Generative AI in Enterprise Knowledge Management: Recognizing Challenges and Enabling Success

Masterarbeit

Zur Erlangung des akademischen Grades „Master of Science (M. Sc.)"
im Studiengang Wirtschaftswissenschaft der
Wirtschaftswissenschaftlichen Fakultät der Leibniz Universität Hannover

vorgelegt von:

Name: Webster [redacted]

Vorname: Samantha [redacted]

Prüfer: Prof. Dr. Michael H. Breitner
Betreuer: M. Sc. Lukas Grützner

Hannover, den 04. November 2024

Table of Contents

1 Introduction

1.1 Motivation and Relevance

Knowledge is a decisive part of the economic sense and progress-making (Chou et al., 2005). Knowledge management systems (KMS) have created an innovation on how to create, store, and retrieve knowledge for organizational tasks, inevitably changing how valuable information is handled internally (Santoro et al., 2018). Knowledge structures for enterprises are a vital characteristic of creating a competitive advantage by amplifying internal effectiveness (Santoro et al., 2018). Internal knowledge in enterprises encompasses all gathered data and information incorporated into intra-specific technologies, routines, and employees (Zincir & Rus, 2019). Idrees et al. (2023) highlight internal knowledge management to be a pertinent procedure to the strategic business position of organizations, changing outcome processes and innovation quality to new business models and creation strings. Du Plessis (2007) values knowledge management as a tool to build competencies pertinent to innovation procedures in organizations. Idrees et al. (2023) found more than 28,000 papers published on knowledge management. Today, this figure based on a scopus keyword search string (“Knowledge” AND “Management”) yields over 30,000 published conference papers, articles, and reviews for the years 2002 until 2024, with rising interest rates based upon a positive growth rate in the past five years. As a result, a vast number of scientific literature has occupied research interests on managing internal knowledge in enterprises to a value-enhancing degree, indicating the relevance of addressing this field (Pendevska, 2022; Shahzad et al., 2020).

Technological endeavors are transforming enterprise landscapes continuously. Recent advances in artificial intelligence (AI) have shifted views on implementing disruptive technologies and are transforming the enterprise environment continuously (Liu et al., 2024). With the novel uprise of generative AI, the abilities and competencies are undoubtedly discussed in various publications grouped to alleviating tasks and enterprise operations, while further addressing an uprise in performance and productivity levels, alleviating costs and dependencies for several model structures (Bariah et al., 2024; Fui-Hoon Nah et al., 2023; KPMG International, 2024; Merhi, 2023). Feuerriegel et al. (2024) predict a 7% global gross domestic product increase with the deployment of generative AI. Originating from a case study, generative AI platforms in knowledge contexts of enterprises are emerging to present efficiency gains while improving quality outcomes by 56%, serving an increased competitive advantage of 51% as of 2023 (Institute for Business Value, 2023; McKinseyDigital, 2024). Therefore, a transformation of internal enterprise knowledge structures equipped with generative AI is inevitably occurring. Yet, with rising deployment rates

of generative AI seeing increasing investing rates in enterprises, challenges to the implementation of generative AI in internal enterprise knowledge systems equally occur (Kanbach et al., 2024). Sixty-seven percent of top management executives are perturbed about integrating generative AI into their knowledge management frameworks, due to its potential to scale challenges and risks (Institute for Business Value, 2023). As for this, investigating the negative backside of generative AI deployment in enterprise knowledge work streams has seen little attention (Al Naqbi et al., 2024). To this day, a qualitative research investigation exploring why the application of generative AI into internal enterprise knowledge management systems leads to challenges and implementation failures is yet to be executed. In scientific literature, internal enterprise knowledge management with applied generative AI is discussed within knowledge conversion using the SECI model (Sumbal & Amber, 2024), business communication alterations (Iaia et al., 2023) or the aggregation of internal knowledge to improve creativity reflection in innovation and ideation phases (Joosten et al., 2024; Koch, 2011). Hitherto, scientific literature has grasped the negative characteristics of generative AI but has not yet assessed a corporate-level perspective of highlighting challenges and implementation failures accustomed to generative AI managing internal knowledge through organizational environments while filtering the critical factors for a successful embedding (Kshetri et al., 2024; Michel-Villarreal et al., 2023; Zhang & Kamel Boulos, 2023).

Assessing a holistic perspective on how to elevate internal knowledge management structures by implementing human, technical and institutional considerations while deploying generative AI is not yet present. We address this research thesis from a high-level perspective which will include a non-specific exploration of organizational fields (Boynton & Zmud, 1984). Highlighting the investigation of success-supporting factors in internal knowledge management of organizations, the research questions arise as follows:

RQ1: What are the challenges and reasons for the failure of generative AI in enterprise knowledge management?

RQ2: What are the critical success factors of generative AI in enterprise knowledge management to enhance business value creation?

The designated pathway followed by the proposed research questions will first be to reveal the challenges and failure reasons for deploying generative AI in enterprise knowledge structures. These insights will serve as a building block for the second research question. Emphasizing the assessment of challenges and failure reasons,

critical success factors to the amendment and the increasingly ubiquitous presence of generative AI in internal enterprise knowledge systems are further extracted.

1.2 Research Procedure

Designing the main body of this thesis, the objective will be to identify and analyze the Critical Success Factors (CSFs) of generative AI tools in internal knowledge management within enterprises to a value-supporting outcome position. By comprehensively examining the internal contextual settings, the thesis is structured as follows:

To answer the research question, the thesis is structured in seven main and constructing chapters.

First, the theoretical background in knowledge management, generative AI, CSFs, and the Technology-Organization-Environment (TOE) framework is displayed. Knowledge management will be defined, including a subchapter reflecting the history of knowledge management and the representation of knowledge management application fields. We will further define generative AI including its timeline and basic technical concepts. The theoretical pillar will further concern the emphasis on CSFs and highlight the TOE framework, giving an insight and bridge to the main body of research. Respectively, the approach to CSFs and TOE framework will equally be given an in-depth view of the definition, history and concern the application in related fields. A brief insight into related success models comparable with the approach of CSFs will additionally be given.

The thesis content is complemented by introducing a chapter dedicated to defining the elements and characteristics of implementing an AI strategy for enterprises. This will encompass delving into both regulatory and strategic endeavors and perspectives of implementing generative AI from an enterprise-focused view in the context of Small and Medium-sized Enterprises (SMEs).

Following, the methodology including the research design is explained. These will encompass the frameworks for the research process and further analysis. The method of CSFs interconnected with the TOE framework is displayed alongside the method of an intelligent literature review. The interview design and evaluation including transcribing and coding the interview material, followed by the evaluation through a focus group discussion will follow at the close of this chapter.

The research process involves gathering and structuring knowledge through expert interviews and an intelligent literature review as a preliminary step to identify CSFs. To embed this, we draw on an extensive literature review in accordance with Webster and Watson (2002) by analyzing 138 scientific based on deploying AI tools. This is further

complemented by gathering expert knowledge through 21 interviews. The research process additionally includes a focus group discussion.
Concluding, the main research body will take place by presenting the aggregated results. Within this chapter, the challenges and reasons for the failure of generative AI in internal enterprise knowledge management are highlighted while identifying a final set of CSFs.
Second to last will include a chapter discussing the results which will encompass a reflection of the integrated TOE-CSF model, give implications for practical and theoretical considerations, and highlight limitations while offering future research capabilities. Concluding, a summary is drawn to conduct the findings and give a brief outlook.

8 Discussion and Recommendations

8.1 *Discussion of Results*

Exploring generative AI challenges and failure reasons targeting to uncover CSFs in enterprise knowledge management, we investigate 93 literature-based findings performed through an extensive literature review while complementing the research by executing 21 expert interviews. This analysis was made possible through the extensive analysis based on literature dedicated to knowledge management as well as generative AI deployment in enterprises empowering the ability to proceed with the identification of an all-encompassing set of challenges and failure reasons while extracting CSFs towards generative AI in enterprise knowledge management (Botega & da Silva, 2020; Kaczorowska-Spychalska et al., 2024).

We deployed the research design by combining the investigation of CSFs embedded within the TOE framework to extract success factors but equally highlight challenges and failure reasons within organizations implementing and adopting generative AI for knowledge management in enterprises in recognition of technological, organizational, and environmental considerations. Applying the TOE framework within our research analysis, we map the identified results post literature analysis and expert interviews to the three categories to mitigate potential bias in a predefined direction while ensuring a balanced organization of the obtained findings (E26). The method to incorporate the TOE framework assessing the CSFs gives character to classifying and organizing enterprise-specific challenges and CSFs into predefined categories, enabling a “clear differentiation” (E22). It centers the opportunity for enterprises to target individual CSFs which are crucial to focus originating from practical relevance, e.g., AI Literacy and Security) (E24, E26). This is further emphasized through experts highlighting their most relevant CSFs, e.g., knowledge quality, developing suitable use cases, and engaging a human-centered perspective (E03, E12).

The TOE framework in combination with highlighting CSFs elevates the opportunity to branch in different directions while keeping to organizational objectives in defined categories incorporating multiple criteria to a successful implementation and adoption premise ignoring inflicting relations (Zhong et al., 2024; Luo et al., 2023). Yet, the CSF-TOE model as the research design poses the challenge of being subjective and limited to the assigned categories. It cannot reflect on interrelations and creates a prejudiced assumption on CSFs categorized to a TOE classification (E22). Nonetheless, the research design enables a novel view on TOE-identified CSFs categorized to the topic of generative AI in enterprise knowledge management guiding key activities and resources to complement implementation and adoption decisions for organizational

endeavors. As recognized by Expert 22 and Expert 23, within unraveling challenges and CSFs for this research analysis, comparable models like the TAM and the UTAUT have considerable emphasis although focusing on the individual adoption alteration of novel IS (Bashir & Madhavaiah, 2014; Venkatesh, 2022). Yet, the applicability of the TAM model in combination with the TOE framework has seen widespread deployment practices (Bryan & Zuva, 2021; Haryanto et al., 2020). By utilizing the integrated CSF-TOE framework holistically, we achieve an enterprise-centered analysis of challenges and reasons for failure, alongside the identification of CSFs that emphasize essential activities tailored to support the adoption and implementation of generative AI in organizational knowledge management. This creates the insight of specifically contributing to an organization-leveled endeavor and embarks on creating value by recognizing challenges that highlight critical success grounds for generative AI in knowledge management elevating its embedding in enterprise-related proceedings.

Conducting the research on challenges, failure reasons, and CSFs for generative AI in enterprise knowledge management yields a multifaceted view of the final outcomes. First, our analysis reveals a general comprehension of challenges and failure reasons from a theoretical and practical perspective. It offers insights into a three-dimensional perspective within the TOE framework, highlighting failure reasons in account of leveraging generative AI for knowledge management in enterprises. Conducting expert interviews, as portrayed in Table 3, we address the research need of why the application of generative AI into internal enterprise knowledge management systems leads to challenges and implementation failures compared to related articles highlighting negative characteristics but failing to bridge a knowledge management-infused enterprise context (Feuerriegel et al., 2024; Fui-Hoon Nah et al., 2023). From our literature review and the expert interviews, we derive 15 items and 57 categories addressing challenges and failure reasons for generative AI deployed in KMS of enterprises. Notably, the challenges and reasons for failure align with both the literature and expert interviews in terms of the mentioned numbers, though experts place particular emphasis on challenges as a key term. Our findings in Table 7 reveal a high emphasis on challenging categories being an insufficient database and knowledge infrastructure mentioned in 47 respective abstracts and by 12 experts. Similarly, theory and practice highlight discarding learning development and training with 52 papers and 13 experts as a challenge addressed with generative AI in enterprise knowledge management. As for this, 53 papers and 11 experts mention the failure reason being a lack of continual understanding and building capabilities. Additionally, challenge-infused categories concerning generative AI in enterprise knowledge management commit to opacity and black box problems, identified in 49 papers and eight expert interviews. This is also recognized within the item lack of trust

base and the corresponding challenge of hallucination, reduced or failed accuracy and reliability concerns, mentioned by 70 papers and 15 out of 21 experts. However, we observe that six experts point to the absence of knowledge communities as a key reason for generative AI failure in enterprise knowledge management, a factor highlighted in only one scientific study. Additionally, the findings reveal challenges that have not yet been addressed in scientific research but were identified in practice, such as knowledge drain and the emergence of shadow IT, each noted by two experts. Eight experts emphasize the challenge being the lack of adapting process-related structures when addressing the deployment of generative AI for knowledge management purposes in enterprises, which has equally not been a targeted subject in scientific research. As a distinctive element, the research identified underreliance as an element which is solely focused in scientific research but did not find identification in the executed expert interviews. Resulting, the challenge of neglecting generative AI for knowledge management work in enterprises plays less of a role in practical environments. Rather, the challenge of overreliance on generative AI tools in enterprise knowledge management found higher recognition with 35 abstracts and five experts. While aiming to target a holistic failure and challenge-infused apprehension for generative AI as a technology in enterprise knowledge management, we do not foresee the abilities with which further challenges with increasing technology sophistication will arise. Selected described challenges will fade while presently listed aspects with seemingly low recognition in literature and practice will increase in importance and relevance and influence the identified CSFs. While evaluating the challenges and failure reasons, the literature review procedure and expert interviews characterized a tendency to derive CSFs from challenging aspects and vice versa. During our interview process, we experimented to practice deriving opportunities as a predecessor to filtering challenges and failure reasons presented by generative AI in enterprise knowledge management. Yet, after two rounds the procedure did not yield favorable results and, therefore, was dropped. Further, the challenges and failure reasons of generative AI in knowledge management of enterprises mirror the identified CSFs. In this context, the experts found it challenging to clearly distinguish between challenges and CSFs, highlighting an external, uncontrollable determinant (E03).

In recognition of identifying success elements, we conclude a final of 16 CSFs with 69 categories for generative AI in enterprise knowledge management. Here, we equally identify that the scientific literature is in line with expert views on critical factors enabling the success of generative AI in knowledge management of enterprises in light of the mentioned papers and experts highlighting the items. Extracted from Table 8, 52 abstracts and 11 experts identify trust in generative AI technology and output as a critical success-enabling category. As for this, providing and maintaining a sufficient

database and knowledge infrastructure is mentioned by 47 papers and 12 experts as critical to success while equally 47 papers and 12 experts support the critical element of knowledge quality. Similarly, encouraging learning development and training is identified by 52 abstracts and 13 experts supporting a contributing success element identified by equal measures in research and practice.

As noted by Expert 26, discrepancies arise from the subjective selection of experts, which is influenced by individual knowledge bases and regional differences in how generative AI for knowledge management in enterprises is perceived. The results implore three categories to which a discrepancy classification can be attributed when extracting CSFs. The first category attributes a high promotion of scientific literature outweighing expert interviews. The second category encloses expert interviews having a higher focus on selected categories than scientific literature. The third category encompasses novel contributions by practice not yet mentioned in scientific literature. Within this study, we deploy the discrepancy evaluation model by Provus (1969) to evaluate the differences between references from scientific literature and expert interviews concluding the identified CSFs. As argued by Expert 22, the analysis towards uncovering insights into the concluded results should follow a clear set of rules. Therefore, we follow the difference identification on a percentage-based structuration (E22). Starting with the first category, within the identified results of Table 9, we reveal a high contribution of scientific literature with 31 papers to a seamless integration into existing knowledge structures, with only two experts arguing this as a contributing element to the CSF usability, revealing a difference evaluation of 6.5%. Similarly, the tendency to be highly promoted in scientific literature and less in expert interviews is argued for an intuitive and appealing user interface with a discrepancy of 8.3%, accountability and responsibility with 6.3%, and engagement in team dynamics with 3.3% which is mentioned in 30 abstracts but only by one expert. Revealing the insights assigned to the second category, three abstracts and two expert interviews mention reward systems as a category supporting the CSF user centricity resulting in a higher promotion of expert interviews than mentioned in scientific literature and a discrepancy percentage of 66.7%. Enabling a switch in the operating mindset is mentioned by one paper to three expert interviews revealing a difference level of 300%. Similarly, the category of building knowledge communities supporting the CSF generative AI knowledge team perspective is argued by six experts while only being mentioned in one scientific paper. Last, the third category focuses on novel contributions. Gamification elements and promoting technology education and extendibility features are highlighted by 3 and 8 experts respectively and are yet to be introduced in scientific research, identifying a difference level of 100%. Further, practical perspectives include three novel CSFs namely adaptability requirements, project foundation, and strategic execution which have not seen recognition in the

literature dedicated to generative AI in knowledge management in the field of IS. Supported by Expert 22 and Expert 25, these could possibly be found in related literature strings as critical aspects, highlighting the reason for not being recognized as CSFs in this research focus. Expert 22 determines the crucial confrontation to decipher novel and integration topics for CSFs, i.e., those topics that are novel and not mentioned in related literature endeavors and topics that are integrated due to viewing and incorporating additional literature fields.

Focusing on this research investigation, the majority of the identified CSFs for generative AI in enterprise knowledge management build a bridge to research areas of IS and management-related fields. Yet, a selective number remains specific to generative AI. Expert 26 quantifies that the CSFs strategic execution or project foundation show a link to related IS and management topics, as “project management topics, for example, for which there is already a great deal of literature anyway” and relate to being exclusively mentioned in the interviews. The CSFs strategic execution and adaptability requirements are deeply rooted in management-connected research areas and identified in contextual embeddings of IT projects (Mathrani & Viehland, 2010; Singh, 2018). In the context of implementing business intelligence systems, driving a vision attributed to the CSF of strategic execution and relating to adequate team dynamics as the CSF generative AI knowledge team perspective have been equally identified (Yeoh & Popovič, 2016). Project management-connected topics are further enclosed respectively in related research supporting the CSF project foundation (da Cruz Andrade et al., 2023). Therefore, the identified CSFs solely mentioned in the expert interviews can be argued as integration topics as they have been identified as CSFs in related literature. The CSF top management support and categories towards training and education on novel technologies have found equal recognition in related literature (Zhong et al., 2024). Similarly, Ram and Corkindale (2014) include adequate resources, e.g., technical and organizational resources, useability, and trust-based inquiries as CSFs in ERP and chatbot implementation environments representing related IS research fields (Gavali & Halder, 2020; Zhang et al., 2023). Related literature further heavily emphasizes design elements of generative AI such as the database architecture in ERP embeddings as a CSF (Chee Hong et al., 2024). Therefore, the majority of the identified CSFs for generative AI in enterprise knowledge management bear resemblance to related IS and management-identified research areas. Janssen et al. (2021), in their research, decipher the failure reasons of chatbots in real-world scenarios and filter 12 CSFs for their deployment. Here, multiple overlapping CSFs are identified emphasizing factors of design elements dedicated to a success-based deployment but crucially engage the importance of incorporating project-related aspects as identified within our results such as top management support and strategic

execution as well as to design structures of IS which is transferrable to this study. Similarly, Zhang et al. (2023) investigate success factors for implementing chatbots in customer service from an enterprise-focused perspective. They reach similar conclusions by evaluating the risks of chatbot implementation to identify success-enhancing factors, which are shaped by strategic and organizational foundations, such as change management and organizational resources (Kaushal & Yadav, 2023). This aligns with the study by Janssen et al. (2021), who emphasize the identification of challenges and CSFs as a supporting tool to guide risks within the deployment of generative AI in enterprise knowledge management. Skuridin and Wynn (2024) go beyond and connect CSFs to chatbots within a TOE framework. Further literature has analyzed CSFs for knowledge management exclusively. Akhavan et al. (2006) identify 16 concepts related to the success of KMS in enterprises. Core findings reveal the balance of related CSFs being top management support, trust and architectural grounds connecting to the identified CSFs in this study. Related research investigates CSFs of knowledge management including strategic layers, technological resources, and culture-dedicated endeavors (Conley & Zheng, 2009; Mas-Machuca & Martínez Costa, 2012). Embedded within the TOE framework, the identified CSFs for generative AI in enterprise knowledge management see a first classification attempt. Yet, many interactions and interrelations are apparent and set to be further elaborated in their position as crucial factors emphasizing deploying generative AI in enterprise knowledge management. Expert 25 highlights this by stating that “multiple mentions would theoretically be possible, so that means you don't have to wire things up really hard, but there are certainly points that could fall into several groups”. Nonetheless, various interactions and interrelations between the identified challenges and CSFs are evident, showing further potential for investigating the deployment of generative AI in enterprise knowledge management.

8.2 Implications and Value for Research

By exploring the challenges and failure reasons and the resulting CSFs for generative AI in enterprise knowledge management, a critical contribution to the pillar of IS in enterprise environments is made. Emphasizing the challenges and failure reasons followed by identifying CSFs ingests and mobilizes added efforts towards the handling and deployment of AI systems in knowledge management premises of enterprises. This research work contributes to vital advancements in investigating the continuous generative AI presence in enterprises while being confronted with repeated boundaries to their value-gaining embedding. This encapsulates elevating the target of highlighting implementation and adoption decisions when considering the further infusion of generative AI for knowledge work in enterprises. Originating from a plethora of work targeted at generative AI, this study serves as a foundation to encompass current

research strings on generative AI in knowledge management environments while accessing the emergence of challenges and failure reasons and deriving the factors for success in organization-dedicated domains. Targeted implications originate in highlighting a present view of generative AI back side effects on established knowledge structures in enterprises. This advances from the perspective of generative AI seizing increasing presence and demand in multiple organizational structures and procedures complementing knowledge management tasks and fostering the extended attention of crucial aspects of emphasis in enterprises. As technology based on generative AI has power-infused alteration characteristics on organizational proceedings, highlighting the challenge-inflicted aspects sparks escalating effects towards enhancing the research base of identifying CSFs for enterprises. The research value is expanded by enlightening a novel thread of research foundation to further guide past, present, and future endeavors towards assessing generative AI in enterprise knowledge management. This is embodied through providing an elevated research body progressing innovative and insightful perspectives and an incentivizing framework for knowledge management systems in enterprises moderated through generative AI transforming traditional conceptualizations of knowledge work. Therefore, this work provides the base to transform knowledge management perceptions in enterprises while gaining insights on novel technologies infusing traditional operations of knowledge creation, storage, transformation and application.

8.3 Implications for Practice

From an economic point of view, generative AI in knowledge management has decisive benefits delivering value not yet considered by enterprises prior to its introduction. Hitherto, with the introduction of a novel technology, the practical application seems to be foreseen by an overlook of benefits disregarding the challenges and reasons why generative AI in addition has the potential to fail. Therefore, this research stands on the pillars to highlight the backside, driving enterprises to consider a double-sided perspective while gaining insight into factors critical to success. The CSFs thereby can highlight not only the economic increase in competitive advantage but also go deeper to understand how enterprises can elevate their internal knowledge management processes to greater efficiency. Enterprises have the ability to drive higher protection means having recognized challenges and failure reasons when applying generative AI to their knowledge management systems. This poses particular importance as it would reduce the investment of unused resources as well as gain greater value in a shorter period. Further, in being aware of challenges and failure reasons, enterprises are equipped with the knowledge to steer countermeasures of key activities and resources in deploying generative AI in enterprise knowledge management. Enterprises gain the ability to showcase the identified CSFs in relevant case studies to transfer to practical

embeddings of possible PoCs. This has the benefit of transcending the unknown levels of possible success features but highlights the key areas to drive business objectives and gain elevating success results with higher quality. Therefore, this study values the contribution to practical processes in guiding enterprises to a higher state of operating practices in providing greater insights on crucial success-determining features while equally uncovering not-to-be-overlooked challenges. The TOE framework highlights technological, organizational, and environmental critical aspects for enterprise success, framing the accumulation of crucial features relevant in the practical tense of execution. It thereby aids the classification of challenges and failure reasons as well as CSFs of generative AI in enterprise knowledge management into enterprise-relevant focus areas. This alleviates enterprises to examine challenges and failure reasons followed by CSFs in a structured and targeted scope orientation while highlighting their need for further value creation in practice-relevant considerations.