

Shaping the Knowledge Worker Through a *T-Shaped Skills Profile* Framework

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Abstract: The paper revisits the concept of knowledge workers using the lens of a *T-shaped skills profile*. This framework combines breadth and depth of a worker's knowledge with their skill durability. The T-shaped skill profile represents an individual who combines deep expertise in a field (the vertical bar of the T) with a broad understanding across multiple disciplines (the horizontal bar). This metaphor emphasizes the balance between specialized knowledge and not specialized one. To enhance this approach, a time dimension accounting for the perishability of skills, is integrated. Indeed, the unprecedented changes the last Covid-19 pandemic have brought about in work habits and culture seem to forecast the working habits of the future. Changes, such as a less work-centric behavior and higher flexibility demands, necessitate a better understanding these knowledge workers. 10 interviews have been conducted with knowledge workers from various organizations and sectors. Results show an original inverted pyramid T-shaped skills profile featuring a time dimension following this pattern: (i) Contextual level – Semi durable skills and knowledge; (ii) Foundational level – durable skills and knowledge; (iii) Specialist level – Perishable skills and knowledge. New insights on the nature of these knowledge workers are also provided. This paper contributes to theory by bridging two interesting concepts: the traditional eclectic approach to knowledge workers and the T-shaped skill profile. This research provides valuable insights to managers, supporting the development of effective policies and structures to retain and motivate these specialized employees.

Keywords: Knowledge Workers; T-Shaped Skills Profile; Skill Depth; Skill Breadth.

1. Introduction

Understanding the competencies of workers in terms of breadth, depth and their potential for innovation has been an ongoing problem in organizations (AlEssa and Durugbo, 2022; Birkinshaw et al, 2020). This is particularly the case for knowledge workers (KWrs) who add significant value to organizations' mission (Kaur, Gupa, Singh et al, 2019; Newell, 2015; Drucker, 1959, 1999). Millar et al (2017) argue that leading KWrs requires different leadership structures recognizing that these workers present different identities (Sveningsson and Alvesson, 2003). Additionally, the level of knowledge depth (or expertise) and knowledge breadth (or general business knowledge) vary among workers. Understanding this peculiarity is conditional to organizational creativity (Mannucci and Yong, 2018) and thus innovation. As knowledge workers' skills are perishable (Arbesman, 2012), aligning these with corporate objectives calls for a strategic approach that harness the potential of the workforce (Muzam, 2023). Echoing Peter Drucker's (1959) prophetic statement which declares that leading KWrs will be the greatest management challenge of the 21st century, Issahaka and Lines (2021) note that scant progress has been made in addressing this issue. Instead, scholarly discourse has often consisted of normative and fragmented propositions. A better understanding of these workers in terms of knowledge depth and knowledge breadth, and the relevance of their skills along a time continuum, is a possible avenue that this study examines through the T-shaped skills profile. The time dimension or skill perishability factor is paramount within the current economic landscape (Harris and Spencer, 2019; Bansal, Reinecke, Suddaby et al, 2022).

Extant literature acknowledges the fuzzy character of the knowledge worker and the challenges in 'defining it' (Alvesson, 2001; Surawski, 2019). For example, Davenport (2005) conceptualizes the knowledge worker from an individual point of view (e.g., having a high degree of education) while Surawski (2019) argues that KWrs are specialists that require trust to achieve specific goals. Drucker (1994) is concerned by KWrs at work where they primarily use knowledge and information to complete their tasks. Following a study on the nature of knowledge work, Pyöriä (2005) concludes that the existing literature lacks a satisfactory definition capable of encompassing all dimensions of knowledge work.

To address this issue recent studies have highlighted the potential a framework such as the T-shaped skills profile promises. The T-shaped skills profile is a framework that supports a representation of individuals' skills breadth and depth (Heikkinen, 2018; Saukkonen and Kreus, 2022). The horizontal bar to the T encompasses broad competencies that allow knowledge workers to integrate knowledge across multiple domains. The vertical segment signifies depth in a specific domain or expertise area. It represents specialized skills and knowledge that make workers specialists in their fields. Finally, a third dimension is considered: time. This dimension is expressed by the skill durability model introduced by IBM and discusses skills in terms of durability (Malik, 2020).

This paper aims to contribute to the discussion on knowledge workers management and leadership within an increasingly complex work environment. More specifically, the focus is on KWrs' evolving skills, capabilities, want and needs. To gain deeper insights on the unique attributes of these workers and their engagement with organizational requirements, T-

shaped skills profile is implemented. This research seeks to examine how knowledge workers evolving organizational and personal dimensions are understood through the T-shaped skills profile. The following three sub-research questions facilitate the study:

1. How do knowledge workers engage with the organization they work for?
2. What are knowledge workers' generic/durable capabilities and their contextual/semi-durable capabilities?
3. What are knowledge workers' specialistic/perishable capabilities?

The following sections present a conceptual framework and summarize the research method. This is followed by a discussion of the results, culminating in a final framework with corresponding explanations. The paper concludes with a discussion and conclusion section.

2. Conceptual Framework

2.1 Knowledge Workers

Introduced in 1959 by Drucker, the concept of KWr remains highly relevant in today's organizational landscape (e.g., Muzam, 2023; Issahaka and Lines, 2021). Although no consensus has been reached in literature regarding their definition, numerous attempts have been made to delineate KWrs. Davenport (2005) challenged Drucker's (1959) original definition, emphasizing that KWrs' work is characterized by "thinking for a living" rather than merely knowing more about their job compared to other people in the organization. Kidd (1994) highlighted the non-routine nature of KWrs' work, where they create their own processes, necessitating experiential learning. More recently, Surawski (2019) refined the definition, portraying KWrs as individual engaged in cognitive tasks demanding a broad knowledge base, complex problem-solving skills, and autonomy. Surawski (2019) also echoes Drucker's perspective, emphasizing the shift toward specialization, expertise, and the need for novel management paradigms to enhance productivity. However, Waizenegger et al (2020) extended the term KWrs to include remote workers leveraging information technology during the pandemic, aligning with Davenport's (2005) view. This juxtaposition of definitions has contributed to confusion in the field over the past two decades.

Drucker (1959) was among the pioneering management scholars to anticipate the rise of these forward-thinking specialists. KWrs demand effective leadership while simultaneously navigating self-management. Subsequently, Davenport (2005) acknowledged workers who consistently interact with knowledge within an environment profoundly impacted by the surge in information technology. This scenario necessitates novel management approaches. In Drucker's (1999) view, the term KWr highlights the transition from traditional labor to intellectual work. He further emphasized the critical role of KWrs' productivity in the global economy, already foreshadowing the contextual challenges organizations must address. An empirical study conducted by Zhan et al (2013) describes these continually evolving circumstances surrounding KWrs, circumstances driven by technological advancements and the necessity for their skill updates. Despite the numerous scholarly contributions attempting to 'define' the KWrs' context, both Pyöriä (2005) and Surawski (2019) noted that there is (still) a lack of a structured framework that fully encapsulates the roles and attributes of KWrs within changing economies.

2.2 The T-Shaped Skills Profile Development

Originally introduced by David Guest in 1991, the T-shaped skills profile was developed to address organizations' need for talented workers amidst the 1990s' economic and technological turmoil in the U.S. Prominent industry figures like Tim Brown, Chief Executive Officer of IDEO, have endorsed this T-shaped skills profile, viewing it as essential for fostering innovation and interdisciplinary collaboration (Hansen, 2011). The T-shaped skill sprofile is a framework or model that helps delineate workers' skills in term of expertise or knowledge depth and general knowledge or knowledge breadth. This framework also gained popularity among scholars and is used to discuss the multidisciplinary nature of academic research networks and their 'T-shapedness' (Turner et al, 2019). In his PhD dissertation, Heikkinen (2018) explored the concept of T-shaped professionals to understand the knowledge Finnish students should acquire to remain relevant at work in the future. His work highlighted the importance of equipping knowledge workers with the ability to navigate diverse contexts and collaborate effectively across disciplines.

Despite the many promises the T-shaped skills profile holds, its descriptive and fragmented nature, coupled with a top-down perspective, falls short of capturing the dynamics of the modern workplace (Heikkinen, 2018). The model oversimplifies the multifaceted skills needed today and overlooks context as a crucial influence factor. In response, alternative solutions (i.e., different skill profile shapes) have been proposed (e.g., Elayan, Hayajneh, Abdellatif et al, 2022). The T-shaped skills profile continues to be a focal point in discussions about professional competency, highlighting the importance of both deep domain-specific expertise and broad interdisciplinary knowledge. Addressing these limitations, Saukkonen and Kreuz (2023) introduced the T2-model. This framework conceptualizes individuals as possessing depth in a specific domain (the vertical

line of the T) complemented by breadth across various disciplines (the horizontal line). This horizontal dimension is vital for fostering collaboration, cross-disciplinary understanding, and adaptability in dynamic work environments. Overall, the framework shows that the ideal KWr shows an ability to integrate business expertise with technological skills, balancing both technical and social components within a broader system (Figure 1)

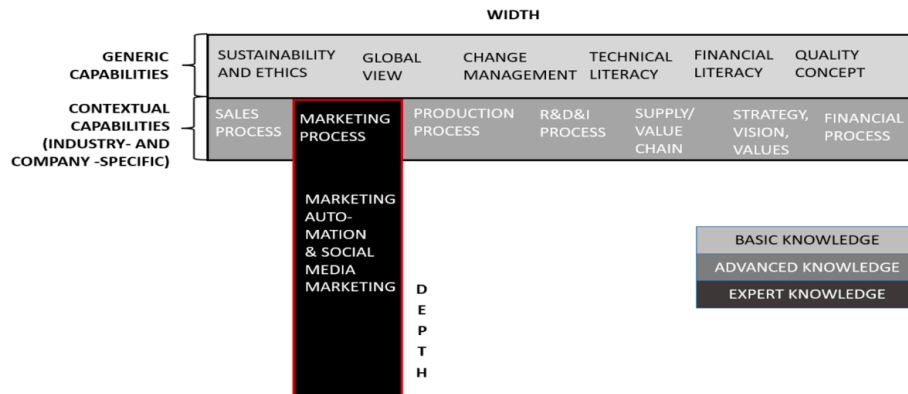


Figure 1: T2-shape skills profile for a digital marketing lead (From Saukkonen, and Kreuz, 2022, p. 1039)

2.3 The Perishability Factor

Drucker (1999) emphasized the significance of continuous learning and teaching within one's field of expertise as a key contributor to a knowledge worker's productivity. Considering evolving job market demands and the constant need for fresh skills in the workplace, employees must continually enhance their capabilities (Muzam et al., 2023). Harris and Spencer (2019) recognize the changing employment landscape and stress the need for employees to re-skill and develop. The authors added that this situation has led companies to broaden and innovate their learning resources and modify their approaches to workplace strategy. This prompted organizations to make the integration of new learning systems a rapidly expanding area in Human Resources investment. In addition, humans can forget knowledge (Baddeley, 2013), tendency that becomes problematic conspires with the increasing pace of change. This predicament forces an acknowledgement of the idea of 'skill perishability' when attempting to visualize KWrs. The skill profile categorization proposed by IBM offers a clear framework that aligns well with the T2-model developed by Saukkonen and Kreuz (2022). Skill perishability also presents a fit with Drucker (1985) who stated that what individuals have learned by age 21 will begin to become obsolete five to ten years later and will have to be replaced or at least, refurbished by new learning, new skills, and new knowledge.

This study adopts the following approach conceptualized within the T2-model:

- i. Durable skills last for more than 7.5 years. This group of skills includes more foundational skills such as design thinking, project management practices, effective communication, and leadership. These skills can be positioned in the horizontal bar of the T shape.
- ii. Semi-durable skills last between 2.5 to 7.5 years. This category often includes frameworks that form the base for field-specific technologies, processes, and tools. These skills can be positioned in the horizontal bar, below the top line of the T shape.
- iii. Perishable skills last less than 2.5 years. These skills include specific technology skills frequently updated, organization-specific policies, tools, and specialized processes. These skills can be positioned in the vertical bar of the T shape.

3. Method

This study strives to understand KWrs' lived experiences in working situations. These are viewed as dynamic, shaped through interactions within their evolving professional environments. The subjective and context-dependent nature of these experiences calls for qualitative research (Creswell and Creswell, 2023). A semi-structured interview was designed to capture the nuanced and varied experiences of 10 KWrs based in The Netherlands, aged between 30 to 55 years old. The respondents were identified within the researchers' personal network. The interview guide structure was inspired from the T2-model from Saukkonen and Kreuz (2023). To facilitate the conversation and obtain rich data, interviewees were asked to describe a positive experience in managing a project and a negative one. Following the description of the positive project, the researchers stimulated a conversation around broad generic skills, contextual skills and expert skills, making sure to cover all dimensions of the T2-model.

Data analysis followed Brooks and King's (2014) thematic analysis method, moving from an open, exploratory phase to focused categories centered on the KWrs' perspective, but within the categories of the T2-model Brooks and King's (2014) method supports the use of a preliminary framework to analyze the data. In this instance, the T2-model was used only during the selective coding stage to develop the final template that encapsulates foundational, contextual and expert skills respectively. Beyond Brook and King's (2014) recommendation, researchers identified patterns in respondents' responses that supported the use of a framework such as the T2-model. In discussing their most rewarding career projects or periods, respondents consistently shared the following insights. In the following order, respondents:

1. Perceived competence growth, fostered through collaborative knowledge/skill acquisition, which was crucial for task performance.
2. Internalized corporate objectives aligned with their own values, morals, and ambitions.
3. Gained adequate autonomy over resources, authority, and strategic/tactical information over time.
4. Exhibited pride, commitment, and drive within a context of entrepreneurial management (as described by Drucker in 1985).
5. Focused their tactical decisions on preserving value and future development, balancing innovation with risk mitigation.
6. Engaged in in-situ development of essential expertise (referred to as "the T's tip") via experimentation and collaboration.
7. Believed that management trust was rooted in the worker's track record and their effective ability to create value.

These seven patterns reveal a tri-level framework, delineating an evolving profile and visual representation of the KW. This approach supports then the use of framework as a guiding structure for making sense of the data. In the final coding stage, the identified codes were refined into major themes, providing contrasts with established academic models. The T2 model by Saukkonen and Kreuz (2023) was employed to categorize the findings into foundational, contextual, and specialist skill levels.

4. Results

The results of this study are provided hereafter, summarized in Figure 2. The elongation of the contextual level (the pointy part of the figure) challenges the traditional proportions of the T2-model or the original T-shaped skills profile. This research results propose a modified visualization as an inverted triangle, which more accurately represents the skill distribution and acquisition in contemporary knowledge workers (Figure 2). The items of this figure are explained hereafter.

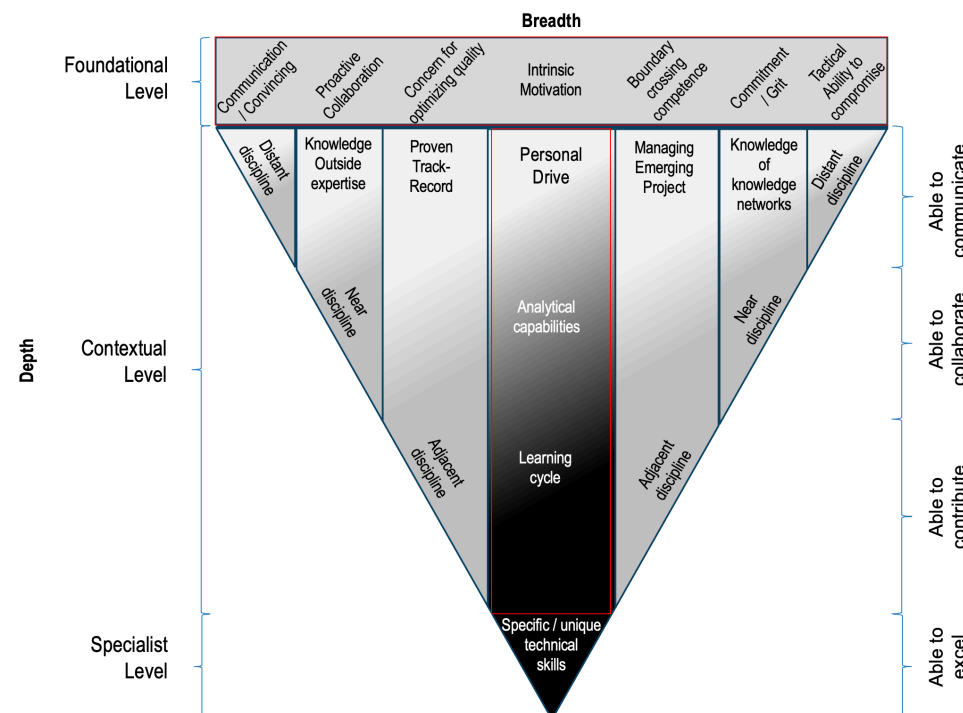


Figure 2: Modified T-shaped skills as inverted triangle illustrating contemporary knowledge workers

4.1 The Foundational Level

The Foundational Level (Durable Skills and Knowledge) encompasses a variety of essential and distinct skills and traits that contribute to the economic relevance of KWrs within an organization. The different dimensions composing this level are presented hereafter.

Communication and Convincing Skills: KWrs skillfully combine persuasive communication with their deep professional expertise to drive progress in collaborative projects and initiatives. A cancer research laboratory specialist aptly likened the process of seeking approval to “a bit like a game”—a strategic challenge to make it appealing to management. KWrs navigate the delicate balance between substance and influence, ensuring that their ideas resonate and propel organizational success.

Proactive Collaboration: Respondents shared that active engagement and collaboration characterize their interactions. They engage in a dynamic exchange of advice, embodying both learning and teaching principles, as emphasized by Drucker (1985; 1999). These KWrs adeptly navigate organizational hierarchies, leveraging informal networks, and harnessing the collective strengths of diverse teams. Hence, KWrs thrive in an ecosystem of shared knowledge, where their interactions foster growth, innovation, and collective success.

Concern for Optimizing Productivity and Quality. KWrs take proactive steps to enhance both their personal productivity and the organizational output within their functional domain. This proactive behavior is triggered by a combination of sufficient knowledge and genuine concern. Drucker (1959; 1999) and Kidd (1994) support this perspective, which diverges from Davenport (2005). In essence, when KWrs possess the right knowledge and care deeply about their work, they become catalysts for positive change, challenging the status quo and driving progress in their organizations.

Intrinsic motivation. In line with Drucker’s (1959; 1999) management theory lies a counterpoint to external management as a mean of behavior control or motivation. The empirical evidence resonates with self-determination theory (Ryan and Deci, 2000), underscoring that autonomy, competence and relatedness are conditional to KWrs. It does not matter whether the emphasis lies on group affiliation or individual self-actualization as mentioned by a defense infrastructure specialist.

Boundary-Crossing Competence: In line with Heikkinen (2018) and Saukkonen and Kreuz (2022), results show that KWrs rely on a unique capacity to bridge disciplinary and organizational divides, enabling seamless adaptation and knowledge integration across diverse domains.

Commitment/Grit: KWrs exhibit *grit*. They proactively orchestrate their deep involvement and demonstrate a willingness to endure discomfort in pursuit of their goals. Their unwavering dedication is evident through phrases like “have to,” “committed,” “our motto,” and “stand for.”

Ability to compromise: KWrs exhibit a strategic behavior that prioritizes immediate tangible value, while intentionally deferring uncertain aspects for future iterations. Rather than rigidly pursuing an “all or nothing” approach, KWrs strategically balance short-term impact with long-term adaptability and growth.

Davenport’s (2005) emphasis on the analytical aspects of knowledge workers within a repetitive context differs significantly from the findings, which underscore the importance of non-routine work and intrinsic motivation.

4.2 The Contextual Level

The Contextual Level (Semi-durable Skills and Knowledge) plays a pivotal role in KWrs’ productivity and innovation capabilities intricately tied to specific organizational contexts. The different dimensions composing this level are presented hereafter.

Knowledge Beyond Expertise: KWrs need to possess a nuanced understanding of adjacent fields to ensure high-quality and effective service delivery. This multidisciplinary approach not only broadens their expertise but also enhances their capacity to explore, analyze, and hypothesize. Importantly, this horizontal expansion of skills challenges the conventional T-shaped model, emphasizing the value of a wider knowledge base. Within this multidimensional perspective, KWrs connect insights across domains, fostering innovation, and breaking down silos within organizations.

Proven Track Record: Knowledge work inherently involves novelty, and some skills must be acquired on-the-fly. Whether KWrs receive the necessary support and autonomy hinges on the established level of trust, which is influenced by their demonstrated success and the promise of future reciprocity.

Personal Drive: A significant finding in this study is that the concept of drive resides within the contextual layer. It can be best understood as an innate ability to stay motivated, which becomes evident when not hindered by context-dependent organizational elements. This perspective aligns with Entrepreneurial Management, as defined by Drucker (1985), which highlights the essential conditions for fostering innovation as positive and sustaining factors. Additionally, Herzberg’s (1968)

list of Hygiene factors in the Two-Factor theory outlines what must be in place within a work context to sustain an employee's drive. Furthermore, respondents explained that the emotional connection between work and the situation at hand is shaped by a delicate interplay of pride and shame.

Managing emergent project Skills: Unlike traditional project management, where projects are meticulously planned and executed, respondents had to face a different challenge: managing the emergence of projects. This aspect, although it may appear to align with Davenport (2005), spotlights the non-routine nature of KWrs' work. It is not about adhering to routine project management protocols; rather, it is about cultivating innovation momentum and seizing opportunities as they arise. Results show that KWrs thrive in the dynamic interplay of creativity, adaptability, and forward-thinking.

Knowledge of Knowledge Networks: KWrs leverage networks for productivity, placing tacit knowledge and interpersonal connections above rigid formal organizational structures. This underscores the significance of informal relationships and personal initiative in navigating complex organizations. As an Information and Technology architect puts it, success often hinges on "knowing the right people who do know."

4.3 The Specialist Level

The Specialist Level, symbolized by the vertical bar of the T-shaped skills profile, centers on the most perishable and defining aspect of a KWrs' profile: specialist skills and knowledge. As Drucker (1999) described, KWrs are experts in their respective fields, inherently making them specialists. Their specialized expertise is pivotal for high-value productivity within organizations. The following codes emerged from the study.

Analytical Capability: Consistently, respondents exhibit robust analytical skills within their specialized domains. These skills are essential for comprehending complex challenges and driving continuous improvement in respondents' specific work areas.

Learning Cycle: Respondents explained that they manage their own dynamic learning cycle, leveraging their network for knowledge assimilation, setting up experiments, and actively seeking feedback. This process emphasizes Drucker's (1999) view on the necessity of continuous learning and teaching in knowledge work.

Creation of Business Functionality: Respondents play an ever-expanding role in innovating and enhancing corporate value propositions. They frequently lead the charge in creating new services or improving existing ones. When the complexity of a business function surpasses a certain threshold, optimization becomes achievable primarily through the expertise and insights of KWrs. Their ability to navigate intricate challenges and drive strategic improvements is pivotal for organizational success.

Specific / Unique Technical Knowledge: Contrary to the conventional understanding of specialization (Heikkinen, 2018), our findings reveal that respondents often combine multiple skills to create unique value. This creatively combined expertise poses staffing challenges and underscores the nuanced nature of respondent's specialization. This is the case both for a deep expertise in a single niche and a blend of skills that create unique capabilities driving business innovation.

5. Discussion and Conclusion

This study attempts to shed more light on the opaque concept of KWrs using a T-shaped skills profile. The ambiguity surrounding the broad use of the KWr label within the working environment has hindered progress in research in this field. After Davenport's (2005) seminal publication, subsequent research has often resorted to short-lived lists and descriptions of niche situations (e.g., Surawski, 2019). This research shows for the first time a structured and holistic vision through the T-shaped skill profile that makes a KWr a special type of employee.

Data underscores the value of boundary crossing skills (Hansen, 2011) but finds that these and their adjacent skills go dormant without the drive to apply them. While Heikkinen (2018) focuses on educating students about boundary crossing, this study delves deeper in this phenomenon and explores the contextual requirements for effective utilization of skills. The impact of organizational context on KWrs is transformative. The T-shaped skill profile has evolved into an inverted triangle (Figure 2). Contrary to the belief that specialization equates to expertise in a single niche, our study reveals that unique value often arises from a combination of skills as suggested by Saukkonen and Kreuz (2022). Interviewees, while not top experts in any single skill, occupy their own crossroads, deriving value from the intersection of multiple abilities. Their unique value was derived from an intersection of several skills, of which the core to their discipline took centerstage.

A second original finding is that this study delves into the intricate components of specialist-level expertise or skill depth identified in the data as *analytical capability, specific technical knowledge, and self-management of their learning cycle, oriented towards the creation of new business functionality*. Moreover, the dynamic underpinning how these skills become

relevant or qualify a worker as a knowledge worker, is revealed. The most valuable, specialized, and perishable skillset—the one forming the tip of the inverted triangle—is cultivated during KWrs' quests. Skills from adjacent disciplines are not merely accessed indirectly but are actively assimilated to a significant extent. The learning cycle of a KWr seems to move their skills and knowledge set laterally as well, it is not restricted to vertical motion. A significant finding highlights that KWrs undertake a quest, actively seeking to broaden their knowledge beyond existing boundaries. This insight aligns with Kidd's (1994) perspective on non-routine, analytical knowledge work. Similarly, Drucker's approach emphasizes that KWrs possess deeper job-related expertise compared to others in the organization. As a result, the KWr label specifically pertains to those actively involved in knowledge work as described in this study. Moreover, it is important to observe that KWrs do not proactively engage with their organizations unless the fundamental conditions that stimulate motivation (or drive), are present. It is essential for employees within a business function to be empowered to communicate, collaborate, and contribute to the corporate strategy. However, the responsibility ultimately lies with the KWrs to surpass this baseline by fostering innovation and optimization. Indeed, data shows that leader's micromanagement is counterproductive. This study presents two main limitations. (i) Data is extracted from a small number of respondents (n=10) (ii) solely based in The Netherlands. Further research should be conducted in different settings and with a greater number of respondents. Research can also focus in turn on different dimensions of the framework and identify, for example, what should foundational skills composed of.

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