. This research provides valuable insights into the current state of knowledge retention strategies and underscores the importance of applying such procedures for long-term success. By integrating digital transformation insights, this study offers a blueprint for organizations aiming to enhance their knowledge retention frameworks, foster innovation, and remain competitive. Organizations that have not yet implemented these practices can use this analysis to recognize their importance, while those that have can use it for benchmarking. As the results reveal, most organizations still lack effective knowledge retention procedures.

2. Materials and Methods

2.1. Sample and Participants

The participants in this research are people in positions of responsibility (management positions, middle management of teams or departments, and other key positions) in companies in the Autonomous Community of the Basque Country. In total, the questionnaire was sent to 253 people (the invited sample) with responsibility positions in organizations within the Autonomous Community of the Basque Country (hereinafter referred to as the CAPV), obtaining a response rate of 66.4%. Responses which were not completed in full were discarded. A single questionnaire was sent out per company, resulting in a final sample of 168 managers (participating sample) from 168 companies in the CAPV.

As mentioned above, there are three fundamental reasons for choosing the CAPV, which, taken together, make this territory a singular case at the European level: It is the second highest-ranking region in Spain in terms of GDP (Instituto Nacional de Estadística (INE), 2023); industry plays a significant role in its economy, contributing considerably to its overall economic structure (Instituto Nacional de Estadística (INE), 2023); and it is recognized as one of the most prominent innovation hubs, often referred to as an 'innovation valley' due to its strong focus on technological advancements and research-driven initiatives (European Commission, 2024).

The participant profile is primarily that of individuals holding managerial positions or leading a department or team, where their knowledge of the customer or the service provided by the organization is crucial to the business.

The main demographic characteristics of the sample are as follows: (i) Gender: 54% identify as female, with the remainder identifying as male; (ii) Age: A total of 1.8% are under 25 years old, 11.9% are between 26 and 35, 20.2% are between 36 and 45, 32.7% are between 46 and 55, 32.1% are between 56 and 65, and only 0.6% are over 66 years old; (iii) Job position: A total of 61.3% hold managerial roles, 26.8% are in middle management, and the remaining 11.9% occupy other key positions of responsibility.

Additionally, the data show that 3.6% of the participants have less than 5 years of work experience, 22% have between 11 and 20 years, 32.1% have between 21 and 30 years,

and 32.1% have more than 31 years of work experience. Regarding their tenure within their organizations, 18.5% have been with their organization for less than 5 years, 17.3% for 5 to 10 years, 25.6% for 11 to 20 years, 22.6% for 21 to 30 years, and 16.1% for more than 31 years (Figure 2).

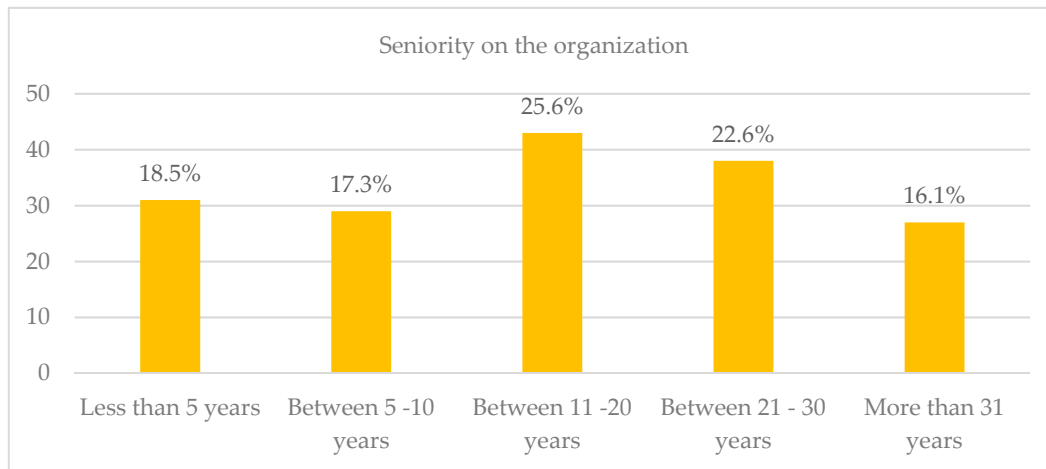


Figure 2. Seniority in the organization. Source: own elaboration.

Regarding the size of the companies (European Commission, 2024), 29.2% of the participants work in small companies (<50 workers), 26.8% work in medium-sized companies (50–249 workers), and 43.5% work in large companies (>250 workers). In terms of the sector activity of the companies participating in this study, heterogeneity can be observed: construction (4.8%), industry (30.4%), retail and hospitality (3.0%), transport and storage (3.0%), banking, finance and insurance (3.0%), information and communication (4.2%), public administration (3.0%), education (9.5%), healthcare (1.8%), and others (36.3%) (Figure 3).

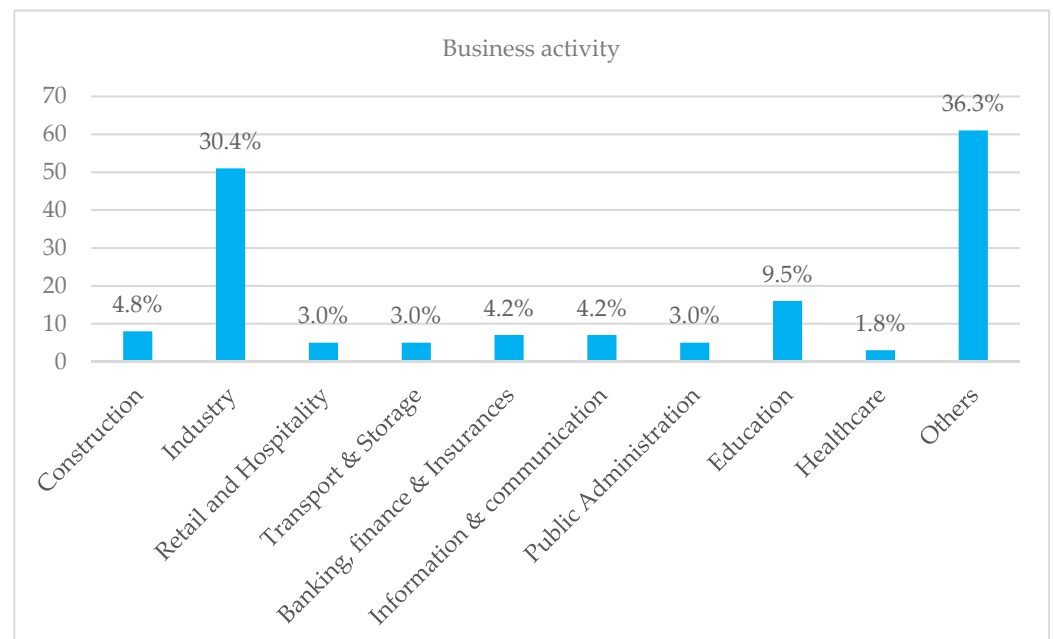


Figure 3. Business activity. Source: own elaboration.

2.2. Measurement Instruments

To conduct this research, a questionnaire with a 65-item Likert scale was designed. This scale consists of two parts. The first part includes descriptive questions about the

company (3 items), the existence of knowledge transfer and generational handover protocols within the company (10 items), and the characteristics of the job position and duties of the respondent (5 items). The second part addresses questions on organizational culture (9 items), organizational innovation (4 items), and competitive advantage (5 items), based on a study carried out by [Azeem et al. \(2021\)](#). This questionnaire also measures knowledge-sharing behavior (9 items), organizational strategy (7 items), leadership effectiveness (5 items), business performance (4 items), and job performance (4 items) based on a study conducted by [Sonmez Cakir and Adiguzel \(2020\)](#). Additionally, ad hoc questions related to the existence of knowledge transfer procedures and their characteristics were asked.

To confirm and validate that the designed items accurately reflected the constructs and dimensions under analysis, an expert judgement was applied. A panel of 13 specialists was convened, including 4 academic professors in organizational competitiveness, 3 professors of organizational climate, and 6 HR managers with experience in managing generational handover processes. Based on the feedback received from the expert panel, necessary adjustments were made to the questionnaire items. Subsequently, a pilot study was conducted to assess the behavior of the scale, which confirmed the validity of this study's dimensions. Specifically, the wording of the questions and responses was validated to ensure that there were no discrepancies in understanding among the participants.

2.3. The Data Collection Procedure

The scale was distributed electronically using a convenience sampling procedure. The researchers contacted the Chambers of Commerce in each of the three provinces in the region to distribute the questionnaire among their member companies, as well as HR experts from various companies in the Autonomous Community of the Basque Country (CAPV). The questionnaire was distributed between February and June 2024. All of the participants provided informed consent before beginning the survey. The data collection included information on the existence and characteristics of both knowledge transfer and generational handover protocols.

2.4. Research Objectives

The objectives of this research are as follows: (1) to analyze the existence of knowledge transfer procedures within organizations and evaluate whether they are used to retain knowledge; (2) to investigate whether appropriate generational handover processes exist in companies and whether they are considered a priority; (3) to assess the characteristics of knowledge transfer processes, identifying the type of knowledge that is codified and the time dedicated to these processes; (4) to describe how these knowledge retention processes are utilized within organizations; and (5) to examine whether there are differences in knowledge transfer behaviors based on the size of the organization.

3. Results

Regarding the analysis of the existence of knowledge transfer procedures, formal protocols were largely absent. Specifically, 59.5% of the respondents believe that their companies lack these protocols, while only 40.5% believe they exist (see [Figure 4](#)).

Among the organizations that do have knowledge transfer procedures, the participants perceive these processes as effective in preventing knowledge loss. In other words, they consider the strategies applied within their organization to be efficient ([Figure 5](#)). This highlights the importance of the usage of knowledge transfer procedures within organizations to preserve knowledge.

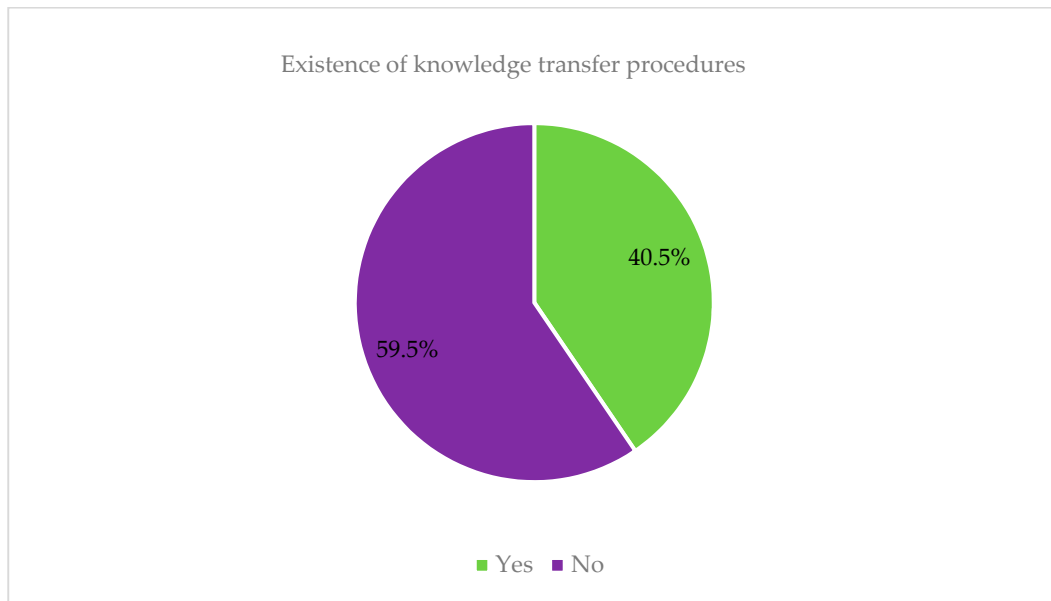


Figure 4. Existence of knowledge transfer procedures. Source: own elaboration.

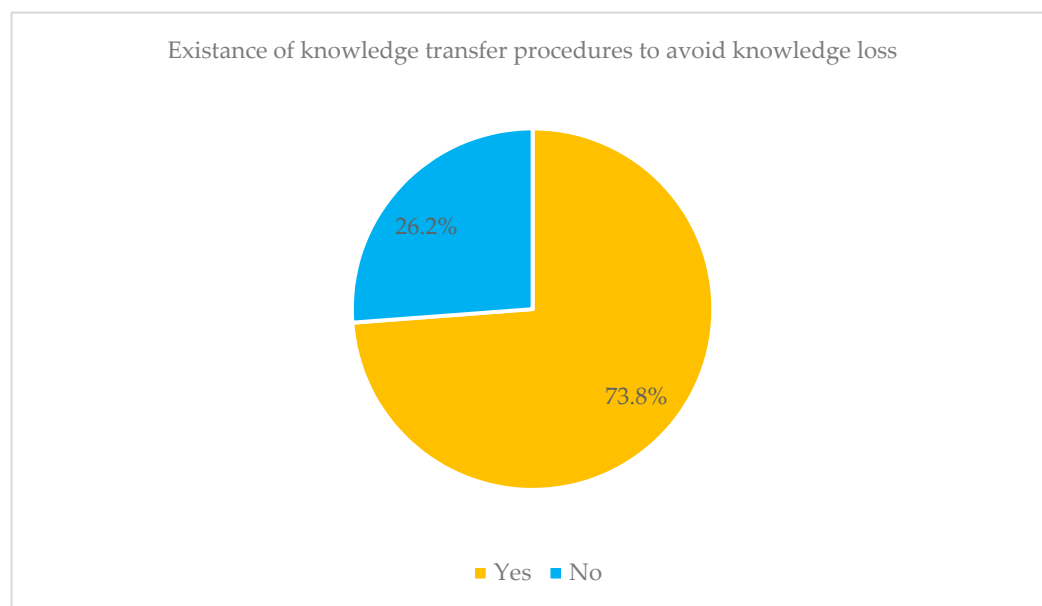


Figure 5. Existence of knowledge transfer procedures to avoid knowledge loss. Source: own elaboration.

Therefore, regarding the analysis of the existence of knowledge transfer procedures within the organizations, it can be concluded that the majority of these companies lack formal knowledge transfer protocols; however, when such protocols do exist, they are perceived as efficient. Thus, the companies that apply knowledge transfer protocols perceive an improvement in maintaining knowledge within organizations, avoiding knowledge loss between employees.

On the other hand, 69.6% of the sample believes that their organization does not have adequate generational handover processes for knowledge transfer, while the remaining 30.4% confirm the existence of such protocols for generational handover (Figure 6). These results give an overview of what the situation is for the sample's organizations in terms of the application of generational handover protocols. Linking the previous literature, it is

possible to state that the majority of the organizations do not apply this kind of protocols, and therefore, they struggle to maintain organizational knowledge.

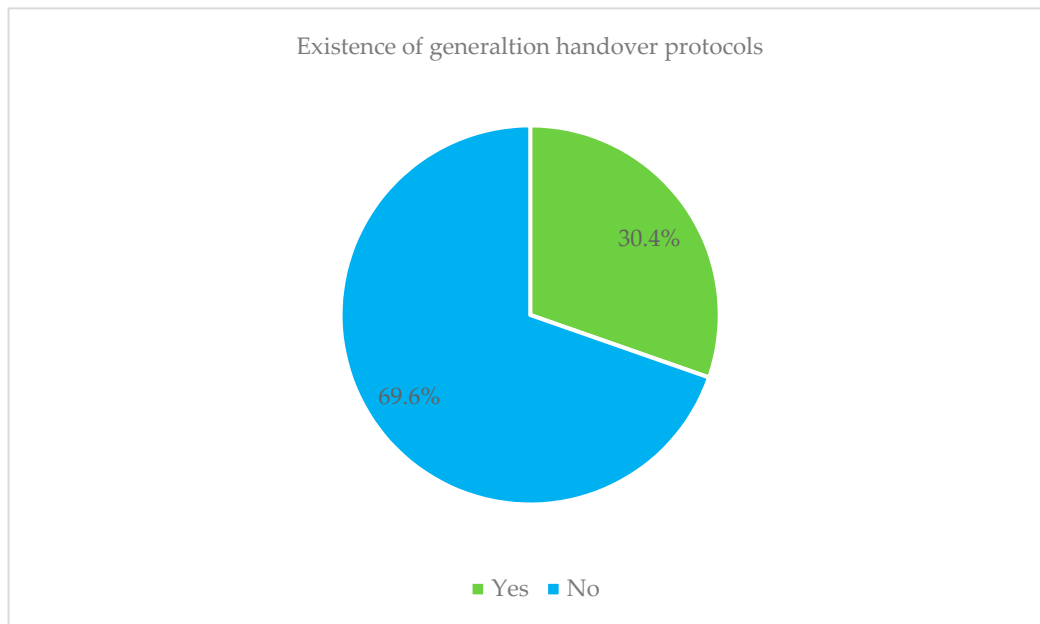


Figure 6. Existence of generation handover protocols. Source: own elaboration.

Furthermore, the majority of the participants (76.8%) consider generational handover to be a high or very high priority for their organizations. Only 23.2% of the sample believes that this process should not be considered a priority within their company (Figure 7).

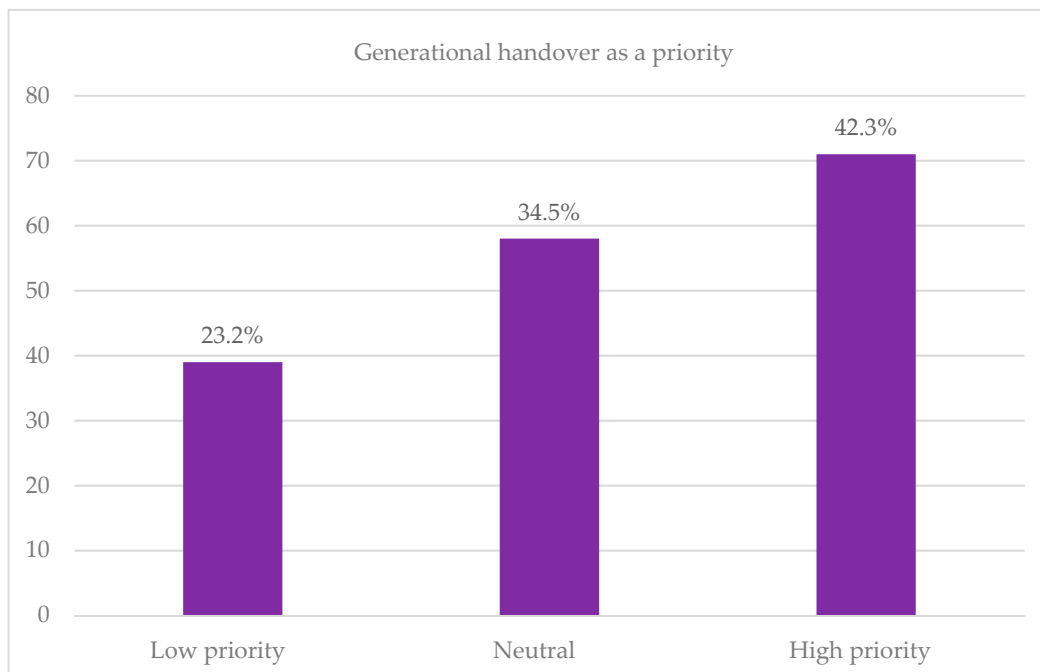


Figure 7. Generational handover as a priority. Source: own elaboration.

Thus, regarding the existence of adequate generational handover processes in organizations, it can be concluded that in the analyzed sample, the majority of the participants consider generational handover processes to be fundamental (highly or very highly pri-

oritized); however, most also believe that these generational handover processes are not implemented in their organizations.

Moving forward, the majority of the participants (72.6%) report that their organizations use both analog and digital procedures in their knowledge transfer protocols, while 20.3% use only digital procedures (applications or resources), and the remaining 7.1% state that only analog procedures are employed in their organization (Figure 8). These results show that even if organizations do have digital resources that could facilitate the introduction of knowledge transfer procedures, further adjustment is needed to transform protocols into an entirely digital form.

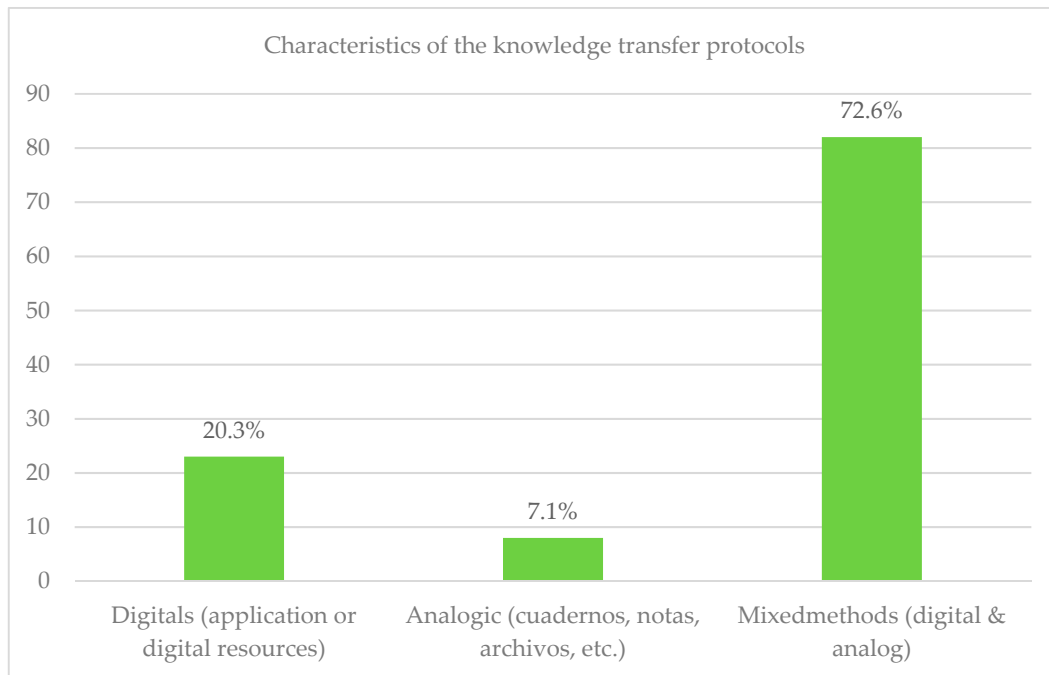


Figure 8. Characteristics of the knowledge transfer protocols. Source: own elaboration.

Regarding the type of knowledge transferred in these processes (Figure 9), most of the respondents (54.8%) indicate that both tangible and intangible knowledge is transferred in their organization. Meanwhile, 31.5% of the respondents report that only tangible knowledge is transferred, and the remaining 13.7% state that only intangible knowledge is transferred. Considering that intangible knowledge is more difficult to transfer, these results show that organizations share more tangible knowledge, as the protocols used do not require digital equipment for its transfer.

Additionally, participants were asked to indicate the time that their organizations dedicate to knowledge transfer processes (see Figure 10). The results are as follows: (i) The majority (44%) estimate that the time spent is between 1 and 2 months; (ii) 29.8% believe that their organization dedicates between 3 and 6 months to this process; (iii) 17.3% estimate this period to be between 7 months and 1 year; and (iv) only 8.9% report that the process lasts more than 1 year. Thus, the estimated time spent on knowledge transfer is low considering its complexity and the involvement needed of the organizations and employees.

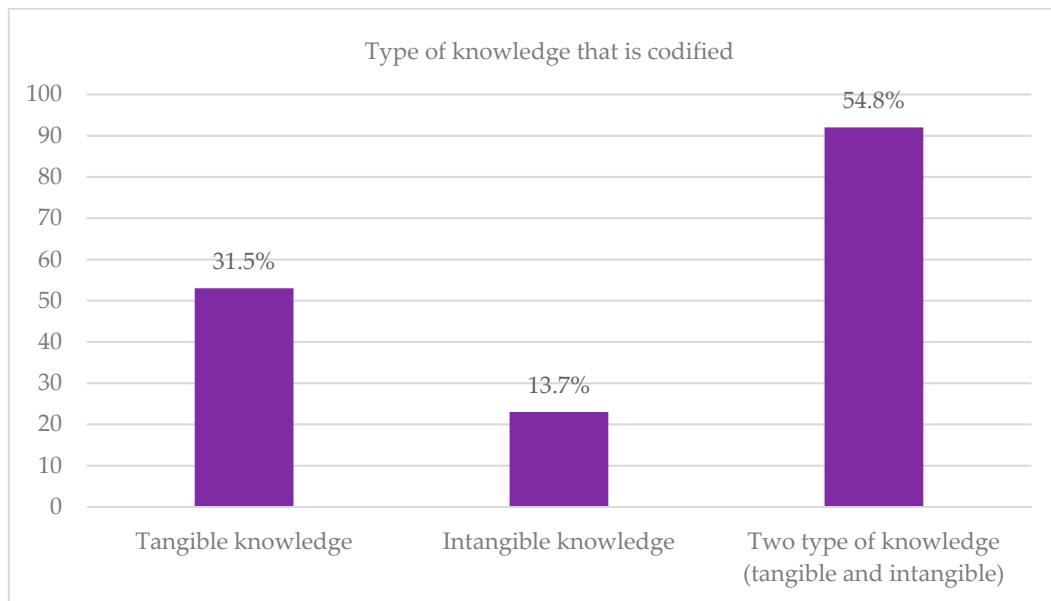


Figure 9. Type of knowledge that is codified. Source: own elaboration.

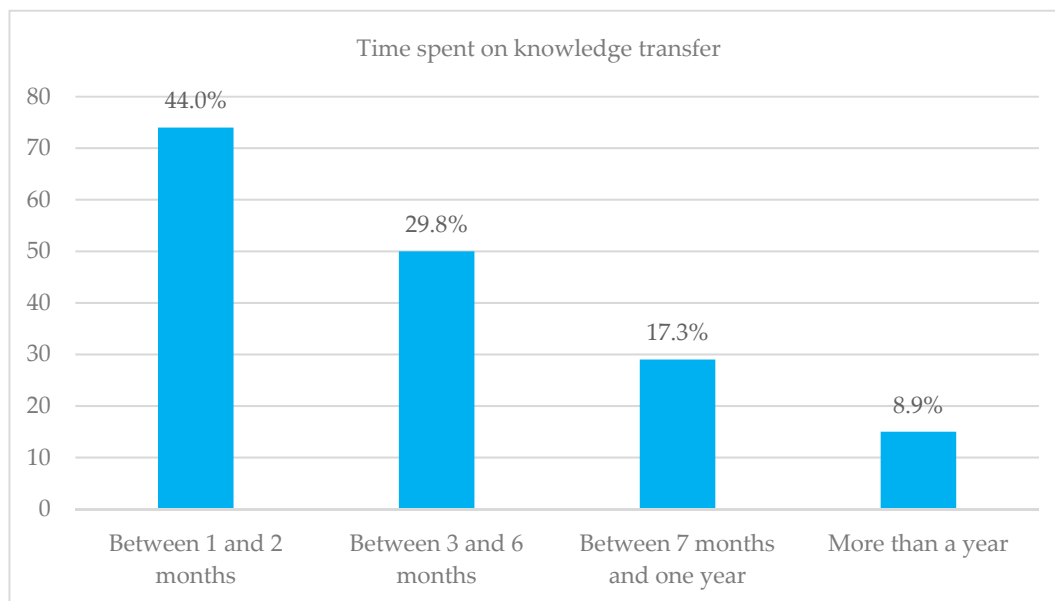


Figure 10. Time spent on knowledge transfer. Source: own elaboration.

Thus, regarding the characteristics of knowledge transfer processes in organizations, it can be concluded from the analyzed sample that the majority of organizations use both analog and digital procedures to transfer knowledge. The knowledge being transferred is both tangible and intangible. Moreover, the time invested in these processes is typically less than one year.

Regarding the use of knowledge retention processes, 19.6% of organizations use these processes exclusively for knowledge retention, while 3% use them both exclusively and routinely, and 2.4% use them exclusively and for audits. Additionally, 47.1% of the participants state that their organizations use knowledge transfer processes routinely to retain knowledge, 7.7% use these processes both routinely and for audits, 14.9% use them exclusively for audits, and only 5.3% confirm that such procedures are used in specific situations, routinely, and for audits (Figure 11).

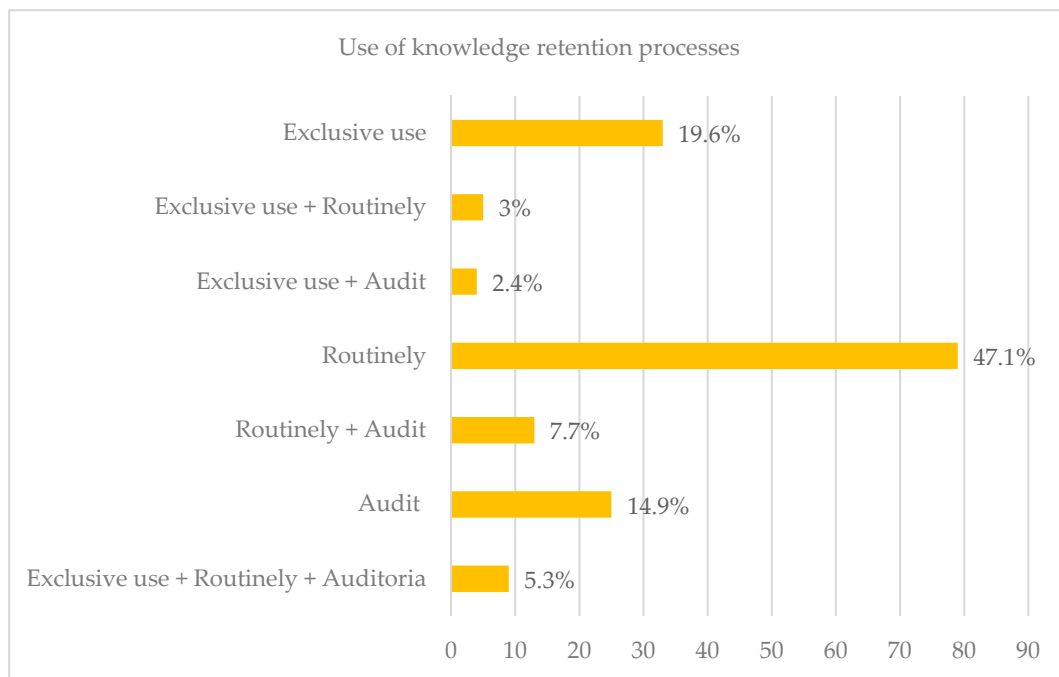


Figure 11. Use of knowledge retention processes. Source: own elaboration.

In order to examine whether there are differences in knowledge transfer behaviors based on the size of the organization, the variable for knowledge transfer behavior ($\alpha = 0.899$) was measured, demonstrating adequate reliability. To verify the assumption of normality, the Kolmogorov–Smirnov test was performed on the variables for knowledge transfer behavior (the KS test (167) = 0.118; $p < 0.001$) and the number of employees in the organization (the KS test (167) = 0.282; $p < 0.001$), indicating that the sample does not follow a normal distribution. The assumption of homoscedasticity was evaluated using Levene’s test ($F(2,164) = 0.563$; $p = 0.570$), suggesting that there is homogeneity of variances. The results of the Kruskal–Wallis test ($H(2) = 0.675$, $p = 0.714$) did not reveal a significant effect of organization size on employees’ knowledge transfer behavior. These results indicate that knowledge transfer behavior does not significantly vary by organizational size, suggesting that other factors such as the knowledge transfer protocols or strategies may play a more critical role.

4. Discussion

The main objective of this research is to analyze the knowledge transfer procedures within companies in the Autonomous Community of the Basque Country. The results show that most organizations lack formal strategies for organizational knowledge transfer. This highlights an opportunity for digital transformation to fill these gaps, offering tools and platforms that can streamline knowledge transfer processes and foster innovation in business models. This suggests that many companies risk losing valuable knowledge, as key employees may retire or leave, potentially impacting both internal efficiency and their position in the labor market (Torres et al., 2018). Igoa-Iraola and Díez (2024) emphasize that establishing knowledge transfer procedures is crucial to prevent knowledge drain. Effective strategies help preserve organizational knowledge, reduce risks, and enhance operational continuity, underscoring the importance of knowledge management policies (Papa et al., 2020). This type of planning directly influences business performance and should be prioritized (Naim & Lenka, 2018). Argote and Fahrenkopf (2016) highlight how such procedures improve communication, facilitating smoother transitions and minimizing knowledge loss (Santoro et al., 2018).

The findings reveal that while most organizations recognize knowledge retention as a priority, they lack formal processes. Digital transformation emerges as a key factor in closing this gap, as companies that embrace digital tools for knowledge transfer often achieve more sustainable, efficient, and innovative outcomes. This gap could pose significant challenges, particularly as companies contend with an aging workforce and recruitment difficulties due to declining birth rates, which exacerbate knowledge loss (Smit et al., 2020). A lack of long-term focus may also contribute to this issue, with organizations often failing to develop clear strategies for knowledge retention (Abubakar et al., 2019). However, larger organizations, with resources devoted to analysis and innovation, are more likely to design generational handover strategies and implement better knowledge transfer protocols (Levine & Prietula, 2012; Kianto et al., 2017). Organizations generally use a combination of digital and traditional resources for knowledge transfer. The degree of digitalization significantly affects the sophistication and efficacy of knowledge transfer protocols, as companies that invest in advanced digital tools exhibit superior adaptability and a competitive edge in dynamic markets (Martínez-Morán et al., 2024). Both tangible and intangible knowledge are valued, and customized strategies are necessary to address the specific needs of different sectors and job positions. However, 91.1% of companies dedicate less than a year to generational handover processes, a timeframe often insufficient for effective knowledge transfer.

Less than half of the organizations integrate knowledge transfer into their daily operations, limiting its long-term sustainability. Embedding digital strategies into routine knowledge transfer practices could enhance sustainability and foster a continuous culture of learning and innovation. This indicates that significant progress is still needed for companies to fully embed knowledge transfer strategies and prevent knowledge loss. Raising awareness about the importance of knowledge retention is crucial to ensuring organizational continuity, competitiveness, and long-term success (Antunes & Pinheiro, 2020).

In conclusion, no significant differences were found in knowledge transfer practices based on firm size. However, digital tools for knowledge retention can level the playing field, enabling small and medium-sized enterprises (SMEs) to adopt scalable, innovative solutions similar to those of larger corporations, thus maintaining their competitiveness. In terms of a study conducted by Park et al. (2015) stated that the age of a company's joint venture could be a driver of knowledge and a moderator of its effect on performance. Moreover, on the study conducted by Sonmez Cakir and Adiguzel (2020), white-collar employees from the industrial sector in Pakistan were analyzed, and the results showed that organization leader effectiveness and knowledge sharing between department managers have a positive effect. Knowledge transfer remains a critical factor in maintaining organizational competitiveness across small, medium, and large companies. Ensuring the retention of technical and specialized knowledge not only promotes continuity but also fosters innovation and adaptability in today's dynamic business environment.

One of the main limitations of this study is the representativeness of the sample. While the research includes a significant number of companies from the Basque Autonomous Community (CAPV), the use of convenience sampling may limit the generalizability of the results. A more representative, random sample of companies from the region, or an expansion of this study to the national or international level, would be desirable. Additionally, focusing on the CAPV, although it is relevant due to its industrial context, restricts comparisons with other regions or sectors that may have different socioeconomic or industrial characteristics.

For future research, it is recommended to expand this study to other regions in Spain or internationally to evaluate whether the findings are consistent across different industrial

and cultural contexts. This would allow for comparison of the results and provide a more global perspective on knowledge transfer processes. Additionally, a longitudinal study conducted over a longer period could help observe the changes in knowledge transfer and generational succession processes, particularly in companies implementing new strategies or procedures over time.

Regarding the impact of digitalization, further exploration into how digital tools enhance knowledge retention processes across sectors could provide insights into their effectiveness and potential for fostering innovation. Investigating whether significant differences exist between sectors in the use of digital technologies for knowledge retention would also be beneficial.

Another area for future research is the transfer of tacit knowledge, which often cannot be formally codified. Exploring digital methods for tacit knowledge retention, such as virtual mentoring or knowledge-sharing platforms, could provide valuable strategies for companies. Finally, a sectoral comparison could be carried out, broadening the analysis to include sectors beyond industry, such as services, technology, or education, to determine whether the knowledge transfer strategies and challenges differ across these sectors.

This study has significant implications for research, practice, and society. In the realm of research, the findings highlight the critical role of knowledge transfer protocols as a cornerstone of organizational sustainability, offering a framework for future studies on the integration of digital transformation into knowledge management strategies. From a practical perspective, companies can use these insights to develop more effective strategies that combine digital tools with traditional methodologies, maximizing the retention of critical knowledge and minimizing the losses associated with workforce turnover. Thus, this research improves the quality of life of employees by promoting structured knowledge transfer protocols that reduce workplace stress and improve clarity. It fosters a culture of continuous learning and adaptability, empowering individuals to embrace change positively. These outcomes lead to greater professional satisfaction and resilience during workforce transitions. Socially, this work underscores how knowledge transfer policies can mitigate the economic and social impacts of an aging workforce while promoting greater equity in access to knowledge and training, which are essential for long-term competitiveness in a rapidly evolving global market. These research avenues can guide other scholars interested in the topic and help companies improve their organizational knowledge management practices.

5. Conclusions

This research provides valuable insights into the current state of organizations regarding the knowledge retention and transfer strategies within companies in the Basque Autonomous Community.

Firstly, this study reveals that most organizations lack effective strategies for knowledge transfer. This underlines the potential of digital transformation to bridge these gaps, offering innovative digital tools that can streamline knowledge transfer and improve competitiveness on an evolving market. This suggests that over time, these companies may face significant knowledge loss, potentially undermining their competitiveness in the market.

Secondly, while most organizations do not implement formal processes for knowledge retention, they recognize its importance and consider it a priority. This awareness indicates that organizations understand the critical role knowledge retention plays in ensuring the efficiency and sustainability of their operations, even if they have yet to develop adequate strategies to manage it effectively. Embracing digital tools as part of these strategies could elevate their knowledge retention efforts, making them more efficient and aligned with modern business demands.

Thirdly, in terms of the protocol characteristics, this study concludes that organizations use mixed strategies, combining digital and analog methods for knowledge transfer. Both tangible and intangible knowledge are prioritized. The integration of digital resources enhances these mixed strategies, enabling companies to secure knowledge in innovative ways that support adaptability and resilience. However, the time dedicated to these processes is limited, with 91.1% of organizations allocating less than a year to generational knowledge transfer. Additionally, fewer than half of the organizations incorporate these knowledge transfer processes as part of their routine management strategies.

Finally, this study highlights that no significant differences were found in knowledge transfer practices based on organizational size. This finding suggests that digital transformation has democratized the access to effective knowledge transfer practices, allowing companies of all sizes to leverage similar tools for maintaining market competitiveness. This suggests that knowledge transfer is a relevant strategy for all companies, regardless of size, and plays a key role in their efforts to retain critical knowledge and maintain market competitiveness.

The originality of this study lies in its pioneering focus, as it is one of the first to analyze the knowledge transfer processes in a unique European region where industrial innovation is central. By addressing the role of digital transformation, this research provides actionable insights into how companies can use technology to enhance knowledge retention and foster business model innovation. Moreover, this research represents an important step in highlighting the challenges organizations face with knowledge loss, encouraging internal reflection on the necessary steps to improve and remain competitive in the labor market.

This study provides a comprehensive overview of the existence and characteristics of the protocols applied for knowledge transfer, offering valuable insights for both the scientific community and the business sector. These findings emphasize the strategic advantage of integrating digital transformation into knowledge retention protocols, which not only safeguards organizational knowledge but also promotes sustainable growth. These results enhance our understanding of the current state of these protocols and their application in organizational contexts. Additionally, this research could contribute to the implementation of effective knowledge transfer protocols and raise awareness of their importance in ensuring long-term business competitiveness.

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References

- Abubakar, A. M., Elrehail, H., Alatailat, M. A., & Elçi, A. (2019). Knowledge management, decision-making style and organizational performance. *Journal of Innovation & Knowledge*, 4(2), 104–114. [[CrossRef](#)]

- Adeosun, O. T., & Ohiani, A. S. (2020). Attracting and recruiting quality talent: Firm perspectives. *Rajagiri Management Journal*, 14(2), 107–120. [CrossRef]
- Antunes, H. D. J. G., & Pinheiro, P. G. (2020). Linking knowledge management, organizational learning and memory. *Journal of Innovation & Knowledge*, 5(2), 140–149. [CrossRef]
- Argote, L., & Fahrenkopf, E. (2016). Knowledge transfer in organizations: The roles of members, tasks, tools, and networks. *Organizational Behavior and Human Decision Processes*, 136, 146–159. [CrossRef]
- Asrar-ul-Haq, M., & Anwar, S. (2016). A systematic review of knowledge management and knowledge sharing: Trends, issues, and challenges. *Cogent Business & Management*, 3(1), 1127744. [CrossRef]
- Azeem, M., Ahmed, M., Haider, S., & Sajjad, M. (2021). Expanding competitive advantage through organizational culture, knowledge sharing and organizational innovation. *Technology in Society*, 66, 101635. [CrossRef]
- Basque Business Confederation. (2023). *Con el reto demográfico y los problemas para acometer el relevo generacional, la FP debe jugar un papel aún más relevante*. Available online: <https://www.confebask.eus/saladeprensa/noticias/fp-euskadi-debe-jugar-papel-aun-mas-relevante.html> (accessed on 2 July 2024).
- Battistella, C., De Toni, A. F., & Pillon, R. (2016). Inter-organisational technology/knowledge transfer: A framework from critical literature review. *The Journal of Technology Transfer*, 41(5), 1195–1234. [CrossRef]
- Battiston, D., Espinosa, M., & Liu, S. (2024). Talent poaching and job rotation. *Management Science*, 1–33. [CrossRef]
- Bernal, O. A. V., Laverde, W. E. M., & Torres, C. M. G. (2022). Enfoque de sistemas integrados de gestión en desempeño de organizaciones para toma de decisiones. *Revista de Ciencias Sociales y Sostenibilidad*, 2(1), 17–27. [CrossRef]
- Boveda, I., & Metz, A. J. (2016). Predicting end-of-career transitions for baby boomers nearing retirement age. *The Career Development Quarterly*, 64(2), 153–168. [CrossRef]
- Burmeister, A., & Deller, J. (2016). Knowledge retention from older and retiring workers: What do we know, and where do we go from here? *Work, Aging and Retirement*, 2(2), 87–104. [CrossRef]
- Castellano, S., Davidson, P., & Khelladi, I. (2017). Creativity techniques to enhance knowledge transfer within global virtual teams in the context of knowledge-intensive enterprises. *The Journal of Technology Transfer*, 42(2), 253–266. [CrossRef]
- CECOP. (2013). *The European confederation of cooperatives and worker-owned enterprises active in industries and services. Business transfers to employees under the form of a cooperative in europe: Opportunities and challenges*. Available online: https://www.socioeco.org/bdf_fiche-document-2110_en.html (accessed on 17 July 2024).
- Cerna, L., & Czaika, M. (2016). European policies to attract talent: The crisis and highly skilled migration policy changes. In *High-Skill migration and recession* (pp. 22–43). Palgrave Macmillan UK. [CrossRef]
- Chen, S., Sun, J., & Liang, Y. (2024). The impact on knowledge transfer to scientific and technological innovation efficiency of talents: Analysis based on institutional environment in China. *Technology Analysis & Strategic Management*, 36(7), 1398–1413. [CrossRef]
- Cox, V., & Overbey, J. A. (2022). Generational knowledge transfer and retention strategies. *Development and Learning in Organizations: An International Journal*, 37(4), 10–13. [CrossRef]
- del Castillo, J., Paton, J., & Barroeta, B. (2017). *The great basque competitive transformation towards sustainable innovations*. In *Sustainable innovation and regional development*. Edward Elgar Publishing. [CrossRef]
- European Commission. (2024). *A new European innovation agenda. Connected innovation ecosystems. research and innovation*. Available online: https://research-and-innovation.ec.europa.eu/document/download/12476e45-0413-4487-bdd6-668d7457f1cc_en?filename=ec_rtd_neia-list-of-riv.pdf (accessed on 5 August 2024).
- European Region Development Fund. (2020). *Facilitating business transfer for sustainable jobs and economic activity. A policy brief from the policy learning Platform on SME competitiveness. Interreg Europe*. Available online: <https://www.interregueurope.eu/find-policy-solutions/policy-briefs/facilitating-business-transfers-for-sustaining-jobs-and-economic-activity> (accessed on 16 July 2024).
- European Union. (2020). *Enhance the competitiveness and sustainability of European SMEs through succession procedures and models. Success road. Interreg Europe*. Available online: <https://projects2014-2020.interregueurope.eu/successroad/> (accessed on 9 August 2024).
- Eustat. (2024). *The GDP of the basque country increased by 1.8% in the third quarter of 2024 and employment rose by 1.6%*. *Basque Stat. Inst.* Available online: https://en.eustat.eus/estad/id_11/ti_quarterly-economic-accounts/latest-press-release.html (accessed on 25 July 2024).
- Ferguson, S., & Hoover, M. (2024). *Understanding America's labor shortage: The most impacted industries*. U.S chamber of commerce. Available online: <https://www.uschamber.com/workforce/understanding-americas-labor-shortage-the-most-impacted-industries> (accessed on 30 June 2024).
- Ganguly, A., Talukdar, A., & Chatterjee, D. (2019). Evaluating the role of social capital, tacit knowledge sharing, knowledge quality and reciprocity in determining innovation capability of an organization. *Journal of Knowledge Management*, 23(6), 1105–1135. [CrossRef]
- Gavilán, A. (2024). *Informe Annual 2023. Capítulo 3. Dirección General de Economía y Estadística. Banco de España*. Available online: <https://www.bde.es/wbe/es/publicaciones/informes-memorias-anales/informe-anual/> (accessed on 2 August 2024).
- Guerrero, M., Amorós, J. E., & Urbano, D. (2021). Do employees' generational cohorts influence corporate venturing? A multilevel analysis. *Small Business Economics*, 57(1), 47–74. [CrossRef]

- Igoa-Iraola, E., & Díez, F. (2024). Procedures for transferring organizational knowledge during generational change: A systematic review. *Heliyon*, 10(5), e27092. [CrossRef] [PubMed]
- Instituto Nacional de Estadística (INE). (2023). *Contabilidad Regional de España*. Available online: https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736167628&menu=ultiDatos&idp=1254735576581 (accessed on 9 August 2024).
- Jiménez, H. F., & Amaya, C. L. (2014). Lean Six Sigma en pequeñas y medianas empresas: Un enfoque metodológico. *Ingeniare. Revista Chilena de Ingeniería*, 22(2), 263–277. [CrossRef]
- Kampkötter, P., Harbring, C., & Sliwka, D. (2018). Job rotation and employee performance—Evidence from a longitudinal study in the financial services industry. *The International Journal of Human Resource Management*, 29(10), 1709–1735. [CrossRef]
- Kianto, A., Sáenz, J., & Aramburu, N. (2017). Knowledge-based human resource management practices, intellectual capital and innovation. *Journal of Business Research*, 81, 11–20. [CrossRef]
- Kossyva, D., Theriou, G., Aggelidis, V., & Sarigiannidis, L. (2024). Retaining talent in knowledge-intensive services: Enhancing employee engagement through human resource, knowledge and change management. *Journal of Knowledge Management*, 28(2), 409–439. [CrossRef]
- Kwok, L. (2022). Labor shortage: A critical reflection and a call for industry-academia collaboration. *International Journal of Contemporary Hospitality Management*, 34(11), 3929–3943. [CrossRef]
- Latilla, V. M., Frattini, F., Petruzzelli, A. M., & Berner, M. (2018). Knowledge management, knowledge transfer and organizational performance in the arts and crafts industry: A literature review. *Journal of Knowledge Management*, 22(6), 1310–1331. [CrossRef]
- Levallet, N., & Chan, Y. E. (2019). Organizational knowledge retention and knowledge loss. *Journal of Knowledge Management*, 23(1), 176–199. [CrossRef]
- Levine, S. S., & Prietula, M. J. (2012). How knowledge transfer impacts performance: A multilevel model of benefits and liabilities. *Organization Science*, 23(6), 1748–1766. [CrossRef]
- Levy, M. (2011). Knowledge retention: Minimizing organizational business loss. *Journal of Knowledge Management*, 15(4), 582–600. [CrossRef]
- Lisa, F., Rosen, A., Astrid, H., & International Labour Organization. (2024). *Imbalances between supply and demand recent causes of labour shortages in advanced economies*. International Labour Organization. [CrossRef]
- Lissitsa, S., & Laor, T. (2021). Baby Boomers, Generation X and Generation Y: Identifying generational differences in effects of personality traits in on-demand radio use. *Technology in Society*, 64, 101526. [CrossRef]
- Maheshwari, V., Gunesh, P., Lodorfos, G., & Konstantopoulou, A. (2017). Exploring HR practitioners' perspective on employer branding and its role in organisational attractiveness and talent management. *International Journal of Organizational Analysis*, 25(5), 742–761. [CrossRef]
- Martínez-Morán, P. C., Díez, F., Solabarrieta, J., Fernández-Rico, J. M., & Igoa-Iraola, E. (2024). Talent management digitalization and company size as a catalyst. *Systems*, 12(5), 168. [CrossRef]
- Martins, E. C., & Meyer, H. W. (2012). Organizational and behavioral factors that influence knowledge retention. *Journal of Knowledge Management*, 16(1), 77–96. [CrossRef]
- Massingham, P. R. (2018). Measuring the impact of knowledge loss: A longitudinal study. *Journal of Knowledge Management*, 22(4), 721–758. [CrossRef]
- Moura-Leite, R. C. (2011). Responsabilidad social empresarial de las pymes: El caso del distrito V de Huelva-España. *Organizações & Sociedade*, 18(56), 139–152. [CrossRef]
- Naim, M. F., & Lenka, U. (2018). Development and retention of Generation Y employees: A conceptual framework. *Employee Relations*, 40(2), 433–455. [CrossRef]
- Papa, A., Dezi, L., Gregori, G. L., Mueller, J., & Miglietta, N. (2020). Improving innovation performance through knowledge acquisition: The moderating role of employee retention and human resource management practices. *Journal of Knowledge Management*, 24(3), 589–605. [CrossRef]
- Park, C., Vertinsky, I., & Becerra, M. (2015). Transfers of tacit vs. explicit knowledge and performance in international joint ventures: The role of age. *International Business Review*, 24(1), 89–101. [CrossRef]
- Ramírez, J. F. (2023). Aprendizaje Organizacional como factor condicionante de la competitividad de la Empresa Pequeña y Mediana-PYME. *Experior*, 1(2), 132–147. [CrossRef]
- Ramona, T., & Alexandra, B. (2019). Knowledge retention within small and mediumsized enterprises. *Studies in Business and Economics*, 14(3), 231–238. [CrossRef]
- Rodríguez-Sánchez, J., González-Torres, T., Montero-Navarro, A., & Gallego-Losada, R. (2020). Investing time and resources for work–life balance: The effect on talent retention. *International Journal of Environmental Research and Public Health*, 17(6), 1920. [CrossRef]
- Sánchez-Hernández, M. I., González-López, R., Buenadicha-Mateos, M., & Tato-Jiménez, J. L. (2019). Work-Life balance in great companies and pending issues for engaging new generations at work. *International Journal of Environmental Research and Public Health*, 16(24), 5122. [CrossRef]

- Santoro, G., Vrontis, D., Thrassou, A., & Dezi, L. (2018). The Internet of Things: Building a knowledge management system for open innovation and knowledge management capacity. *Technological Forecasting and Social Change*, *136*, 347–354. [CrossRef]
- Singh, S. K., Gupta, S., Busso, D., & Kamboj, S. (2021). Top management knowledge value, knowledge sharing practices, open innovation and organizational performance. *Journal of Business Research*, *128*, 788–798. [CrossRef]
- Smit, S., Tacke, T., Lund, S., Manyika, J., & Thiel, L. (2020). The future of work in Europe. McKinsey Global Institute (MGI). Available online: <https://www.mckinsey.com/> (accessed on 28 July 2024).
- Sonmez Cakir, F., & Adiguzel, Z. (2020). Analysis of leader effectiveness in organization and knowledge sharing behavior on employees and organization. *Sage Open*, *10*(1), 2158–2440. [CrossRef]
- Sumbal, M. S., Tsui, E., Durst, S., Shujahat, M., Irfan, I., & Ali, S. M. (2020). A framework to retain the knowledge of departing knowledge workers in the manufacturing industry. *VINE Journal of Information and Knowledge Management Systems*, *50*(4), 631–651. [CrossRef]
- Tlaiss, H. A., Martin, P., & Hofaidhllaoui, M. (2017). Talent retention: Evidence from a multinational firm in France. *Employee Relations*, *39*(4), 426–445. [CrossRef]
- Torres, A. I., Ferraz, S. S., & Santos-Rodrigues, H. (2018). The impact of knowledge management factors in organizational sustainable competitive advantage. *Journal of Intellectual Capital*, *19*(2), 453–472. [CrossRef]
- United Nations. (2023). *The looming jobs crisis. Signals spotlight 2023. Future of development*. Available online: <https://www.undp.org/future-development/signals-spotlight-2023/looming-jobs-crisis> (accessed on 22 June 2024).
- Urlick, M. J., Hollensbe, E. C., & Fairhurst, G. T. (2017). Differences in understanding *Generation* in the workforce. *Journal of Intergenerational Relationships*, *15*(3), 221–240. [CrossRef]
- Whysall, Z., Owtram, M., & Brittain, S. (2019). The new talent management challenges of Industry 4.0. *Journal of Management Development*, *38*(2), 118–129. [CrossRef]

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