

## Article

# Towards a Holistic Framework of Knowledge Worker Productivity

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**Abstract:** Many jobs today are predominantly knowledge work. This makes organizations dependent on value created by knowledge workers (KWs). Many of the initiatives to improve and manage knowledge worker productivity (KWP) give unpredictable results depending on factors that are often hidden and unknown. It is important to find a holistic approach to improve and manage KWP that gives consistent results across many different organizations. This paper takes us a step closer towards that objective by mapping insights gained from a systematic literature review to activities in a purposeful activity model of the individual KW at work and, based on the findings, proposing a draft of a holistic KWP framework. The main components of the framework are the state of the individual KW, work done and outcome. The systematic literature review searched for papers with topics that touched on approaches, frameworks, tools, or models which aim to tackle the productivity, performance, effectiveness, efficiency, or management of KWs. Relevant concepts were extracted from each paper and categorized into groups. Twelve groups were formed of which six consisted of concepts relevant to individual KWs and their work: organizational commitment and engagement, communication and relationships, personal characteristics and development, personal knowledge management, well-being and job satisfaction and task approach.

**Keywords:** knowledge worker; productivity; job satisfaction; personal knowledge management; task; organizational commitment; engagement; well-being; communication; relationships



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## 1. Introduction

At the brink of the fourth industrial revolution, knowledge work has become increasingly more important. Knowledge is the basis of innovation, which is needed to solve problems, seize opportunities and face the challenges that arise during the disruption of a revolution. As automation substitutes manual and routine labor, the productivity of our knowledge work becomes a limiting factor in our economies. Knowledge work is performed by knowledge workers (KW) which “have high degrees of expertise, education, or experience and use this to acquire, create, share, or apply knowledge in their jobs” (Óskarsdóttir et al. 2021, p. 1).

Drucker (1999) stated over twenty years ago that knowledge worker productivity (KWP) was in a similar condition as manual worker productivity was in the beginning of the 20th century, before Taylor revolutionized it with scientific management. We have made some progress since, but the various frameworks, approaches and methods that have been developed to improve and manage KWP do not show consistent results or only tackle a part of the problem. There is a need for a holistic approach to a theory of KWP that considers the different facets of KWP and their interactions. There is an extensive amount of research in various fields that explore relevant factors to KWP, making this a difficult endeavor.

Óskarsdóttir and Oddsson (2017) and Óskarsdóttir et al. (2021) suggest a holistic approach to KWP using soft systems methodology (SSM) to aid in descriptive theory building. According to Carlile and Christensen (2005), descriptive theory building consists of three steps: observation, categorization and association, which are iterated to formulate a theory that can be applied and improved in normative theory building. SSM has tools that are useful in these three steps when dealing with wicked problems. Wicked problems have many competing viewpoints, which change depending on new experiences or knowledge of individuals or groups. SSM was formulated by Checkland (2011) to explore these kinds of problems in industry, but Óskarsdóttir and Oddsson (2017) and Óskarsdóttir et al. (2021) are attempting to use the methodology to explore the problem situation of managing and improving KWP based on findings from previous research.

SSM consists of four activities: (1) finding out about a problem situation, (2) formulating purposeful activity models (PAMs), (3) debating the situation and (4) taking action for improvement. Óskarsdóttir and Oddsson (2017) executed the first activity and analyzed the problem situation of managing and improving KWP using extensive literature reviews on KWP challenges from both the perspective of the organization and the individual KW. Based on the review, they identified four problems from the perspective of the organization: information needs and knowledge interdependence; motivation, work engagement and health; organizational structure and changes; the nature of knowledge work. They also found that individual KWs experience the following problems as influential to their productivity: too much demand and insufficient resources, choosing what to do and how to do it, self-development, self-awareness, achieving and/or setting goals, performing to full potential, making thinking more productive, successful relationships, collaborations and motivation. The results were abstracted into simple rich pictures and specific root definitions of relevant systems. Building on the results of Óskarsdóttir and Oddsson (2017), Óskarsdóttir et al. (2021) executed the second activity in the SSM and formulated a PAM of the system from the perspective of the individual KW. A PAM is a conceptual model which is used to explore what activities need to be performed to achieve the purpose of the system by looking at it as a process (Checkland 2011). The PAM in Óskarsdóttir et al. (2021, p. 4) was built by assembling and linking the activities relevant to “the process in which the KW uses resources to execute actions to create tangible or intangible artifacts with the intention of generating value”.

This paper executes the third activity in SSM, debating the situation, as well as using the findings to draft a descriptive theory of KWP. The purpose of the third activity in SSM, debating the situation, is to compare the PAMs created in the second activity with how others perceive the problem situation to initiate a discussion that highlights assumptions about the problem situation, finds accommodations among conflicting views and identifies actions for improvement (Checkland 2011). There are multiple roles in SSM that can be invited to debate the situation, such as clients (those who initiate the study of the problem situation), problem owners (who give different perspectives of the problem situation) and problem solvers (those who want to do something about the situation) (Checkland 1993). In this paper the PAM presented in Óskarsdóttir and Oddsson (2017) is debated from the perspective of the problem solvers using insights from a systematic literature review. The focus is on factors that are directly relevant to individuals and their work according to the PAM presented in Óskarsdóttir et al. (2021) but limited to the perspective of the individual KW.

This paper takes us a step closer towards a holistic theory of KWP by describing some of the factors and measures that an operationalized model of KWP should include regarding individual KWs and their work (see Section 5). The draft of a descriptive theory of KWP is based on the results of the third SSM activity, debating the situation, where the insights from the systematic literature review are mapped to the activities in the PAM of the individual presented in Óskarsdóttir et al. (2021) (see Section 4). The design of the research and execution of the literature review are detailed in Section 2 below. Section 3 highlights

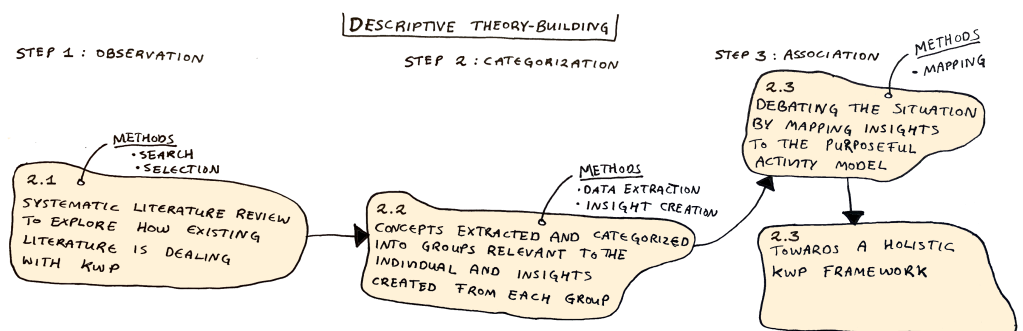
the discussions in each concept group which lead to the insights which are mapped to the PAM.

## 2. Methodology

The main purpose of this research is to contribute towards a theory of knowledge worker productivity (KWP). Theories provide a base which can be built upon. When it comes to KWP, there is no single integrated body of knowledge which can be used for analytical and empirical testing and applied to real-world problems. Knowledge and research relevant to KWP is distributed through multiple fields of study and at a high level of detail. There is a vast amount of existing literature that touches on factors that influence KWP. The first step towards a theory of KWP should, therefore, utilize the existing literature, extract the fundamental elements that affect KWP and explore how they work together from a high level of abstraction using a holistic approach.

This research uses soft systems methodology (SSM) to aid in the theory-building process proposed by [Carlile and Christensen \(2005\)](#). They split the theory-building process into two stages which are iterated through and build theories cumulatively: the descriptive stage and the normative stage. The descriptive stage is preliminary because researchers need to move through it to develop a normative theory which is based on careful field-based research. The descriptive stage consists of three steps: (1) observation, (2) categorization and (3) association.

[Checkland \(2011\)](#) developed the SSM to deal holistically with wicked problems using systems thinking. It has four main activities which are iterated, each with its own set of tools to guide the inquiry into a problem situation towards an acceptable solution that is aligned with all viewpoints and does not intensify competing interests. The four main activities are: (1) finding out about a problem situation, (2) formulating purposeful activity models (PAMs), (3) debating the situation and (4) taking action for improvement. This paper builds on the results of [Óskarsdóttir and Oddsson \(2017\)](#) and [Óskarsdóttir et al. \(2021\)](#), which execute the first two activities of SSM when executing the third activity debating the situation. Figure 1 shows the phases of this research in relation to the three steps of descriptive theory building and in which subsections they are discussed.



**Figure 1.** Phases of this research (Section 2.1) systematic literature review, (Section 2.2) data extraction and insight creation, (Section 2.3) debating the situation towards a holistic framework.

In the observation step of descriptive theory building, this research utilizes a systematic literature review to explore how the existing literature deals with KWP (see Section 2.1). In the categorization step, concepts are extracted and categorized into groups relevant to the individual and insights created from each group (see Section 2.2). To aid in the association step of descriptive theory building, the third activity in SSM is executed: debating the situation (see Section 2.3).

### 2.1. Systematic Literature Review

A systematic literature review search was executed on the Web of Science in May 2021. It searched for papers with a topic that touched on approaches, frameworks, tools,

or models which aim to tackle the productivity, performance, effectiveness, efficiency, or management of knowledge workers (KWs). The search resulted in four hundred and seventeen papers, of which one hundred and fifteen papers were selected by title and abstract review. If the title and abstract was relevant to knowledge worker productivity (KWP) and not too focused on one profession, the paper was included. Case studies were excluded, even though they give good insights, to limit the scope to a more general discussion on KWP. Seventeen papers were not available, so ninety-seven papers were read to extract information about approaches, frameworks, tools, or models relevant to KWP. The search term can be found in Table 1. The search term is in the advanced search query format used in the web of science.

**Table 1.** Search term in the advanced search query format used in the web of science.

Literature Review Search Terms
(TS = (( (productiv* OR perform* OR effectiv* OR effici* OR manag*) NEAR (((knowledg* OR profession* OR information*) NEAR/1 worker*) OR (white NEAR/1 collar*) OR (specialist*)) NEAR (approach* OR method* OR framework* OR tool* OR model*) AND (organization* OR compan* OR (public NEAR/1 (service* OR enterprise*)))))) AND LANGUAGE: (English)

Each paper was read by one researcher who filled out a data extraction spreadsheet where the main theme of each paper was identified and concepts relevant to the productivity, performance, effectiveness, efficiency, or management of KWs extracted. These concepts in the data extraction spreadsheet were then grouped together by theme. Twelve groups were formed. Six groups contain concepts that are directly relevant to individual KWs and their work: organizational commitment and engagement, communication and relationships, personal characteristics and development, personal knowledge management, well-being and job satisfaction and task approach. Six groups contain concepts relevant to the structure, initiatives and environment of the organization in which the KW works: internal marketing, job design, knowledge management, management approach, work climate and measuring productivity. This paper only moves forward with the six concept groups directly relevant to the individual KW and his/her work. Figure 2 shows the main themes identified in the ninety-seven papers. To simplify, each paper was only allowed one main theme.



**Figure 2.** Main themes of the papers.

Around 40% of the papers, in total 38 papers, had the main theme innovation and working with knowledge. Older papers were more focused on knowledge management and information communication technology (ICT), while newer papers shifted their focus more to personal knowledge management and innovation performance. Even though

human resource management practices was the second most popular theme, only 13 papers discussed this theme. These papers detailed, for example, studies on what human resource management practices were being used in some specific context, how specific strategies affect performance or how different strategies work with different job characteristics or in different work climates. The third and fourth most popular themes were management strategies and retaining workers, commitment and engagement, with 12 and 10 papers focusing on these themes, respectively. Other themes, which fewer than ten papers address, are measuring productivity, organizational performance, task approach, work climate, health and well-being and decision making.

Seventy-eight of the ninety-seven papers in the literature review touched on concepts grouped into the six concept groups directly relevant to individuals and their work: organizational commitment and engagement, communication and relationships, personal characteristics and development, personal knowledge management, well-being and job satisfaction and task approach. Table 2 shows these groups and some examples of concepts from the papers in each group. The list of concepts in Table 2 is not exhaustive but does give an idea of how the groups were formed.

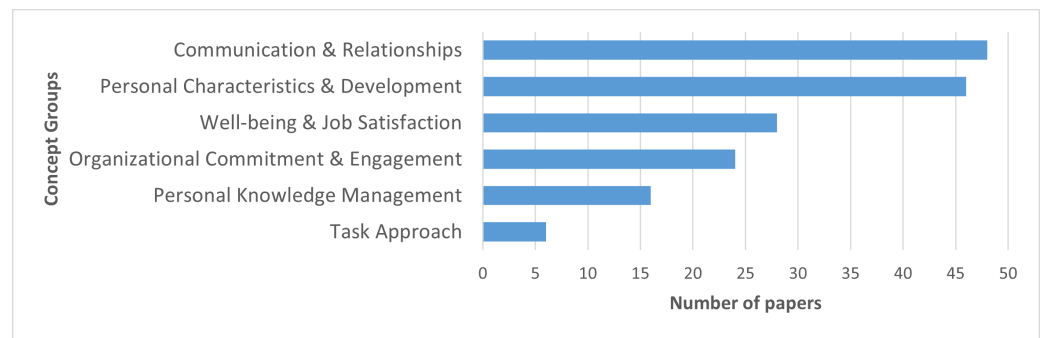
**Table 2.** Groups and Concepts.

Group	Concepts
Communication and Relationships	social and network support, mutual acceptance, cooperation, mutual understanding, timely communication, conflict resolution skills, define forms of communication, functional communication, continuous communication, internal communication, teams, teamwork
Personal Characteristics and Development	resiliency, learning orientation, goal orientation, prove orientation, avoid orientation, self-development, sensation seeking personality, individual characteristics, coping strategies/behaviors, diffuse vs. specific orientation, expectations, experiences, backgrounds, competencies, organizational citizenship behavior, internal motivation, self-efficacy, initiative, self-determination, workplace boredom relief strategies, self-regulation theory
Well-being and Job Satisfaction	role stress, conservation of resources theory, theory of frustration, stress, burnout, well-being, job satisfaction, recognition, Herzberg's theory (hygiene factors and motivating factors), knowledge sharing leads to job satisfaction
Organizational Commitment and Engagement	work engagement, psychological empowerment, meaning, purpose, competence, have impact, organizational commitment, flow
Personal Knowledge Management	absorptive capacity, personal knowledge management, knowledge building, shadow IT, knowledge reuse, social learning, social networking, expanding horizons, personal competitiveness
Internal Marketing	internal marketing, communicating organizational goals, training and development, initiatives, internal communication, interrelations, motivating workers, rewards, work support, motivation programs, social exchange theory
Task Approach	time-chunking, switching tasks, hyper-refocusing, interruptions, time management skills, IT use, multitasking behavior, timing of email processing, task effectiveness, task interdependence, complexity theory

Figure 3 shows how many papers addressed concepts in each group.

Most papers discussed concepts belonging to more than one group. The most popular group was communication and relationships. Forty-eight papers discussed concepts from that group. A close second was the group personal characteristics and development, which was discussed in forty-six papers.





**Figure 3.** Number of papers which discussed each concept group.

## 2.2. Data Extraction and Insight Creation

The papers that addressed concepts in each group were read again to extract the main ideas relevant to the group's theme and concepts and explore the association between the concepts within the group and how they influence the productivity of the individual KW according to the papers. This resulted in a summary of the main ideas relevant to the productivity of the individual KW for each group. From each summary, key insights were formulated from inferences made from the literature in each group. The key insights attempt to combine and abstract the main ideas to simplify and highlight associations that are likely important for the management and improvement of KWP. The results of this work are presented in Section 3.

## 2.3. Debating the Situation Towards a Holistic Framework

Óskarsdóttir et al. (2021) explored the problem situation of managing and improving KWP by executing the second activity in the soft systems methodology (SSM). They formulated a purposeful activity model (PAM) of the system for the individual KW defined in the first activity in SSM, analyzing the problem situation, which was performed in Óskarsdóttir and Oddsson (2017). The PAM proposed by Óskarsdóttir et al. (2021, p. 4) describes the activities that the individual knowledge worker (KW) engages in when using “resources to execute actions to create tangible or intangible artifacts with the intention of generating value”. These are the activities needed for the system to achieve its purpose of generating value for the individual himself/herself, the organization he/she works for and the community at large.

The third activity in SSM, debating the situation, compares how others view the problem situation with that captured in the PAM. To debate the situation, the insights gained in the literature review are mapped to the PAM presented in Óskarsdóttir et al. (2021). Debating the situation provides opportunities to rethink a situation, identify actions that can be taken to improve it and highlight assumptions about the situation. The mapping highlights what factors affect which activities and how. Therefore, it gives an idea of why these factors are important, how they affect the activities and where further study is needed to support the worker in his/her activities.

The insights from the literature review and the activities from the PAM are then used as building blocks in a draft of a holistic KWP framework as a step towards a descriptive theory of KWP. Keywords are extracted from the mapped PAM and grouped together to formulate a holistic KWP framework with factors relevant to the individual KW. The next section discusses the results of the data extraction and insight creation, followed by the sections which present the mapped PAM and the draft of a descriptive theory in the form of a holistic KWP framework.

## 3. Insights from the Systematic Literature Review

This section lists the summaries of the main ideas relevant to the productivity of the individual knowledge worker (KW) and presents the key insights inferred from each

group. The first subsection looks at what the literature goes into regarding communication and relationships.

### 3.1. Communication and Relationships

A KW's feelings, perceptions and behaviors are affected by their interactions with others (Meneghel et al. 2016). Ozbas (2005) highlights that the organization needs to be aware of the intent and quality of communication. The organization needs to encourage workers to be truthful in their communication by reducing potential gain from exaggeration and reward workers for disclosing unfavorable information. Individual motivation to learn and improve is linked to the desire to use knowledge honestly, knowledge sharing and collaboration (Machuca and Costa 2012). Hitka et al. (2019) found that communication in the workplace was one of the most highly valued motivation factors, and Paros (2021) found that timely communication influenced productivity. Imani et al. (2020) and Huber (2017) state that relationships and communication play a critical role in organizational innovation.

It is important that managers have the ability to interact and communicate with people (Druteikiene et al. 2013; Quinn 2005; Vlasenko et al. 2019). Managers should promote cooperation, sharing and strong and stable interactions within the group and ensure feelings of belonging and trust to improve the perceptions of relationships among colleagues (Meneghel et al. 2016). Solomonidou and Katsounari (2020) found that being heard and acknowledged through feedback, support, encouragement and constructive communication was a motivating factor and improved performance. They found that it is important to maintain functional relationships and communicate effectively with both superiors and colleagues. Training in how to give social support as well as in conflict resolution skills is important for the performance of KWs (Orgambidez and Benitez 2021).

Social exchange theory suggests that workers would rather invest in mutually rewarding relationships where they get more from an interaction than they give (Amar and Hlupic 2016; Kehoe and Collins 2017). Kehoe and Collins (2017) explored the effectiveness of a human resources system which includes practices which aim to support employees in building relationships with colleagues. Such practices include training and feedback on professional network development, frequent social functions and formal mechanisms for knowledge sharing. They found that a relationship-oriented human resources system had positive effects on KWs' collective access to knowledge (Kehoe and Collins 2017). Organizations need to build deep, meaningful and amicable relationships with their internal stakeholders to create a favorable social climate that encourages workers and co-aligns their intentions with organizational purposes (Ahmadi et al. 2018; Imani et al. 2020). Workers are as a whole exposed to the same work climate leading to a common interpretation, understanding and attitudinal evaluation of the job experience (Meneghel et al. 2016). The organizational climate should, therefore, focus on strengthening human relationships for effective knowledge utilization, transfer and acquisition (Igielski 2017).

Ramezan (2016) studied the impact of organizational culture on social capital, which originates from an individual's relations network. According to Nahapiet and Ghoshal's model, social capital consists of structural, relational and cognitive aspects. The structural aspect includes the social system and networks, such as which members have access to which people, how they can access them, strength of ties, hierarchy and utilization of networks. The relational aspect considers the type and nature of relationships as well as what assets and resources the relationships create and foster. The cognitive aspect refers to the shared cognitive frame that is needed to transfer knowledge, history and shared values of an organization to new members. Social capital impacts competitive advantage, performance, innovation and knowledge processes within knowledge-intensive organizations. Ramezan (2016) states that social capital can be improved by using organizational culture to synchronize values and norms of workers with organizational values and norms.

The existence of positive relationships, which create trust and communication opportunities, are fundamental for knowledge sharing (Hortovanyi and Ferincz 2015). Knowledge sharing is a process that transfers knowledge to contribute to organizational goals via

communication channels between individuals (Castaneda and Toulson 2020). Information communication technologies (ICT) support real-time synchronous and asynchronous communication through for example video conferencing, social media and messaging tools and can be used to remove communication barriers such as geographical distance and time differences (Aral et al. 2012; Castaneda and Toulson 2020; Gupta et al. 2011; Hortovanyi and Ferincz 2015). As Yang and Ho (2007, p. 420) states, “to support collaborative design, information technology must not only augment the capabilities of the individual specialists, but also enhance the communications and collaborative resources of collaborators”. Even though ICT tools can make work easier, they can cause communication overload with increased access to workers both inside and outside of work (Moussa et al. 2017; Gupta et al. 2011).

Top management should communicate a clear mission and integrate groups within the organization as well as convey fairness, transparency, impartiality and trust (Lee and Kim 2001; Meneghel et al. 2016). Machuca and Costa (2012) found that reliable and transparent communication through teamwork is an important factor for sustaining competitive advantage in knowledge-intensive organizations. Working in teams allows workers to learn from colleagues and create new ideas through dialogues and discussions (Janz and Prasarnphanich 2003). Teams form a communication channel for knowledge seekers and knowledge senders to exchange their knowledge to improve performance (Janz and Prasarnphanich 2003). According to cooperative learning theory, teams need to have positive interdependence, promotive interaction and group processes to share and develop tacit knowledge while completing their work. A team has positive interdependence if the members are linked through a shared group goal that each member identifies with and feels that he/she cannot be successful unless all other members of the group are successful. Positive interdependence is associated with strengthened mutual relationships, which lead to mutual aid and exchange of knowledge (Lin 2010). Promotive interaction refers to the extent to which members of a group interact to develop the skills necessary within the group to accomplish tasks and support the success of each team member. Group process refers to the concerted effort to evaluate the performance implications of group behaviors and norms (Janz and Prasarnphanich 2003). Solomonidou and Katsounari (2020) found that factors such as common understanding, mutual acceptance, positive communication, collaboration and support promoted group work, facilitated resolution of conflicts and facilitated the discharge of work-related anxiety and emotional fatigue.

These three characteristics of teams, positive interdependence, promotive interaction and group process to share and develop tacit knowledge, allow the teams to create shared mental models, which include interaction patterns, responsibilities, communication channels, role interdependences and an understanding of each other's knowledge, skills, attitudes, preferences and tendencies (Guiette and Vandenbempt 2013). Transactive memory theory states that individual members of a team can serve as external memory aids to each other, allowing members to specialize in different areas (Yang and Ho 2007). This reduces the cognitive load of each individual but enlarges the memory capacity of the group and gives them access to information across various domains (Yang and Ho 2007).

Team mental models can give teams an advantage in coordinating, interpreting and processing complex and unpredictable situations but can become a liability in novel situations where the existing team mental model is inadequate (Guiette and Vandenbempt 2013). Team mental model content becomes embodied in organizational routines and beliefs, making them hard to change. This is the reason for inertia when it comes to strategic change. It is important realign team mental models to the vision, mission and strategic changes of the organization by communicating expectations clearly so that rumors and gossip do not dominate the sensemaking process. It is also important to align different and potentially disconnected team mental models to develop an understanding of each other's mental models so that conversations between different groups can be meaningful with mutual understanding and empathy (Guiette and Vandenbempt 2013).



Autonomy has a positive effect on knowledge sharing if the social and network support is sufficient (Shujahat et al. 2021). When workers can self-organize their knowledge and communication networks they can better utilize them to develop solutions to problems, generate knowledge and share it (Janz and Prasarnphanich 2003). Team effectiveness is dependent on the helping behaviors of team members (Lin 2010; Lyons and Bandura 2016). Activities that individuals engage in to enhance work relationships, assist others and take initiatives are perhaps more important than an individual's performance on task requirements (Lyons and Bandura 2016). As Dooley and O'Sullivan (2000, p. 375) states "it is through communication that a holistic perspective of the organization can be achieved and revolutionary ideas for innovation captured."

Table 3 shows the two key insights extracted from the literature in the concept group communication and relationships.

**Table 3.** Communication and Relationships (CR) —Key Insights.

Key Insights	
CR1	Shared experiences create shared mental models which are necessary for the transfer of knowledge. Relationships are built on shared experiences and foster feelings of belonging and trust, which aids in the creation of mental models and the willingness to engage in organizational citizenship behaviors.
CR2	The intent of communication depends on the interplay of the level of personal gain of the communication and the level of organizational gain of the same communication. Organizational culture and reward systems impact the alignment of these two aspects.

These insights are mapped to the PAM for individuals proposed by Óskarsdóttir et al. (2021) in Section 4. The next subsection analyzes the main themes found in the literature on personal characteristics and development.

### 3.2. Personal Characteristics and Development

Human resources are integral to an organization's competitive advantage. It is important to develop the people who make up the human resources of organizations to empower them and increase their sustainability (Tazakori et al. 2019). Pickett (1998) states that organizations need to analyze the knowledge and skills required to perform a particular job to establish an effective individual developmental plan. These personal characteristics are identified as valuable capabilities for the job market and can be developed through interventions: self-efficacy, creativity, information literacy, communication, self-esteem, motivation and personal growth (Tazakori et al. 2019). Ahmadiyeh et al. (2020) propose that managers encourage workers to take responsibility for their own personal improvement and identify their own improvement needs, which can be used to create specific developmental and improvement strategies. This is especially important for contingent workers so as not to limit career development and work opportunities (Redpath et al. 2009). Finding ways to incorporate the personal and career developmental needs of individuals into the organizational resourcing decision-making process is fundamental to enhance workers' contributions to the organization and retain workers (Dainty et al. 2009; Fischer and de Albuquerque 2005; Horwitz et al. 2006).

Meneghel et al. (2016, p. 2051) emphasized the importance of resilience in workers as it "helps the employee to face the demand for flexibility, adaptation and improvisation in situations characterized by change and uncertainty" and it requires workers "to find unknown inner strengths and resources to cope effectively". They state that high quality relationships, that reinforce feelings of belonging, support and trust, foster resilience. Some of the characteristics mentioned above are grouped together under the concept of psychological capital, which "represents an individual's state of development of the combined positive psychological resources of hope, efficacy, resilience and optimism" (Alessandri et al. 2018, p. 33). Psychological capital is associated with job performance, organizational citizenship behaviors, job satisfaction and commitment. These four characteristics allow an individual to

have confidence and the willingness to succeed at challenging tasks (efficacy), make positive attributions (optimism) allowing them to persist in the face of adversity and bounce back (resilience) to attain success and redirecting paths to goals (hope) to succeed. Psychological capital can be developed through targeted training interventions (Alessandri et al. 2018).

Organizational citizenship behavior is “a voluntary individual behavior that helps the organization most efficiently function as a whole without taking into consideration a structured reward system” (Zehir et al. 2019, p. 6). It encompasses behaviors such as when workers help others without expecting anything in return, treat others around them with respect, carry out their tasks well beyond the minimum required levels, voluntarily participate in the organization’s politics and have positive attitudes (Bhatnagar 2014; Lyons and Bandura 2016; Zehir et al. 2019). Organizational citizenship behaviors minimize individual opportunistic behaviors, increase innovative behaviors such as participating in discussions and being active in the implementation of changes and help to cultivate a climate of cooperation, collaboration, innovation and positivity (Lyons and Bandura 2016; Zehir et al. 2019). Social identity theory claims that individuals have a tendency to categorize themselves as members of certain groups which enhances their self-esteem, sense of unity with the group and belongingness (Kunda et al. 2019). Employees that identify with their organizations are more likely to engage in more organizational citizenship behavior out of loyalty and pride (Kunda et al. 2019). Joo and Lee (2017) found that engaged individuals with affective commitment were more likely to show organizational citizenship behavior.

Motives are elements of personality that are a driving force behind behaviors and express the psychological causes or reasons for that behavior (Hitka et al. 2019). Motivation is a dynamic process that considers both personal and sociopsychological factors that interact with one another. Therefore, motivators can change with experiences, environment, context, knowledge and so on (Hitka et al. 2019). Hitka et al. (2019, p. 5498) states that “employee motivation can work effectively only if it is based on adequate knowledge and understanding of motivation factors and their differentiation in relation to certain types of employees”. Tampoe (1993) presented a model for motivating KWs which describes how personal motivation influenced by the expectation and perceived value of rewards is translated into task-motivated energy through task- and domain-relevant skills and personal effectiveness, which can be directed towards attaining work goals if the organization is enabling and there is both role and goal clarity. He identified four key motivators—personal growth (the opportunity for individuals to realize their potential), operational autonomy (the discretion to achieve assigned tasks within the boundaries of strategic direction and self-measurement indices), task achievement (being able to produce quality work relevant to the organization that the individual can be proud of) and money (earning a just income for the contribution made and share in the wealth created through incentive schemes). The organization can encourage their workers using activities such as motivating programs, rewards, work support, directing worker performance behaviors through worker involvement and identification with the organization (Krausert 2014).

Steward et al. (2009) explored how role identities affected the performance of salespeople. The specific role identity that individuals have draws them to specific information congruent with how they see themselves and prompts them to select behaviors that are consistent with their role identity. Role identities can influence the attributions of workers, that is how they perceive causation. Attribution theory explores what factors are involved in how individuals perceive causation, which in turn affects intentions for future behavior. Different attributions manifest from different orientations. For example, those with a growth orientation or mindset are more likely to attribute failure to a lack of knowledge and focus on learning from the experience, while those with a fixed orientation might attribute failure to external factors beyond their control. Workers often make self-enhancing attributions that support their role identities: how they see themselves (Steward et al. 2009).

The literature mentions different types of orientations that affect how different individuals perceive and behave in their jobs, work climates and organizations. Raina et al.

(2020) explore how diffusion specificity, which is the level of particularity a culture uses to define different constructs, affects the interface between work and family life. They found that individuals with a diffuse orientation perceive work and family as overlapping and are more likely to experience work–family enrichment by integrating their work and personal lives. Work–family enrichment is the extent to which experiences or resources from one role improve the performance and quality in another role. Meanwhile, van der Heijden et al. (2012) explored the effect of a worker’s proactive orientation on their relief strategies to workplace boredom. Proactive orientation describes how much an individual acts on their environment in a self-directed way with the aim to change or improve the current work circumstances (van der Heijden et al. 2012). An individual’s proactive orientation can be influenced by interventions such as training in proactiveness and assertiveness. van der Heijden et al. (2012) found that workers with a high proactive orientation found it easier to remain involved with their job despite high levels of boredom and a lack of challenges.

Yildiz et al. (2021) found that an individual’s learning and prove orientations were important predictors of their capacity to recognize, understand and utilize new knowledge (i.e., their absorptive capacity). Learning orientation is an individual’s “willingness to seek challenges and opportunities for improving knowledge and skills in order to accomplish mastery over task” (Yildiz et al. 2021, p. 2). Prove orientation is how much an individual focuses on demonstrating performance and competence to obtain favorable judgments from others. These two types of orientations are extracted from goal orientation theory, which focuses on different types of motivational orientations driving individuals’ actions (Yildiz et al. 2021). Shujahat et al. (2021) found three benefits of a lifelong learning orientation in regards to personal knowledge management: lifelong learners were more likely to share their knowledge, to develop knowledge and skills for themselves and others and challenge themselves, increasing the quantity and quality of their job goals.

Alkhatib (2017) explored moral judgment when dealing with ethical dilemmas in the construction industry and proposed a moral decision-making model. His personal moral framework consists of an individual’s personal value system and moral reasoning process. An individual’s personal value system develops gradually through interactions with different social groups and authoritative figures. Every individual brings these personal values into their professional life, where they affect their decisions, experiences and behaviors. Alkhatib (2017) included some common personal values that influence moral attributes in their framework such as: honesty, integrity, trustworthiness, reliability, dignity, caring, discipline, fairness, justice, duty, respect, friendship, patience, enthusiasm, sincerity, kindness, appreciations, forgiveness and equality. Hernaus and Vokic (2014) and Duxbury and Ormsbee (2020) argued that job design needs to take into account the different personal values and preferences of different generations of workers and tailor the jobs to them to improve KWP.

Table 4 shows the four key insights extracted from the literature in the concept group personal characteristics and development.

These insights are mapped to the purposeful activity model (PAM) for the individual proposed by Óskarsdóttir et al. (2021) in Section 4. The next subsection discusses the highlights found in the literature on well-being and job satisfaction.

**Table 4.** Personal Characteristics and Development (PCD) —Key Insights.

	Key Insights
PCD1	Preferred behavior leads to the willingness to succeed at challenging tasks, help others without expecting anything in return and make positive attributions to attain success without succumbing to adversity and giving up. This state is attributed to psychological capital and engaging in organizational citizenship behaviors. Role identity, how the individual sees himself/herself in work, affects how they perceive causations, which in turn affects intentions for future behavior. The individual's social identity, whether the worker has a sense of unity, trust and belongingness within the organization, can positively impact these preferred behaviors.
PCD2	The level of motivation towards engaging in preferred behaviors is influenced by an individual's motives, which are elements of personality that drives behaviors shown and motivators such as personal growth, operational autonomy, task achievement and financial incentives.
PCD3	There are many spectra of orientations influenced by cultures, experiences, personality and personal value systems of individual workers, which affect behaviors shown. The organization needs to find KWs with the appropriate orientation combination that takes into account the person–job–environment fit, which leads to preferred behaviors.
PCD4	To drive KWs towards engaging in preferred behaviors, organizations should be aware of the motivators of individual workers to motivate them towards organizational goals and support the workers in personal development.

### 3.3. Well-Being and Job Satisfaction

Well-being at work depends on satisfaction with the environment, leadership, career development and job characteristics (Joo and Lee 2017). Well-being, therefore, is influenced by a worker's person–environment fit. When an individual perceives a predominance of positive feelings over negative feelings, he/she experiences not only well-being but happiness. Happy workers are more likely to be active, approach oriented, energetic, interested in their work, sympathetic to others and persistent when facing challenges or difficulties (Joo and Lee 2017).

The dynamic equilibrium theory of stress states that “stress results from a broad system of variables that include personality and environmental characteristics, coping processes, positive and negative experiences, and various indices of psychological well-being” (Solomonidou and Katsounari 2020, p. 2). According to this theory, both individual and organizational factors influence a worker's well-being. Organizational factors include both the aspects of an organizational climate as well as the worker's subjective experience of that climate. Meanwhile, individual factors refer to individual attitudes, behaviors, personalities and coping processes. Expectancy is the belief in the relationship between the effort exerted and the performance obtained (Orgambidez and Benitez 2021). If the worker believes that an increase in effort is followed by an increase in performance, his/her expectancy is higher (Orgambidez and Benitez 2021). Expectancy depends both on internal factors, such as the psychological state of the individual and external factors, such as task difficulty and uncertainty about roles and tasks (Orgambidez and Benitez 2021). An imbalance between effort and rewards is known to cause stress, emotional distress and increase the risk of coronary heart disease and depression (Spanier et al. 2014). What is a reward differs between individuals and context, it is not only wages but can also be, for example, esteem, recognition, job security and the possibility of promotion (Spanier et al. 2014). Performance appraisals, which are necessary to determine rewards, can be conducted more effectively if the job definition and its strategic purposes are clear (Tamasevicius et al. 2020).

Solomonidou and Katsounari (2020) found that excessive workload, working overtime, role ambiguity, role conflict, ethical dilemmas, unmet personal expectations and a negative public perception of the profession were sources of stress among social workers. They also found that if these stressors were combined with insufficient support and understanding by supervisors and colleagues it could lead to burnout symptoms. Burnout “is a psychological response to exposure to chronic stressors at work and is characterized by high levels of emotional exhaustion, depersonalization, and reduced personal accomplishment” (Solomonidou and Katsounari 2020, p. 2). Other factors that increase the likelihood of burnout that were identified are: hardiness, locus of control, personality characteristics,

attitudes, perfectionism, a need to please others, complexity of client problems, absence of autonomy, lack of feedback on work performance, lack of meaningful rewards and lack of job security (Solomonidou and Katsounari 2020).

Joo and Lee (2017) found that workers felt a greater sense of well-being when they perceived more organizational support and had more psychological capital. Perceived organizational support describes the general belief of how much the organization values their workers' contributions and cares about their well-being, while psychological capital is an individual's positive psychological state of development (Joo and Lee 2017). According to the norm of reciprocity, a worker who perceives a high level of organizational support is likely to repay in turn by contributing more to the organizational objectives (Joo and Lee 2017; Vora 2004). For example, if an organization does not look after the well-being of their workers through trust and care, they cannot expect their workers to help customers with trust and care (Vora 2004). Therefore, a KW's job satisfaction and well-being are necessary to achieve customer satisfaction (Vora 2004). Organizations can improve perceived organizational support and the psychological capital of their workers through interventions such as growth opportunities, performance management, compensation systems and training and development (Joo and Lee 2017).

Job satisfaction is positively related to high performance (Lee et al. 2019). Job satisfaction describes an alignment between KWs' personal interests or needs and what the organization provides (Kucharska and Erickson 2020). It refers to a pleasurable emotional state which results from the perception of achievement or fulfillment in one's job (Lee et al. 2019). A KW with a preferred balance of motivational and reward factors that are of importance to them has a high level of job satisfaction (Tampoe 1993). Machuca and Costa (2012) found that trust, transparency, flexibility, collaboration, commitment, honesty and professionalism were factors that generally have a positive effect on job satisfaction. Meneghel et al. (2016), likewise, found that job satisfaction as well as work resilience and performance could be increased by interventions on collective perceptions of social context, such as training supervisors in a supportive management style, promoting cooperativeness and developing stable within-group interactions to ensure feelings of belonging and trust. Perceptions of social context are "the set of positive perceptions by employees of the behaviors enacted by the most relevant social constituents within the organization" (Meneghel et al. 2016, p. 2048).

Palvalin et al. (2018, p. 4) states that "enhanced knowledge transfer may promote job satisfaction, which again is linked to better productivity". Knowledge transfer gives KWs greater access to knowledge, builds relationships and promotes a more positive work climate, which enriches the job experience and, therefore, increases job satisfaction (Janz and Prasarnphanich 2003; Kucharska and Erickson 2020). Lee et al. (2019) found that workers with high levels of job satisfaction were more likely to engage in informal learning at work, enhancing knowledge transfer. Knowledge transfer and job satisfaction, therefore, can reinforce each other. Kucharska and Erickson (2020) studied the mutual relationship between knowledge transfer and job satisfaction in the context of an organizations information technology competency. They found that an organization's information technology competency influenced job satisfaction and knowledge transfer more in KWs in the IT industry than for other industries. This verified their hypothesis that factors that influence job satisfaction vary for different industries.

Sahibzada et al. (2020) states that not only knowledge transfer but all knowledge management processes improve job satisfaction through the implementation of motivating factors, while adjusting hygiene elements. According to Herzberg's two-factor theory, motivating factors, such as personal growth, achievement and recognition, increase job satisfaction, while the presence of hygiene factors, such as salary, physical environment and support from supervisors, prevent job dissatisfaction. Knowledge management processes increase job satisfaction by confirming rewards, providing work support, supporting training and development, providing authority to perform allotted jobs, building a collaborative culture and supporting a learning and knowledge-based environment that allows KW's



to positively interact arousing intrinsic motivation for knowledge creation (Cai et al. 2020; Razzaq et al. 2019; Sahibzada et al. 2020).

Table 5 shows the three key insights extracted from the literature in the concept group well-being and job satisfaction.

**Table 5.** Well-being and Job Satisfaction (WJS)—Key Insights.

Key Insights	
WJS1	The level of well-being, in the form of emotional and physical state, can range from happy, with predominantly positive feelings, through neutral to burnout, with high levels of emotional exhaustion and health problems. The level is influenced by the person–environment fit, individual factors, such as attitudes, behaviors, personalities and coping processes and organizational factors including the person’s subjective experience of the organizational environment and expectancy.
WJS2	The level of job satisfaction is a subset of well-being, where the emotional state results from the perception of fulfillment in one’s job where an individual’s interests and needs are aligned with what the organization provides. The level is influenced by motivating factors, such as personal growth, achievement and recognition and the presence of hygiene factors, such as salary, physical environment and support.
WJS3	To influence the level of well-being and job satisfaction, the organization should ensure perception of organizational support, ensure feelings of belonging and trust and cultivate a culture of transparency, collaboration, honesty, flexibility, commitment and professionalism.

These insights are mapped to the PAM for the individual proposed by Óskarsdóttir et al. (2021) in Section 4. The next subsection looks at personal knowledge management.

### 3.4. Personal Knowledge Management

Personal knowledge management is a key competence in modern workplaces which allows individuals to perform effectively within the organization (Ahmadiyeh et al. 2020). Personal knowledge management is a concept that describes how KWs manage, organize and develop their organizational knowledge at the individual level (Grundspenkis 2007; Jarrahi et al. 2021; Shujahat et al. 2021). It represents a bottom-up approach to traditional knowledge management (Chatti 2012; Shujahat et al. 2021). Grundspenkis (2007) states that personal knowledge is the combination of an individual’s own knowledge, experience and skills, while organizational knowledge is the sum of individuals’ knowledge utilized by the organization and the knowledge that exists in organizational systems, processes, products, rules and culture. Meanwhile, Kotis and Vouros (2006) states that personal knowledge is created through practice, while organizational knowledge is created through the interaction between organizational members.

KWs need autonomy to manage and exchange personal knowledge and coordinate with each other to generate organizational knowledge (Pirro et al. 2010). Pirro et al. (2010, p. 48) found that “enabling the autonomy of KWs and coordinating their knowledge is more effective than superimposing predefined knowledge organization procedures”. Yildiz et al. (2021) found that an individual’s absorptive capacity cannot be translated into high innovation performance unless the work environment is coordinated. The concept of absorptive capacity describes a KW’s ability to identify, assimilate and exploit knowledge from the environment (Yildiz et al. 2021).

Most personal knowledge management models deal with knowledge locating/capturing, knowledge sharing/transferring, knowledge creation and knowledge application processes. For example, Chatti (2012) set forth a personal knowledge network model which views knowledge as a personal network and represents a knowledge ecological approach to knowledge management. Meanwhile, Schmitt (2020) proposed a decentralized personal knowledge management system based on Popper’s three world perspective, Briscoe’s digital ecosystems modified with Gibson’s theory of affordances and Nonaka’s model of dynamic knowledge creation. These different perspectives of personal knowledge management both fulfill the objective of making KWs better at capturing, sharing,

creating and using knowledge while maximizing effectiveness in relationship building and socializing (Grundspenkis 2007).

Jarrahi et al. (2021) identified four personal knowledge management practices common to KWs—knowledge reuse, social learning, social networking and expanding horizons. Knowledge reuse is when a KW finds a codified piece of information and reuses it in relation to new situations, projects or problems. Knowledge repositories, which are common in traditional knowledge management, play a key role in supporting knowledge reuse. Formal learning, such as workshops, courses and training, fosters knowledge reuse practices by providing information and allowing KWs to practice in reusing it. Vogel et al. (2011) and Wang et al. (2011) developed a performance-oriented approach to learning on the job using e-learning by translating the organizational mission and vision into goals that drive the learning. Social learning is when a KW finds a person, within or outside the organization, with relevant expertise to share needed knowledge for a knowledge problem. This practice is inherently social and relies on both strong and weak relational ties. While knowledge reuse utilizes explicit knowledge (knowledge that can be codified), social learning utilizes tacit knowledge (knowledge based on personal experiences, insights and judgments which are difficult to articulate by codification). Social networking is the long-term and purposeful practice of developing and maintaining social infrastructures, which influences the KW's identity and provides social capital that can be tapped for social learning. Expanding horizons is the practice of constantly researching about the future of the KW's work and career so the KW can better predict and adapt to changes. The tacit knowledge from this practice drives self-development (Jarrahi et al. 2021).

Personal knowledge management can be said to consist of three building blocks: personal knowledge practices, informal social relationships and ICT. There has been a shift of responsibility for personal learning and knowledge management from the organization to the individual (Jarrahi et al. 2021). The majority of knowledge gained at work is through the KW's own experiences and social relationships, in other words through informal learning (Lee et al. 2019). KWs rely, therefore, more on shadow IT for information when organizational IT is insufficient or ineffective. Shadow IT are informal IT systems used for and at work but not necessarily endorsed by the organization, such as social media, personal cloud services, communication technologies and personal devices (Jarrahi et al. 2021).

Personal information management is a subset of personal knowledge management and refers to an individual's activities related to the acquisition, usage and maintenance of information (Hwang et al. 2015), such as the managing of documents, files, emails, messages and other forms of information that KWs need to deal with every day. Makinen (2012) studied personal information management in mobile work where the mobile workers perceived less support from the organization in their personal information management. The mobile workers found it important to secure records, utilize technical solutions and centralize their information (Makinen 2012).

KWP should improve if an individual utilizes their resources, such as time, energy and attention, better by managing their information. Hwang et al. (2015) proposed that personal information management effectiveness consists of two underlying dimensions: personal information management motivation and personal information management capability. Personal information management motivation is influenced by four information behaviors (Hwang et al. 2015):

- Information proactiveness, which is a worker's willingness to actively seek out information and improve the use of it with respect to his/her job;
- Information sharing, which is a worker's willingness to distribute information to collaborate with others;
- Information transparency, which is a worker's willingness to disclose negative information about his/her experience to others to build relationships and teach others;
- Information formality, which is a worker's willingness to use formal patterns of information communication such as policies, manuals, reports and document archives.

Meanwhile, personal information capability consists of five abilities (Hwang et al. 2015):

- Sensing information, which is a worker's ability to actively detect and identify information in the environment;
- Collecting information, which is a worker's ability to gather relevant information;
- Organizing information, which is a worker's ability to arrange information;
- Processing information, which is a worker's ability to translate information into specific knowledge for the job;
- Maintaining information, which is a worker's ability to accurately discern the future value of processed information.

Table 6 shows the four key insights extracted from the literature in the concept group personal knowledge management.

**Table 6.** Personal Knowledge Management (PKM)—Key Insights.

	Key Insights
PKM1	Absorptive capacity in the form of sensing, collecting, organizing, processing and maintaining information; dictates the individual's ability to work with knowledge.
PKM2	A combination of the following attitudes towards working with knowledge influences personal knowledge management: proactiveness, sharing, transparency, formality and expanding horizons.
PKM3	The KW engages in the practices of knowledge reuse and social learning to appreciate and utilize information sources.
PKM4	The KW engages in the practice of social networking to acquire and maintain his/her information sources.

These insights are mapped to the PAM for the individual proposed by Óskarsdóttir et al. (2021) in Section 4. The next subsection discusses what the literature focuses on regarding task approach.

### 3.5. Task Approach

There have been changes in KWs' work environment due to digitization, which affect his/her task approach (Gaskin and Skousen 2016). A task is a goal-oriented activity that has a beginning and an end. Digitization has increased numbers of interruptions and fragmented work into tiny chunks, which has led to frequent task switching and an increase in multitasking behavior (Appelbaum et al. 2008; Gaskin and Skousen 2016). Even though digitization provides new pathways for interruptions, it also provides workers with ways to isolate themselves from interruptions, such as silencing notifications, turning off email clients, etc. Such isolation though could have social implications or affect task effectiveness if the task is interdependent (Aral et al. 2012; Lin 2010). Interruptions are unscheduled synchronous interactions that are not initiated by the recipient and result in bringing the recipient's task to a temporary halt (Gaskin and Skousen 2016; Gupta et al. 2011). Task switching requires a rearranging of physical or cognitive resources in order to assist the switch from focusing on one set of stimuli to another, often called task reconfiguration (Appelbaum et al. 2008; Gaskin and Skousen 2016). Pausing after one task to allow for successful task reconfiguration reduces ramp-up time and errors for the subsequent task (Gaskin and Skousen 2016). Even though digitization has led to more fragmented work, it also retains the exact state of the KW's work intact between interruptions, decreasing task reconfiguration costs. Multitasking is the process of performing two or more simultaneous tasks (Appelbaum et al. 2008). Multitasking is known to increase task completion time, reduce reaction times and increase error rates (Aral et al. 2012). However, multitasking also allows KWs to increase efficiency by smoothing their time over tasks when facing bursty work requirements. This means that some multitasking leads to productivity gains but beyond a certain point it reduces productivity (Aral et al. 2012).

Digitization also increased access to information, which can lead to information overload (Gaskin and Skousen 2016; Gupta et al. 2011). For example, KWs are spending more time processing emails than before, which leads to a perception of a shortage of time, resulting in information overload (Gupta et al. 2011). Too many emails are vying for the

KW's attention, which can result in the KW making decisions that are just good enough instead of the best possible decision (bounded rationality), as the KWs have limited time and resources available to make decisions and complete tasks (Gupta et al. 2011). However, the asynchronous nature of information and communications technology (ICTs), such as email, allows the KW to seek information and knowledge without the constraints of coordinating the availability of information sources, increasing their efficiency (Aral et al. 2012).

The KW needs to adapt to the changes in his/her work environment due to digitization to utilize it to improve his/her productivity, rather than allowing it to be a potential inhibitor (Gaskin and Skousen 2016). Task approach strategies were identified that individual KWs can use to deal with these changes, such as time management, task prioritization and hyper-refocusing (Gaskin and Skousen 2016; van der Heijden et al. 2012). Time management refers to the KW's ability to set goals, prioritize tasks, plan tasks and monitor the progress of his/her work. van der Heijden et al. (2012) found that KWs who are proficient in time management are less vulnerable to workplace boredom and engage in less distraction behavior. Time chunking is a method which can be used in time management. It refers to allocating blocks of time to specific tasks. Gaskin and Skousen (2016) proposed three mutually exclusive options for allocation of time: (1) blocking out the full estimated time needed to fulfill a task, (2) intentionally fragment the estimated time into more manageable chunks and (3) allowing the task to be elastic, where it pauses and recommences depending on context and environment. For example, Aral et al. (2012) found that by allocating specific email processing slots during the workday, KWs could more effectively allocate their attention and minimize interruptions caused by emails.

Task prioritization consists of a strategy guiding the position placement of tasks into the queue of things to accomplish (Gaskin and Skousen 2016). Innately, workers are driven by heuristics to minimize danger and maximize pleasure when prioritizing tasks. Unfamiliar tasks can be perceived as threats resulting in procrastination. Interruptions also pose more serious threats in unfamiliar tasks. When a task is unfamiliar, it requires more cognitive resources, which makes task reconfiguration harder, leading to a larger cognitive expense or performance cost. Task reconfiguration costs are higher when switching between two similar tasks than when switching between two very different types of tasks. Hyper-refocusing refers to the ability to switch between tasks without incurring substantive task reconfiguration costs. That is, focus is not lost but jumps from one set of stimuli to another. Even though it is unlikely that it is humanly possible to hyper-refocus perfectly, there is a moderate variance of this ability across individuals. It would be beneficial if this ability could be trained (Gaskin and Skousen 2016).

Table 7 shows the two key insights extracted from the literature in the concept group task approach.

**Table 7.** Task Approach (TA)—Key Insights.

Key Insights	
TA1	Innately, KWs are driven by heuristics to manage risk/reward when prioritizing tasks and getting things done.
TA2	Time management skills should be used to minimize task reconfiguration costs by arranging tasks and creating strategies to deal with interruptions.

These insights are mapped to the PAM for individuals proposed by Óskarsdóttir et al. (2021) in Section 4. The next subsection investigates the main themes in the literature regarding organizational commitment and engagement.

### 3.6. Organizational Commitment and Engagement

Organizational commitment refers to an individual's attachment to the organization (Razzaq et al. 2019; Snape and Redman 2003). It is reflected in the behavior of the worker towards enhancing the organization's interests, in the worker's emotional attachment with the organization, identification with the organization and internalization of the organiza-

tion's goals, norms and values (Koch and Schermuly 2021). Organizational commitment is connected to behaviors such as withdrawal intentions, performance, informal learning, organizational citizenship behaviors, absenteeism and presenteeism (Cohen 1993; Dhaini et al. 2016; Lee et al. 2019; Orgambidez and Benitez 2021).

The leading model of organizational commitment is Mayer and Allen's three-component model which splits organizational commitment into three components: affective commitment that is value-based, normative commitment that is obligation-based and continuance commitment which is based on an assessment of costs and benefits (Razzaq et al. 2019; Snape and Redman 2003). Affective commitment results in a stronger attachment to the organization than normative or continuance commitment as it is based on a desire to remain with the organization and act in ways that make the individual belong. Meanwhile, if an individual has normative commitment, he/she only focuses on fulfilling the obligation and then moves on. A continuance commitment can also be fleeting, since an individual would be quick to jump ship if an opportunity with better benefits or fewer costs arises (Snape and Redman 2003).

Many of the papers looked at organizational commitment as a mediator and at factors that affected the organizational commitment levels of workers. For example, Razzaq et al. (2019) studied the mediating role of organizational commitment in the relationship between knowledge management practices and performance. They found that a collaborative and supportive organizational culture, which provides opportunity for learning and knowledge acquisition, has a positive effect on organizational commitment. Kunda et al. (2019) found that a worker's perception of the corporate social responsibility activities of an organization can have an effect on his/her organizational commitment through variables such as ethical leadership, organizational pride and trust. Koch and Schermuly (2021) found that the commitment of workers in a project-based organization was higher in projects which adhered to agile project management values and principles compared with traditional project management values and principles. Kehoe and Collins (2017), Ahmadiyeh et al. (2020) and Imani et al. (2020) explored high-commitment human resources systems and practices that fostered an environment of overinvestment in employees that resulted in increased affective commitment.

Worker's with a high level of commitment are more likely to be personally invested in their work and be more engaged (Orgambidez and Benitez 2021). Engaged workers are more motivated, productive and involved in their organizations and willing to go above and beyond what is expected (Gupta 2019; Joo and Lee 2017). Most papers use Schaufeli's definition of work engagement, which stresses three dimensions of engagement: vigor, absorption and dedication. Alessandri et al. (2018, p. 35) describes these three dimensions as "vigor (the willingness to invest energy and effort into the work), dedication (experiencing a sense of significance and pride) and absorption (a state of mind characterized by full concentration and immersion in the work)". Meanwhile, Joo and Lee (2017, p. 209) describes the dimensions in this way: "work engagement is regarded as an intentional and thoughtful pursuit of work (i.e., dedication or cognitive engagement); as absorbing and interesting (i.e., absorption or emotional engagement); and as inspiring and energetic that they are willing to devote themselves with passion (i.e., vigor or physical/behavioral engagement)".

Joo and Lee (2017), Alessandri et al. (2018) and Gupta (2019) found that workers were more engaged in their work when they had higher perceived organizational support, perceived career support and psychological capital. Psychological capital is an individual's positive psychological state of development, for example hope, efficacy, resilience and optimism, while perceived organizational support is an individual's beliefs concerning how much the organization values them (Alessandri et al. 2018; Joo and Lee 2017). Psychological capital can be increased through targeted training interventions (Alessandri et al. 2018).

Work engagement is not a constant, it fluctuates over time depending on situational factors and the availability of job and personal resources (Alessandri et al. 2018). Job and personal resources foster work engagement (Gupta 2019). They can be physical, social, psychological or organizational and help in achieving work goals, deal with job demands



and encourage personal growth, learning and development (Gupta 2019). Orgambidez and Benitez (2021) found that role ambiguity and role conflict have a negative effect on the commitment and engagement of workers by draining job and personal resources. Role ambiguity is when the expectations regarding a role are not clear and role conflict is when there are incompatible demands, requests or information (Orgambidez and Benitez 2021). Psychological capital, autonomy, career opportunities, social support, a positive organizational climate and situation awareness are examples of important job and personal resources that satisfy the human needs of autonomy, competence and belonging (Gupta 2019).

Situation awareness is the perception of elements in the environment, which allows for the comprehension of their meaning, the projection of their status in the future, whether a response is needed and what that response should be (Quinn 2005). Situation awareness with simultaneous automatic application of relevant knowledge and skills can move situations to a desired state by responding to tacit and unconscious standards of appropriateness. These standards of appropriateness are learned in practice but not explicitly articulated (Quinn 2005). This series of micro-wins towards small unconscious tacit goals allows workers to perceive themselves to be succeeding in real time, which gives a feeling of flow (Quinn 2005). Flow is a high-performance experience which can lead to improved KWP if the worker has difficult and specific goals that give him/her a direction to exert his/her effort on behalf of the organization (Quinn 2005). A worker in flow has high levels of work engagement.

Table 8 shows the four key insights extracted from the literature in the concept group organizational commitment and engagement.

**Table 8.** Organizational Commitment and Engagement (OCE)—Key Insights.

Key Insights	
OCE1	An optimized commitment level (continuance, normative or affective) manifests in workers engaging in more preferred behaviors (in the form of psychological capital) enhancing the organization's interests and does not overexpend the personal resources of the worker.
OCE2	To not overexpend the personal resources of the worker, the organization should invest in their workers, design jobs sufficiently to reduce role ambiguity and conflict and cultivate a collaborative learning environment where the worker perceives support.
OCE3	Engagement describes the level of vigor, absorption and dedication of the worker, which impacts work done, motivation and behavior in the workplace.
OCE4	Engagement level fluctuates depending on situational factors and personal resources.

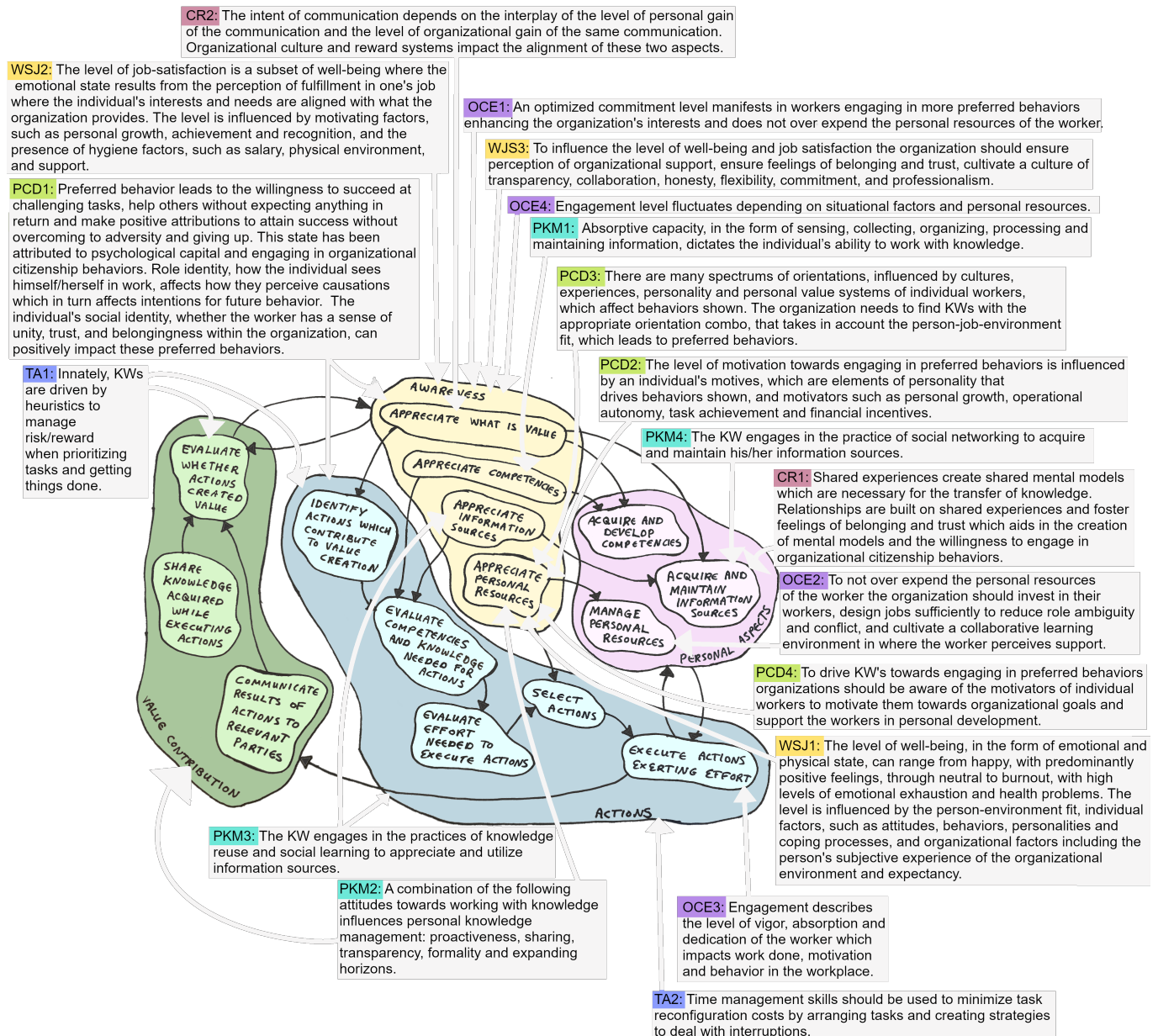
These insights are mapped to the PAM for the individual proposed by Óskarsdóttir et al. (2021) in the next section.

#### 4. Debating the Situation

To debate the situation, the insights gained in the literature review above were mapped to the PAM presented in Óskarsdóttir et al. (2021). The aim of mapping the insights from the systematic literature review was to take a step closer to a holistic and operationalized model of KWP. The mapping highlights what factors affect which activities and how. Figure 4 below shows the insights mapped to the PAM, but first let us start with a walkthrough of the figure by discussing the insights from each group and to which activities they are mapped.

There were four insights gained from the concept group personal characteristics and development (PCD). PCD1 describes the intended outcome of preferred behaviors of workers. It is less clear what these preferred behaviors are, but the literature agrees that they should lead to the willingness to succeed at challenging tasks, helping others without expecting anything in return and making positive attributions to attain success without overcoming adversity and giving up. PCD1 also mentions some factors that influence these preferred behaviors such as psychological capital, which consists of efficacy, resilience, hope

and optimism and engaging in organizational citizenship behaviors. Role identity, how the individual sees himself/herself in work, affects how they perceive causations, which in turn affects intentions for future behavior. The individual's social identity, whether the worker has a sense of unity, trust and belongingness within the organization, can positively impact these preferred behaviors. PCD1 is, therefore, mapped to both actions and awareness because it touches both how the worker sees himself/herself in work through appreciating personal resources, competences and what is value for himself/herself and the organization, which affects how he behaves and identifies actions which contribute to value creation, evaluates what he needs for those actions, selects them and executes the actions.



**Figure 4.** Insights mapped to the PAM of a KWP System for the Individual (Reprinted with permission from Óskarsdóttir et al. (2021). © 2021 by Óskarsdóttir et al.).

PCD2, PCD3 and PCD4 are all mapped to appreciate personal resources. PCD2 is about motivation towards engaging in preferred behaviors, which are influenced by an individual's motives and motivators. Motives are elements of personality that drive the behavior shown, while motivators can both be internal and external, such as personal

growth, operational autonomy, task achievement and financial incentives. PCD3 describes how the different spectra of orientations, influenced by cultures, experiences, personality and personal value systems of individuals, affect behaviors shown. The organization needs to find the appropriate orientation combination that takes into account the person–job–environment fit, which leads to preferred behaviors. When appreciating personal resources, the worker can gauge his/her level of motivation, motives, motivators and orientations using self-awareness, which helps him/her recognize whether there is a person–job–environment fit. PCD4 states that to drive KWs towards engaging in preferred behaviors, organizations should be aware of the motivators of individual workers to motivate them towards organizational goals and support the workers in personal development.

There were three insights gained from the concept group well-being and job satisfaction (WJS). WJS1 describes the level of well-being in the form of emotional and physical state and feeds directly into appreciate personal resources in the PAM. The level of well-being can range from happy, with predominantly positive feelings, through neutral to burnout, with high levels of emotional exhaustion and health problems. By appreciating personal resources, KWs become more aware of their level of well-being and the influence of the person–environment fit, individual factors such as attitudes, behaviors, personalities and coping processes and organizational factors including how he/she perceives them. WJS2 describes the level of job satisfaction, which is a subset of well-being where the emotional state results from the perception of fulfillment in one's job, where the individual's interests and needs are aligned with what the organization provides. The level of job satisfaction is influenced by motivating factors, such as personal growth, achievement and recognition and the presence of hygiene factors, such as salary, physical environment and support. Because of this alignment with what the organization provides and influence by the presence of hygiene factors, the level of job satisfaction is mapped to awareness and not just appreciate personal resource, such as well-being. The KW needs not only to appreciate his/her personal resources but also what is value for the KW himself/herself to identify his/her interests and needs to align with what the organization provides, as well as appreciate what is value for the organization, appreciate competences and appreciate information sources to be able to contribute to organizational goals and fulfill that need of achievement and recognition. The last insight in the well-being and job satisfaction concept group, WJS3, goes into what the organization can do to influence the level of well-being and job satisfaction of their workers. These are interventions such as ensuring a perception of organizational support, ensure feelings of belonging and trust and cultivating a culture of transparency, collaboration, honesty, flexibility, commitment and professionalism. It is also mapped to awareness because the KW experiences these interventions through their appreciation of what they perceive as valuable to the organization and their appreciation of the availability of information sources through, for example, the collaboration and helpful behaviors of colleagues.

There were two insights gained from the concept group communication and relationships (CR). CR1 is about relationships which are built on shared experiences and foster feelings of belonging and trust, which aids in the creation of mental models and the willingness to engage in organizational citizenship behaviors. Shared mental models based on shared experiences are necessary for knowledge transfer. CR1 is, therefore, mapped to acquire and maintain information sources. Building relationships are a way to acquire and maintain information sources. CR2 is about how the intent of communication depends on the interplay of the level of personal gain of the communication and the level of organizational gain of the same communication. CR2 is, therefore, mapped to appreciate what is value. What the KW experiences as value for himself/herself gives the KW an idea of the level of personal gain of the communication and the KW's interpretation of what the organization perceives as value gives him/her an idea of the level of organizational gain of the same communication. Organizational culture and reward systems impact the alignment of these two aspects.

There were four insights gained from the concept group personal knowledge management (PKM). PKM1 is mapped to appreciate competences as it describes absorptive capacity, which is a competence that dictates an individual's ability to work with knowledge. It is the KW's capacity to sense, collect, organize, process and maintain information. PKM2 describes a combination of attitudes that influence personal knowledge management: proactiveness, sharing, transparency, formality and expanding horizons. PKM2 is mapped to both appreciate personal resources and value contribution. The KW needs to appreciate his/her personal resources to identify his/her attitude towards working with knowledge and be aware of how it affects his/her behavior. A KW's willingness to actively seek out knowledge, utilize it and distribute it to collaborate with others (proactiveness and sharing) as well as a KW's willingness to use formal patterns of communication, such as policies, manuals, reports and document archives and disclose negative information to build relationships and teach others (formality and transparency) are crucial for the activities communicate results of actions to relevant parties and share knowledge acquired while executing actions in value contribution. The attitude of expanding horizons, constantly researching about the future of the KW's work and career so that the KW can better predict and adapt to changes, is part of evaluating whether actions created value.

PKM3 states that the KW engages in the practices of knowledge reuse and social learning to appreciate and utilize information sources. It is mapped to appreciate information sources and actions. Knowledge reuse and social learning is used in the activities evaluating competences and knowledge needed for actions, evaluate effort needed to execute actions, select actions and executing actions exerting effort in actions. Reusing knowledge in new situations, projects, or problems usually takes more effort than using previous knowledge, so it affects the evaluation process when selecting actions. Knowledge reuse is then used when executing the actions that require the codified information to be reused. Social learning is inherently social and relies on both strong and weak relational ties. So, it also affects the evaluation of knowledge needed and effort, because for social learning to occur, it requires access to the person, within or outside the organization, with the relevant expertise. The activity of appreciate information sources is important to recognize where codified information can be accessed and what strong and weak social ties the KW has access to for information and relevant knowledge. PKM4 states that the KW engages in the practice of social networking to acquire and maintain his/her information sources. Social networking is the long-term and purposeful practice of building and maintaining social infrastructures, which gives a KW a sense of identity and social capital that can be tapped for social learning.

There were three insights gained from the concept group task approach. TA1 is about the inherent drive of KWs by heuristics to manage risk/reward when prioritizing tasks and getting things done. This inherent drive affects the evaluation of effort needed, decision making regarding actions and how the KW perceives the value created by his/her actions. It is, therefore, mapped to both evaluate whether actions created value and the activity group actions. TA2 is also mapped to the activity group actions. TA2 is about time management skills and how they should be used to minimize task reconfiguration costs by arranging tasks and creating strategies to deal with interruptions.

There were four insights gained from the concept group organizational commitment and engagement (OCE). Two of them can be mapped to the activities grouped under awareness, OCE1 and OCE4. OCE1 is about optimized commitment and requires the KW to internalize organizational goals, norms and values to get a sense of belonging and identify with the organization so that the KW can exhibit preferred behaviors that enhance the organization's interests. The KW does this through the activity of appreciating what is value, both for himself/herself and the organization. OCE1 also emphasizes that it is imperative to find an optimized commitment level where it does not overexpend the personal resources of the worker. Too much affective commitment in an environment that does not meet the needs of the KW can lead to an imbalance between effort and rewards. An imbalance between effort and rewards can cause emotional exhaustion or distress and

health problems. The KW needs to appreciate his/her personal resources to set boundaries and communicate his/her needs so his/her personal resources are not overexpended by his commitment to the organization. OCE4 highlights that a KW's engagement level fluctuates depending on situational factors and personal resources, which the KW needs to be aware of to utilize engagement to complete work. OCE2 brings attention to what the organization can do to support KWs in managing their personal resources. Organizations should invest in their workers, design jobs sufficiently to reduce role ambiguity and conflict and cultivate a collaborative learning environment in where the worker perceives support. OCE3 describes how the KW experiences engagement through his/her level of vigor, absorption and dedication, which impact his/her experience and the quality of the work performed when executing actions exerting effort. Figure 4 shows all these insights mapped to the PAM.

From the mapping, it seems that there are some gaps in the literature found in the systematic literature review. Most of the insights tackle activities related to acquiring the input, which are listed under awareness and personal aspects. Very few insights target the activities used in the transformation process, which are grouped into actions. Only two of those activities are about practices or skills that the KW utilizes when getting things done, PKM3 (practices of knowledge reuse and social learning) and TA2 (time management skills). The other three insights that target actions describe attributes or states of individuals which affect how they accomplish things. Only one insight, OCE3, targets a specific activity within actions. OCE3 describes the engagement level of the individual which directly affects execute actions exerting effort.

Even fewer insights were mapped to the activities relevant to generating target outcomes, which are grouped under value contribution. PKM2 is mapped to value contribution because it describes attitudes towards working with knowledge, which include the willingness to be proactive, share, be transparent, follow formal processes and expand horizons. These attitudes should have a positive influence on behaviors such as communicating results of actions to relevant parties, share knowledge acquired while executing actions and evaluate whether actions created value. TA2 is directly mapped to evaluate whether actions created value because it describes the natural heuristics to manage risk and rewards, which can drive an evaluation of whether an action was worth taking and whether it is worth taking again. Even though most of the insights are mapped to activities grouped in awareness and personal aspects, there is one activity that no insight is mapped to: the activity acquire and develop competencies. The literature found in this systematic literature review focused on problem solvers did not tackle the acquisition and development of competencies.

The next section takes the insights from the literature review and the activities from the PAM and uses them as building blocks in a draft of a holistic KWP framework as a step towards a descriptive theory of KWP.

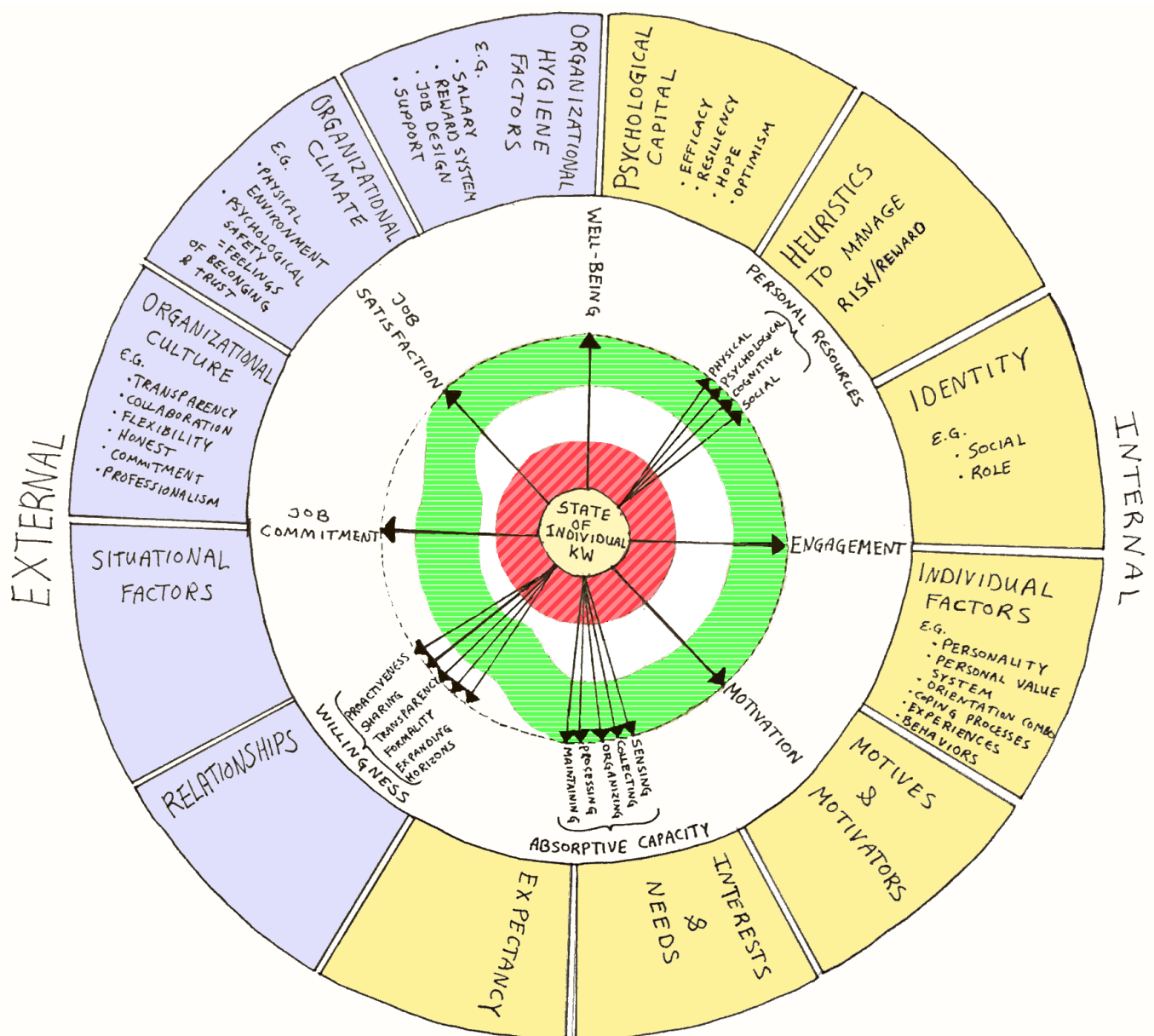
## 5. Towards a Holistic Knowledge Worker Productivity Framework

Keywords were extracted from the mapped purposeful activity model and grouped together to take a step towards a holistic knowledge worker productivity (KWP) framework. Most of the keywords were connected to the state of the individual knowledge worker (KW), while the rest of the keywords were related to the work done by the KW. The proposed holistic KWP framework therefore consists of the state of the individual KW, the work done and how they influence outcome. Before presenting the proposed KWP framework, let us dive deeper into the components of the framework, starting with the state of the individual (see Figure 5).

The literature review showed that there were eight important levels that make up the state of the individual KW relevant to KWP. Level of well-being, personal resources (physical, psychological, cognitive and social), engagement, motivation, absorptive capacity (sensing, collecting, organizing, processing and maintaining information), willingness (proactiveness, sharing, transparency, formality and expanding horizons), job commitment and job satisfaction. Figure 5 shows these levels as axes in a radar chart. The red area shows



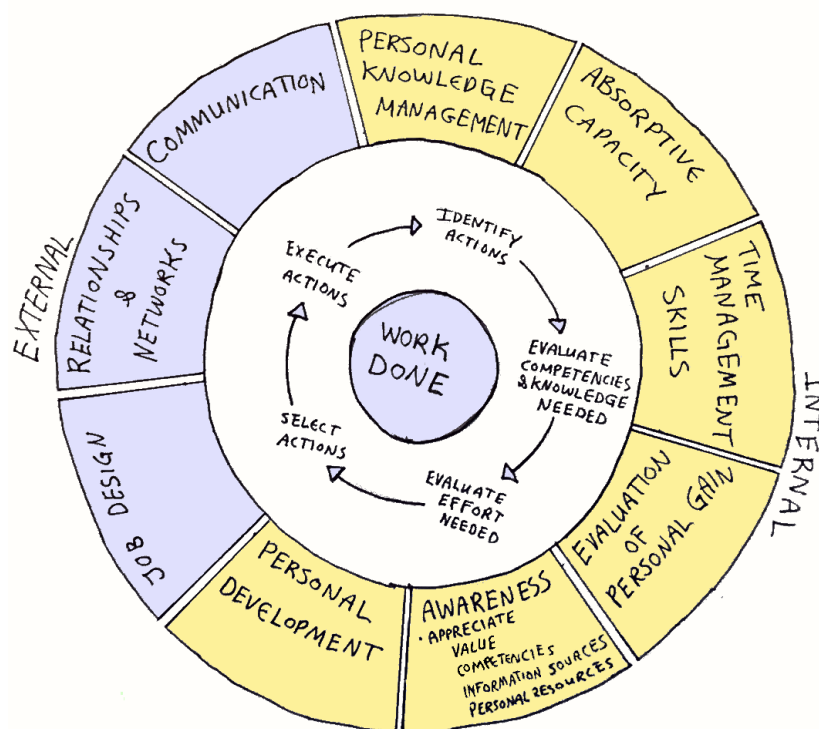
the undesirable state of each level, while the green area shows the desirable state. In most of these levels it is desirable to maximize them, but for job commitment and willingness, it is rather desirable to find an optimal level. Too much job commitment can make a worker more hesitant to set boundaries, which can lead to a worker draining his/her personal resources. Low levels of personal resources can lead to exhaustion and other health problems dragging the level of well-being down, which also affects engagement and job satisfaction. In the level of willingness, which consists of the attitudes of proactiveness, sharing, transparency, formality and expanding horizons, it is also important to find the optimal level. For example, it is important that a worker is proactive and finds novel solutions to old problems, but sometimes it is more important that the worker does what is expected of him/her.



**Figure 5.** The state of the individual component in the proposed KWP framework. In the middle, it shows eight important levels that make up the state of the individual KW relevant to KWP as axes in a radar chart. Around the radar chart are the internal and external factors that influence these levels and the state of the individual KW.

Around the radar chart are some of the factors identified that influence these levels and the state of the individual KW. Seven of these factors are internal: psychological capital (efficacy, resiliency, hope and optimism), heuristics to manage risk/reward, identity (social and role), individual factors (e.g., personality, personal value system, orientation combo, coping processes, experiences and behaviors), motives and motivators, interests and needs and expectancy. These are yellow in Figure 5 and are factors pertaining to the individual himself/herself. Five factors are external and influence the state of the individual KW through interactions and how the KW perceives his/her environment and others around him/her. These are blue in Figure 5. The external factors are organizational hygiene factors (e.g., salary, reward system, job design and support), organizational climate (e.g., physical environment and psychological safety giving feelings of belonging and trust), organizational culture (e.g., transparency, collaboration, flexibility, honest, commitment and professionalism), situational factors and relationships. Figure 5 shows the state of the individual component.

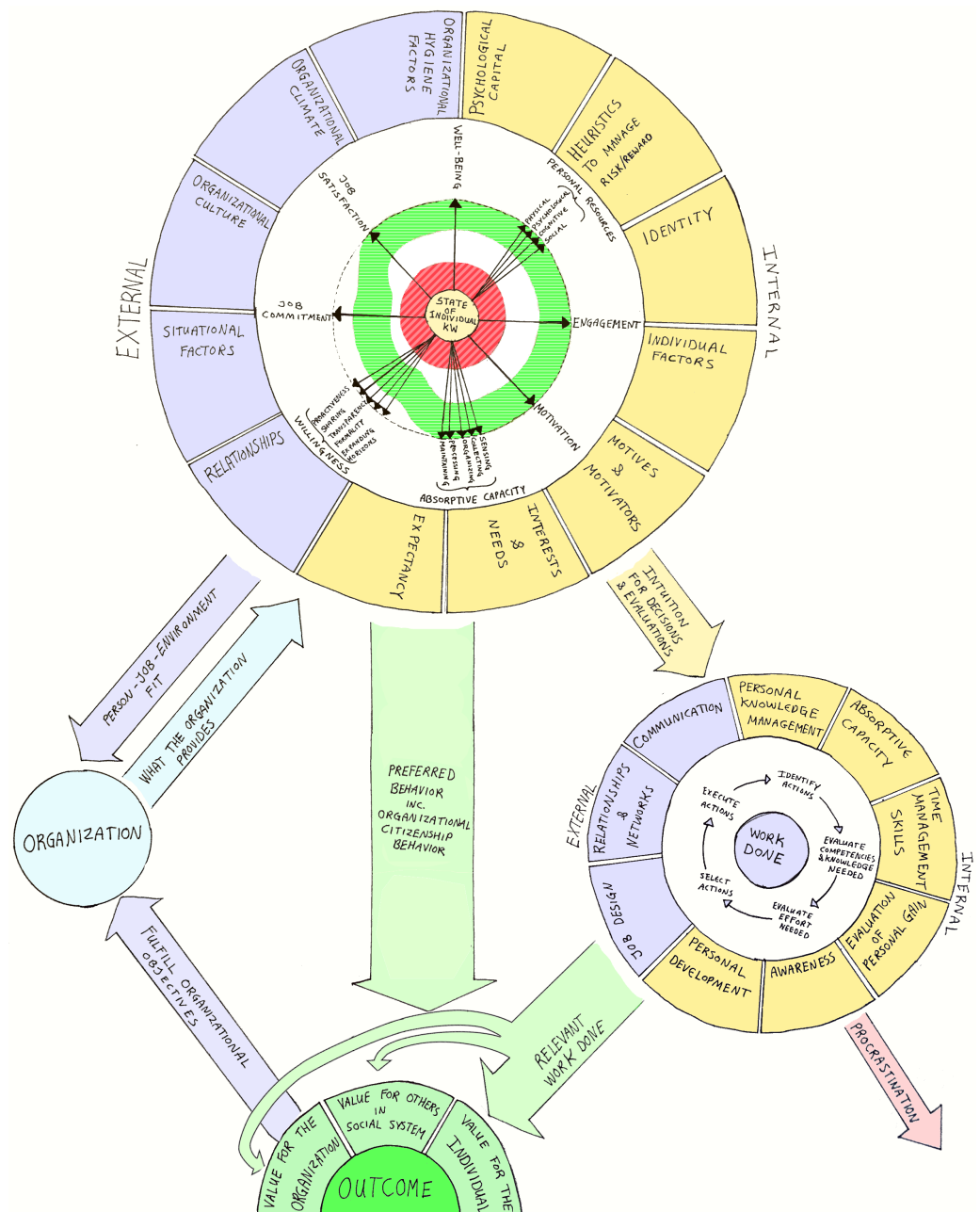
Now, let us look at the work done component of the framework (see Figure 6). In the middle, there is a flowchart with the main activities the KW engages in to completing work: identify actions, evaluate competencies and knowledge needed, evaluate effort needed, select actions and execute actions. Around this process are factors that influence it. There are six internal factors pertaining to the KW himself/herself: personal knowledge management, absorptive capacity, time management skills, evaluation of personal gain, awareness (appreciate value, personal resources, information sources and competencies) and personal development. There are three external factors that influence the KW in completing work: job design, relationships and networks and communication.



**Figure 6.** The work done component in the proposed framework. It shows a simplified process of completing work in the middle. Around the process are internal and external factors that influence work done through decision making, evaluations and resources used.

Figure 7 shows these two components, how they interact, how they are connected to the organization and how they influence outcome. The state of the individual KW is at the top of the framework and interacts with all the other components. From the state of the individual KW, intuition for decisions and evaluations flows to the work done component

(the yellow arrow). The state of the individual KW affects how the KW evaluates effort and competences and knowledge needed for actions and makes decisions on what actions to execute. The state of the individual KW component touches on factors such as how the KW perceives the organizational climate and culture, identifies with his/her role within the organization and whether what the organization provides fulfills his/her needs and perceived expectancy, which dictates the person–job–environment fit of the KW within his/her organization (the blue arrow leading towards the organization component). The state of the individual KW also influences whether the KW engages in preferred behaviors, including organizational citizenship behaviors (the green arrow leading to outcome).



**Figure 7.** The proposed draft of a holistic KWP framework. It includes the state of the individual component and the work done component as well as two new components outcome and organization. The arrows between the components show a simplified flow of inputs/outputs from each component.

There are two arrows flowing from the work done component, procrastination (pink arrow) and relevant work done (green arrow). There is always some work that does not

create any value which flows out in the procrastination arrow, but the relevant work done arrow splits into three depending on whom it creates value for. The arrow is widest towards value for the individual but becomes thinner when flowing to value for others in the social system and the organization. This is because most of the relevant work done creates value for the individual, while some of the relevant work done creates value for others in the social system and the organization. This highlights the need for the organization to align what they perceive as value with what the individual perceives as value to maximize their benefit of the work performed by the KW. The value created for the organization should fulfill organizational objectives (the blue arrow flowing to the organization component).

Since this research has just looked at the literature regarding individual KWs, the organization component does not have any detail. A next step in the research should be to look at KWP from the perspective of the organization and identify factors that influence KWP. The limitations of this research as well as possible future research are discussed in the next section.

## 6. Discussion and Conclusions

This research resulted in a draft of a holistic KWP framework describing components and factors that influence knowledge worker productivity (KWP) relevant to individual KWs and their work. The framework was developed from interpretations and inferences made from a systematic literature review and the purposeful activity model proposed by Óskarsdóttir et al. (2021). The main components of the conceptual framework were the state of the individual knowledge worker (KW), work done and outcome. Outcome of relevant work can be value for the individual KW, others in the social system and the organization. It is human nature to gravitate towards creating value for oneself, therefore, the organization needs to align their needs with what creates value for the individual KW to maximize value contribution towards their organizational goals and objectives. This can be conducted by influencing the state of the individual KW, through external factors such as reward systems, culture, support and relationships to guide the KW towards engaging in preferred behaviors such as organizational citizenship behavior. The state of the individual KW also affects the KW's intuition when evaluating work and making decisions.

The state of an individual KW in the conceptual framework was indicated by eight levels: level of well-being, personal resources, engagement, motivation, absorptive capacity, willingness, job commitment and job satisfaction. There were seven internal factors identified that influence this state and five external factors. They were psychological capital, heuristics to manage risk/reward, identity, individual factors, motives and motivators, interests and needs, expectancy, organizational hygiene factors, organizational climate, organizational culture, situational factors and relationships. The work done component included the main activities the KW engages in to completing work as well as six internal factors and three external factors that influence the KW's work. These factors are personal knowledge management, absorptive capacity, time management skills, evaluation of personal gain, awareness, personal development, job design, relationships and networks and communication.

The hope was to draw up a draft of an operationalizable model of KWP concerning the individual that could be tested. However, the systematic literature review resulted mostly in more what factors that influence KWP. The search term used filtered for approaches, methods, frameworks, tools, or models which aim to tackle the productivity, performance, effectiveness, efficiency, or management of KWs. The expectation was to extract how the existing literature is dealing with KWP from the perspective of the individual. The lack of operationalizable how elements extracted from the literature means that more steps need to be taken before an operationalizable model of KWP can be proposed. Therefore, a draft of a holistic KWP framework was drawn up instead as a step towards a holistic operationalizable model of KWP. The framework highlights indicators and activities that are connected to the productivity and performance of the individual KW as well as identifying factors that influence these indicators and activities. This gives an idea of what an operationalizable

model should consider. Additional study is needed into how each factor influences the state of the individual KW and work done as well as the interactions between the factors and the different levels of the state of the individual. This could be carried out by executing more specific literature reviews on these factors and utilizing causal diagrams to explore the interactions.

For example, the systematic literature review did not catch important literature regarding well-being, ergonomics, the influence of the physical environment and stress. Only two papers had the theme of health and well-being in the ninety-seven resulting papers in the literature review. In the seventy-eight papers that touched on concepts relevant to individual KWs and their work, there were twenty-eight that discussed concepts in the group well-being and job satisfaction. However, only sixteen of these papers mention well-being or stress and most of them only once. It seems that research on these topics is not connected to approaches, methods, frameworks, tools or models regarding performance and productivity.

The problem situation of managing and improving KWP, as captured by the purposeful activity model (PAM) of a system for the individual KW in Óskarsdóttir et al. (2021), was debated by mapping the key insights from the systematic literature review to the PAM. Debating the situation is the third activity in the soft systems methodology (SSM). The mapping highlighted what factors affect which activities in the KW's process of transforming resources to tangible and intangible artifacts with the intention of generating value. It also indicated the different associations between the factors and the activities. It was clear from the mapping that there are gaps in the literature found in the systematic literature review. As mentioned above, there was a lack of practical approaches that could be applied directly to the management and improvement of KWP. Few of the insights tackled how an individual KW would carry out an activity even though the systematic literature review was designed to target problem solvers. Very few insights mapped to the activities connected to the transformation process itself. It seems that very few researchers are tackling how because they are still making sense of what influences KWP.

Most of the insights focused on the state of the individual KW and how that state influences work done through the activities required to acquire the input (resources) used in the transformation process. Such resources include an appreciation of what is value, personal resources, information sources and competencies. It was curious that none of the insights mapped to the activity acquire and develop competencies, even though it is part of the activities required to acquire the input. It causes one to think whether research that tackles in some way the acquisition and development of competencies of the individual KW is not connected to productivity, effectiveness, efficiency, management, or performance or whether that kind of research does not result in approaches, methods, frameworks, tools, or models. It also seems that discussions about concepts regarding individual KWs and their work do not focus much on the activities required to generate the target outcome (value). From the findings in this systematic literature review, it seems that the focus is more on the efficiency of the KW rather than on the effectiveness. Finding and maintaining the optimal state of individuals so that they can get more done and engage in more preferred behaviors does not necessary lead to more value contribution but probably leads to more efficiency in accomplishing things.

The next step in this research should be to explore the problem situation from the perspective of the organization as a problem owner by creating a PAM of a KWP system for the organization and debating it by mapping key insights from the six groups identified in this systematic literature review relevant to the structure, initiatives and environment of the organization. The observations, categorizations and associations gained from applying the SSM to another problem owner should result in more building blocks for a theory of KWP. The draft of a holistic KWP framework could then be expanded by the insights and activities identified in the SSM process for the organization. When both perspectives of the organization and the individual KW are accommodated in the draft of a holistic KWP framework, the next steps towards an operationalizable holistic KWP model can be taken.



There is a need to delve deeper into the many levels, factors and associations in the draft of a holistic KWP framework to figure out how to measure and manage them. Being able to measure progress towards a targeted outcome is imperative when attempting to improve a problem situation.

Many jobs today are predominantly knowledge work. This makes organizations dependent on value created by KWs. There are approaches, frameworks and methods being used to manage and improve KWP. Most of these approaches have been developed by the organizations themselves to solve numerous problems they face regarding KWP. These approaches cannot, therefore, be found in the literature on current research. It would be pertinent to enhance this research by studying the approaches being used in varying organizations to expand a theory of KWP with insights from the industry. Many of the initiatives taken to improve and manage KWP give unpredictable results and depend on factors that are often hidden and unknown. It is important to find a holistic approach to improve and manage KWP that gives consistent results across many different organizations. The objective of this research was to shed light on these factors and draw up a holistic view of the individual KW at work to expand our understanding of why these initiatives give unpredictable results and take a step towards consistent KWP.

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## Abbreviations

The following abbreviations are used in this manuscript:

KW	Knowledge worker
KWP	Knowledge worker productivity
SSM	Soft systems methodology
PAM	Purposeful activity model
ICT	Information communications technology
PCD	Personal characteristics and development
WJS	Well-being and job satisfaction
CR	Communication and relationships
PKM	Personal knowledge management
TA	Task approach
OCE	Organizational commitment and engagement

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