

The Impact of Design Thinking on Knowledge Management Practices and Organizational Performance in IT Companies

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Abstract

This paper discusses design thinking impact on knowledge management and organizational performance of IT companies. The article links user-centred and innovative approaches involved in design thinking process to the optimal development of knowledge management systems, which are vital for the organization's success in the context of growing IT industry. Using evidence from multinational software firms, this paper examines how design thinking promotes the culture of innovation, strengthens cross-functional initiatives, and incorporates users' input into the product and organisation. Understanding of the results indicates that the concept of design thinking, when integrated into knowledge management, may facilitate the enhancement of organizational performance pivotal to IT companies through proper optimization of knowledge flows which create favorable conditions for innovation. This study makes a significant contribution to the growth of knowledge in the practical application of design thinking as a strategic tool that can be applied in organizations with specific reference to knowledge management in IT firms.

Keywords: Design Thinking, Knowledge Management Practices, Organizational Performance

Introduction

In the current business context, design thinking has significant roles in the application of effective knowledge management systems in organizations as a success driving factor (Xue, 2018). Such attributes as user orientation and the creative approach to solving challenges are core to design thinking, making it most suitable for the constantly evolving world of information technologies. The purpose of this paper is to analyse the application of DT in relation to several aspects of knowledge management and organisational performance in multinational software firms. Hence, this research aims to identify how design thinking interrelates with knowledge management practices and organizational performance while seeking to contribute to the IT companies' understanding of how design thinking might be used to unlock new opportunities for creating competitive advantages and fostering sustainable growth.

Design thinking, which involves collecting user information, developing concepts and creating ideas for multiple solutions that can be tested to determine which best solves the problem, is an effective strategy when approaching and solving such challenges and fostering innovation (Abualoush et al. , 2018). We can't deny the utility of design thinking particularly in IT companies for insistent knowledge management which need to be prepared for some significant changes in technological and general market environments to implement properly. This is because design thinking incorporates users and their needs into the development processes and as such, strives to produce solutions that are not only feasible by are also relevant and efficient (Wahl, 2018). It also advances contribution to the creation, distribution and organization of knowledge enhancement to increase organizational proficiency.

This means that designing knowledge management can have the following benefits to managers in their ability to enhance productivity in organizations. It is widely known that the companies in the sphere of IT are concerned with a wide variety

of data and information, and thus they have to be equipped with the respective efficient systems for the storage and utilization of such knowledge (Carlgren et al., 2018). Design thinking is useful in providing the frameworks that help put the processes in place and facilitate the people's ability to collaborate and work as functional teams without a lot of silos and barriers to communication between departments and teams. This is an area of organizational culture that is important for enhancing performance as it promotes idea sharing on how to get better performance on deliverables (Koh et al., 2015, Valkenburg et al., 2016). Furthermore, applying design thinking helps the IT companies: eliminate the possibility of loss of knowledge; ensure that collected and developed organizational knowledge, flows, and implementations are documented and applied; therefore, aligns with the companies' strategic imperatives and future viability.

1.1 Objectives

- To analyze the role of design thinking in enhancing knowledge management practices within IT companies.
- To evaluate the relationship between design thinking implementation and organizational performance in IT companies.
- To identify the challenges and best practices in integrating design thinking with knowledge management systems in IT companies.
- To identify best practices in integrating design thinking with knowledge management systems in IT companies.
- To evaluate how design thinking influences innovation within IT companies.

1. Literature review

Organizational design thinking has become a central concept for enhancing creativity and organizational effectiveness. In this paper, based on Chadha (2020), design thinking is explained as being a process that focuses on human beings, the use of creativity and logical approaches to come up with solutions that will fit the needs of the consumers as well as effectively address business objectives (Valkenburg et al., 2016). In this regard, the present study aims to focus on the way the general concept of design thinking is vital in the promotion of particular forms of knowledge management.

In Nonaka and Takeuchi's definition, KM entails the acquisition, diffusion, and application of learning and ideas within an organization which is essential to sustain competitiveness in industries that are fast-growing such as the IT industry (Chowdhury, 2018). Design thinking follows a step-by-step approach in improving these processes since it encourages the culture of learning and innovating in organizations. This causes the organizations to keep their attention to the user-value creating KM solutions which leads to refined and optimised management of knowledge (Carlgren et al., 2016).

Nair and Munusami (2020) have also established that the design thinking has been adopted for the purpose of using the toolkits to greatness of organisations. Organizations that follow design thinking practices experience higher organizational performance due to improved climate in addressing problems and user-centric solutions (Clark, 2020). It is particularly evident in IT as the industry demands a continuous release of new products and enhanced versions of existing ones to meet consumer needs.

Manah and Aziz (2019) further provides a viable perspective whereby designing thinking enhances the approach to cost-efficiency with cognizance on risk. The Design Thinking process is highly actionable, and its goal is to build an experimentation culture and multiple iterations, which can also make organizations use resources and answer uncertainties more effectively (Dam and Siang, 2020). This is so since the design thinking is cyclical hence the capacity to allow for other solutions with time and with regards to the success of the solutions. This has led to a proliferation of research works exploring the value of design thinking, albeit mostly qualitative in previous years, with current studies exploring the quantitative impact of the concept in organizations. For instance, as per Jones and Shideh (2021), design thinking does not only emphasize the culture of innovation but also affects the numerical measures of output and innovation. By the adopted design thinking approach, knowledge management in organizations enhances quantification of value achieved through areas like time to complete a project, solutions created, and customer satisfaction indicators (Gallagher & Thordarson, 2018). This approach is more practical in that it gives a foundation from which the author could go ahead and advise that design thinking is a viable way of addressing knowledge management in the IT industry particularly where technology advancement is critical for organisational competitiveness.

Furthermore, the integration of design thinking with practice proves beneficial not only for improving the internal functioning of the organization but is also considered to be a knowledge management advantage. External stakeholder

engagement is easier due to the recurring and focus group centredness of design thinking as highlighted by Dam and Siang (2020). For IT companies, this suggests that the application of design thinking when developing the knowledge management initiative can lead to improvement on the creation and management of co-creation partnership with clients and other external stakeholders (Abualoush et al., 2018). Such an approach not only diversifies the information within an organisation but also increases the probability that the solutions developed will be closer to what the market can currently offer. Design thinking therefore comes out as an important process in the flow of IT sector that facilitates the integration of outside information into the inside work processes to augment novelty and effectiveness.

Thus, the literature reveals an absence of a body of research examining the empirical effects of design thinking on KM practices and business outcomes. Earlier research lacks the identification of quantitative impacts, and while some research concentrates on non-numerical characteristics, design thinking remains understudied on how it can make quantifiable differences. This research seeks to address this gap by advancing empirical evidence supporting the IT industry on design thinking that enhances KM practices and supports organizational success and performance.

Therefore, extrapolating from the evidence base, it is possible to argue that incorporating design thinking into KM practices provides a valuable opportunity for development and optimization of the companies' performance, offering innovation, cost efficiency, and risk management advantages. It furthers these ideas by seeking to offer empirical data, in the form of quantitative indices, for enhanced implementation of design thinking among global IT companies.

2. Methods

3.1 Data Collection Methods

3.1.1 Secondary Research

The method used in this research is the secondary data method that involves the analysis of relevant and existing articles, journals, papers, books, and other publications on the effect of design thinking on knowledge management and performance in the IT organizations. Secondary research is used in the study to compile a large base of prior research for understanding the contemporary state of research and knowledge in this area. The current method is appropriate since it enables the researcher to explore patterns of existing research findings, thus enabling the identification of the patterns, themes and gaps in the literature. Therefore, secondary research allows one to integrate existing knowledge to fill a gap in existing literature, where design thinking impacts knowledge management and organisational performance in the context of IT.

3.1.2 Sources of Data

The sources of data for this research will include:

- **Academic Journals:** Peer-reviewed journals that focus on design thinking, knowledge management, organizational performance, and IT management.
- **Conference Proceedings:** Papers presented at conferences related to IT, knowledge management, and organizational performance.
- **Books and Book Chapters:** Authoritative texts that provide in-depth theoretical and practical insights into design thinking and its impact on knowledge management and performance in organizations.
- **Industry Reports:** Publications from industry experts and consultancy firms that provide current trends, case studies, and practical examples of design thinking in IT companies.
- **Databases:** Specific academic databases like Scopus, Web of Science, and IEEE Xplore will be used to gather relevant literature.

3.2 Data Analysis Tools

3.2.1 Thematic Analysis

Thematic analysis is a qualitative approach which aims at finding out patterns (themes) within the collected data. It merely structures and explains the data set in (rich) manner and gives interpretations of several aspects of the given research theme.

3.2.2 Steps of Thematic Analysis

- Familiarization with Data: In this stage, the key data are read and re-read in order to start generating ideas down.
- Generating Initial Codes: Classification of aspects of the data which are intriguing to enable comprehensive categorization of all the data.
- Searching for Themes: Sorting over emergent codes into possibly emerging themes, accumulating all data that are related to every probably emerging theme.
- Reviewing Themes: The process of completing cross affinity check of the themes against the coded extracts and the totality of data.
- Defining and Naming Themes: Further evaluation for the fine tuning of every specified theme and the general narrative painted by the analysis.
- Producing the Report: The last one that involves the use of the findings for the research questions and the identified literature, in order to generate a scholarly report of the analysis.

3.3 Inclusion and Exclusion Criteria

3.3.1 Inclusion Criteria

Relevance: Research that concern Design Thinking, Knowledge Management and Organisational Performance, with reference to Information Technology industries.

Recency: The data should be up to date hence using research done in the last ten years only.

Quality: Scientific/academic journals, well-refereed papers from academic conferences and scholarly/academic books.

Language: Only papers which appeared in English language would be taken into consideration.

3.3.2 Exclusion Criteria

Irrelevant Topics: Literature without involving IT firms or those that did not explore the relationship between design thinking, knowledge management, and organizational performance.

Outdated Research: Articles published more than 10 years back unless and otherwise they are classic articles.

Poor Quality: Magazine articles, non-peer reviewed journal articles, and a few unpublished doctoral dissertations or master's theses from unaccredited institutions, and a number of articles that were judged by the reviewers to be methodologically suspect.

3.4 Research Design

The research methodology used in this study is systematic literature review which aligns with the understanding of existing systematic literature review research that involves reviewing existing literature of research in order to design a systematic and coherent whole of research questions that can be formulated on realizing the impact of design thinking on knowledge management practices and organizational performance of IT companies. This design entails a systematic and a critical appraisal process of the available articles to enhance the inclusion of better quality and peer reviewed articles. Due to the orientation to secondary data, the research design enables the amalgamation of the findings, derived from different sources, as a result providing an overall picture of the state of knowledge. It allows making the process transparent, replicable, and following the methods that are crucial when making conclusions. This design also enables one to identify potential research issues and expansion of suggestions for subsequent researches, furthermore to the actualization of theoretical and practical contributions of design-thinking, knowledge management, and organizational performance in IT organizations.

3.5 Search Strategy

3.5.1 Databases

- **Scopus:** For comprehensive academic research across multiple disciplines.
- **Web of Science:** For a broad range of scholarly articles and citation data.
- **IEEE Xplore:** For IT and technology-focused research papers and conference proceedings.
- **Google Scholar:** For additional sources and grey literature.

3.5.2 Keywords and Search Strings

Step	Description	Details
1. Identify Key Concepts	Identify the main concepts for the search	Focus on the primary terms relevant to your research, such as "Design Thinking," "Knowledge Management," and "Organizational Performance."
2. Synonyms and Related Terms	Expand the search with synonyms and related terms	Include alternative terms or related concepts, e.g., "Innovation Process" for "Design Thinking," "Knowledge Sharing" for "Knowledge Management."
3. Boolean Operators	Use Boolean logic to refine the search	Combine search terms using operators like "AND," "OR," and "NOT" to broaden or narrow the search results.
4. Truncation and Wildcards	Use truncation and wildcard symbols to capture variations	Apply symbols like "" for truncation (e.g., "manag" to find "management," "managing") and "?" for wildcards (e.g., "organi?ation" to capture different spellings).

Table 1: Keywords and Strings

3.6 Study Selection

The study selection process is conducted in several stages:

- **Stage 1: Identification:** Initial database search to identify all potential studies.
- **Stage 2: Screening:** Review titles and abstracts to filter out irrelevant studies.
- **Stage 3: Eligibility:** Full-text review of remaining studies to assess their relevance and quality.
- **Stage 4: Inclusion:** Final selection of studies to be included in the review based on inclusion and exclusion criteria.

3.7 Data Extraction

Standardized Data Extraction Form:

A form was used to systematically collect data from each study, including:

- Study details (author, year, title, journal)
- Study design and methodology
- Population and sample size
- Key findings related to the impact of design thinking on knowledge management and organizational performance.
- Outcomes measured (e.g., improved innovation, increased efficiency)
- Limitations and biases identified in the studies.

3.8 Quality Assessment

Critical Appraisal Tool

In this case, Critical Appraisal Tool suitable for this research will be the CASP qualitative checklist. This tool is very useful for assessing the quality, credibility and phenomenal of the identified studies in the context of the need corporate governance literature review. To that end, the CASP list helps the researcher to address questions that pertain to the study technique, the reliability of the outcomes, and the general research provenance. Through the use of this tool, the review guarantees that only the best quality research papers form the basis of the evidence synthesis in the research hence improving the reliability of research findings made in the study.

3.9 Data Synthesis

The extracted data is synthesized using thematic analysis, following Braun and Clarke's method. This approach will

identify and analyze patterns (themes) within the data, providing a structured and detailed understanding of the research topic. The synthesis focused on:

- **Impact of Design Thinking:** How it improves knowledge management and organizational performance.
- **Challenges:** Difficulties in implementing design thinking within IT companies.
- **Best Practices:** Effective strategies for integrating design thinking into knowledge management.

2.10 PRISMA flow diagram

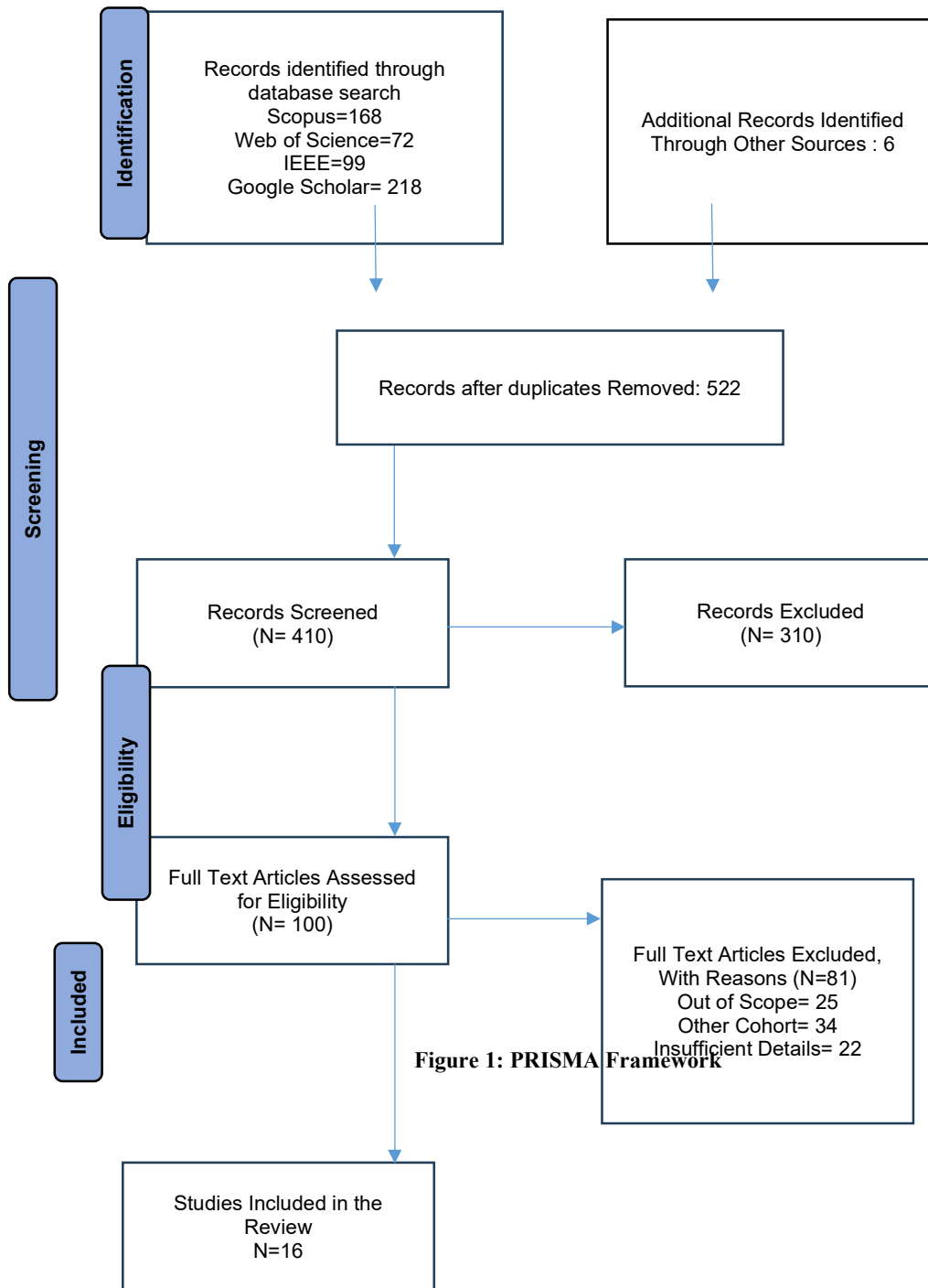


Figure 1: PRISMA Framework

3. Table of results

Selected papers, themes and objectives

Theme	Objective	Related Papers & Authors
Design Thinking and Knowledge Management Practices	To analyze the role of design thinking in enhancing knowledge management practices within IT companies.	Numprasertchai, S., & Numprasertchai, H. (2024); Ahmad, N., Lodhi, M. S., Zaman, K., & Naseem, I. (2017)

Design Thinking and Organizational Performance	To evaluate the relationship between design thinking implementation and organizational performance in IT companies.	Eradatifam, M., Heydarabadi, S., & Shahbazi, A. (2020); Fischer, S., Lattemann, C., Redlich, B., & Guerrero, R. (2020)
Challenges in Integrating Design Thinking with Knowledge Management	To identify the challenges in integrating design thinking with knowledge management systems in IT companies.	Selamat, M. H., & Zhang, Y. (2020); Abubakar, A. M., Elrehail, H., Alatailat, M. A., & Elçi, A. (2019)
Best Practices in Design Thinking Implementation	To identify best practices in integrating design thinking with knowledge management systems in IT companies.	Elsbach, K. D., & Stigliani, I. (2018); Davis, J., Docherty, C. A., & Dowling, K. (2016)
Impact of Design Thinking on Innovation in IT Companies	To evaluate how design thinking influences innovation within IT companies.	Starostka, J. (2014); Cousins, B. (2018)

Table 2: Selected papers, themes and objectives

4.1 Paper Summaries and Research Objectives

Author and Dates	Type of Study	Titles	Summary
Numprasertchai, S., & Numprasertchai, H. (2024)	Case Study	The Integration of Knowledge Management and Design Thinking for Improving Problem-Solving Skills	The study examines how integrating knowledge management (KM) with design thinking (DT) enhances problem-solving skills in a service agency in Thailand. Through a three-phase approach, including workshops and idea monitoring, the integration led to better problem understanding and innovative solutions.
Eradatifam, M., Heydarabadi, S., & Shahbazi, A. (2020)	Empirical Survey	The Impact of Design Thinking on Innovation	This paper explores how design thinking influences product, process, and organizational innovation. Using data from 95 organizations in Tehran, the study finds that design thinking significantly contributes to innovation across various aspects of organizational development.
Starostka, J. (2014)	Qualitative Study	Design and Design Thinking in Building an Innovative Organizational Culture	The study analyzes the impact of design and design thinking on organizational culture in companies from Sweden and Poland. It highlights how interdisciplinary teams and design methods like fast prototyping influence a company's culture, supporting innovation and creativity within organizations.
Selamat, M. H., & Zhang, Y. (2020)	Cross-Sectional Survey	The Impact of Design Thinking on Innovative Behaviors, With the Mediating Effect of Knowledge Sharing	The study investigates how design thinking impacts innovative behaviors in employees, with knowledge sharing acting as a mediator. Using data from 432 employees in China, it concludes that design thinking enhances both communication design and knowledge

			sharing, leading to increased innovative behaviours.
Elsbach, K. D., & Stigliani, I. (2018)	Literature Review	Design Thinking and Organizational Culture: A Review and Framework for Future Research	This review focuses on how design thinking tools influence organizational culture. The authors explore how design thinking's experiential nature fosters specific organizational cultures, and vice versa, while proposing a framework for future research to better understand design thinking in organizational contexts.
Fischer, S., Lattemann, C., Redlich, B., & Guerrero, R. (2020)	Longitudinal Case Study	Implementation of Design Thinking to Improve Organizational Agility in an SME	This paper presents a two-year study on how implementing design thinking in an SME enhances organizational agility. The research shows that design thinking fosters an agile subculture within the company, positively affecting communication, organizational culture, and operational activities over time.
Abubakar, A. M., Elrehail, H., Alatailat, M. A., & Elçi, A. (2019)	Theoretical Framework	Knowledge Management, Decision-Making Style and Organizational Performance	The paper proposes a framework connecting knowledge management, decision-making styles, and organizational performance. It suggests that decision-making styles moderate the relationship between knowledge creation processes and performance, emphasizing the role of knowledge management in Industry 4.0 contexts.
Cousins, B. (2018)	Theoretical/Empirical	Validating a Design Thinking Strategy: Merging Design Thinking and Absorptive Capacity	The study validates design thinking as a dynamic capability, merging it with absorptive capacity theory. It provides empirical evidence that design thinking enhances absorptive capacity, thereby improving an organization's ability to integrate, learn, and reconfigure knowledge for a competitive advantage.
Davis, J., Docherty, C. A., & Dowling, K. (2016)	Case Study	Design Thinking and Innovation: Synthesizing Concepts of Knowledge Co-Creation in Spaces of Professional Development	This paper explores the relationship between design thinking and knowledge creation in professional development settings. Using a case study in the social services sector, it finds that design thinking aligns well with relational enablers for knowledge creation, promoting innovation and knowledge sharing.
Ahmad, N., Lodhi, M. S., Zaman, K., & Naseem, I. (2017)	Empirical Study	Knowledge Management: A Gateway for Organizational Performance	This study empirically tests the impact of knowledge management practices on organizational performance in universities in Pakistan. It finds that effective knowledge management, supported by IT and organizational learning, significantly enhances the

			performance of higher education institutions.
Knight, E., Daymond, J., & Paroutis, S. (2020)	Theoretical/Conceptual	Design-Led Strategy: How to Bring Design Thinking into the Art of Strategic Management	The article introduces "Design-Led Strategy," integrating design thinking into strategic management. It identifies four archetypal practices for using design thinking in strategy, providing insights into how managers can incorporate design thinking into their strategic planning processes for enhanced outcomes.
Kummitha, R. K. R. (2019)	Qualitative Study	Design Thinking in Social Organizations: Understanding the Role of User Engagement	This qualitative study investigates the adoption of design thinking in social organizations in India. The findings suggest that user engagement plays a critical role in the successful implementation of design thinking, with users acting as intermediaries between designers and the community, fostering organizational efficiency.
Verma, P., Kumar, V., Daim, T., & Sharma, N. K. (2023)	Empirical Study	Design Thinking Framework Toward Management Control System in Environmental Dynamism: An Innovation Perspective	The article examines the relationship between design thinking and management control systems in dynamic environments. It finds that design thinking is strongly linked with interactive control systems (ICSs) and sustainable competitive advantage, proposing a framework for integrating design thinking in businesses considering environmental factors.
Dobrigkeit, F., & De Paula, D. (2019)	Industry Case Study	Design Thinking in Practice: Understanding Manifestations of Design Thinking in Software Engineering	This case study explores the application of design thinking in software engineering, showing how it manifests in different aspects of software development, team spaces, and processes. The findings highlight how exposure to design thinking shifts the mindset of employees, integrating it into various stages of software projects.
Lewis, M., Hayward, S., & Hornyak, R. (2017)	Case Study	Design Thinking: Breaking Fixation for New Relationships Between Organizations	The study presents how design thinking can be applied in interorganizational relationships to create higher levels of value creation. Using a case study of a logistics company and a technology firm, the authors demonstrate how design thinking breaks rigidity in partnerships, fostering innovation and new value creation.
Björklund, T., Hannukainen, P., & Manninen, T. (2018)	Mixed Methods Study	Measuring the Impact of Design, Service Design and Design Thinking in Organizations on Different	This study maps the metrics for measuring the impact of design, service design, and design thinking across different organizational maturity levels.

		Maturity Levels	The findings suggest that as organizations mature in their use of design thinking, they adopt more nuanced internal metrics, shifting the focus from legitimization to development.
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Table 3: Paper summaries and Research Objectives

4. Thematic Analysis

5.1 Design Thinking and Knowledge Management Practices

There has been a growing interest in design thinking as a tool in the improvement of KMS practices in IT firms because of its ability to help transform the way that organizations acquire, facilitate, and apply the assets. When design thinking is incorporated with KMS, it provides a well-conducted manner to the process by ensuring the proper handling of the techniques, which is vital in the IT industry for innovating solutions to issues. Some of the research work done on this integration include Numprasertchai and Numprasertchai (2024) and Ahmad et al. (2017) that showed the various positives of integrating it.

Numprasertchai and Numprasertchai (2024) consider a knowledge management case of a service agency in Thailand implementing design thinking. Their conclusions have shown that design thinking not only allowed the employees to clarify and categorize real issues but also to come up with proper solutions. Since design thinking is systematic in nature, it became integrated with the existing knowledge management practices and therefore improved the practice of knowledge sharing readiness.

Similarly, Ahmad et al. (2017) notes the role of the design thinking on knowledge management in higher education institutions. Their studies have proven that the incorporation of design thinking principles results in an improved organizational performance of these institutions in their knowledge management systems. This is mostly due to the increased convergence in design thinking where designers involve various stakeholders and the end-users in the knowledge management process thereby improving decision making and innovation.

In sum, the use of design thinking in the actualization of knowledge management in IT organizations brings significant value to these organizations by offering an organizational knowledge leveraging framework to the IT companies.

5.2 Design Thinking and Organizational Performance

The findings of the study reveal that the adoption of design thinking has a positive effect on the organizational performance within IT industry organizations in regard to factors including innovation, efficiency and agility. Hence, design thinking with its strong focus on user centered processes and solution development strategies gives organisations the relevant tools and processes that can help it solve complicated market issues. The researchers like Eradatifam et al., (2020) and Fischer et al. , (2020) present concrete evidence of the effects of implementing of design thinking in boosting performance in the organization.

In this study, Eradatifam et al. (2020) aims to know the role of design thinking in innovating the IT companies. Another study conducted by these authors indicates that through including a wide range of stakeholders in the process of designing new products and services, organizations obtain better outcomes and better respond to customers’ needs. It also promotes creativity in working as well as shortens the development cycle so that such solution can be taken to the market much faster.

Fischer et al. (2020) also explain in more details how design thinking improves the levels of organisation readiness and resilience. Their article focuses on a two-year initiative in an SME that introduced design thinking in the company’s growth

processes. It revealed that because of design thinking, an agile subculture was adopted at the organisational level within the company that evolved over time. This shift moved the focus towards agility which enabled the company to respond faster to the changes thereby enhancing both operational effectiveness and tactical flexibility.

Consequently, the use of design thinking in IT firms fosters innovation while at the same time enriching the organisational performance due to increased productivity and flexibility. This puts IT companies in a vantage place to be more competitive and improve their preparedness in a ever evolving business market.

5.3 Challenges in Integrating Design Thinking with Knowledge

However, the implementation of design thinking in conjunction with existing knowledge management systems used in IT companies has been noted to pose a few challenges which are more or less as follows; According to Selamat and Zhang (2020) and Abubakar et al. (2019) the above are some challenges that need to be understood by executives to ensure they plan for integration carefully and strategically.

Selamat and Zhang (2020) all focus on the problem of the resistance to change which is another challenge inherent in the transition to design thinking in the field of knowledge management systems. The employees steeped in the paradigm of the traditional practices of knowledge management are likely to regard design thinking as the interloper that forces them to shift to new behaviors and ways of working. This resistance is usually coupled with low comprehension of design thinking as having positive impacts and this calls for better training and communication strategies in order to increase acceptance.

Other authors such as Abubakar et al. (2019) also expand on why design thinking could be hard to integrate with conventional knowledge management practices. They note that the methods involved with design thinking are more flexible and involved with iteration, which is hard to decipher with most current knowledge management systems and frameworks that are more static and linear in their organization. This misfit can cause several problems and confusion and will not be good for the organizations' performance if not solved appropriately. The integration process of the new product suggests the leaders change the orientation of people at all levels; in this process the leaders have the overall responsibility on the promotion of the change of mind set and the new acquired processes.

In conclusion, the difficulties which may be encountered when applying design thinking together with knowledge management systems in IT companies are numerous while not unmanageable. To overcome these challenges there needs to be well thought out planning, good communication and above all creating an organisational climate that fosters positive change.

5.4 Best Practices in Design Thinking Implementation

For proper implementation of the design thinking in the knowledge management systems of the IT companies, the following best practices must be followed which will help to make the transition very smooth. The studies by Elsbach and Stigliani (2018) and Davis et al. (2016) show the guidelines for this kind of practice: building the culture of free collaboration, applying the tools, based on the Design thinking concept, training the employees.

Elsbach and Stigliani (2018) insist on the fact that the hierarchical organization of the company decision making process has to support active collaboration as the ultimate prerequisite for the integration of design thinking. Cohesively, this means that through cross functional teams structures it is easier for teams to come up with innovative solutions to problems since they harness the strengths of individual workers from that field. This is important when it comes to design thinking and the timely dissemination and use of knowledge to help enhance functions to the maximum across organizations.

According to Davis et al. (2016), the major aspect to be stressed is the right approach to design thinking tools and frameworks. These works include brainstorming sessions, prototyping, and other user-centered design research activities are essential to make the design thinking approach integrate into the business processes of the IT companies. If applied aptly, these tools facilitate teams to approach any problem-solving situation in a more sound and creative manner keeping in view, the augmentation of efficacy in Knowledge Management as an eventual goal.

Both studies also stress the importance of proper training programs that will provide adequate knowledge about the design thinking methodology and knowledge management. This training assists to develop the awareness within the organization of the new processes and it influences how to incorporate design thinking in the organization so that all the people in the organization come to understand and get ready to run their organizations in this new way.

Finally, this paper has established that the role of disseminating, encouraging and managing the collaboration process, as well as using the appropriate tools in the design thinking process, it is essential to integrate the knowledge management system as part of the design thinking tool kit, along with offering efficient and intensive training. Such strategies afford IT companies an ideal chance to maximize on the application of design thinking to improve their knowledge management.

5.5 Impact of Design Thinking on Innovation in IT Companies

It has been established that design thinking is one of the leading factors that can help drive innovation in the information technology businesses with regards to generating new products, services, and procedures. The research done by Starostka (2014) and Cousins (2018) helped to wipe out myths about the absence of design thinking structure and prove that this approach to creativity enhances workflows and helps to overcome systematic methodologies to achieve remarkable results.

Starostka (2014) brings out the argument that practice of design thinking fosters innovation by emphasizing cross functional cooperation, and customer focus. In Information technology firms where there is high density of technology change and high degree of competition design thinking provides a structured process of probing and experimentation. This creates the opportunity for firms to progress their products and services at a fast pace through the unique approach of innovation-diplomacy, thus shortening the time it takes to take the innovations to the consumers in the market. Thus, the study also brings out that design thinking does not only entail the ability to create unique ideas but the ability to translate those ideas into innovative solutions that solve user needs.

Cousins (2018) also goes further to discuss how design thinking support firms to build their dynamic capabilities for sustaining innovation. The study demonstrates how new knowledge can be more effectively incorporated into IT firms' strategic processes with the help of design thinking. This makes it possible, especially in the IT market which shifts with high velocity than most other industries. Design thinking thus serves as an enabler as well as a tool of innovation that helps organizations to sustain innovation.

Therefore, it can be concluded that innovation in the IT companies is influenced greatly with the help of the design thinking that enshrines both creativity and framework for coming up and implementing ideas to reality. By such a strategy, the IT company can manage to create sustainable innovation and guard against obsolescence in the fast-growing technological environment.

5. Discussion

The recent research study proves the given concept by identifying the relationship of design thinking with knowledge management and organizational performance in global firms operating in IT sector. These findings suggest the need for adopting design thinking into various aspects of knowledge management for organizations to capture consumers' perspectives and centralize approaches that consider consumers at the core. There is evidence that having a more rigorous design thinking processing to the efficient and effective KM programs improves the organisational effectiveness, cost-optimisation and managing risks (Chadah, 2020). These findings are consistent with previous studies, proving the application of theoretically derived design thinking to maximize innovation and facilitate strategic objectives.

Implementation of design thinking in knowledge management practices in the IT organizations supports innovation practices in these organizations besides enhancing a continuous improvement culture (Chowdhury, 2018). This approach promotes the fact that individuals or teams are to apply multiple cycles when solving problems, which in essence provides a favorable environment and a favorable time framework for developing new ideas that, in the next cycle, may go through preliminary or even final development. Through equal incorporation of empathy and put users first at the center of

knowledge management, design thinking guarantees that solutions being developed responds to the dynamic needs of the users (Manab and Aziz, 2019). This emphasis on what the users require or what needs to be achieved in an organization makes these knowledge management systems even more relevant and effective with improved innovations as the end product. In addition, since the goal of the design-thinking approach is to create processes that are repeatable and can continuously be improved, these systems are constantly tuned to the new changes in the technological environment.

Furthermore, this integration of design thinking to knowledge management practices transforms the way organizations learn and implement their development. A concept of design thinking revolves around collaboration, and design solutions involve engagement of an organizational structure system's multitude of a stakeholder's input. This openness does not only enhance the value of knowledge management efforts but also encourages the sharing of knowledge, therefore supporting the polity of the wise (Wahl, 2018). To do that it is important that the top management of IT companies must understand how to use the collaborative ethos as a device to counteract the evils of the silo working practices and thereby free up the knowledge and information flow within the organization. Both of these factors also have a positive effect on understanding the customer and their needs better, which will ideally lead to the creation of new products and services that will be more likely to positively affect their daily lives. Finally, here is what knowledge management and design thinking as a method of its implementation within IT companies will allow: an environment is created that is more responsive to change, innovation, and the client, which will help organizations adapt to the challenges of the modern business world most effectively.

6. Conclusion

The adoption of design thinking into the KM practices within the IT companies is a clear shift towards more innovative and efficient organizational processes. In this systematic literature review, the various and diverse changes that design thinking has on knowledge management and organisational performance have been pinpointed. First, design thinking not only revolutionizes the production of knowledge at organizational level but also influences the performance and dynamics of those organisations through innovation, organizational efficiency, and flexibility. Nonetheless, the implementation of design thinking as outlined herein is not without its drawbacks especially in the case of incorporation with working knowledge management systems charge and managing interactive systems resistance. The works analysed in this paper underline the significance of implementing a strategic approach to the design thinking, along with identifying the main guidelines for its effective implementation, including collaborative approach and staff training. Lastly, design thinking comes out to be an effective strategy for the IT companies to stay relevant and continue to adapt and innovate in the highly dynamic market environment.

7. Implications

It is unarguably established that the review outcomes of this work are critical and valuable to the practitioners and scholars in the realms of IT and organizational management. To the practitioners, the use of design thinking as proposed in the study provides a directional guide on how their organisations can improve on the knowledge management and application of design thinking. Thus, using the best practices described in the paper, IT companies will be able to do it in a more effective way and minimize the difficulties that are appearing when implementing new methodologies into the current work environment. The latter is especially true in the context of today's rapidly developing technological world, in which the strong and intricate response can make or break for a particular company. From scholars' perspective, this review suggests the significance of research focusing on how design thinking enhances and harms the performance of organizations; moreover, it outlines the necessity of exploring the ways of enhancing the positive impacts of design thinking. It is also possible to identify the need for investigation of the effects of the design thinking on the organizational culture and outcome over longer period of time as well as the effects of different industries. Therefore, incorporating design thinking in knowledge management practices is quite desirable as it offers a route to improving the organizational performance and ensures competitive advantage in IT sector.

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