

Silesian University of Technology

Scientific discipline

Management and Quality Science

Dissertation Topic:

The Competency Framework of Knowledge Workers in
the Age of Digital Transformation

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Abstract

Amidst the rapid digital transformation that is fundamentally reshaping work environments and redefining job roles, often resulting in new roles and the obsolescence of others, there lies a critical need to redefine and enhance the competencies of knowledge workers. Knowledge has emerged as the most valuable asset and primary driver of economic value in this new digital age. However, traditional competency models are often inadequate for the dynamic, complex, and technology-infused nature of contemporary knowledge work. This represents a significant gap in understanding and managing the workforce, as existing frameworks frequently fail to capture the fluidity, complexity, digital integration, and interconnectedness of modern knowledge work. This dissertation addresses the core problem of precisely defining what constitutes “knowledge work” in the digital age and identifying the key competencies needed for success in these roles, as traditional frameworks fail.

The *main objective of this dissertation* is to develop a comprehensive, empirically grounded competency framework tailored for knowledge workers in the age of digital transformation. The research questions guiding this study include how digital transformation redefines knowledge work and its competency requirements; the distinct characteristics of digital-age knowledge work; the adequacy and limitations of existing competency frameworks and theories; the specific essential and emerging competencies; and the core components and structure of a robust framework. The study employs *an exploratory mixed-methods research approach* using a funnel strategy comprising three main phases: a Systematic Literature Review (SLR), an Expert Panel, and a Knowledge Workers Survey. The SLR synthesised existing knowledge on knowledge worker competencies within the digital economy, adhering to PRISMA guidelines. An expert panel of 17 experts from 14 different countries was convened to validate and refine the identified competencies and gather insights into future trends. Finally, a survey instrument was administered to 183 diverse knowledge workers, predominantly in the Service and IT Professionals sector, located in Silicon Mountain, Buea, Cameroon. Qualitative data from expert panels and open-ended survey responses were analysed using thematic analysis, while quantitative survey data were processed using statistical software (Statistica, Microsoft Excel), including Probit regression and correlation analysis. A mixed-methods approach enabled triangulation of findings, enhancing validity and reliability.

The theoretical framework of this study is supported by several interconnected perspectives. It draws upon competency-based theory (McClelland, 1973; Spencer & Spencer, 1993), which posits that specific competencies determine performance. This is integrated with

various learning theories spanning individual (Constructivism, Experiential Learning, Self-Regulated Learning), group (Social Constructivism, Situated Learning, Collaborative Learning), and network (Network Learning Theory, Connectivism) perspectives, recognising the expanded and digitally mediated learning space (Lave & Wenger, 1991; Siemens, 2005; Kolb, 2015). Furthermore, the study is conceptually backed by strategic management theories, particularly the Resource-Based View (RBV) and its evolution to the Knowledge-Based View (KBV) of the firm, emphasising intangible assets like knowledge and skills as sources of competitive advantage (Barney, 1991; Grant, 1996). The concept of the Learning Organisation (Senge, 1990) also provides a roadmap for nurturing knowledge. This multidisciplinary foundation facilitates a comprehensive understanding of how knowledge workers learn and develop competencies in the age of digital transformation.

Building on this theoretical foundation and the identified research gaps, the study tested several key hypotheses. H1 posited that the identified competency groups (digital, cognitive, learning agility, social, self-management, social and emotional, leadership) are crucial for effective knowledge work. H2 proposed that specific cognitive skills (critical thinking, creativity) and social skills (communication) have the greatest positive impact on performance. Finally, H3 asserted that the competency framework for knowledge workers exhibits a dynamic and structured relationship effectively represented by a three-tiered model (Foundational, Enabling, Strategic), where each tier builds upon the one preceding it.

Some important findings from the empirical investigation revealed that cognitive skills and social/emotional competencies are perceived as equally crucial by experts for both current and future knowledge work. Experts most frequently cited *critical thinking and resilience* as essential skills, emphasising adaptability for the future. The knowledge worker survey confirmed that *social skills and cognitive skills* have a statistically significant positive impact on the effectiveness of knowledge work. Practitioners highly prioritised *task and time management, communication skills, and relational skills* for their daily tasks. The findings indicate that while foundational skills, such as *digital literacy and communication*, are essential, higher levels of *cognitive and socio-emotional competencies* are increasingly crucial differentiators for effective knowledge work. The research highlights the need for “*meta-competencies*,” particularly learning agility and adaptability, to navigate the dynamic work environment. These empirical findings validate the study's hypotheses, confirming the crucial role of identified competency groups (H1), the significant impact of specific cognitive and social skills (H2), and supporting a dynamic, structured framework (H3). Based on these synthesised findings, a novel competency framework is proposed, organised into the

hypothesised three interconnected and progressive tiers: Foundational, Enabling, and Strategic. The framework challenges traditional static competency models, advocating for dynamic, adaptable approaches, and serves as a valuable foundation for organisations, policymakers, and future research in navigating the complexities of the digital age.

A key novelty of this study is its empirical examination of knowledge worker competencies within an emerging African tech ecosystem (Silicon Mountain, Cameroon), offering valuable insights that extend beyond predominantly Western-centric paradigms. The research highlights the growing and synergistic importance of interpersonal and adaptive competencies, such as emotional intelligence, collaboration, communication, learning agility, and resilience, which complement and often enable technical proficiency in digital work environments. This research provides significant practical implications for talent management strategies, the design of training and development programmes, and recruitment practices. Organisations are encouraged to foster cultures of continuous learning, implement robust and holistic competency assessments, offer personalised learning pathways that integrate technical and transversal skills, and utilise mentorship. The dissertation establishes a valuable foundation for organisations seeking to optimise their human capital, for policymakers aiming to address the evolving skill demands of the digital age, and for future research exploring the dynamic evolution of competencies within the globally interconnected digital economy.

Keywords: Knowledge Workers, Competencies, Competency Framework, Digital Transformation, Digital Age, Learning Agility, Soft Skills, Transversal Competencies, Learning Theories.

Dissertation Structure Overview

The dissertation is organised into six comprehensive chapters, systematically addressing the critical aspects of knowledge worker competencies in the age of digital transformation. Each chapter builds on the preceding one, progressing from foundational concepts to empirical investigation, framework development, and concluding with an integrated synthesis of findings and implications.

Chapter 1, “*Digital Transformation and the World of Work*,” establishes the broader context. It provides a theoretical background on digital transformation, defining its key concepts and exploring its profound impact on modern organisations. This chapter examines the evolution of organisational structures and processes, specifically highlighting the paradigm shift towards networked, agile, and learning organisations. It further analyses the implications of these changes for required skill sets, contrasting the demands of the modern knowledge

economy with traditional paradigms, and contextualises the evolving role of human resource management, with a particular focus on competency-based and talent management strategies.

Chapter 2, “*Knowledge Work and Knowledge Workers*,” delves into the core subject of the research. It explores the dimensions of knowledge, specifically its types, strategic importance, and management within the context of the digital transformation era. The chapter critically defines knowledge work and distinguishes between knowledge workers, describing their unique characteristics (for example, complexity, non-routine cognitive tasks, and reliance on expertise) compared to traditional labour. By discussing the rise of new knowledge worker roles, this chapter lays the foundation for understanding the subsequent need for revised competency conceptualisations.

Chapter 3, “*Competencies of Knowledge Workers*,” transitions to the identification and conceptualisation of competencies essential for this workforce. It critically reviews relevant learning theories that underpin competency development (for example, Situated Learning, Communities of Practice, Social Learning, and Expansive Learning Theory) and evaluates existing competency frameworks in the digital age, identifying crucial gaps in the literature. Building on this, the chapter presents key competencies identified through the initial research phases and proposes a preliminary conceptual structure for a tailored competency framework, while also exploring determinants and enablers of workplace learning.

Chapter 4, “*Research Design and Methodology*,” meticulously outlines the empirical approach adopted for this study. It restates the research problem and guiding questions, detailing the mixed-methods design employed to address them. This chapter describes the three core methodologies: a Systematic Literature Review (SLR) to synthesise existing knowledge; quantitative expert panel consultations to validate and refine the emerging competency framework; and a knowledge worker survey conducted among 183 participants in a specific emerging tech hub (Silicon Mountain, Cameroon) to gather direct empirical data. Details regarding survey design, data collection protocols, respondent characteristics, and analytical procedures are provided, culminating in a presentation of the integrated research model.

Chapter 5, “*Findings and Discussion*,” presents and synthesises the empirical results from the expert panel and knowledge worker survey. This chapter provides a detailed analysis that directly addresses the research questions concerning the identified importance, evolution, and interplay of various identified competencies. It discusses the key findings, highlighting significant patterns, statistical correlations, and divergences between expert and practitioner perspectives. The theoretical and practical implications of these findings are explored in

relation to the existing literature, with a focus on understanding the impact of these competencies on enhancing knowledge work within the complexities of the digital era.

Chapter 6, “*The Development of Competency Framework for Knowledge Workers in the Age of Digital Transformation*,” constitutes the core constructive contribution of this dissertation. Building directly upon the theoretical foundations established in Chapter 3 and the empirical findings analysed in Chapter 5, this chapter proposes and details the developed competency framework. It outlines the framework's multi-dimensional structure, incorporating both Tier-Based (Foundational, Enabling, Strategic) and Category-Based (Technical, Transversal, Learning) frameworks. This chapter elaborates on the specific competencies within each component, tailored to the needs of knowledge workers navigating digital transformation, thereby directly addressing the research question regarding the core components and structure of a robust and relevant framework.

Finally, the dissertation culminates in a General Conclusion that integrates the entire research journey. This section summarises the key findings in direct response to the overarching research questions, reiterates the study's main theoretical and practical contributions (including the proposed framework), and presents consolidated recommendations for practitioners, organisations, and policymakers. It also critically acknowledges the limitations inherent in the research design and geographical focus, proposing specific and actionable directions for future research to further advance understanding of knowledge worker competencies in the dynamic global digital economy.