Towards Sustainable Knowledge Sharing Practices: An Analysis of Organizational Level Enablers

Kathryn Cormican¹,*, Chen Meng¹, Suzana Sampaio² and Qiong Wu³

¹ Enterprise Research Centre and LERO—The Irish Software Research Centre, School of Engineering, National University of Ireland, H91 HX31 Galway, Ireland; c.meng1@nuigalway.ie
² Department of Computer Science, Federal Rural University of Pernambuco, Rua Dom Manuel de Medeiros, s/n, Dois Irmãos, Recife 52171-900, PE, Brazil; suzana.sampaio@ufrpe.br
³ School of Business, Macau University of Science and Technology, Avenida Wai Long, Taipa, Macau 999078, China; qiwu@must.edu.mo
* Correspondence: kathryn.cormican@nuigalway.ie; Tel.: +353-91-493975

Abstract: Sustainable management activities focus on creating efficiencies and value for organizations. Scholars advocate that evaluating and enabling appropriate management interventions can pave the way for future competitive advantage and sustainability. Knowledge management is regarded as a key organizational resource and a means of gaining a sustainable competitive advantage. This is especially important in high-tech service organizations, which are under increasing pressure to capture, process and share knowledge efficiently. While much work has been conducted to advance our knowledge on good practices, there is a dearth of empirical evidence relating to organizational level enablers for knowledge sharing. We advocate that creating the conditions conducive to knowledge sharing influences an organization’s ability to sustain a long-term competitive advantage. Therefore, this current study extends the literature on knowledge management by exploring the questions of whether and how key organizational factors impact knowledge sharing, focusing on the role of trust, communication, reward systems and leadership. To do this, we analyzed prior work and generated hypotheses relating to relevant enablers. We then operationalized these constructs via a structured data collection instrument, which consisted of 27 measurable items. Empirical data were collected from 104 team members in a high-tech service organization in Ireland. Data were analyzed using a quantitative approach, and descriptive statistics, correlations and regression analyses are presented. Our research offers a persuasive body of evidence supporting the notion that trust, communication, reward systems, and leadership strongly impact knowledge sharing in organizations. Specifically, the findings reveal that employees are more willing to share their personal knowledge with those they trust, and carefully designed communication systems can enable knowledge sharing. Reward systems play an important role in affecting employees’ motivation to share knowledge, while empowering leadership and participatory leadership are two main drivers in promoting knowledge sharing. This research addresses a relatively unexplored area, has implications for sustainable management practices relating to organizational design and provides ideas for future research studies.

Keywords: knowledge sharing; enablers; organizational factors; trust; communication; leadership; reward systems; case study

1. Introduction

Sustainability has become increasingly important for organizations seeking to gain and maintain a competitive edge [1–3]. There is considerable evidence to suggest that organizations that implement sustainable practices outperform their counterparts [4]. In recent years, knowledge management in the context of sustainability has acquired a lot of attention. This is not surprising as knowledge is considered to be a strategically important resource for organizations. Having access to knowledge resources, however, does not guarantee success. Organizations must generate, share, and apply knowledge in practice...
to develop a sustainable competitive advantage [5,6]. However, these critical processes must be well-managed to maintain growth and competitiveness.

Prior work has found that knowledge management initiatives have a significant positive impact on an organization’s long-term viability. For example, Demir [7] discovered a positive link between knowledge management and organizational sustainability. López-Torres et al. [8] found that knowledge management enabled sustainability in operations, and Chiabrishvili and Zaim [9] discovered a positive relationship between knowledge management and sustainability in Kuwait companies. Nevertheless, despite its importance, there is a paucity of studies in this domain and scholars such as Martins et al. [10] believe that knowledge management in the context of sustainability offers a rich vein of research opportunities.

Researchers in the area of knowledge management emphasize the importance of knowledge sharing. There is broad recognition that effective knowledge sharing is considered to be one of the key contributors to organizational effectiveness and is often used to achieve superior and sustainable performance [11,12]. Knowledge sharing consists of providing, collecting, and receiving information [13]. It is lauded to enhance key decision-making skills, improve technical and problem-solving skills, and strengthen relationships between an organizations’ members [14]. However, it is a complex endeavor and fraught with challenges. Kipkosgei et al. [15] argue that although organizations understand the value of knowledge sharing, most organizational knowledge is not shared in practice. Effective knowledge sharing initiatives are difficult to implement, and despite recent developments, many companies are failing to reap the rewards envisaged.

Perhaps this is because knowledge is such an elusive concept. It is intangible, dynamic and complex [16–18]. Knowledge can be classified in terms of tacit (implicit) or explicit (codified) [19,20]. Tacit knowledge has a personal quality that makes it difficult to formalize. Explicit knowledge, on the other hand, can be documented and codified. While explicit knowledge is relatively easy to access and share among organizational members, tacit knowledge, conversely, is not as it is intrinsically related to the individual and embedded in the human experience [21]. Nevertheless, many of the proposed solutions to knowledge sharing to date have been technology-driven and focused on managing existing knowledge. Prior research in the area of knowledge sharing has focused on initiatives and solutions that manage explicit knowledge while giving much less attention to relevant organizational factors that support tacit knowledge sharing [22].

Some scholars have expressed reservations about this approach as it considers knowledge as if it were an object to be possessed and overlooks the more important work of encouraging the sharing and application of tacit knowledge [23]. For example, Bartol and Srivastava [17] claim that organizational knowledge is the result of individuals sharing their knowledge and experiences in the workplace. Nonaka et al. [19] also suggest that the organizational context and the social elements that influence the knowledge sharing process are critical and deserve more attention. Consequently, organizations must establish an environment that encourages people to interact with one another. Ni et al. [24] also insist that organizations should focus on creating an environment that fosters a more positive attitude toward knowledge sharing among employees, while Cross and Baird [25] contend that organizations should create processes and practices that enable individuals and groups to exchange and use organizational knowledge. Therefore, creating the appropriate environment and culture to share knowledge freely among workers is vital to the success of organizations. However, there is a dearth of research focusing on the influence of salient organizational factors to enable sustainable knowledge sharing. More research is needed to help us understand the role of organizational characteristics in knowledge-sharing outcomes.

In order to address this deficit, this current study seeks to enrich our understanding of how organizational factors derived from the extant literature influence knowledge sharing in practice. We argue that managing these factors is critical for improving an organization’s overall effectiveness and enhancing sustainable competitiveness. The current study aims
to answer the questions of whether and how trust, communication, reward systems, and leadership impact knowledge sharing and extends the literature on knowledge sharing in at least three ways.

First, while empirical support has begun to accumulate regarding the relationship between knowledge sharing and sustainable performance, there is a dearth of research focusing on the influence of salient organizational factors. Prior studies have examined knowledge sharing from different perspectives. For instance, many scholars have examined technology-related solutions that enable explicit knowledge transfer, such as information communication technology (ICT) tools [26], databases and repositories [27], the role of intranets and virtual communities of practices [28]. Researchers have also examined knowledge sharing at the individual level, e.g., an individual’s intention to share knowledge [14], personal motivation to share knowledge [29,30], as well as interpersonal trust [31]. However, research on critical enablers for knowledge sharing at the organizational level remains relatively scarce. This study joins the smaller group of researchers (e.g., [12,32,33]) by focusing on the organizational level and exploring the role that organizational factors play in shaping knowledge sharing in organizations.

Second, Al-Busaidi [34] asserts that knowledge sharing challenges arise from the context in which they are situated, in particular, the individuals, peers, organizations, and the sector. Consequently, researchers are calling for more context-specific research on knowledge sharing [35,36]. Focusing on specific organizations provides us with important contextually grounded insights into what types of management practices are important for sustainable knowledge sharing within organizations. This study captures real-world data from a high-tech service organization in Ireland and, therefore, directly addresses calls for research that investigate knowledge sharing practices in specific organizational contexts. It contributes to a greater understanding of what practices are important and how they should be managed in a specific context.

Finally, this study advances the body of knowledge in knowledge sharing by developing and validating an instrument based on good practice that can be used to empirically measure knowledge sharing in other contexts and organizations. Each item was designed to capture best practices derived from the literature. Face validity, content validity and construct validity were used to improve the integrity of the instrument. It can be used by organizations to assess current versus best practices. Alternatively, researchers can use it to answer Wickramasinghe and Widyaratne’s [36] call for more empirical studies in the domain.

The remainder of this article is structured as follows. First, a brief discussion of the dynamics of knowledge and the benefits of knowledge sharing is presented. This is followed by a discussion of prior work relating to the organizational level enablers for knowledge sharing, which culminates in our hypotheses. Next, an overview of the quantitative approach used to achieve this study’s main objectives, and the protocols used to capture and analyze the data are provided. Descriptive statistics, correlations and results from regression analyses are presented, followed by a discussion on how these findings relate to the extant literature. Finally, the paper concludes by demonstrating how this study contributes new knowledge in the area, identifies some limitations to the study and presents some avenues for future research.

2. The Concept of Knowledge and Knowledge Sharing

Despite several attempts to define knowledge in the literature, it continues to be a much-debated topic among academics and practitioners depending on the context and perspective it is used in. We claim that knowledge is the synthesis of ideas, experience, intuition, skills, and lessons learned that can add value to a company by informing decisions and enhancing performance. Knowledge is classified in a variety of ways in the literature (see Table 1). While this classification is far from complete, it does give some indication of the breadth of previous research in this field. The contrast between tacit and explicit knowledge receives a lot of attention. Explicit knowledge can be codified and captured in
formulae, designs and manuals. Badaracco [37] terms this migratory knowledge because it can move around the organization. Conversely, tacit knowledge is personal and intrinsically related to the individual. It comprises experiences, ideas, insights and beliefs. It can only be accessed through direct connection and collaboration with others who are familiar with the context in which it is shared.

**Table 1. Knowledge typologies.**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Reference</th>
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<tbody>
<tr>
<td>Tacit knowledge</td>
<td>Polanyi and Sen [20]</td>
</tr>
<tr>
<td>Explicit knowledge</td>
<td></td>
</tr>
<tr>
<td>Migratory knowledge</td>
<td>Badaracco [37]</td>
</tr>
<tr>
<td>Embedded knowledge</td>
<td></td>
</tr>
<tr>
<td>Experiential knowledge</td>
<td></td>
</tr>
<tr>
<td>Reported knowledge</td>
<td>Wikstrom et al. [38]</td>
</tr>
<tr>
<td>Intimate knowledge</td>
<td></td>
</tr>
<tr>
<td>Declared knowledge</td>
<td></td>
</tr>
<tr>
<td>Cognitive knowledge (know what)</td>
<td>Stewart [39]</td>
</tr>
<tr>
<td>Advanced skills (know how)</td>
<td></td>
</tr>
<tr>
<td>Systems understanding (know why)</td>
<td></td>
</tr>
<tr>
<td>Self-motivated creativity (care why)</td>
<td></td>
</tr>
<tr>
<td>Process knowledge</td>
<td>Ruggles [40]</td>
</tr>
<tr>
<td>Factual knowledge</td>
<td></td>
</tr>
<tr>
<td>Catalogue knowledge</td>
<td></td>
</tr>
<tr>
<td>Cultural knowledge</td>
<td></td>
</tr>
<tr>
<td>Perceptual (cognitive)</td>
<td>Yang et al. [18]</td>
</tr>
<tr>
<td>Conceptual (psychomotor)</td>
<td></td>
</tr>
<tr>
<td>Affectual knowledge</td>
<td></td>
</tr>
<tr>
<td>Rational</td>
<td>Bratianu and Bejinaru [16]</td>
</tr>
<tr>
<td>Emotional</td>
<td></td>
</tr>
<tr>
<td>Spiritual</td>
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We argue that knowledge is useless unless it can be applied. In other words, it must be transformed into some observable outcome. To do this, knowledge must be shared. Several theories have been used to study knowledge sharing in organizations, including the theory of reasoned action (TRA), which aims to explain the link between attitudes and behaviors in human behavior; the theory of planned behavior (TPB), which focuses on an individual’s intention to behave in a particular way; and the social exchange theory (SET), which advocates the exchange of knowledge as a valuable resource for mutual benefit (see [41,42]).

Certain researchers claim that knowledge sharing requires a shared social process [17,19,26,27,43]. We believe that the goal of knowledge sharing is to facilitate communication and collaboration among members of an organization in order to promote performance (e.g., reduce cost, improve quality, enhance creativity, etc.). In this view, knowledge sharing focuses on identifying existing knowledge, and transferring it so that it can be applied to perform specific tasks faster, cheaper, smarter and better than they would have been addressed otherwise [44]. Effective knowledge sharing drives organizational learning, which in turn accelerates and enhances performance. It has been shown in the literature to provide individuals, teams, and organizations with the potential to improve their work performance and generate creative solutions. Table 2 summarizes knowledge sharing outcomes relative to these levels.
Table 2. Benefits of knowledge sharing.

<table>
<thead>
<tr>
<th>Level</th>
<th>Outcome</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual level</td>
<td>Knowledge sharing improves problem-solving, enhances decision making and improves employee performance</td>
<td>[45–48]</td>
</tr>
<tr>
<td></td>
<td>Knowledge sharing improves idea generation and innovative behavior</td>
<td>[49,50]</td>
</tr>
<tr>
<td>Team level</td>
<td>Knowledge sharing enhances problem-solving at the team level</td>
<td>[51]</td>
</tr>
<tr>
<td></td>
<td>Knowledge sharing improves team productivity</td>
<td>[52,53]</td>
</tr>
<tr>
<td></td>
<td>Knowledge sharing enhances team creativity</td>
<td>[54,55]</td>
</tr>
<tr>
<td></td>
<td>Knowledge sharing facilitates organizational learning capability</td>
<td>[56]</td>
</tr>
<tr>
<td></td>
<td>Knowledge sharing increases organizational innovation</td>
<td>[57,58]</td>
</tr>
<tr>
<td>Organizational level</td>
<td>Knowledge sharing improves organizational financial performance in terms of cost reduction and profitability</td>
<td>[59–61]</td>
</tr>
</tbody>
</table>

It is important to remember that sharing knowledge is not always beneficial. It is a voluntary yet difficult action that demands time, effort and involvement [62–64]. Excessive knowledge sharing, according to Foss et al. [65], can lead to increased mental processing and redundancy, while Huang et al. [66] discovered that knowledge sharing among highly differentiated individuals does not always lead to better performance outcomes.

3. Prior Work and Hypothesis Development

Creating the appropriate environment to share knowledge freely among members is vital to the long-term success of organizations. We argue that organizational factors can enable the conditions that promote knowledge sharing for sustainable competitive advantage. Therefore, the relationship between knowledge sharing and other managerial and cultural components of an organization is examined in this study. This perspective pays particular attention to the social aspects of knowledge sharing and transfer. Prior work has confirmed the important role that organizational factors play in affecting employees’ behaviors and actions [12,28,29]. Several theoretical studies attempt to explain the factors that contribute to effective knowledge sharing [30–32]. An analysis of the extant literature reveals several organizational factors that must be in place to enable successful knowledge sharing. The literature provides empirical evidence to suggest that trust, communication, reward systems and leadership may be particularly important. While it is acknowledged that these categories are by no means exhaustive or indeed mutually exclusive, they are however clearly important to enable successful knowledge sharing in practice and have implications for sustainable management and so deserve further scrutiny. The following section synthesizes the current literature and debate in the domain and presents hypotheses for our study.

3.1. Trust

Asrar-ul-Haq and Anwar [67] examined the antecedents for knowledge sharing from 2010 to 2015, and trust emerged as the most significant factor that was studied during this time. Trust has been proven to benefit knowledge sharing within an organization [36,68–70] and has been directly related to improved performance [71]. The extent to which co-workers are trusted recipients and sources determines organizational members’ readiness to share and use tacit knowledge [31].

Nakano et al. [70] found that trust was a major influencer of knowledge sharing in the context of production units. Xue et al. [21] assert that trust affects the knowledge sharing behavior of individuals working in teams, while Fang et al. [43] analyzed multinational organizations and discovered that when trust is mutually held in the cultural values
of the subsidiary and the headquarter, it becomes easy to transfer knowledge from the headquarter to the subsidiary. However, it is important to note that trust can take a very long time to develop among team members and only seconds to destroy.

Previous studies have examined the effects of different types of trust on knowledge sharing. For example, Lucas [72] discovered that interpersonal trust between co-workers and the reputation of co-workers had different effects on employee experiences in knowledge sharing within an organization. Lin [73] found that close friendships and social ties among co-workers facilitate trust, which in turn encourages knowledge sharing. Smedlund [74] found in a related study that the presence of a social network based on both interpersonal and established working relationships enhances tacit knowledge sharing and use.

The above literature demonstrates that trust is an important factor for knowledge sharing and, consequently, for overall performance within an organization. Therefore, our first hypothesis is:

**Hypothesis 1 (H1).** Trust has a positive impact on knowledge sharing within organizations.

### 3.2. Communication

Communication has been examined as an enabler of knowledge sharing and transfer in recent years, and it continues to be a topic of discussion among various researchers. Communication facilitates the achievement of goals within the workplace [70], and it is lauded to promote voluntary knowledge-sharing behavior [75,76]. Communication has been studied as an important variable concerning knowledge sharing in many contexts such as high turbulent environments [75], cross-functional teams [77,78] and virtual teams [79,80]. It has been shown to influence knowledge sharing in organizations [36,70] and affects overall performance [81]. Al-Alawi et al. [81], Mueller [69], Wickramasinghe and Widyaratne [36] contend that face-to-face communication is one of the most important factors to facilitate smooth knowledge sharing.

Communication was found to be closely associated with workspace structure [82]. Strong bonds are formed between team members in open working environments, leading to employees being more comfortable communicating [75,81]. Islam et al. [83] discovered that an organization that promotes open communication between its team members can produce more effective knowledge transfer, lower the cost of error, and create new work-related knowledge. Gumus [84] investigated communication and its effect on knowledge sharing in terms of communication satisfaction and style and found knowledge sharing is more prominent within a group than out of a group. Nevertheless, Al-Alawi et al. [81] found that friendships or strong bonds complicate communication as co-workers feel they cannot communicate work-related problems to co-workers that they are friends with. This contradicts previous literature that states friendships enhance knowledge sharing [85].

Communication is undeniably important for knowledge sharing in the context of overall performance. Consequently, our second hypothesis is proposed:

**Hypothesis 2 (H2).** Communication has a positive impact on knowledge sharing within organizations.

### 3.3. Reward Systems

Jeon et al. [86] pointed out that both extrinsic and intrinsic motivation positively influence the knowledge-sharing attitude of individuals, which in turn governs their behavior toward knowledge sharing and transfer. Rewards are inextricably linked to and significantly overlap with motivation. However, there is much debate in the literature concerning the link between rewards and performance, and their impact on performance is unclear.

Rewards can be categorized into two types. Extrinsic rewards comprise monetary incentives, such as bonuses and pay increases, whereas intrinsic rewards are based on recognition mechanisms, such as job security and promotions [42]. Many scholars demon-
strated that rewards facilitate knowledge sharing [17,36,81]. However, some research has revealed that rewards are not capable of promoting knowledge sharing [68], nor have a relationship with knowledge sharing [87].

In their study, Tan et al. [68] demonstrated that monetary rewards motivate knowledge sharing, whereas Bock and Kim [42] found that monetary rewards created a negative attitude to knowledge sharing in their study. Tan et al. [68] advocated that performance-based reward systems are the most effective way to motivate employees to share knowledge within the organization. Durmusoglu et al. [88] discovered that when rewards are integrated into the culture of the organization, knowledge sharing increases. In a recent study, Halisah et al. [89] found that performance climate moderates the effect of knowledge sharing culture on employees’ knowledge sharing intention.

In a meta-analysis of 44 research studies involving 14,023 individuals, Nguyen et al. [90] found that both extrinsic and intrinsic factors were linked to higher levels of knowledge sharing, while the effect was stronger for intrinsic motivation. Further investigation revealed that individual characteristics, organizational context and cultural context moderated the motivation and knowledge sharing relationship.

Based on this, our third hypothesis is:

**Hypothesis 3 (H3).** Reward systems have a positive impact on knowledge sharing within organizations.

### 3.4. Leadership

Leadership has been highlighted as an important enabler of knowledge sharing in the organization. Leaders promote knowledge-sharing behavior through specific measures. More specifically, they are responsible for creating trust among employees [73,91] and motivating them to share knowledge by setting and conveying knowledge sharing goals [92].

Søndergaard et al. [93] assert that leadership is crucial in promoting knowledge sharing across different hierarchy levels in an organization and found a positive relationship between leadership and individual knowledge sharing in their study. Lee et al. [94] discovered that leadership is positively related to knowledge sharing and team performance, and recently, Muhammed and Zaim [95] discovered that leadership’s support of the immediate manager is a key element in peer knowledge sharing behavior.

While some consider leadership to be one of the most important factors that influence knowledge sharing [67,94,96], it has been found to have no relationship to knowledge sharing in other studies [36]. The relationship between leadership and information sharing appears to be dependent on the style of leadership. For instance, Xue et al. [21] studied the concept of empowering leadership concerning knowledge sharing. Their research findings revealed that empowering leadership significantly affects the knowledge-sharing behaviors of individuals. Srivastava et al. [97] also found that empowering leadership was positively related to knowledge sharing and improved performance. Lin and Hsiao [73] examined the relationships between transformational leadership and knowledge sharing. They found that transformational leaders emphasize the meaning of tasks that subordinates engage in at work which, in turn, has an impact on knowledge sharing.

Similarly, Kim and Park [98] also found a positive relationship between transformational leadership and knowledge sharing. Additionally, Tripathi et al. [99] report similar findings to Shafi et al. [100], who investigated the relationship between servant leaders and knowledge sharing and found a positive association.

Some researchers have discovered, however, that leaders can operate as a barrier to knowledge sharing. Leaders have been observed to obstruct the flow of information, preventing them from executing certain jobs or sharing knowledge efficiently [75]. Costa et al. [71] found that workers felt more dependent on their co-workers than their leaders in the workplace.

The literature discussed above demonstrates that leadership may have an impact on knowledge sharing, but there is no clear consensus on the subject and, therefore, it needs to be explored further. Based on these conclusions, this paper’s fourth hypothesis is:
Hypothesis 4 (H4). Leadership has a positive impact on knowledge sharing within organizations.

3.5. Connections to the Current Study

Knowledge that is not well managed is easily lost, especially tacit knowledge, as it resides in the minds of people. Prior research has demonstrated that tacit knowledge sharing requires a shared social process and that many contextual factors can influence sustainable performance outcomes. However, researchers claim that knowledge sharing is insufficiently explored relative to other knowledge management processes [64] and is poorly managed in practice [15]. Furthermore, there is insufficient empirical research on the effects of organizational factors in specific contexts [62,70,71]. Based on our analysis of the literature, we propose that trust, communication, reward systems and leadership have a positive influence on knowledge sharing in a high-tech service context. Further analysis of each of these factors illustrates that they are complex and influential. It is apparent that there is no absolute consensus on whether or how they influence knowledge sharing within a high-tech service organization. Our study, therefore, seeks to rectify this gap. To do this, we operationalized these four constructs and generated scale items to test the relationship between the constructs and knowledge sharing. The approach taken is further elaborated in the next section.

4. Methods

A quantitative approach was taken in this study and a structured data collection instrument was used to collect relevant empirical data. The approach taken to developing the instrument was based on that advocated by DeVellis [101]. This process began with the identification of enablers from the literature, as discussed in the previous section. These constructs were then operationalized using measurable items. Measuring something ill-defined is fundamentally difficult [102]; therefore, it was critical to start with a strong conceptual understanding of our model. This model was built using a top-down approach. It includes a detailed examination of the pertinent literature, which enabled us to identify and categorize the important organizational enablers. Then, using a bottom-up approach, explicit statements that characterized best practices in each of the domains were created following food practice [103]. Each item was carefully refined to assess all relevant construct characteristics (see Table 3).

Likert-type scales are one of the most commonly used formats to gauge levels of agreement with an item and so they were used in our study. A five-point Likert scale was used to assess the extent to which respondents agreed or disagreed with each statement. This approach avoided extreme responses and allowed for greater differentiation and granularity in responses.

Validity is essential for scale development and so several tests were used in this study. DeVellis [101] states that all constructs and items that appear on the data collection instrument must align with the goals of the study. Furthermore, all items must be phrased correctly so that they are easily understood and meaningful. Face validity is a subjective test that determines whether or not an instrument accurately measures the idea it claims to measure. Pre-test meetings with subject matter experts were held before the survey was released to assess the face validity of the survey’s content. The goal of these meetings was to ensure that the most important factors were included, that the items were relevant and appropriate and that any errors were eliminated. Attention was also paid to ensuring that the grammar, syntax, structure, and logical flow were correct following the advice from DeVon et al. [104] and DeVellis [101]. Suggestions for improvement were taken into account, and changes to the instrument were made as a result.
Table 3. Constructs and items.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
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</table>
| Knowledge sharing       | 1. Colleagues exchange knowledge with their peers while working  
2. There are no barriers to knowledge sharing in our organization  
3. Employees are willing to share knowledge within teams  
4. If I need information, I can get it from colleagues  
5. Colleagues are good at using knowledge from other team members in the organization  
6. When I have learned something new, I see to it that colleagues outside my department can learn it as well |
| Trust                   | 1. When something goes wrong, I do not blame others for failure  
2. I find it is easier to trust my colleague if they are competent in his or her role  
3. Trust between my colleagues can take a long time to build  
4. Trust can reduce fear of knowledge sharing  
5. I trust my co-workers’ ability in providing me with useful information |
| Communication           | 1. There is a high level of face-to-face communication among my colleagues in the workplace  
2. I find it is easier to communicate with people that I have strong bonds with  
3. Language is not a problem when communicating with other colleagues  
4. Working around a large table with other colleagues can enhance communication  
5. Teamwork collaboration enhances communication between staff |
| Reward systems          | 1. I would share more of my knowledge with a colleague if I was formally recognized or rewarded  
2. A satisfactory reward system exists in our organization  
3. Our organization’s reward system motivates employees to improve work performance  
4. The indirect rewards in our company, such as appreciation and recognition, play a greater role than the monetary incentives  
5. I would prefer to have a feeling of participation rather than receiving any form of incentive |
| Leadership              | 1. I can accomplish my work under the guidance of our organization’s leadership  
2. I can obtain from my team leader all the information I need to carry out my day-to-day work  
3. A team leader’s function is to act as a collaborator to share knowledge among employees  
4. An empowering leadership style can increase an employee’s responsibility  
5. When managers are in command of employee behavior, it can have a negative effect on the employee’s motivation to share knowledge  
6. I am more reliant on a team leader rather than my team members in the workplace |

Next, the instrument was pilot tested with 7 representatives of the sample population to ensure content validity. Content validity measures the degree to which a sample of items or statements, when taken together, constitute an adequate operational definition of a construct. The content validity ratio proposed by Lawshe [105] formed the basis for our analysis. This method involves soliciting the opinions of subject matter experts (n = 7) on the items in a survey. They are asked to rate each item on the scorecard from “essential”, “useful” or “not necessary” on a three-point scale. According to Lawshe [105], if more than
half the reviewers indicate that an item is essential, that item has some content validity. In light of this, only items that reached this target remained on the survey, and the remaining items were removed.

Finally, the instrument was assessed for construct validity and internal consistency. Internal consistency describes how closely the items in a survey measure the same construct. The correlations between several items on the same test are used to ascertain if different items claiming to measure the same basic construct (e.g., trust, communication, rewards, or leadership) give similar results. The knowledge sharing subscale consisted of 6 items (\(\alpha = 0.890\)), the trust subscale consisted of 5 items (\(\alpha = 0.762\)), and the communication subscale consisted of 5 items (\(\alpha = 0.806\)), the reward subscale consisted of 5 items (\(\alpha = 0.894\)) and leadership subscale consisted of 6 items (\(\alpha = 0.856\)), thus demonstrating high levels of internal consistency. Next, empirical data were collected from the participants and the data were analyzed.

Members of a high-tech service organization operating in Ireland were targeted for this study. The justification for our choice was to ensure that all participants worked in a shared context-specific environment with similar constraints. To ensure that the sample was representative of the population and to reduce selection bias, random sampling techniques were employed. Team members comprising engineers/technicians/scientists and managers/supervisors were targeted. Proportional allocation was not carried out as it was considered to be irrelevant for this study. The instrument was distributed to 347 people using Google forms. A cover letter explaining the study’s rationale and goals was included. Target participants were invited to be as open and honest as possible when responding. They were assured that responses were strictly confidential that all data would be aggregated and so their individual responses would be anonymized.

Care and attention were given to the nature of statistical tests used to ensure that they aligned with the goals of the study. We used Pearson’s correlation as it is widely recognized to be a useful mechanism for measuring the relationship between independent and dependent variables. This test also helped us to determine the size and direction of the correlations. In addition, we used regression analysis, as this test helped us to determine whether the relationships were statistically significant. More information about the targeted participants and how the data were analyzed is provided in the following section.

5. Results
5.1. Profile of Respondents

A total of 135 questionnaires were returned, yielding a response rate of 39%. After cleaning the data and removing invalid and incomplete responses, 104 valid questionnaires were used in the analysis. Table 4 presents a summary of the respondents who participated in the study. Among respondents, 64.4% were female, while males accounted for 35.6% of the total. In addition, 67.3% of the sample were aged between 21 and 30 years old and 29.8% between 31 and 40 years old. The respondents were highly qualified: 73.1% of respondents held a bachelor’s degree and 14.4% held a master’s degree. Among respondents, 55.8% were team members, 20.2% were managers, and supervisors accounted for 13.5%.

5.2. Knowledge Sharing and Key Organizational Factors

A Pearson’s correlation was computed to assess the relationship between the organizational factors and knowledge sharing (see Table 5).

A strong correlation was found between trust and knowledge sharing (\(r = 0.672, p < 0.01\)). Similarly, strong correlations were found for communication and knowledge sharing (\(r = 0.695, p < 0.01\)), reward systems and knowledge sharing (\(r = 0.644\) and \(p < 0.01\)) and leadership and knowledge sharing (\(r = 0.769, p < 0.01\)).
Table 4. Profile of respondents.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (n = 104)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender Male</td>
<td>37</td>
<td>35.6</td>
</tr>
<tr>
<td>Gender Female</td>
<td>67</td>
<td>64.4</td>
</tr>
<tr>
<td>Age ≤20</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Age 21–30</td>
<td>70</td>
<td>67.3</td>
</tr>
<tr>
<td>Age 31–40</td>
<td>31</td>
<td>29.8</td>
</tr>
<tr>
<td>Age 41–50</td>
<td>2</td>
<td>1.9</td>
</tr>
<tr>
<td>Age ≥50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Education High School</td>
<td>5</td>
<td>4.8</td>
</tr>
<tr>
<td>Education Diploma</td>
<td>7</td>
<td>6.7</td>
</tr>
<tr>
<td>Education Bachelor’s degree</td>
<td>76</td>
<td>73.1</td>
</tr>
<tr>
<td>Education Master’s degree</td>
<td>15</td>
<td>14.4</td>
</tr>
<tr>
<td>Education PhD</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Education Other</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Role in organization Team member</td>
<td>58</td>
<td>55.8</td>
</tr>
<tr>
<td>Role in organization Manager</td>
<td>21</td>
<td>20.2</td>
</tr>
<tr>
<td>Role in organization Supervisor</td>
<td>14</td>
<td>13.5</td>
</tr>
<tr>
<td>Role in organization Other</td>
<td>11</td>
<td>10.6</td>
</tr>
</tbody>
</table>

Table 5. Correlations of knowledge sharing and organizational factors.

<table>
<thead>
<tr>
<th>Variable</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Knowledge Sharing</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B Trust</td>
<td>0.672 **</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Communication 0.695 **</td>
<td>0.788 **</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D Reward Systems 0.644 **</td>
<td>0.580 **</td>
<td>0.490 **</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Leadership 0.769 **</td>
<td>0.737 **</td>
<td>0.770 **</td>
<td>0.633 **</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

** p < 0.01.

A regression analysis was subsequently conducted to explore the nature of the relationship between knowledge sharing and trust (see Table 6). As the coefficient of dependence is positive, the rise in x (trust) generates an increase in y (knowledge sharing). Therefore, hypothesis one was supported: Trust has a positive impact on knowledge sharing within organizations ($\beta = 0.672, p < 0.001$).

Table 6. Regression analysis summary for trust predicting knowledge sharing.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>0.772</td>
<td>0.517</td>
<td>1.494</td>
<td>0.138</td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>0.854</td>
<td>0.093</td>
<td>0.672</td>
<td>9.159</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Dependent variable: A (knowledge sharing).

Regression analyses were also conducted for communication, reward systems and leadership and knowledge sharing (see Tables 7–9). As all coefficients of dependence are positive, the results imply that communication ($\beta = 0.695, p < 0.001$), reward systems ($\beta = 0.644, p < 0.001$) and leadership ($\beta = 0.769, p < 0.001$) can significantly and positively influence knowledge sharing. Therefore, all our hypotheses are supported.

Table 7. Regression analysis summary for communication predicting knowledge sharing.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>0.619</td>
<td>0.500</td>
<td>1.238</td>
<td>0.219</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>0.841</td>
<td>0.086</td>
<td>0.695</td>
<td>9.770</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Dependent variable: A (knowledge sharing).
Table 8. Regression analysis summary for reward systems predicting knowledge sharing.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>2.874</td>
<td>0.313</td>
<td>9.193</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Reward systems</td>
<td>0.514</td>
<td>0.060</td>
<td>0.644</td>
<td>8.507</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Dependent variable: A (knowledge sharing).

Table 9. Regression analysis summary for leadership predicting knowledge sharing.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>0.728</td>
<td>0.394</td>
<td>1.844</td>
<td>0.068</td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>0.862</td>
<td>0.071</td>
<td>0.769</td>
<td>12.142</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Dependent variable: A (knowledge sharing).

6. Discussion

6.1. Trust and Knowledge Sharing

The results show that trust has a positive impact on knowledge sharing in this study, which is consistent with prior empirical work in this area [36,69,81]. Specifically, Wickramasinghe and Widyaratne [36] investigated 150 software developers in Sri Lanka; Costa et al. [71] investigated 395 individuals in social care institutions in the Netherlands; and Al-Alawi [81] examined 231 employees from public and private sectors in Bahrain. All of these studies demonstrate significant positive associations between trust and knowledge sharing. However, Kim and Lee [106], did not discover a statistically significant relationship between trust and knowledge sharing in their study. Our research, therefore, extends the academic debate by surveying 104 team members in a high-tech service organization in Ireland and confirms the positive trust–knowledge sharing relationship. We believe that the relationship between organizational members can be strengthened and improved by fostering mutual trust. Where high levels of trust exist, people are more willing to accept others’ opinions and individuals are more willing to engage in cooperative behaviors such as knowledge sharing. Therefore, an organization seeking to create a sustainable environment for knowledge sharing can start by establishing a working environment that fosters trust.

6.2. Communication and Knowledge Sharing

According to our results, communication has a positive impact on knowledge sharing ($\beta = 0.695, p < 0.001$). This result confirms the findings in previous studies [36,69,81,83]. It is also consistent with the findings from a meta-analysis conducted by Witherspoon et al. [35] that analyzed 46 studies and found that communication is one of the important enablers for knowledge sharing. Communication creates an environment for team members to produce and exchange their assumptions about values, norms, and culture and helps to generate shared meaning. This, in turn, fosters an environment conducive to knowledge sharing. This relationship can also be explained by social interactionist theories, which relate to the nature of language acquisition and transmission. This theoretical perspective maintains that both nature and nurture have an impact on language acquisition and transmission processes [21]. Knowledge sharing, in this view, is similar to the acquisition and transmission of a language, and it may be influenced by organizations that facilitate communication processes (a form of nurture). However, we did not investigate which communications patterns are more effective for knowledge sharing. We, therefore, encourage future studies to explore this topic in more detail.

6.3. Rewards Systems and Knowledge Sharing

Based on the research results, the conclusion can be made that reward systems have a positive impact on knowledge sharing ($\beta = 0.644, p < 0.001$). This finding is consistent with prior work [36,68,83]. An effective reward system is essential to motivate employees to exchange knowledge because it costs time and energy to share knowledge with others.
Additionally, other studies emphasize the use of intrinsic or soft rewards as a method of recognition and appreciation [81,87] as they found that employees share personal knowledge to acquire a sense of contribution, input, and participation. Our results also uphold these claims as most respondents believe that “the indirect rewards in our company, such as appreciation and recognition, play a greater role than the monetary incentives”. Intrinsic rewards are, therefore, regarded as the most important individual motivational driver to knowledge sharing and, consequently, organizations seeking to create a sustainable environment for knowledge sharing should concentrate on supporting these mechanisms.

6.4. Leadership and Knowledge Sharing

According to the research results, leadership has a positive impact on knowledge sharing ($\beta = 0.769, p < 0.001$). This finding is consistent with previous literature, where leadership and knowledge sharing were found to have a positive correlation within organizations [21,36,69,93]. A team leader has the ability and power to facilitate the flow of knowledge. They can also work as collaborators in getting team members together, helping them to share knowledge and providing feedback for the team. The role of a leader is to create sustainable processes and opportunities to facilitate knowledge sharing in an organization. For example, leaders organize team discussions that can contribute to knowledge sharing by providing new information, ideas, and solutions.

We encourage researchers to study why certain leadership styles are more effective in promoting knowledge sharing. We learned that when employee behavior is commanded or dictated by leaders, the motivation and desire to transfer knowledge are negatively influenced [36,75]. Moreover, sometimes organizational members deem team members of a project to be more reliable than an appointed leader. Therefore, questions about whether participatory, empowering and servant leadership styles are considered to be key drivers for sustainable knowledge sharing are worthy of further exploration.

7. Conclusions

It is apparent that specific measures must be implemented to achieve superior and sustainable performance in organizations seeking to optimize knowledge sharing. Developing appropriate interventions and actions can enable sustainable competitive advantage [69,70]. They have been shown to add value to organizations [107–110]. However, the challenge of implementing sustainable management practices is complex and difficult. This study addresses several gaps in the literature by providing context-specific empirical data on key organizational factors important for effective and sustainable knowledge sharing. We found that trust, communication, rewards systems and leadership have a positive and significant influence on knowledge sharing in a high-tech service organization.

Despite the need for further validation in longitudinal research, these findings are timely and contribute to the current discussion on knowledge sharing in several ways. By investigating different enablers to knowledge sharing, this study will help scholars and professionals pay more attention to relevant factors and processes, which can promote organizational effectiveness and sustainability. They can assist managers to concentrate on specific sustainable interventions that enable effective knowledge sharing in their organizations. Early recognition of how these enablers materialize in practice allows for proactive actions. For example, they can help with the planning and implementation of improvement efforts. They can also help managers to reallocate resources to optimize efficiencies.

Limitations and Future Research

The results of this study demonstrate that trust, communication, rewards systems and leadership influence knowledge sharing within an organization. However, like with any study, several limitations are recognized.

The study’s purpose was to gain insight into a specific phenomenon (i.e., factors important to knowledge sharing) in a specific setting (i.e., service organization). As a result, quantitative data were collected from a single organization. While this approach
was considered effective for presenting a contextual study of a small number of aspects related to knowledge sharing, it is recognized that the conclusions are restricted in their generalizability. Future research can make a significant contribution by analyzing factors in a wider range of scenarios. Because the scale used in this study was determined to be valid, reliable and robust, it may be applied to a broader sample of people from various backgrounds. This would allow for a more thorough comparison and would be helpful to advance this research area.

This research looked at complex social conceptions by breaking them down into several quantitative scale items. However, it is recognized that this strategy may overlook other important aspects of knowledge sharing. As a result, a more in-depth examination of these factors is essential to comprehend how they operate in various settings. Measures can also be improved by developing more situation-specific items [62]. Therefore, future researchers may wish to adapt our items to other contexts.

Correlation and regression techniques were used in our analysis as they were deemed best suited to answer our research questions. We recognize that additional methods such as mediation and moderation analyses would also be useful. Consequently, we would encourage future researchers to incorporate them into their research designs. The inclusion of a mediator would help researchers to explain how or why certain constructs influence knowledge sharing, while the inclusion of a moderator would allow researchers to ascertain whether a variable influences the strength of the relationship between the independent and dependent variables.

This study adopted a cross-sectional approach in our research design as the goal was to demonstrate direct relationships in a specific context. However, we acknowledge that knowledge sharing is a dynamic process and would benefit from more longitudinal research designs to explore the dynamic nature of knowledge sharing outcomes. Similarly, conducting a multilevel analysis that includes the individual, the team, and the organization for a holistic comprehension of the concept of knowledge sharing would be an intriguing endeavor. It would also be useful to assess knowledge sharing practices outside the boundary walls and between organizations.

**Author Contributions:** Conceptualization, K.C. and C.M.; methodology, K.C., S.S. and Q.W.; software, K.C and C.M.; validation, K.C., S.S. and Q.W.; formal analysis, C.M., S.S. and Q.W.; investigation, K.C. and C.M.; resources, K.C.; data curation, Q.W. and S.S.; writing—original draft preparation, K.C.; writing—review and editing, K.C.; visualization, C.M.; supervision, K.C.; project administration, S.S. and Q.W.; All authors have read and agreed to the published version of the manuscript.

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**Conflicts of Interest:** The authors declare no conflict of interest.

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