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Relationships Between Generational Handover Protocols, Knowledge Transfer Behavior, and Key Organizational Outcomes

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Abstract

(1) Background: This paper examines the relationships between generational handover protocols, knowledge transfer behavior, and key organizational outcomes. (2) Methods: A quantitative design was applied, using non-parametric tests and partial least squares structural equation modeling (PLS-SEM) on survey data from 168 employees in companies located in the Basque Country. (3) Results: The presence of formal knowledge transfer protocols and generational handover processes was significantly associated with greater employee knowledge-tranfer behaviors. These behaviors, in turn, had significant positive effects on organizational innovation and job performance. Although moderate correlations were observed with strategy, performance, and competitive advantage, the structural model did not confirm direct relationships. (4) Conclusions: Despite their strategic importance, many organizations still lack formalized mechanisms for knowledge preservation. This study offers a framework for understanding the impact of structured knowledge transfer practices on organizational performance and suggests avenues for future research in knowledge continuity and succession planning.

Keywords: knowledge transfer; generational handover protocols; knowledge-tranfer behavior; organizational innovation; job performance

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1. Introduction

Knowledge is a key factor for organizational success [1]. It is a core element that enables organizations to stand out in the market and, as a consequence, attract highly qualified talent [2]. In this context, organizational knowledge refers to the processes, strategies, and specific actions developed within an organization to perform complex tasks. These tasks require understanding a set of general principles grounded in collective understandings historically consolidated within the organization [3]. The creation of organizational knowledge demands a comprehensive consideration of the business context, available knowledge assets, and the processes of knowledge generation occurring throughout the organization [4]. Although this process can be challenging, it should be treated as a strategic priority, as it forms a fundamental pillar for ensuring competitive advantage and sustainability in today's market [5]. Therefore, this paper aims to analyze the associations among organizational knowledge transfer behaviors with applied knowledge transfer and generational handover protocols within enterprises. It also explores the potential influence of knowledge transfer behaviors on key organizational outcomes. Thus, this research

responds to the study of knowledge and its management, which has been a subject of importance for organizations over the last few years [6,7], and it continues to be highly relevant in today's business [8,9].

Although knowledge retention is regarded as one of the top priorities for companies [10], the primary challenge lies in its effective implementation [11,12]. Most organizations lack efficient processes for retaining knowledge [13,14], highlighting a gap between the strategic importance attributed to knowledge retention and the practical difficulties in managing it. The absence of well-defined procedures impedes the implementation of effective knowledge transfer strategies [15,16]. When an organization struggles to identify and track its internal knowledge, managing it becomes significantly more complex [17,18]. It is essential for organizations to establish robust structures and information flows [19,20]. Indeed, internal strategies and processes are necessary to ensure that knowledge created within the organization is effectively transferred among employees and is not lost [21]. However, prior research suggests that the influence of knowledge transfer may vary across outcomes, being more directly linked to innovation and individual performance [12,22].

Knowledge transfer refers to the process through which knowledge, skills, ideas, concepts, and experiences are transmitted from one source—an individual, group, or organization—to another [23,24]. This process combines communication, assimilation, and application of knowledge in a new context, aiming to improve innovation capacity, efficiency, and organizational sustainability. Thus, knowledge transfer is crucial for maintaining organizational performance [25]. In organizations, knowledge transfer typically occurs either between departments or among employees, depending on the procedures established [26]. For knowledge to flow effectively, organizations must have internal structures in place [27]. These structures are often formalized through protocols specifically designed to facilitate knowledge transfer [28]. Research shows that such protocols help organizations track and codify both generated and existing knowledge [29]. By identifying and transferring knowledge effectively, organizations can improve their competencies and ultimately achieve higher performance levels [2,30].

This process focuses on the transfer of knowledge that takes place during the final stages of an employee's professional career. It involves the transmission of competencies, including (i) theoretical and/or practical knowledge; (ii) soft, social, and/or technical skills; and (iii) know-how [31]. The primary objective of generational handover is to retain critical knowledge and competencies within the organization, thereby supporting its sustainability by preserving the expertise necessary to carry out key organizational activities [32]. It is primarily directed at highly experienced employees approaching retirement [33]. The aim is to ensure that these employees effectively transfer essential competencies, mitigating the risk of losing critical knowledge and skills required for their roles and ultimately contributing to the organization's sustained outcomes [34]. Thus, this research adopts an exploratory, correlation-based approach to investigate the associations among generational handover processes, knowledge management, and organizational knowledge transfer behaviors.

Generational handover processes focus on transferring the critical knowledge of an experienced employee who has been with an organization for years and is approaching retirement [33,35]. The organization recognizes this employee's knowledge as essential for the functionality of their role and the activities they perform within the organization's value chain [32]. In other words, both their position and expertise are crucial for executing a central function within the organization [36]. For this reason, it is vital for the organization to transfer this knowledge to the employee who will assume the role [37]. This ensures that accumulated knowledge is retained within the organization, safeguarding its continuity and sustainability [9]. Nowadays, organizations face a significant challenge in retaining the

knowledge of employees from the baby boomer generation—individuals with specialized knowledge and long tenures—who are planning to retire in the coming years [38]. At the same time, they are grappling with high turnover rates due to talent leakage from employees who are not yet of retirement age [39,40]. The absence of generational handover processes often results in the loss of critical knowledge from key employees, which can negatively impact organizational functionality and outcomes [41,42].

Previous studies have analyzed the importance of knowledge transfer for improving employees' knowledge transfer behaviors [43,44]. Indeed, this study builds upon previous research conducted by Igoa-Iraola et al. [45], which examined the presence of knowledge transfer protocols in organizations. The present study extends that earlier work by incorporating a broader set of organizational variables. Thus, this research differs in terms of the sample location, as it is one of the first investigations conducted in the Basque Autonomous Community (CAPV) concerning generational change processes. Therefore, this research adopts an exploratory, correlational approach to examine how generational handover processes relate to employees' knowledge transfer behaviors. Its relevance stems from highlighting these practices as potential avenues for fostering knowledge transfer within organizations. Furthermore, the findings offer valuable contributions to both practice and academia, enriching organizational knowledge management and providing preliminary empirical evidence for future research.

Generational transfer procedures have a direct impact on employee productivity [46,47]. One key outcome of implementing such processes is the improvement in the quality of knowledge transfer behaviors among employees [48–50]. These procedures help organizations identify the key characteristics of a job, the knowledge required to execute tasks, and the resources needed to conduct it [28,51]. This ensures that employees have clear guidance for executing tasks related to their roles [52,53]. In turnover cases, generational handover procedures facilitate smoother transitions and quicker integration into new positions [54,55]. The establishment of formal channels by the organization allows for easier, faster, and more comfortable exchanges of information, fostering both formal and informal interactions [56]. In this regard, increased knowledge transfer behaviors are strongly linked to enhanced employee job performance [57].

Knowledge management and generational handover procedures significantly influence organizational outcomes [22,58]. This approach fosters organizational innovation by establishing a clear and well-defined structure [59]. In the context of knowledge management, organizational innovation is closely linked to knowledge transfer behaviors, as organizations that actively share and apply knowledge are better positioned to generate innovative solutions [60]. Effective knowledge transfer ensures that new knowledge is created, disseminated, and utilized, driving continuous improvement and adaptation solutions [61]. Effective generational handover procedures allow organizations with superior innovation capabilities to bolster their competitive advantage and adaptability in a rapidly changing environment [62,63]. This enables organizations to analyze, redesign, or refine the structures intended for knowledge retention [64]. Indeed, these procedures improve the strategic resilience of organizations as their implementation strengthens the organization's capacity to adapt to internal changes—such as employee retirements—without compromising its operational continuity [65]. By ensuring the retention and effective dissemination of critical knowledge, organizations enhance their ability to respond flexibly and proactively to challenges [66].

Generational handover procedures contribute to improved organizational performance, enhancing the organization's positioning in the labor market [12,67,68]. Such efforts are essential to maintaining organizational outcomes in an increasingly dynamic labor market [43]. Given that talent shortages affect organizations worldwide, the creation and

implementation of effective knowledge retention systems are crucial [69]. Thus, the aim of this research is to explore the relationships between knowledge transfer and generational handover processes and employees' knowledge transfer behaviors, as well as to examine the associations between these behaviors and key organizational factors related to organizational outcomes. The novelty of this study stems from its exploratory analysis of the relationship between knowledge transfer and generational handover processes and employees' knowledge-sharing behaviors. It also employs a correlational design, using structural equation modeling to test theoretically grounded directional relationships between knowledge transfer behaviors and key organizational outcomes. This study emphasizes the strategic relevance of developing protocols for knowledge transfer and generational succession to enhance knowledge retention and organizational outcomes. Thus, this study has the following hypotheses:

H1: *The existence of knowledge transfer protocols is positively associated with knowledge transfer behavior;*

H2: *The implementation of generational handover processes is positively associated with knowledge transfer behavior;*

H3: *Knowledge transfer behavior is positively correlated with organizational innovation;*

H4: *Knowledge transfer behavior is positively correlated with job performance;*

H5: *Knowledge transfer behavior is positively correlated with organizational performance;*

H6: *Knowledge transfer behavior is positively correlated with organizational strategy;*

H7: *Knowledge transfer behavior is positively correlated with competitive advantage.*

In this study, we aim to examine the relationship between two distinct types of organizational mechanisms—general knowledge transfer protocols and generational handover protocols—and their impact on a single dependent variable: employees' knowledge-sharing behavior. While both types of protocols are designed to retain and disseminate organizational knowledge, general knowledge transfer protocols are broader in scope and typically apply to knowledge exchange across departments or functions, whereas generational handover protocols are specifically aimed at preserving critical knowledge during the retirement transitions of experienced employees. Accordingly, Research Questions 1 and 2 explore the influence of each type of protocol separately on employees' willingness and behavior to transfer knowledge (Figure 1). In our analysis, we operationalized these independent variables through separate items in the questionnaire, allowing us to assess their distinct associations with knowledge transfer behavior using non-parametric comparisons. The association between knowledge transfer behaviors and critical organizational factors will be analyzed in response to Research Questions 3, 4, 5, 6, and 7 (Figure 2). Although all hypotheses are grounded in the existing literature, the present study adopts an exploratory perspective, acknowledging that not all relationships may manifest as direct effects. Accordingly, the manuscript will describe the characteristics of the sample, the measurement instrument, and the procedure followed. This will be followed by a presentation of the results and their analysis from both practical and theoretical perspectives.

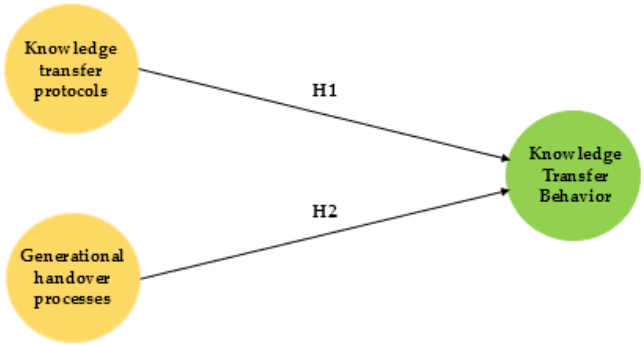

Figure 1. Research Model: Analysis of Knowledge Transfer Protocols and Generational Handover Processes on Knowledge Transfer Behavior. Source: Own elaboration.

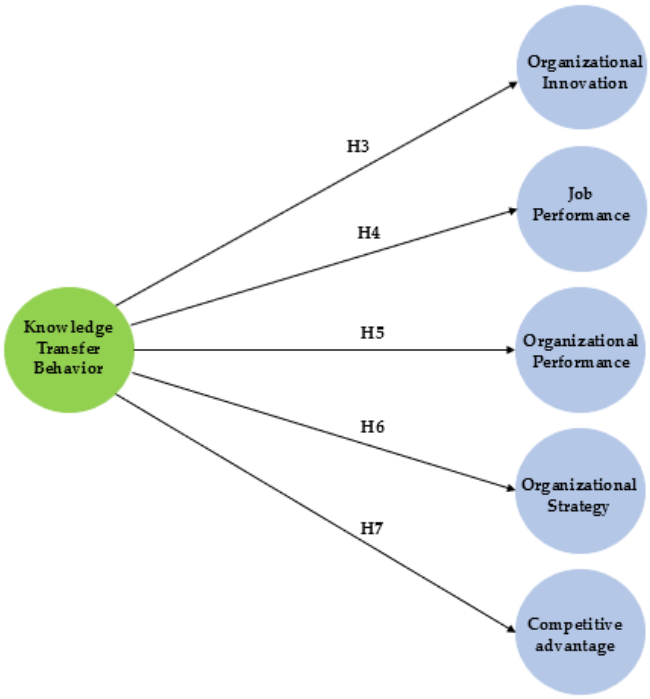

Figure 2. Research model: Analysis of Knowledge Transfer Behavior and Organizational Variables. Source: Own elaboration.

2. Methods

2.1. Sample and Participants

The initial sample consisted of 253 individuals occupying responsibility positions—such as directors, department heads, or other strategic roles—within companies located in the Basque Autonomous Community (CAPV). These individuals were invited to participate in this study by completing an online questionnaire. Of those contacted, 66.4% submitted valid responses. To ensure data consistency and quality, only fully completed questionnaires were included in the final analysis, resulting in a sample of 168 managers.

Among the final 168 participants, 54% were women. Regarding age distribution, 1.8% were under 25 years old; 11.9% were between 26 and 35 years old, 20.2% between 36 and 45, 32.7% between 46 and 55, 32.1% between 56 and 65, and 0.6% were over 66. In terms of professional roles, 61.3% were senior managers; 26.8% held middle management positions, and 11.9% had specific responsibilities without formal management roles.

With respect to organizational tenure, 18.5% had less than 5 years of experience; 17.3% had between 5 and 10 years; 25.6% had between 11 and 20 years; 22.6% had between 21 and 30 years, and 16.1% had more than 31 years.

The CAPV stands out at the national level for its robust industrial sector and, at the European level, is recognized as one of the most dynamic hubs of technological innovation. According to the Spanish National Institute of Statistics [70], it is the second-highest region in Spain in terms of GDP, underscoring its economic strength. Furthermore, the European Commission's 2023 Regional Innovation Scoreboard [71] classifies the CAPV as a "Strong Innovative Region" based on indicators such as R&D expenditure, inter-firm collaboration, and patent generation. These features highlight not only its role as a strategic innovation hub but also its commitment to long-term economic resilience.

The participating companies' headquarters were distributed as follows: Gipuzkoa (38.7%), Bizkaia (39.9%), Araba (5.4%), Nafarroa (1.8%), and other autonomous communities (14.3%). Regarding company size, 29.2% of the respondents were from small companies (<50 employees), 26.8% from medium-sized companies (50–150 employees), and 43.5% from large companies (>150 employees).

The sample covered a broad range of economic sectors, including construction (4.8%), industry (30.4%), trade 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 other sectors (36.3%). This sectoral diversity enhances the breadth and representativeness of this study's analysis.

2.2. Measurement Instrument

To collect the data required for this study, a structured questionnaire consisting of 65 items Likert-type response scales was developed. The instrument was organized into two main sections. The first section gathered descriptive information, including general company data (3 items), the existence and implementation of mechanisms for knowledge transfer and generational handover processes (10 items), including items like "to what extent are generational handover processes considered a priority in your organization?" using a 10-point Likert scale (1 = strongly disagree, 10 = strongly agree), dichotomic items (1 = yes, 2 = no) on items such as "are there procedures in your organization to carry out an appropriate generational handover process?" as well as multiple options items giving response to the characteristics on knowledge transfer procedures, and details regarding the respondent's role and responsibilities (5 items).

The second section assessed several key organizational constructs using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Specifically, it measured organizational culture (9 items) with items such as "information is accessible to all members of the organization", innovation (4 items) with items like "innovation is readily embraced in day-to-day management", and competitive advantage (5 items) with items such as "the company's profitability is higher than the competitors", based on the theoretical model proposed by Azeem et al. (2021) [43]. In addition, the questionnaire included items related to knowledge-Sharing behaviors (9 items), including items such as "I often share my work experience and knowledge with colleagues in my organization", organizational strategy (7 items), containing items like "the organization where I work continuously improves the quality of the products or services it creates or offers", leadership effectiveness (5 items), with items such as "I enjoy working with managers", business performance (4 items), including items like "how would you rate the profitability of the company you work for?", and job performance (4 items), with items such as "in my company, employees are constantly supervised", following the framework developed by Sonmez and Adiguzel (2020) [72]. These variables were selected because they are widely recognized in the literature as critical indicators of organizational performance and organizational outcomes [43]. Their inclusion allows for a comprehensive analysis of the impact of knowledge transfer

behaviors [72]. The full version of the questionnaire used in this study is available from the authors upon request.

The instrument incorporated tailored items to capture how knowledge transfer processes are structured and operationalized within organizations. A pilot test with experts in the field was conducted to evaluate the questionnaire's reliability and interpretability.

2.3. Procedure

Data collection was carried out using an online survey, applying a non-probability convenience sampling method. To reach potential respondents, the research team collaborated with the Chambers of Commerce from the three provinces of the Basque Autonomous Community, leveraging their networks to disseminate the questionnaire among affiliated companies. Additionally, human resource professionals from various organizations across the region were directly invited to participate in this study.

The survey was conducted over a five-month period from February to June 2024. Participation in this study was entirely voluntary. Prior to completing the questionnaire, all participants were informed about the purpose of this study, the voluntary nature of their involvement, and their right to withdraw at any time without any consequences. Informed consent was obtained explicitly through a statement at the beginning of the survey. Additionally, all responses were collected anonymously and stored securely to ensure data privacy and confidentiality. This study was approved by the Research Ethics Committee of Deusto University (ETK-22/23-24) and complied with the ethical standards applicable to research conducted in organizational contexts.

The data collected focused on identifying whether organizations had established protocols for knowledge transfer and generational succession, as well as analyzing the characteristics, implementation strategies, and perceived effectiveness of these mechanisms.

3. Results

All analyzed variables show adequate reliability (Table 1). The internal consistency of each variable was confirmed using Cronbach's alpha, with all values exceeding the recommended threshold of 0.70, indicating good reliability. The variable with the highest internal consistency was *organizational innovation* ($\alpha = 0.911$), while *job performance* had the lowest, though still acceptable, value ($\alpha = 0.742$).

Table 1. Internal consistency results.

	Cronbach's Alpha
Knowledge transfer behavior	0.899
Organizational innovation	0.911
Competitive advantage	0.790
Organizational strategy	0.815
Organizational performance	0.839
Job performance	0.742

Source: Own elaboration.

In order to assess the assumption of normality, the Kolmogorov–Smirnov test was performed on the variables (Table 2). The results indicated that none of the variables followed a normal distribution ($p < 0.05$), which justified the use of non-parametric statistical methods in subsequent analyses.

Table 2. Normality results.

	Kolmogorov–Smirnov		
	Statistic	**df**	**Sig.**
Knowledge transfer behavior	0.117	168	<0.001
Organizational innovation	0.117	168	<0.001
Competitive advantage	0.114	168	<0.001
Organizational strategy	0.089	168	0.002
Organizational performance	0.126	168	<0.001
Job performance	0.135	168	<0.001

Source: Own elaboration.

To further evaluate the construct validity of the instruments, an exploratory factor analysis (EFA) was conducted for each of the six variables under study using principal component analysis (Table 3). The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy for all constructs exceeded the acceptable threshold of 0.70, ranging from 0.715 (*job performance*) to 0.900 (*knowledge transfer behavior*), indicating that the data were suitable for factor analysis. Bartlett's test of sphericity was statistically significant in all cases ($p < 0.001$), confirming the presence of sufficient correlations among items within each construct.

Table 3. Kaiser–Meyer–Olkin, Bartlett's Test, and Explained Variance for Each Construct.

	KMO	χ^2	**df**	p	**Retained Factors**	**Total Explained Variance (%)**
Knowledge transfer behavior	0.900	777.797	36	<0.001	2	55.932
Organizational innovation	0.830	488.023	6	<0.001	1	78.972
Competitive advantage	0.765	281.107	10	<0.001	1	56.110
Organizational strategy	0.813	376.054	21	<0.001	1	48.681
Organizational performance	0.749	304.598	6	<0.001	1	67.604
Job performance	0.715	182.678	6	<0.001	2	58.512

Source: Own elaboration.

The exploratory factor analysis supported the internal structure of the scales. According to the Kaiser criterion (eigenvalues > 1), most constructs exhibited a unidimensional structure, except for *knowledge transfer behavior* and *job performance*, which revealed two factors each. The total variance explained by the extracted factors ranged from 48.68% for *organizational strategy* to 78.97% for *organizational innovation*, indicating acceptable levels of explained variance across constructs.

The structural equation modeling using the partial least squares (PLS-SEM) method revealed that *knowledge transfer behavior* significantly and positively influenced *organizational innovation* ($\beta = 0.440$, $t = 5.319$, $p < 0.001$) and *job performance* ($\beta = 0.432$, $t = 4.739$, $p < 0.001$). The relationships with *organizational performance* ($\beta = -0.103$, $p = 0.272$), *organizational strategy* ($\beta = 0.040$, $p = 0.675$), and *competitive advantage* ($\beta = -0.054$, $p = 0.600$) were not statistically significant.

The model explained 47.7% of the variance in knowledge transfer behavior ($R^2 = 0.477$, $p < 0.001$), indicating a moderate explanatory power. Regarding model fit, the SRMR value was 0.074, which is below the recommended threshold of 0.08, suggesting an acceptable global model fit.

All constructs demonstrated strong internal consistency reliability with composite reliability (CR) and Cronbach's alpha values exceeding 0.70. Convergent validity was confirmed with average variance extracted (AVE) values above 0.50 for all constructs.

Discriminant validity was also supported, as HTMT values were below 0.90, and their confidence intervals did not include 1.

All outer loadings exceeded 0.70 and were statistically significant ($p < 0.001$), indicating that the indicators reliably measured their respective latent constructs.

Statistically significant differences in *knowledge transfer behaviors* were identified based on the existence of formal protocols within organizations. Companies with established protocols reported significantly higher scores (Mdn = 4.66; Range = 2.22) than those without protocols (Mdn = 4.11; Range = 4.00), as shown by the Mann–Whitney U test (U = 2062.5; $p < 0.001$; Hedges' g = 0.672). This suggests that defined knowledge management structures are associated with higher levels of knowledge transfer behavior.

Similarly, significant differences were also observed in relation to protocols for generational handover. Organizations that had implemented such protocols demonstrated higher levels of *knowledge transfer behaviors* (Mdn = 4.77; Range = 2.11) than those that had not (Mdn = 4.22; Range = 4.00), with a statistically significant result (U = 1880.0; $p < 0.001$; Hedges' g = 0.575). These findings indicate that organizations with formalized transition mechanisms tend to report more effective knowledge transfer.

Spearman's correlation analyses revealed that organizational innovation (ρ = 0.570, $p < 0.001$, n = 166) and job performance (ρ = 0.529, $p < 0.001$, n = 166) had the strongest positive association with knowledge transfer behavior (Table 4). These results suggest that higher levels of innovation and job performance are associated with increased knowledge transfer behavior. Although competitive advantage (ρ = 0.382, $p < 0.001$, n = 166), organizational strategy (ρ = 0.395, $p < 0.001$, n = 166), and organizational performance (ρ = 0.361, $p < 0.001$, n = 166) also showed significant correlations, their effects were weaker, showing a moderate correlation, which was consistent with the PLS-SEM results.

Table 4. Correlation (ρ) between Knowledge Transfer Behavior and Organizational Variables.

Variable	O.I.	C.A.	O.S.	O.P.	J.P.
Knowledge transfer behavior	0.570 *	0.382 *	0.3950 *	0.361 *	0.529 *

Source: Own elaboration. Note: O.I. = Organizational Innovation; C.A. = Competitive Advantage; O.S. = Organizational Strategy; B.P. = Organizational Performance; L.P. = Job Performance; * $p < 0.001$.

4. Discussion

This article explores the association between knowledge transfer and generational handover protocols with knowledge transfer behaviors. These behaviors are positively associated with key organizational outcomes; however, only innovation and job performance demonstrated a statistically significant direct effect in the structural model.

The findings reveal significant differences in employees' knowledge transfer behaviors depending on whether knowledge transfer protocols are present within the organization. These results align with previous research by Loebbecke et al. [9], which underscores the importance and effectiveness of implementing knowledge transfer strategies in organizational settings. Thus, knowledge management processes are strongly associated with organizational development and sustainability [73]. Institutionalized knowledge transfer procedures are commonly found in organizations that maintain strong operations and show signs of strategic development. [74]. Consequently, organizations should prioritize strategies that optimize communication channels, facilitate smoother knowledge transfer, and ensure effective knowledge retention [75]. In this context, knowledge transfer emerges as an indispensable tool for ensuring organizational prosperity and sustainability [2].

Findings reveal significant differences in knowledge transfer behaviors depending on the implementation of generational handover protocols within organizations. Specifically, these processes improve communication between employees, fostering greater fluidity in

knowledge sharing within the organization [56]. The retirement of key employees with critical knowledge poses a significant challenge for organizations due to the potential loss of essential expertise [36]. This concern is particularly pressing as many organizations face the impending retirement of a large number of experienced professionals with specialized knowledge [31]. Generational handover processes involve strategic planning, aligning an employee's pre-retirement timeline with the time required to ensure an effective knowledge transition. This includes collecting and documenting all the necessary information and expertise related to the job, ensuring that the successor can perform the role effectively [32]. Such processes are widely used as preventive strategies aimed at preserving critical knowledge within the organization, even as employees leave due to retirement [33]. One defining feature of generational handover processes is the time allocated to identify, analyze, and plan for the impending vacancy. This includes determining the critical knowledge required for the role and ensuring its effective transfer to the incoming employee [76,77].

Results show that knowledge transfer behaviors are positively associated with organizational innovation. Therefore, it is essential for organizations to prioritize strategies that enhance knowledge transfer behaviors through communication channels and streamline knowledge exchange to ensure effective retention of institutional knowledge through innovation [69]. In this context, knowledge transfer is closely linked to organizational prosperity and long-term sustainability [2]. Knowledge transfer, and, therefore, structured knowledge transfer protocols, are frequently associated with smoother knowledge flow between employees of different generations [24]. This is associated with more bidirectional forms of knowledge transfer [64]. Research by Lam et al. [78] suggests that increased interaction among employees fosters greater creativity and innovation, which, in turn, leads to the generation of new ideas and continuous improvement in daily operations.

In addition, the results reveal a strong positive correlation between knowledge transfer behavior and job performance, indicating a substantial relationship between these two variables. This finding suggests that employees who actively share and transfer knowledge also tend to perform at higher levels. When employees clearly understand the organization's objectives and the rationale behind its procedures, their involvement and commitment to assigned tasks typically increase [44]. In this context, knowledge transfer tools—such as generational handover protocols—support the internalization of processes and enhance employees' ability to access and apply critical knowledge efficiently. These protocols are linked to improved communication and are often present in organizations with higher productivity and performance sustainability [75]. When relevant knowledge is readily available, employees can more easily review, contrast, and implement it in their day-to-day activities.

Generational handover protocols involve strategic planning that aligns the timeline of an employee's upcoming retirement with the time required to ensure an effective knowledge transfer. These protocols serve as essential preventive strategies for preserving critical knowledge within the organization, particularly in the context of retirement-related departures [28]. They support the identification, analysis, and planning of vacancies by helping determine the key knowledge associated with a position and ensuring its effective transmission to the designated successor [71]. In this way, generational handover protocols enhance communication clarity between employees and promote a more fluid and structured exchange of knowledge across the organization.

Although the results indicated a positive correlation between knowledge transfer behavior and organizational strategy, the structural model did not confirm a statistically significant influence. This suggests that while generational handover protocols contribute to strategic alignment at a procedural level, the relationship between knowledge transfer behavior and organizational strategy may be mediated by other organizational variables not captured in the present model, such as leadership style or institutional culture [66,67].

Nevertheless, knowledge transfer behavior represents a strategic tool for building resilient, adaptable, and future-oriented organizations [76]. These strategies are associated with stronger knowledge management infrastructures and may be linked to enhanced competitive positioning [57]. Therefore, knowledge transfer and generational handover strategies are essential for organizations to better understand their internal knowledge flows and potentially enhance their overall performance, although this relationship has not been directly confirmed by the structural model.

Although a positive correlation was observed with organizational performance, the structural model did not support a significant direct relationship. This suggests that while knowledge transfer behavior may contribute to organizational performance, its impact could be indirect, being potentially mediated by other factors. Thus, the contribution of knowledge transfer behavior to performance may require an enabling organizational context to fully materialize. These findings suggest that when knowledge transfer becomes a routine part of employees' behavior, organizations might enhance their internal effectiveness by strengthening knowledge retention strategies [47,77].

In terms of competitive advantage, while the results revealed moderate correlations between knowledge transfer behavior, the structural model did not identify statistically significant direct effects. This indicates that the potential benefits of habitual knowledge transfer on competitive positioning may not manifest immediately or directly but rather through intermediate mechanisms such as improved collaboration, innovation processes, or long-term cultural change [43,78].

Thus, hypotheses H1 to H4 were empirically supported, while H5 to H7 were not confirmed in the structural model. In conclusion, this research successfully achieved its objectives: to analyze the relationships between generational handover protocols, knowledge transfer behavior, and key organizational outcomes, highlighting their significant association with organizational innovation and job performance.

5. Conclusions

This research provides a thorough perspective on the organizational benefits associated with the implementation of knowledge transfer procedures within the context of generational transitions. It highlights how knowledge transfer behaviors relate to organizational factors that are linked to internal and external effectiveness. Firstly, this study clarifies that the implementation of knowledge transfer protocols is significantly associated with employees' knowledge transfer behaviors, facilitating the identification, analysis, and preservation of knowledge within the organization. Secondly, it highlights that generational handover processes are positively associated with knowledge sharing among employees, particularly by improving the transfer of critical knowledge from individuals approaching retirement. Finally, the findings demonstrate that knowledge transfer behaviors are significantly and positively associated with innovation and job performance. Although moderate correlations were observed with competitive advantage, organizational performance, and organizational strategy, the structural model did not confirm significant direct effects for these variables. The originality of this research stems from its exploratory, correlation-based approach to examining the relationships between knowledge transfer and generational handover processes and employees' knowledge transfer behaviors. This study emphasizes the strategic value of developing protocols to support effective knowledge retention initiatives.

The results identify significant effects between the presence of knowledge transfer processes and specific outcomes—particularly innovation and job performance—while no significant direct effects were observed for other organizational dimensions. The structural equation model did not find statistically significant direct effects on organizational performance, organizational strategy, or competitive advantages. This research makes a notable

contribution, highlighting the potential role of knowledge retention protocols as a strategic approach to supporting organizational outcomes and encouraging both the academic and business communities to further examine and develop such initiatives. Indeed, at the micro level, the implementation of structured knowledge transfer protocols is recommended to strengthen day-to-day communication, improve task execution, and support individual performance through the effective internalization and application of critical knowledge. At the macro level, organizations should integrate generational handover strategies into their long-term planning to preserve institutional knowledge, enhance innovation capacity, and sustain job performance in the face of workforce transitions.

By presenting an integrated view of the interplay and benefits of knowledge transfer protocols and generational handover processes for knowledge retention, this study provides organizations with insights into the potential strategic value of these strategies for supporting outcomes. Indeed, this research contributes to the formulation of strategic approaches aimed at preventing the loss of critical organizational knowledge. Furthermore, it offers insight that may support organizational outcomes and the development of continuity mechanisms. From a theoretical standpoint, it is important to underscore that studies of this nature facilitate a more profound understanding of knowledge transfer mechanisms, support the development and validation of knowledge management models, and advance the analysis of intergenerational dynamics within organizations. With regard to practical implications, this study represents a significant step toward the refinement of knowledge transfer protocols. Simultaneously, it underscores the relevance of knowledge-sharing behaviors as a factor associated with change management processes.

In summary, the results confirm hypotheses H1 to H4, showing significant effects of generational handover protocols on knowledge transfer behavior. These behaviors also showed an influence on innovation and job performance. However, hypotheses H5 to H7 were not supported, as no significant direct relationships were found between knowledge transfer behavior and organizational performance, organizational strategy, or competitive advantage. These findings suggest that strategic knowledge management protocols may be particularly effective when oriented toward innovation and individual performance improvement, while their impact on broader outcomes may depend on contextual or mediating factors.

5.1. Limitations and Future Lines of Research

This study has some limitations that could be improved for future research. The sample was restricted to the Basque Autonomous Community; thus, the generalizability of the findings to other geographical regions is limited. Future research could include diverse regions or countries to clarify whether the obtained conclusions differ depending on cultural, economic, and organizational contexts. This research relied on a convenience sample, which may not fully represent the broader population. A larger and more representative sample could provide a more comprehensive understanding of how knowledge transfer behaviors function across different types of organizations and sectors. Data was collected through self-reported questionnaires, which could be susceptible to biases (subjectivity, personal interpretation). As the research results are based on a single-source questionnaire and primarily rely on correlations, attention must be given to the potential presence of common method bias. Future studies could address this limitation by incorporating direct observations or carrying out a longitudinal study to track actual changes in knowledge transfer behaviors and their impact on organizational performance over time. Future research would benefit from a more robust methodological framework, such as longitudinal tracking, triangulation of data sources, or experimental validation. Thus, future research could adopt a mixed-methods design, combining quantitative data with qualitative insights.

This would provide an in-depth exploration of factors influencing employees' willingness to share knowledge and the specific elements of protocols that contribute to their effectiveness. Interviews, focus groups, or case studies could provide valuable context and detail. Addressing these limitations in future research could enrich our understanding of knowledge transfer behaviors and their relationship with organizational factors, further refining strategies to enhance organizational outcomes and sustainability.

5.2. Future Research Lines

To enhance the generalizability of the results, similar studies could be conducted in other regions or countries with varying industrial, cultural, and economic contexts. This would help determine whether the observed relationships hold true across different settings. Nevertheless, this research also provides an opportunity to focus on this region and to conduct further analyses with a larger sample, allowing for more targeted responses to specific questions relevant to the Basque territory. Indeed, conducting longitudinal research would provide valuable insights into how knowledge transfer behaviors evolve over time, offering a dynamic view of their impact on organizational factors such as innovation, competitive advantage, and performance. Future research could analyze common barriers to effective knowledge transfer procedures, including a lack of trust among employees, organizational culture that does not prioritize knowledge sharing, or insufficient incentives for employees. Identifying these barriers would help in the development of targeted strategies to mitigate them. Given the positive relationship found between knowledge transfer behaviors and organizational innovation, future studies could delve deeper into this connection. Exploring how specific transfer strategies—such as mentoring programs, technology platforms, or peer learning—impact firms' innovation capacity would be particularly valuable. Considering the diverse sectors represented in the sample, future research could perform detailed analyses by sector to uncover potential differences in knowledge transfer protocols and their effects on organizational outcomes. This sectoral approach could yield tailored recommendations for different industries.

Pursuing these research directions would not only refine knowledge transfer and generational handover strategies but also provide actionable insights for organizations and contribute to the academic understanding of knowledge management.

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