Constructing Knowledge Resources Mastery: Exploring Knowledge Composition in Process Design – A Resource-Based Theory Perspective

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Abstract

The quest for knowledge resources is fundamentally rooted in the recognition of their intrinsic value. However, simply acquiring these valuable resources does not inherently guarantee their significance or transformative impact. This conceptual article investigates the pivotal role of knowledge resources within firms and examines how their integration into organizational processes can unlock their full potential. It explores the intricate dynamics of knowledge resource positioning, utilization, and interaction and how these factors collectively enhance the firm’s value system. This study delves into the heterogeneous nature of knowledge resources through a comprehensive content analysis, moving beyond their inherent characteristics to understand their placement, utilization, and interaction within organizational processes. Our findings highlight the complex interplay between knowledge resources and their contribution to the firm’s overall value. Despite its insightful contributions, this study is not without limitations. The conceptual nature of the research means that empirical validation is necessary to generalize the findings across different organizational contexts. Additionally, the scope of this study is limited to theoretical exploration, and future research could benefit from empirical investigations that test and refine the proposed concepts. Theoretically, this article enriches the knowledge management literature by applying the Resource-Based View (RBV) to elucidate how knowledge resources realize their potential within firm processes. Practically, it provides actionable insights for managers on effective knowledge resource management and value creation, underscoring the importance of strategic positioning and interaction of knowledge

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1 Introduction

Companies' primary goal is to create an environment where knowledge workers with different expertise can come together to make products and services (Grant, 1991). Previous studies have given us valuable insights into how these knowledge workers with diverse skills work together to produce a collective outcome over time (Qiu et al., 2021; Hussain, 2017; Van De Ven et al., 1976), which ultimately serves the purpose of the organization’s better performance. They operate as groups of individuals collaborating cohesively, pooling and applying their collective knowledge to enhance their capacity to achieve their intended objectives, which underlie their establishment (Palmié et al., 2023; Felin and Hesterly, 2007).

On the other side, the external environment changes constantly evolving and presenting opportunities and threats, which keep striking firms to bring change in their existing knowledge reserves to be competent (Aliasghar et al., 2023; Priem et al., 2012). To successfully navigate these changes, firms must possess knowledge resources with dynamic capabilities, a concept elucidated by Qiu et al. (2021), enabling firms to coordinate responsive actions. For that purpose, firms also keep acquiring, developing, bundling, and using valuable resources (Sirmon et al, 2007) and modifying them according to the required and desired performance levels. Organizations deal with these issues through two distinct pathways: either by drawing upon existing knowledge reservoirs or by procuring fresh knowledge where the organization lacks (Ganguly et al., 2019; Simon, 1991). In cases where the existing knowledge reserves prove insufficient or inadequate in effectively addressing the complexities and uncertainties of the business environment, companies may take measures to augment their knowledge resources or seek out new sources of knowledge.

A question might be, why do we acquire certain knowledge resources if they can't effectively deal with environmental changes? To address this question, the dynamic capability of the resources was emphasized (Qiu et al., 2021) so that knowledge resources should be able to respond to environmental dynamic changes, and that’s the reason they are considered valuable resources (Barney, 1991). A simple conclusion can be drawn that resources are heterogeneous as well as multi-dimensional to be able to perform dynamically in different circumstances. In other words, a knowledge resource might not perform in the particular circumstances for which it was acquired but may perform in another specific set of circumstances. Our whole argument is built around the valuable knowledge resources’ dynamic capability and the mechanism that enables such resources to perform at the maximum and ultimately makes firms able to address the environmental complexity and requirements. In addition to that, how can we explore, deal with, and use the multi-dimensional ability of knowledge resources effectively?

We argue that the anticipated value of a knowledge resource at the time of its acquisition may not turn out to be the same as its real value, which can be determined when it is placed and may be equal to or lesser than its anticipated value. The difference becomes apparent when the knowledge resource is integrated into the company's operational processes and interacts with other knowledge resources. This integration process is crucial for realizing its true value within the company's value chain system. However, assessing the desired outcomes can be complex and challenging because it involves understanding the knowledge resource's inherent value and how much value it can generate in process/es. In this paper, we explore the reasons behind and the methods for managers to comprehend the intrinsic value of knowledge resources and position them effectively without compromising their value. In addition to that, we argue that the value of any resource is not solely...
determined by consumers but is also influenced by managers who design knowledge of resource-related processes. The concepts of ‘knowledge resources’ and ‘firm managers’ are the core elements of discussion in this paper, which make valuable resources ‘superior’. For that purpose, we need to put the lens of the resource-based view (RBV) theory which emphasizes the importance of resources that are valuable, rare, hard to copy, and well-organized to maintain a competitive edge (Barney, 1991). Our arguments delve deeper into one of these aspects of RBV theory, i.e., "valuable" knowledge resources, by specifically focusing on making them even more competitive. In other words, achieving success goes beyond simply accumulating knowledge resources; it primarily depends on how well the firm’s managers use them (Barney, 1991; Khanra et al., 2022). To achieve this, knowledge resources should be carefully identified, placed, and utilized in various processes that are meticulously designed to coordinate business activities.

A business firm is made up of several processes, each playing a unique role within the overall value chain of the company (Nwankpa et al., 2022). Properly organizing these micro-scale processes enhances the effectiveness of all the knowledge resources. The knowledge resources assigned to develop processes may not all possess equal intrinsic value due to their inherited heterogeneity (Barney, 1991); they should strive to generate maximum value when they are positioned, arranged, and combined to form a process. The incorrect placement of any knowledge resource in its designated processes cannot only result in the waste of its inherited individual value but can also disrupt the synergistic effects of other knowledge resources.

In the context of firms’ improvement, it is crucial to focus on enhancing the value generated by a company's knowledge resource base (Sahibzada et al., 2023). This endeavor necessitates leadership and managerial expertise to identify and position resources effectively to address environmental challenges. Managers should consistently monitor changes in the value contribution system to understand the underlying causes for adjustments in the current knowledge resources allocation within the firm. Various quantifiable factors, such as declining sales, increasing customer complaints, high employee turnover, declining product quality, and reduced profitability, can serve as reliable indicators to gauge fluctuations in the value generated by different processes and the contribution of various knowledge resources involved. The pace and nature of these changes can vary across industries, requiring managers to adapt and reallocate knowledge resources as needed promptly. Industries like fashion or technology often demand rapid attention and knowledge resource realignment, making this an ongoing and dynamic process.

Our significant contribution to the ‘knowledge management’ literature is to fill up a gap in understanding the specific conditions that lead a knowledge resource to transition from having inherent value to becoming highly valuable. We argue that how knowledge resources are placed and interact with other knowledge resources can impact their ability to unlock their latent value. To answer the question of how knowledge resources should be utilized and positioned to achieve the desired level of value generation, we explain the mechanisms involved in identifying the true value of knowledge resources. Additionally, we emphasize that it's not just the nature of knowledge resources that makes them heterogeneous, as previously discussed in strategy literature (Barney, 1991; Penrose, 1959), but also their placement and interaction with other knowledge resources, which has not been explored extensively in the field.

This paper's central theme revolves around the idea that value generation is an ongoing process influenced by both external environmental factors and internal strategic processes within the firm. Achieving an optimized value chain framework requires the seamless integration of these internal and external aspects, driven by managerial expertise (Hussain, 2017; Schniederjans et al., 2020) and we highlighted how to achieve that optimal level of value contribution. While external factors may trigger changes, the fundamental mechanisms are primarily rooted within the firm itself (Barney, 1991; Penrose, 1959). In the realm of strategic resources, knowledge is often regarded as a vital resource (Rehman et al., 2022). Some argue that businesses possess a superior capacity
compared to markets when it comes to generating and harnessing this resource (Kogut and Zander, 1992).

2 Knowledge as a resource

Within the broad spectrum of firm resources encompassing factors such as location, capital access, competencies, and culture, as discussed in the literature (Habbershon & Williams, 1999). Our study classifies ‘knowledge’ as intangible resources falling under the realm of ‘organizational capital.’ We delve deeply into the deliberate methodologies employed for harnessing the knowledge resources. It is pivotal to recognize that the intrinsic value of a resource is not realized until its potential for value augmentation is comprehended. Our investigation systematically addresses the query, elucidating the influence of knowledge resources on firm performance. This is primarily because such knowledge is challenging to replicate and obtain readily through market transactions (Barney, 1991). A compelling case can be made that knowledge embedded in a firm's distinctive historical and social environment can serve as a long-lasting competitive advantage.

2.1 Knowledge as a source of competitive advantage

The significance of knowledge in enhancing a firm's competitive advantage has been acknowledged by various scholars (Penrose, 1959), particularly through the knowledge-based view, emphasizing its pivotal role in both strategic and competitive contexts (Grant, 1991; Kogut & Zander, 1992). While existing literature has extensively explored the transfer and dispersion of workers' knowledge (Stasser et al., 1995; Stewart & Stasser, 1995), it remains conspicuously silent on the systematic integration of these knowledge resources to harness synergies for optimizing firm performance. To delve deeper into this inquiry, we turn to the strategic management field, where researchers have sought to comprehend how firms effectively leverage resources to enhance their performance (Barney, 1991; Wernerfelt, 1984).

In the realm of strategy literature, the Resource-Based View (RBV) theory posits that superior firm performance can be attributed to superior resources (Penrose, 1959). Competitive advantage is derived from these resources when they possess attributes such as value, rarity, and inimitability or non-substitutability (Barney, 1991; Peteraf, 1993) but are restricted to disclosing the circumstances under which such knowledge resources become superior. With their diverse capabilities, knowledge workers collaborate to execute projects, whether in providing services or developing products (Edmondson & Nembhard, 2009; Huckman et al., 2009). A substantial body of research has examined the pooling of dispersed knowledge among team members (Larson et al., 1996). This heterogeneity in knowledge arises due to its tacit nature, deeply rooted in the social and historical context of both individuals and firms. Consequently, knowledge resources are inherently difficult to copy or imitate by competitors, rendering them a potential source of sustainable competitive advantage (Barney, 1991). We argue that strategically integrating knowledge with other firm knowledge resources enhances the firm's ability to navigate a dynamic and complex business environment. Therefore, it is not solely the knowledge itself that matters as a resource but rather how it is integrated with other knowledge resources that make this integration process crucial. Taking dynamic capabilities from the firm to the individual level, we may inquire why some firms struggle to utilize their knowledge workers as valuable resources effectively.

2.2 Demand-Side: A Value Adjustment Trigger

Environmental changes occur for every firm, and they need to adapt, manage, and position themselves in such a way that enables them to create or enhance value (Ireland et al., 2003; Mahoney, 1995; Sirmon et al., 2007) for the customers as well as for the firm, which ultimately serves the purpose of the firm’s existence. In particular, our thoughts do not prove strategy as a zero-sum game (Adner & Zemsky, 2006; Priem, 2007) but an attempt to integrate both sides by emphasizing one important ingredient of strategy, i.e., the knowledge resource arrangements. The
environmental changes provide opportunities for the firms to establish the required knowledge resource reserves to address that change accordingly (Barney, 1986). By understanding the environment, managerial experience plays a bridging role between the opportunities and the required firm's knowledge resource reserves, and for that purpose, different processes are designed to contribute to the value chain system.

Our initial argument is that the value of any resource is determined by the customers (Priem et al., 2012) but the mechanism resides within the firm. Building the argument around this initial stance, we observed that at times, firms need to redefine, redesign, modify (if required), and then develop different processes comprised of heterogeneous knowledge resources. The ‘processes’ designed by the firm are valuable until customers are willing to pay for them. When environmental changes occur or customers' preferences are changed over time, they may reduce or stop giving value to the firm's existing set of knowledge resources, which means that the knowledge resources used and positioned in the processes are not able to protect the minimum amount of value which any firm may expect from such knowledge resource bundles.

In the realm of knowledge resource management, it is crucial to recognize that the value of knowledge resources remains intact, and they continue to fulfill their designated functions. However, it is imperative to acknowledge that the perceived value generated by these knowledge resources may not align with customers' expectations, as customer expectations determine this value (Priem et al., 2012). It becomes necessary to address this issue promptly, as failing to do so may lead customers to migrate to companies offering more effective bundling and, consequently, a higher perceived value.

The desired composition of knowledge resources within a specific process should be tailored to respond to external demands effectively. To evaluate and adjust the value output of a firm's processes, indicators such as market share, sales performance, customer feedback, and the number of complaints can be considered (Priem et al., 2012). Moreover, the future impact of a knowledge resource can be uncertain, making it challenging for managers to accurately assess its potential value contribution (Foss et al., 2008). Over time, changes in the external environment may unveil previously unrecognized potential within a knowledge resource, which remained untapped due to prior environmental conditions. These resources are often referred to as ‘slack’ resources (Carnes et al., 2019). While environmental changes may trigger this revelation, it is the responsibility of the firm to adapt and redesign its processes to harness the untapped potential of these knowledge resources fully. Therefore, managers must comprehend the latent capabilities of knowledge resources within their existing reserves, which may not have been considered in their previous configurations (Carnes et al., 2019).

Proposition 1a: The higher the sensitivity of the competitive environment in an industry, the greater the chances of affecting the value produced by the existing designed processes of a firm.

Proposition 1b: The higher the inability of knowledge resources used in processes to address environmental changes, the higher the chances of compromise on the value creation ability of the firm.

2.3 Resource-Side: A Value Contribution Mechanism

When specific knowledge resources are combined in a particular process, they can contribute their highest value. However, the same knowledge resources may not yield the same level of value when used in a different process. An effective and efficient bundling of resources is essential to optimize these processes and ensure that diverse knowledge resources reach their maximum potential in terms of value creation (Sirmon et al., 2007). This necessitates acquiring untapped knowledge resources or adjusting the existing set of resources within the affected bundle to address underutilization issues. Different firms have varying abilities to create value for their customers,
and not all available products are equally valued by customers, leading to heterogeneity (Barney, 1991). This heterogeneity in value creation results from differences in the value released by the knowledge resources involved in the firm's value chain system. However, we have limited knowledge about how knowledge resources are structured within different processes. While Sirmon et al. (2007) provided insights into structuring, bundling, and leveraging resources and capabilities, they did not delve into the specifics of how to structure and bundle such resources.

In our study, we focus on addressing this core issue, which helps elucidate the mechanism behind structuring and bundling processes involving multiple knowledge resources. We argue that knowledge resources do not possess equal value, not only due to their varying capacity to produce value but also because of their placement and positioning, which affects their interaction with other knowledge resources.

The attribute in question regarding knowledge resources relies on their capacity, capability, and willingness as per their role within a specific process. An enhanced alignment of knowledge resource allocation within a given process is expected to result in improved firm performance within a particular competitive context. This improvement can manifest in cost reduction or an increased willingness among customers to pay for the firm's offerings, making it a valuable indicator of knowledge resource allocation. Firms that effectively integrate their knowledge resources, ensuring that all participating knowledge resources are strategically positioned and willing to contribute to their full capacity in value creation, will gain a competitive advantage.

Conversely, firms that have successfully established processes with valuable knowledge resources but have positioned these knowledge resources poorly will be regarded as underutilizing them. While these knowledge resources may still contribute to the firm's value chain, their selection, placement, and interaction within their allocated processes may prevent them from realizing their full value potential. Nevertheless, these knowledge resources remain valuable, though not superior in their current configuration. It is important to note that not all knowledge resources employed by the firm may achieve their maximum value potential when positioned in a single process. This does not diminish their value; rather, it suggests that their potential may be better harnessed through relocation or by combining them with a different set of knowledge resources where their capabilities can be fully leveraged. The knowledge resources possess multiple dimensions and can be utilized in various combinations due to their inherent variability in efficiency. This multidimensional nature allows these knowledge resources to occupy different positions within the same operational framework and participate in distinct processes concurrently, each with varying levels of effectiveness. It is possible for a resource to excel in one position or specific process while displaying diminished efficiency in alternative locations or within other processes. Likewise, different companies craft unique value propositions, which significantly influence their capacity to construct a competitive value chain system. Consequently, a specific dimension of a knowledge resource may suit one firm's needs but may not yield the same benefits for another company due to differences in market positioning. Managers are responsible for scrutinizing resources comprehensively to ascertain the full spectrum of dimensions where they can be effectively employed to maximize value generation (Hussain, 2017).

It is crucial to ensure that any fluctuations in a knowledge resource's capacity to contribute value to one aspect of a process do not negatively impact the overall value creation within the same process. To achieve this, mapping and tracking all deployed resources within a given process is imperative. This mapping process assists managers in identifying critical areas within their operational processes and quantifying the value contributed by each knowledge resource to the firm's value chain system. The distinctive collection of knowledge resources assembled within a process, wherein each participating knowledge resource delivers its utmost value potential, represents the superior knowledge resources for companies. These knowledge resources can be
regarded as the wellspring of sustained competitive advantage for the firm.

**Proposition 2a:** The better the managers understand the value capacity of each participating knowledge resource in the designed process, the better placement will be possible.

**Proposition 2b:** The better the knowledge resources are placed and positioned in a process with a high level of interaction with each other, the higher the value will be released and contributed by that process in the firm’s value chain system.

**Proposition 2c:** The maximum number of knowledge resources arranged and placed at their best suitable position, the enhanced the knowledge resource value contribution will be in their designated process/es.

### 2.4 The Real Value of a Knowledge Resource

In the realm of knowledge resource management, the acquisition of knowledge resources is driven by their perceived value and their potential to enhance a firm's value chain. However, there exists a discrepancy between the anticipated value contribution of a knowledge resource and its actual value once integrated into operational processes. This actual value is contingent upon the knowledge resource’s engagement with other knowledge resources within the processes. The application of managerial expertise serves to narrow two critical gaps: firstly, the distinction between the expected value contribution of a knowledge resource and the value realized, and secondly, the contrast between the value anticipated by customers and the actual value delivered from the firm's knowledge resource reservoir.

The value of a knowledge resource is divided into three distinct components: the knowledge resource's overall capacity, the expected reduction in value, and the unaddressed loss of value. The primary aspect of this value, often referred to as the total value, is rooted in the knowledge resource's capacity to make the most significant contribution within the firm's value chain system. The secondary facet pertains to the knowledge resource's ability, which may or may not align with its full capacity to generate value. The decision to acquire a knowledge resource hinges on managerial judgment concerning both its capacity and ability. The final dimension of knowledge value relates to the resource's willingness to actively engage in the value chain system, which may be equal to or less than its inherent ability. To optimize a knowledge resource's contribution, it is imperative to curtail the anticipated loss of value during knowledge resource acquisition and minimize unforeseen losses during knowledge resources integration (Hussain, 2017) to reach its full potential within the firm's value chain system.

### 2.5 Knowledge Resource’s Value Contribution Assessment

The acquisition of skills in process design occurs through two distinct methods: either by utilizing existing knowledge resources or by procuring previously untapped knowledge resources, which an organization did not possess beforehand (Simon, 1991). In both scenarios, knowledge resources are amalgamated to create various processes, each yielding differing levels of value to adapt to changing environmental conditions. To illustrate, consider a process composed of several distinct knowledge resources, denoted as a, b, c, and d, where each knowledge resource contributes its full value to the process. If the environment changes, necessitating process redesign or if a manager decides to reposition a specific knowledge resource within the process for improved outcomes compared to the current setup, the expected value contribution from each knowledge resource in the newly designed process (a, c, d, f, and g) must equal or surpass the outcomes of the previous design. Under conditions of uncertainty, the subjective value of a knowledge resource becomes apparent (Kraaijenbrink et al., 2010), influenced by the firm's position and managerial judgment. Different firms with identical information may assign varying values to the same knowledge resource (Schmidt & Keil, 2013); however, in the context of process design, this can be assessed by contrasting its current value contribution with the previous one. This inherent diversity in value
capacity enables different knowledge resources to align with other knowledge resources, aiming to identify the optimal combination among all participating knowledge resources in a given process.

From a theoretical perspective, this paper contributes to the knowledge management literature by advancing the discussion beyond the mere "value" of knowledge resources to their "superiority" by identifying the internal mechanisms within firms. It highlights indicators for identifying circumstances necessitating process design or redesign, which can potentially enhance a firm's value and provide a source of competitive advantage once attained. Additionally, it underscores why heterogeneous knowledge resources can be combined in various ways, and a firm's inherent advantages may enable it to leverage a particular knowledge resource more effectively than others. This does not imply that other firms cannot optimize their knowledge resources; rather, they must identify their optimal knowledge resource management combination within their tailored processes based on their unique requirements while adhering to a similar underlying pattern.

3 Conclusion

In the realm of business operations, it is imperative for firms to consider the knowledge resources they incorporate into their processes carefully. These knowledge resources should be chosen with the primary aim of creating value, both for the customers and the firm itself. This entails the exclusion of knowledge resources that do not exhibit the potential to contribute to the overall value chain. Failure to adhere to this principle can result in compromising the value-generation process. The effectiveness of a knowledge resource often becomes apparent when it is appropriately integrated into a process, allowing it to interact seamlessly with other knowledge resources. Only then can the actual value it brings be accurately gauged. This value must surpass the expected value, or adjustments must be made until the knowledge resource finds its optimal position.

Numerous key performance indicators can be employed to assess how individual knowledge resources perform within their respective processes. Hence, firms should focus their efforts on developing processes that maximize a knowledge resource's capacity to enhance the firm's value chain system. This necessitates scrutiny by managers, who must assess the suitability of processes within the entire value chain system. Managers play a critical role in deciding whether to introduce or remove knowledge resources and rearrange existing knowledge resources.

The comprehensive evaluation process involves a deep understanding of a knowledge resource's potential contribution and its compatibility with other knowledge resources in various process combinations. Within a firm's value chain system, there may be numerous micro-level processes, and any disruption at this level can have far-reaching consequences. Firms that fail to consider and assess the value contribution of specific knowledge resources within their value processes may still deliver value, but it may fall short of its full potential. Moreover, this oversight can disrupt the value-generating capabilities of other knowledge resources down the line. Conversely, when potential knowledge resources are evaluated before their integration into any designed processes, they can operate at peak capacity in conjunction with other firm knowledge resources, synergizing the entire value chain system. Likewise, when all knowledge resources undergo assessment before being incorporated into processes, the resultant value generated can significantly enhance the firm's ability to create maximum value for its customers. Such a strategic approach propels firms ahead of competitors that neglect knowledge resource evaluation in their process design. Ultimately, evaluating a knowledge resource's ability, capacity, and willingness to contribute to a firm's diverse value processes profoundly impacts the speed and overall worth of the value chain system. This, in turn, provides firms with the opportunity to outperform their rivals in delivering value to their stakeholders.

3.1 Limitations

While this study provides valuable insights into the management and utilization of knowledge
resources within firms, it is not without limitations. Firstly, the conceptual nature of this research means that empirical validation is necessary to generalize the findings across different organizational contexts. Though comprehensive, the study’s reliance on content analysis limits the ability to capture the dynamic and evolving nature of knowledge resources over time. Furthermore, the focus on specific organizational processes may not fully account for the diverse ways in which different firms utilize and manage their knowledge resources. Future research could benefit from longitudinal studies that track the transformation and impact of knowledge resources over extended periods, providing a more nuanced understanding of their role within firms. Additionally, the scope of this study is limited to theoretical exploration, and empirical investigations involving a larger, more diverse sample of firms could help validate and refine the proposed concepts. Finally, while this study primarily focuses on the positive impacts of knowledge resource management, it does not extensively address potential negative outcomes or challenges firms might face in this process. Addressing these limitations in future research could significantly enhance the robustness and applicability of the findings.

3.2 Future Directions

This study offers promising directions for future research and lays the groundwork for stimulating academic discussions about how knowledge resources and demands are integrated into firms’ processes. Additionally, it explains how these processes can potentially provide a significant competitive advantage at the individual level by suggesting a shift towards enhancing value creation through process redesign. It is crucial to recognize that various factors, including personality traits, management approaches, firm culture, and structure, may influence managers' decision-making. Therefore, it is essential to conduct thorough research in this expansive area.

Moreover, exploring additional environmental factors in the external context that can serve as indicators for assessing process development is a compelling avenue for further investigation. Likewise, identifying measurable and quantifiable key performance areas within the firm can assist in pinpointing areas that require process redesign. Empirical studies are essential to clarify the contribution of each knowledge resource in the processes designed by firms in various business sectors.

4 References


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