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PROCESSES IN AUDITING AND
CONSULTANCY FIRMS

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Abstract

The doctoral dissertation examines knowledge management processes and their effect on sustainable organisational performance, also the impact of human (trust, interaction and self-efficacy), organisational (rewards, organisational culture, teamwork and organisational structure) and technological factors (information technology and social networks) on the knowledge management cycle including five processes (acquisition, creation, storage, sharing and application), focusing on the knowledge-intensive field of auditing and consultancy, which lacks research of knowledge management processes in the developing economies of the Mid-East region (Lebanon, Syria, and Jordan). The dissertation aims to measure knowledge management processes in auditing and consultancy firms by creating a model allowing for a complex assessment of different human, organisational, and technological factors affecting the processes and forming decisions to enhance the process implementation in auditing and consultancy firms to improve sustainable organisational performance. Scientific literature analysis, expert evaluation, and structural equation modelling (SEM) techniques were used to test the hypothesised research model and analyse the relationship between the variables. The empirical study results proved the significant and positive effects of knowledge management processes on sustainable organisational performance. It determined significant positive effects of trust, interaction, self-efficacy, rewards, organisational culture, teamwork, organisational structure, information technology, and social networks on the knowledge management processes cycle. Some exceptions were related to the effects of interaction on knowledge sharing, rewards on knowledge application, organisational culture on knowledge acquisition, information technology on knowledge acquisition, and social networks on knowledge application. Based on the results, the model for measuring knowledge management processes was created for auditing and consultancy firms. Similar organisations operating in the knowledge-intensive sector would also benefit from considering the positive association between knowledge management processes and sustainable organisational performance and the demonstrated positive effects of specific factors on the knowledge management cycle. These practical implications are relevant to a wider culture that guides sustainable organisational performance to the members and stakeholders of organisations, which, in turn, benefits society and contributes to the improvement of developing economies.

Reziomė

Daktaro disertacijoje nagrinėjami žinių valdymo procesai ir jų poveikis organizacinės veiklos tvarumui, žmogiškųjų veiksnių (pasitikėjimo, tarpusavio sąveikos ir saviveiksmingumo), organizacinių veiksnių (atlygio, organizacinės kultūros, komandinio darbo ir organizacinės struktūros) ir technologinių veiksnių (informacinių technologijų ir socialinių tinklų) poveikis žinių valdymo ciklui. Ciklas apima penkis žinių valdymo procesus (įgijimą, kūrimą, saugojimą, dalijimąsi ir taikymą) audito ir konsultavimo srityje, kurioje trūksta tyrimų, nagrinėjančių žinių valdymo praktikas besivystančiuose Vidurinių Rytų regiono ekonomiose (Libane, Sirijoje ir Jordanijoje). Disertacijos objektas – žinių valdymo procesų vertinimas audito ir konsultavimo įmonėse. Disertacijos tikslas – sukurti žinių valdymo procesų vertinimo modelį, leidžiantį kompleksiskai įvertinti skirtingus žmogiškuosius, organizacinius ir technologinius veiksnius, darančius įtaką žinių valdymo procesams ir priimti sprendimus, siekiant gerinti tų procesų įgyvendinimą audito ir konsultavimo įmonėse, kas susiję su tvarios organizacinės veiklos gerinimu. Hipotezių tyrimo modeliui patikrinti ir tarp kintamųjų analizuoti buvo taikyta mokslinės literatūros analizė, ekspertų vertinimas (struktūruotas klausimynas) ir struktūrinis lygčių modeliavimas (angl. SEM). Empirinės studijos rezultatai patvirtino svarbų ir teigiamą žinių valdymo procesų poveikį organizacinės veiklos tvarumui bei teigiamą poveikį pasitikėjimui, tarpusavio sąveikai, saviveiksmingumui, atlygiui, organizacinei kultūrai, komandinei darbo kultūrai, organizacinei struktūrai, informacinėms technologijoms ir socialiniams tinklams žinių valdymo cikle, išskyrus aspektus, susijusius su tarpusavio sąveikos poveikiu dalijimuisi žiniomis, atlygio poveikiu žinių taikymui, organizacinės kultūros poveikiu žinių įgijimui, informacinių technologijų poveikiu žinių įgijimui ir socialinių tinklų poveikiu žinių taikymui. Remiantis šiais tyrimo rezultatais, buvo sukurtas žinių valdymo procesų vertinimo modelis audito ir konsultavimo įmonėms ir organizacijoms, veikiančioms žinioms imliuose sektoriuose, kurioms būtų naudinga atsižvelgti į tyrimo metu nustatytą teigiamą ryšį tarp žinių valdymo procesų ir tvarios organizacinės veiklos bei nustatyto specifinių žmogiškųjų, organizacinių ir technologinių veiksnių teigiamo poveikio žinių valdymo ciklui. Šie praktiniai rezultatai yra svarbūs platesniam kultūriniam kontekstui, kuris gali padėti organizacijų nariams ir suinteresuotiesiems subjektams atsižvelgti į teigiamą žinių valdymo poveikį tvariam organizacinės veiklos veikimui. Tai savo ruožtu būtų naudinga visuomenei ir prisidėtų prie besivystančių šalių ekonomikų plėtojimo.

Notations

Abbreviations

KM – Knowledge management
KMPs – Knowledge management processes
SEM – Structural Equation Modeling
SPSS – Statistical Package for Social Science
Amos – Analysis of a moment structures
IT – Information technology
MNC – Multinational companies
SMEs – Small and medium-sized enterprises
ICT – Information and communication technology
PCT – Project Change Triangle
 R^2 – R-Squared

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Introduction

Problem formulation

Globalisation and digital transformation technologies in the new era have brought many business challenges and threats (Limsangpetch et al., 2022). Growing innovation increased the demand for creativity, uniqueness, and technological development and contributed to rising market competition (Bem Machado et al., 2022). Organisations were driven to seek new opportunities and to adapt to changes to satisfy stakeholders' needs and improve organisational performance (Spanellis et al., 2021). These changes affected society's information needs and predominant organisations' structural issues. Also, they created many threats for organisations (Min et al., 2022) that were striving to adapt to new technological, economic, and social trends (Migdadi, 2020; Pawlowski & Bick, 2012) to create and develop uniqueness faced with increased competition in the complex and dynamic environment (Raudeliūnienė et al., 2018). The organisation's knowledge-based perception considers intellectual resources as an important organisational asset that sustains competitiveness and uniqueness (Mahdi et al., 2019). Thus, knowledge became the main source of differentiation and a strategic resource that changed the rules of competition (Ogbonna & Harris, 2015), the management practices (Rezaei et al., 2021), and the strategy formation process (Szczepańska-Woszczyzna, 2018). Organisations are then urged to develop and strengthen their

KM cycle and efficiently manage and implement their knowledge (Shahzad et al., 2016) to improve their performance (Youssef et al., 2017) and achieve uniqueness and leadership in the challenging market (Valmohammadi & Ghassemi, 2016). Worldwide, more than USD 600 million are invested annually by the World Bank in knowledge services, and around USD 4 billion per year are spent through loans, budget, and partnership activities in services. However, despite all these investments in KM systems, organisations face a loss of around USD 31.5 billion each year by failing to achieve their KM goals efficiently (Silva & Marques, 2020). Studies report that most KM systems have failed, resulting in huge losses because organisations could not identify their knowledge requirements properly and implement the appropriate strategies that meet those requirements (Spanellis et al., 2021). The challenge for organisations remains to develop and implement the key KMPs that would best support the organisational strategies and goals and to integrate the main factors that sustain KMPs to reach the desired outcomes.

Relevance of the dissertation

The increasingly significant role of knowledge as a unique source positively affecting organisational performance has motivated organisations to consider KM as an efficient approach to different management practices and a means to control access to opportunities and advancement in the twenty-first century when 80% of the biggest companies in the world have implemented KMPs (Migdadi, 2020). KM became known as a discipline at the beginning of the 1990s (Pauleen & Wang, 2017). Over the years, it became of interest to academics, consultants, and business managers observing the challenges faced by their organisations (López-Torres et al., 2019) and scientists and practitioners studying KMPs and their effect on organisational performance (Duke et al., 2022). Most researchers have recognised KM as a crucial factor for an organisation's success (Kavalić et al., 2021; Mehta, 2008) since it positively affects employee and customer satisfaction (Victor & Hoole, 2017) and efficiently increases sustainable organisational performance (Mageswari et al., 2017), building organisational uniqueness in the current dynamic environment (Qandah et al., 2020). Prior research outlined the role of organisational strategy in shaping a successful and effective organisational KM cycle through the support of different human, organisational, and technological factors (Fernandes, 2018). These factors are called to motivate employees and develop strategies and rules that organise the implementation of the KMPs, which would lead to improving the organisational outcomes (Low et al., 2020). In developing countries of the Mid-East region, organisations are still reluctant to implement KMPs (Kassab, 2016) and maintain employee commitment to partake in the

KM cycle (Elwany & Mahrous, 2016). The KM novelty has been recently introduced in the Mid-East countries, which are potential KM users transitioning towards knowledge-based economies (Kassab, 2016). The context of the knowledge-intensive sector in the Mid-East developing countries selected in this study is useful in filling the research gap in this specific context (Tarek et al., 2017). Measuring KMPs is crucial for this sector to effectively manage the knowledge assets and to ensure that the KM initiatives are aligned with the overall business objectives (Centobelli et al., 2019).

Research object

The research object is a measurement of KMPs in auditing and consultancy firms.

Aim of the dissertation

The research aims to create a model for measuring KMPs to allow for a complex assessment of different human, organisational, and technological factors affecting KMPs and forming decisions to enhance the implementation of those processes within the knowledge-intensive sector of the Middle Eastern auditing and consultancy to improve sustainable organisational performance.

Tasks of the dissertation

1. To review scientific KM research, KMPs, KMPs factors, and criteria to identify the research problems and form the hypothesised research model.
2. To evaluate the auditing and consultancy sector in the Mid-East region to examine the relationship of KMPs with the performance of these companies and various factors affecting the KMPs.
3. To test the results of the research analysis related to KMPs in Middle Eastern auditing and consultancy firms through the general model for measuring KMPs.

Research methodology

To investigate the object, the following research methods are applied:

- Theoretical part: a scientific literature review is prepared by analysing previous research approaches and findings related to KMPs and the factors affecting them. Besides, systemic and comparative analyses were conducted to identify the most important KMPs that would significantly influence sustainable organisational performance. In addition, human, organisational, and technological factors were examined to identify the factors that would significantly affect KMPs within organisations. The research hypotheses were formulated according to this part's findings.
- Research part: a hypothesised research model was created, and the proposed hypotheses were tested quantitatively. A structured questionnaire was distributed among experts to collect the data required for analysis. Statistical methods like correlation and structural equation modeling techniques were applied to generate quantitative results for Middle Eastern auditing and consultancy firms.
- Project part: a test of the research model and the analytical results is prepared for Middle Eastern auditing and consultancy firms. The model is created for measuring KMPs and assessing different human, organisational, and technological factors affecting KMPs within the knowledge-intensive sector of Middle Eastern auditing and consultancy firms.

The scientific novelty of the dissertation

Measuring KMPs in Middle Eastern auditing and consultancy firms is one of the very few research studying KMPs in the Mid-East region, where KM is considered a novel concept. The study identifies the key drivers for optimising KMPs in the knowledge-intensive sector, auditing and consultancy firms to improve their performance and gain a knowledge-based sustainable competitive advantage.

Despite some prior research concerning the impact of KM practice on organisational performance, evidence is still lacking for the influence of the whole KM cycle, including five KMPs, on sustainable organisational performance, as well as the impact of various human, organisational, and technological factors on the KMPs implementation, particularly in the context of the knowledge-intensive sector including auditing and consultancy in the developing economies of the Mid-East region.

The practical value of the research findings

The practical value of the research findings lies in the development of a new approach for measuring the efficiency of KMPs and managing the knowledge cycle in a knowledge-intensive sector, especially auditing and consultancy firms, by focusing on specific human factors, such as trust, interaction, and self-efficacy; organisational factors, such as rewards, organisational culture, teamwork, and organisational structure; and technological factors, such as IT and social networks.

By implementing the research findings and supporting the main factors that would affect the KM cycle positively, managers of auditing and consultancy firms can improve the efficiency of organisational processes to achieve better outcomes for their stakeholders and sustainable organisational performance.

Defended statements

1. The efficient implementation of the KM cycle involving five KMPs (acquisition, creation, storage, sharing, and application) within the organisation's activities improves the sustainable performance of organisations operating in a knowledge-intensive sector in developing countries.
2. Human, organisational, and technological factors, specifically trust, interaction, self-efficacy, rewards, organisational culture, teamwork, organisational structure, IT, and social networks, significantly positively influence the KMPs (acquisition, creation, storage, sharing, and application) implementation and improve sustainable performance in organisations operating in a knowledge-intensive sector in developing countries.
3. The model for measuring KMPs significantly influences the management decision to support human, organisational, and technological factors that positively affect the efficient implementation of the KM cycle leading to sustainable organisational performance.

Approval of the research findings

Five articles on the topic of the dissertation have been published: four in journals abstracted and indexed in international scientific databases and one in conference proceedings. Details are provided in the section "List of scientific publications by the author on the topic of the dissertation".

In addition, presentations of the research findings were given at seven international conferences and scientific seminars, four in Lithuania and three abroad:

- 1st International Scientific and Practical Internet Conference “Science Research and Innovation”, April 7, 2022, Dnipro, Ukraine.
- Scientific seminar at the Modern University for Business and Science (MUBS), May 24, 2021, Damour, Lebanon.
- International Scientific Conference, “Contemporary Issues in Business, Management and Economics Engineering”, May 13–14, 2021, Vilnius, Lithuania.
- International Conference on Business Management and Social Innovation, June 8, 2019, Abu Dhabi, UAE.
- International Scientific Conference “Contemporary Issues in Business, Management and Economics Engineering”, May 9–10, 2019, Vilnius, Lithuania.
- 10th International Scientific Conference, “Business and Management”, May 3–4, 2018, Vilnius, Lithuania.
- 21st Lithuanian Young Scientists Conference “Business in the 21st Century”, February 8, 2018, Vilnius, Lithuania.

The structure of the dissertation

The dissertation has the following sections: an introduction, three chapters (The First Chapter: Literature review; The Second Chapter: Research; The Third Chapter: The proposed model), general conclusions, references, a list of publications and presentations by the author on the topic of the dissertation, a summary in Lithuanian, and annexes. The total scope of the doctoral dissertation is 149 pages, excluding the annex. It contains four numbered formulas, 24 tables, 15 figures, and 306 references.

1

Theoretical aspects of knowledge management processes and influencing factors

The First Chapter aims to analyse scientific research in knowledge, KM, KMPs, KMPs factors, and criteria to allow for the examination of the relationship between different factors and KMPs with their effects on sustainable organisational performance.

The First Chapter findings have been published in scientific papers (Kordab, 2020; Kordab & Raudeliuniene, 2018; Raudeliuniene et al., 2021).

1.1. Knowledge management process peculiarities and sustainable organisational performance

This section of the literature review analysis introduces the term knowledge, the definition of knowledge based on different scientific interpretations, various types of knowledge, and knowledge benefits.

To analyse knowledge, scientists differentiated between three terms: data, information, and knowledge. Data consists of raw facts and numbers of little

value, not contributing to decision-making and planning processes (Kang & Kim, 2013; Vrandečić et al., 2005). Data is transformed into information when set in a specific context (Biygautane & Al-Yahya, 2011; Fu et al., 2006). Information consists of organised and meaningful data, which is the basis for actions (Anand et al., 2015). It is the human capacity to interpret the information acquired and convert it to knowledge that gives individuals a chance to build up their particular instinct and advancement (Little & Deokar, 2016). The organised information and procedures in information systems and repositories and individuals' minds are referred to as knowledge (Massingham & Al Holaibi, 2017). Knowledge is defined as the gain of certain expertise (K. Shahzad et al., 2016; Ward & Aurum, 2004), reasonable beliefs (Fang et al., 2013; Koh et al., 2005) and personal capabilities (Rezaei et al., 2021; Wu & Lee, 2007), the combination of know-how (Akbari & Ghaffari, 2017; Rangachari, 2009) with the skills and techniques (Anand et al., 2015), and individuals' values held during their life (Mahdi et al., 2019; K. Shahzad et al., 2016). Knowledge is more likely to be embedded in individuals' minds and social processes rather than in computer databases (Akbari & Ghaffari, 2017; Malhotra, 2001) and may be retrieved and shared when needed (Bowen & Maurer, 2002; Henttonen et al., 2016). Knowledge is developed by combining internal and external organisational resources and competencies (Chou et al., 2005; Henttonen et al., 2016) to solve business problems (Massingham & Al Holaibi, 2017; Nunes et al., 2006), increase innovation (Ting et al., 2021; Wee & Chua, 2013) and improve sustainable organisational performance (Archer-Brown & Kietzmann, 2018; Jung et al., 2007). Accordingly, in this study, knowledge is described as a mix of skills, experiences, values, systems, and procedures that provide a structure for assessing and consolidating new knowledge initiated in the mind of the holder, stored in organisations' documents, repositories, procedures and standards of the organisations, and applied to achieve sustainable organisational performance.

Knowledge researchers have recognised and interpreted different types of knowledge. It could be classified as explicit and tacit, technical and cognitive, situational, conceptual and procedural. The most common classification of knowledge is explicit and tacit. Explicit knowledge is represented in the form of printed materials (Koh et al., 2005; Rozenfeld & Carlos, 2002), databases (Al-Alawi et al., 2007), and information repositories available in the organisations (Qandah et al., 2020), structured and codified in manuals or reports (Serban & Luan, 2002), and ready to be communicated and recorded in the organisational memory (Rothberg & Erickson, 2017). Explicit knowledge is a pure consideration of fundamental principles acquired through education (Gupta & Bhattacharya, 2016; Malik, 2021). This type of knowledge is transmitted and disseminated between individuals and organisations formally and systematically (Akbari & Ghaffari, 2017). On the other hand, tacit knowledge is implicit (Davidaviciene & Raudeliuniene, 2010), unstructured (Serban & Luan, 2002) and intangible

(W. Wu & Lee, 2007), including the values (Davidaviciene & Raudeliuniene, 2010) and expertise (Koh et al., 2005; Rangachari, 2009) incorporated in the organisational practices (Akbari & Ghaffari, 2017; Henttonen et al., 2016). Tacit knowledge, embedded in individuals' minds (Al-Alawi et al., 2007; King, 2009) and implanted in individuals' experiences (Finestone & Snyman, 2005; Rothberg & Erickson, 2017), is transferred through social interaction (Rothberg & Erickson, 2017), face-to-face communication (Fu et al., 2006), and practical application involving such different organisational activities as brainstorming and mentoring (Gupta & Bhattacharya, 2016), coaching and training (Kianto et al., 2016), direct observation and active participation in activities (Malik, 2021). Tacit knowledge is unrecorded and hard to express and analyse (Akbari & Ghaffari, 2017; Qandah et al., 2020). It is used in problem-solving and decision-making (Finestone & Snyman, 2005; Kang & Kim, 2013) and constitutes a source for continuous growth since it is difficult to be transferred or copied by competitors (Nunes et al., 2006; Rothberg & Erickson, 2017). Knowledge is also categorised as technical and cognitive. Technical knowledge is related to the individual's expertise (Rangachari, 2009), while cognitive knowledge refers to the individual's attitudes and social behaviours, including judgments and perceptions (Biygautane & Al-Yahya, 2011). Specialists have proposed that the application of both technical and cognitive knowledge is arbitrated by private and social models produced by the individual's social and cultural interaction, which affects the individual's knowledge (Linderman et al., 2004; Nunes et al., 2006). As people work, their cognitive knowledge forms extensive techniques and culture, enabling them to benefit their organisations. This reasoning has built up a perception of knowledge as a systematic representation of reality that might be found by individuals working alone or in a group (Massingham & Al Halaibi, 2017). Other types of knowledge were identified by Richter-Beuschel and Bögeholz (2020) as problem-solving enablers consisting of the situational knowledge that allows learners to deal with a specific situation, the conceptual knowledge that includes the principles, facts, and concepts to solve specific problems; and the procedural knowledge that allows the transfer of knowledge from one situation to another (Richter-Beuschel & Bögeholz, 2020).

Successful organisations constantly create new knowledge with minimal human, organisational, and technological resources (Acar et al., 2017; Linderman et al., 2004), spread and use knowledge to create uniqueness (Mahdi et al., 2019), enhance sustainability in their performance (Chiñón & Charles, 2020), and achieve the organisation's desired outcomes (Archer-Brown & Kietzmann, 2018; Schiuma et al., 2012). Thus, rather than competing based on physical and monetary capital, the achievement of organisations is affected by the knowledge and skills of their workers (Wee & Chua, 2013). Reliance on individuals' knowledge and

intellectual capacities at work is increasing over time since the organisations' success becomes dependent on the nature of knowledge available to produce and deliver better goods and services that satisfy customer needs and increase the company's sustainability (Anand et al., 2015). Accordingly, organisations have perceived knowledge as the main origin of uniqueness since it is difficult to imitate the power that creates value-added for the organisations and leads to achieving sustainable organisational performance (Akbari & Ghaffari, 2017; Derin et al., 2021). Knowledge, being one of the most crucial assets and critical organisational resources, contributes to improving the efficiency of the organisation's activities and systems as well as achieving sustainable organisational performance by increasing innovation and creating a source of competitive advantage. As it is a major inspiration for the growth of new resource areas, the concentration on knowledge development and utilisation keep rising, and the KM study and the necessity of integrating KMPs within the organisations' activities to achieve sustainability in performance are the focus of this study.

KM barriers and benefits: KM practice can be analysed from different perspectives, such as the artefact-oriented (K. Christensen & Bukh, 2009; Schmitt, 2021), technical (Alomari et al., 2020; Dei, 2021), and process-oriented (K. Christensen & Bukh, 2009; Ranjbarfard et al., 2014; Raudeliūnienė et al., 2018; Raudeliuniene & Szarucki, 2019; Raudeliuniene et al., 2020; Tongo, 2015). The artefact-oriented perspective focuses on knowledge types that can be explicated, validated, and codified, supported by systems similar to administrative systems and information technologies that enable knowledge codification. It considers that knowledge is explicit in nature, so companies can codify and save the possessed knowledge in their systems where it could be retrieved at a later stage; thus, KM is based on collecting, saving, and disseminating the knowledge available (Christensen & Bukh, 2009). From the artefact-oriented perspective, KM depends on organisational memory and process manuals which makes it inadequate for handling management challenges related to the complex knowledge society, given the limited quality and content of the available materials (Schmitt, 2021). However, knowledge is embedded in social and organisational practices and relationships, implying that knowledge should be regarded more subjectively (Henttonen et al., 2016). From a technical perspective, KM systems refer to any kind of information systems that store and retrieve knowledge, trace knowledge sources, and search repositories to capture knowledge (Dei, 2021). These information systems support the management of knowledge by generating value from intellectual and knowledge-based assets by transferring them among individuals, departments, and other organisations to share best practices; thus, KM systems are knowledge databases that can be easily accessed (Alomari et al., 2020). Nevertheless, the application of KM systems within organisations requires both technical and non-

technical support through the integration of individuals, processes, and technologies to be successful (Dei, 2021; Lashari & Rana, 2018). On the other hand, the process-oriented perspective perceives knowledge as a dynamic human process (Christensen & Bukh, 2009), which emphasises the context in which knowledge is created, stored, and shared rather than the documents or the rules. From the process-oriented perspective, knowledge creation, storage, and sharing are considered continuous processes where knowledge can be transformed from tacit to explicit knowledge and transferred between individuals and technology within the organisation (Campanella et al., 2019; Chang & Lin, 2015). In contrast with the artefact-oriented perspective and the technical perspective, the process-oriented KM regards knowledge in an objective and a subjective manner, which contributes strategic value to the organisation and enables it to benefit from both tacit and explicit knowledge as well as the interaction between both types (Akbari & Ghaffari, 2017; Malik, 2021). In addition, the process-oriented KM perspective integrates individuals, processes, and technologies as parts of the KM systems where knowledge practices tie the value of knowledge to process performance throughout the KM cycle (Podrug et al., 2017; Tangaraja et al., 2015) to enhance its performance and achieve uniqueness. The process-oriented perspective is adopted in this research to study the most common KMPs, constituting the KM cycle that optimises knowledge value in the organisation. In addition, the study analyses different human, organisational and technological factors that affect the efficiency of KMPs, playing a mediating role between those factors and the ultimate sustainable organisational performance.

KM can be defined as strategies and rules combining business processes (Chugh et al., 2015; Hwang, 2016), human resource management and organisational behaviour (Hashemi et al., 2018; Qandah et al., 2020), and technology and software engineering (Anand et al., 2015; K. Shahzad et al., 2016). By adopting supportive human activities (Bican et al., 2017; Hegazy & Ghorab, 2015), organisational practices (Nowacki & Bachnik, 2016; Sergeeva & Duryan, 2021) and technological systems (Hwang, 2016), KM integrates the KMPs within the organisation's boundaries (Henttonen et al., 2016; Muthuveloo et al., 2017), facilitating tacit knowledge transformation into explicit knowledge (Chang & Lin, 2015) and transforming individual knowledge into corporate knowledge (Campanella et al., 2019). KM supports the organisations to benefit from the knowledge acquired, created, and stored in its repositories (Shamim et al., 2019; Tubigi & Alshawi, 2015), which leads to enhancing the efficiency of the decision-making and problem-solving processes (Bloodgood, 2019; Hegazy & Ghorab, 2015) and improving the organisation's sustainable performance by leading in the market and achieving uniqueness (Hashemi et al., 2018; Muthuveloo et al., 2017). In this study, KM is described as the set of strategies related to individual, organisational, and technological activities supporting the KM cycle to eliminate the knowledge

barriers and enable the implementation of KMPs, which leads to achieving sustainable organisational performance.

Identified barriers to KM in organisations assist in finding the relevant solutions and identifying the most important enablers that could lead to efficient KM implementation (Table 1.1).

Table 1.1. Barriers facing KM (created by the author)

Barrier description	Author, year
Transforming tacit knowledge into explicit knowledge	Merali, 2000; Casimir et al., 2012; Korbi and Chouki, 2017
The complexity of knowledge for decision-makers	Jonge, 2000; Biygautane and Al-yahya, 2011
Individuals' resistance to sharing knowledge	Karamat et al., 2018; Franco and Mariano, 2007; Dunford, 2000
Absence of employee motivation	Karamat et al., 2018; Veer Ramjeawon and Rowley, 2020
Top management support	Riege, 2005; Karamat et al., 2018; Veer Ramjeawon and Rowley, 2020
Building a knowledge-oriented environment	Merali, 2000; Woitsch et al., 2004; Karamat et al., 2018
The lack of technological infrastructure	Moreno and Cavazotte, 2015; Rowley & Veer Ramjeawon, 2020; Min, 2022
Inadequate information systems	Przysucha, 2017; Chion and Charles, 2020; Wei, 2022
The cost of technological resources	Veer Ramjeawon & Rowley, 2020

At the individual level, transforming tacit knowledge into explicit knowledge through social interaction and networks is a challenge (Korbi & Chouki, 2017; Merali, 2000), where some knowledge may need simplification to be useful for decision-makers (Biygautane & Al-Yahya, 2011; Jonge, 2000). Furthermore, an efficient KM system requires a change in the mindset and attitude of individuals towards sharing the knowledge held, as they might consider knowledge-sharing as losing power and influence (Dunford, 2000; Franco & Mariano, 2007; Karamat et al., 2018). Barriers also include employee resistance to partaking in the KM cycle due to the absence of motivation (Casimir et al., 2012; Karamat et al., 2018). At the organisational level, barriers include the lack of KM integration with organisational strategies and goals, which may prevent a knowledge-oriented environment and KM promotion (Karamat et al., 2018; Woitsch et al., 2004) in addition to the absence of top management support and reward systems that encourage

employees to get involved in the KM implementation (Karamat et al., 2018; Riege, 2005; Veer Ramjeawon & Rowley, 2020). Organisational culture is considered a barrier to KM if it does not focus on the value of knowledge and prevents its application in social interaction between organisational groups and in the decision-making process (Biygautane & Al-Yahya, 2011; Karamat et al., 2018); thus, building and maintaining an environment that encourages and facilitates KMPs is regarded as a challenge (Merali, 2000; Veer Ramjeawon & Rowley, 2020). At the technological level, the barriers consist of lacking the appropriate infrastructure that supports KMPs associated with the high cost of technological resources (Veer Ramjeawon & Rowley, 2020), inadequacies, and complexity of the information systems with the need for training on their appropriate use (Przysucha, 2017).

The barriers that have an adverse effect on the KM implementation in the organisation could be reduced by the organisation's management focusing on the most influential enablers at the different levels that would positively affect the KMPs, which play a mediating role between those enablers and sustainable organisational performance.

The KM benefits were examined by many scientists and identified as the development of staff (Herder & Weijnen, 1999; Qandah et al., 2020), the elimination of technological barriers (Przysucha, 2017), and the achievement of organisational outcomes (K. Shahzad et al., 2016; Spanellis et al., 2021). Through the adoption of staff practices, KM can develop the intellectual assets of a company (Qandah et al., 2020) by allowing employees from different departments to collaborate, share, and interpret knowledge resources (Spanellis et al., 2021; Vassiliou et al., 2000), which enhances employee abilities and competencies (Qandah et al., 2020; Spanellis et al., 2021). The technological resources of the organisation, such as hardware, software, and databases, would be upgraded to retain the employee knowledge and make it easily accessible to others when needed (Podrug et al., 2017); hence, the available knowledge would not be lost when individuals leave the organisation (Franco & Mariano, 2010). KM, backed with such organisational factors as leadership, teamwork, and organisational culture, facilitates the transformation of tacit knowledge into explicit knowledge (Shahzad et al., 2016) and enables its storage in the organisation's repositories, where it would be easy to extract for application (Shamim et al., 2019). This would serve to improve the efficiency of decision-making and problem-solving processes (Qandah et al., 2020) and achieve sustainable performance (Hegazy & Ghorab, 2015; Spanellis et al., 2021). Thus, supported by different human, organisational, and technological factors that help eliminate the knowledge barriers and positively affect the efficient implementation of the KM cycle, KM can assist the organisation in attaining the desired benefits and reaching sustainable organisational performance.

Based on previous scientific analyses, KM is a set of strategies and procedures supporting the KMPs integration within the organisation and enabling the

acquisition, creation, storage, sharing, and application of knowledge. Different barriers that challenge KM can be classified into human, organisational, and technological, which could be eliminated by adopting effective staff practices, organisational culture, and technological resources supporting KMPs to increase the efficiency of decision-making and problem-solving processes and to achieve sustainable organisational performance.

In this study, the effects of different human, organisational, and technological factors on KMPs and their contribution to sustainable organisational performance will be analysed to identify the most influential factors.

KMPs research models proposed by scientists between 2014 and 2021 were analysed to find their main gaps and areas for improvement to propose a new research model. Eleven models are presented in Tables 2 and 3, where the purpose of each model, the tested business sector and the geographical area, the studied KMPs, the methods used to test the model, and the model's limitations were addressed to create the new model and fill the evidence gap regarding the unstudied KMPs, the KM enablers, and the uncovered business sectors and geographical areas based on the previous models' limitations.

Some of the previous models proposed by Ho et al. (2014), Sangari et al. (2015), Kianto et al. (2016), Mageswari et al. (2017), Yusr et al. (2017), Jarmooka et al. (2020), and Ting et al. (2021) considered the impact of specific KMPs on organisational performance from different aspects supported by selected enablers. For instance, Ho et al. (2014) proposed a model to examine the effects of KM enablers on the knowledge circulation process characterised by creation, accumulation, sharing, utilisation, and internalisation from the perspectives of organisational culture and organisational structure, along with the effects of knowledge circulation process on job performance. The SEM technique was used to test the model in Taiwan-based enterprises, which expanded the perception of the relationships among KM enablers, knowledge circulation process, and job performance (Ho et al., 2014). This model includes such generic KM enablers as organisational culture and structure and ignores other factors, which is considered a limitation of this model and an area for future research. In addition, the generalisability of the findings is limited to a specific sector in one country. The model suggested by Sangari et al. (2015) investigated the relationship between KMPs, including knowledge creation, capture, organisation, storage, dissemination, and application processes, and supply chain performance with IT, information system support, supply chain strategy, and supply chain integration, being the moderators. The SEM technique was used to test the model among Iranian manufacturers in the mechanical and engineering industry (Sangari et al., 2015). The model provided perceptions for supply chain managers; however, it only assessed the KMPs influence on supply chain performance with consideration of selected enablers ignoring other factors and other performance aspects, which constitute a limitation

for this model. Additionally, the generalisability of the findings is limited to one industry in one country and a small sample size. Kianto et al. (2016) proposed a model that shows the relationships of five KMPs characterised by knowledge acquisition, sharing, creation, codification, and retention, with job satisfaction in a Finnish municipal organisation. This model was tested using SEM partial least squares (Kianto et al., 2016). The limitations of the tested model consist of the direct relationship between the variables in addition to the generalisability of the findings related to the sector and geographical area. A gap was found where KMPs enablers and organisational performance were not included and empirically tested in this model. Abdollahi et al. (2017) conducted research aiming at evaluating the dimensions of knowledge strategy in IT companies by using the Fuzzy Analytic Hierarchy Process method. The limitation of this study involved the selected factors and the specific business sector (Abdollahi et al., 2017). Mageswari et al. (2017) presented a model that investigates the influence of KM enablers and the impact of KM on organisational performance. KMPs were measured through knowledge acquisition, creation, storage, and sharing processes, while organisational performance is measured through innovation, operational performance, and organisational performance. KM enablers are measured through organisational culture, leadership, management support, KM strategy, use of ICT, use of government facilities, and competitor comparison, which are limited to organisational factors. The model was tested in Indian manufacturing organisations using the partial least square algorithm (Mageswari et al., 2017). Since the model investigated KM for enhanced performance of Indian manufacturing companies, the generalisability of the findings is limited to one industry in one country. The model suggested by Yusr et al. (2017) shows the impact of applying total quality management on enhancing KMPs, specifically knowledge acquisition, dissemination, and application processes, and the relationship between KM and innovation performance. The model provided empirical evidence of the positive role of total quality management in enhancing KMPs using the SEM and variance-based partial least squares techniques. Additionally, KMPs were found to be significant processes to enhance the innovation performance of Malaysian manufacturing companies (Yusr et al., 2017). The model examined the direct relationships among the investigated variables and did not consider the mediating role of the KMPs, while the innovation performance was considered in general. A gap was found in this model concerning the KM enablers other than the studied organisational factors and other unstudied KMPs. In addition, the generalisability of the findings is limited to one industry in one country. Jarmooka et al. (2020) suggested a model that brings together three ICT components and KMPs, including knowledge creation, storage, sharing processes, and innovation. The model developed an interpretation of how ICT could generate more effective KMPs and how

KMPs impact subsequent innovation. The model was tested in Australian enterprises using regression equations and parameter estimates (Jarmooka et al., 2020). The limitations included the measurement of knowledge flow from a technological perspective and the focus on Australian managers limiting the generalisability of the finding. Another gap in this model is that it only evaluates the effects of technological factors on the KMPs, ignoring other factors. Ting et al. (2021) presented a model that aims to investigate the effects of KM infrastructure and KMPs characterised by knowledge acquisition, creation, and utilisation processes on companies' innovative performance and the moderating impact of leadership in the relationship between KM and innovative performance. The model was tested in Malaysian public listed service companies using SEM partial least squares (Ting et al., 2021). The generalisability of the findings and the model implementation are limited to one country, and data was collected from one source. A gap is found related to the limited KMPs addressed and such limited KM enablers as transformational leadership.

These analysed models share some common limitations related to the generalisability of the results as they are tested in specific contexts. In addition, none of the models considered the whole KM cycle as they examined the relationship between specific KMPs and organisational performance. Besides, the impact of selected enablers on KMPs was evaluated, ignoring other factors, such as humans (Table 1.2).

Table 1.2. KMPs research models (created by the author)

Author, year	Model purpose	The business sector/ area	KMPs	Methods	Model limitations
Ho et al., 2014	The model explores the effects of KM enablers on the knowledge circulation process from the perspectives of organisational culture and structure, along with the impact on job performance.	Taiwan-based enterprises.	Creation, accumulation, sharing, utilisation, internalisation.	SEM	Respondents are limited.
Sangari et al., 2015	The model examines the relationship between KMPs and supply chain performance, with IT,	Iranian manufacturers in the	Creation, capture, organisation,	SEM	Generalisability for sector and region

Continued Table 1.2

Author, year	Model purpose	The business sector/ area	KMPs	Methods	Model limitations
	information system support, supply chain strategy, and supply chain integration as moderators.	mechanical engineering industry.	storage, dissemination, application.	SEM	and small sample size.
Kianto et al., 2016	The model shows the relationships between the five facets of KMPs and job satisfaction.	Finnish municipal organisation.	Acquisition, sharing, creation, codification, retention.	SEM and partial least squares technique.	The direct relationship between the variables. Sector and geographical area.
Abdollahi et al. 2017	The model aims to evaluate the dimensions of the knowledge strategy.	IT-based companies	Sourcing, scope, storage, seeking, development.	Fuzzy Analytic Hierarchy Process.	Limitation of selected factors and business sector.
Mageswari et al., 2017	The model investigates the impact of KM enablers and the impact of KMPs on organisational performance.	Indian manufacturing organisations.	Acquisition, creation, storage, sharing.	Partial least squares algorithm.	Specific sector and geographical area.
Yusr et al., 2017	The model shows the effects of applying total quality management on enhancing KMPs and the relationship between KM and innovation performance.	Malaysian manufacturing sector.	Acquisition, dissemination, application.	SEM and partial least squares technique.	Specific sector and geographical area.
Jarmoo-ka et al., 2020	The model brings together the three main components of ICT, KMPs, and innovation.	Australian enterprises.	Creation, storage sharing.	Regression equations parameter estimates.	Measurement of knowledge flow from a technological perspective. Specific area.

End of Table 1.2

Author, year	Model purpose	The business sector/ area	KMPs	Methods	Model limitations
Ting et al., 2021	The model aims to examine the effects of KM on innovative performance and the moderating impact of leadership in the relationship between KM and innovative performance.	Malaysian public listed service companies.	Acquisition, creation, utilisation.	SEM and partial least squares technique.	Data was collected from one source.

Other models proposed by Claver-Cortes et al. (2018), Adeinat and Abdulfatah (2019), Akbar et al. (2019), and Al-Emran et al. (2020) focused on the relationship between KM enablers and KMPs without considering the organisational performance. For example, Claver-Cortes et al. (2018) created a model to determine the effect that the social context can have on knowledge creation and knowledge transfer inside the internal network of a multinational company. The model was tested using the SEM technique in Spanish subsidiaries of foreign multinational companies operating in high-technology and knowledge-intensive sectors. As per the authors, this study proposed previously unavailable strategic KM measures (Claver-Cortés et al., 2018). A limitation of this model is that it was tested in a specific sector and area. A gap was found in this study as only two KMPs were considered: knowledge creation and knowledge transfer, in addition to the KM enablers that were not analysed. Adeinat and Abdulfatah (2019) suggested a model that aims to evaluate the impact of organisational culture on the KMPs, including knowledge creation, knowledge dissemination, knowledge exchange, and knowledge application in one university in Saudi Arabia. The model emphasises the importance of recognising the basic organisational culture to create and implement a successful KM strategy. However, the effects of organisational culture on KMPs may differ from one institute to another, which constitutes a limitation for this model tested in one university in Saudi Arabia using SPSS Amos and SEM techniques (Adeinat & Abdulfatah, 2019). Also, a gap can be noticed since organisational culture is the only organisational factor addressed to affect the KMPs. Akbar et al. (2019) proposed a model to evaluate the effects of applying social technologies as platforms for knowledge creation, exchange, organisation, and utilisation while considering user e-literacy as a moderator variable. The model was tested using SEM and path analysis in Iranian insurance companies (Akbar et al., 2019). The generalisability of the findings and the model implementation are limited to one industry and one country. As this model only

evaluates the effects of technological factors on KMPs, ignoring other factors, this constitutes a gap.

The model proposed by Al-Emran et al. (2020) aims to examine the effect of knowledge acquisition and knowledge sharing on mobile learning acceptance through the extension of the technology acceptance model by those factors. The proposed research model was tested in two universities in two developing countries, i.e., Universiti Malaysia Pahang (UMP) in Malaysia and Al Buraimi University College (BUC) in Oman, which limited the generalisability of the findings and the model implementation. The model focused on expanding the technology acceptance model with knowledge sharing and knowledge acquisition, ignoring other important processes and moderators (Al-Emran et al., 2020). Pham et al. (2021) proposed a model to investigate and evaluate factors related to KM in universities in Hanoi, Vietnam.

The KMPs factors and indicators were limited knowledge sharing factors, KM with big data systems, knowledge creation, knowledge use, knowledge gathering, leadership, knowledge rating, and knowledge storage (Pham et al., 2021). Pham et al. (2021) used the Fuzzy Analytic Hierarchy Process method for factors evaluation. The KMPs factors and indicators were limited knowledge sharing factors, KM with big data systems, knowledge creation, knowledge use, knowledge gathering, leadership, knowledge rating, and knowledge storage (Pham et al., 2021). Pham et al. (2021) used the Fuzzy Analytic Hierarchy Process method for factors evaluation.

The discussed models have limitations in studied KMPs, the selected enablers, and the generalisability of the findings (Table 1.3).

Table 1.3. KMPs research models (created by the author)

Author, year	Model purpose	The business sector/ area	KMPs	Methods	Model limitations
Claver-Cortes et al., 2018	The model's purpose is to analyse the relationship between the strategic KMPs and to determine the impact that the social context can have on knowledge creation and transfer inside the internal network of an MNC.	Spanish subsidiaries of foreign MNCs of high technology and knowledge-intensive sectors.	Creation, transfer, dissemination, storage.	SEM	Specific sector and geographical area.

End of Table 1.3

Author, year	Model purpose	The business sector/ area	KMPs	Methods	Model limitations
Adeinat and Abdulfatah, 2019	The model's purpose is to examine the effect of an organisation's culture on the overall process of KM.	University in Saudi Arabia.	Creation, dissemination, exchange, application.	Estimation in SPSS Amos and SEM.	Specific sector and geographical area.
Akbar et al., 2019	The model is proposed to evaluate the impact of applying social technologies as platforms for knowledge creation, knowledge exchange, knowledge organisation, and knowledge utilisation.	Iranian insurance companies.	Creation, exchange, organisation, utilisation.	SEM and path analysis.	Specific sector and geographical area.
Al-Emran et al., 2020	The model aims to examine the impact of knowledge acquisition and knowledge sharing on Mobile learning acceptance.	IT undergraduate students in Malaysia and Oman universities.	Acquisition, sharing.	SEM and partial least squares technique.	The model was proven by universities in developing countries only.
N. Pham et al., 2021	The model aims to investigate and evaluate factors related to the KM model.	Universities in Hanoi, Vietnam.	Sharing, creation, use, gathering, rating, storage.	Fuzzy Analytic Hierarchy Process.	Specific sector and geographical area.

The analysis of the models suggested by previous researchers reveals some main limitations and gaps:

1. The studied KMPs are limited, and the KM cycle is not covered, rather specific KMPs were addressed.
2. The factors affecting the KMPs are mainly technological or one specific organisational factor ignoring the other human and organisational factors that might have an important role and effect on KMPs.
3. The effects of the KMPs on organisational performance were addressed in only a few models where performance was linked to some aspects like

innovation without other considerations, especially the sustainability aspect of performance.

4. The mediating role of KMPs between the enablers and the organisational performance was not considered.
5. All proposed models were tested in only one business sector or one country, where a lack of evidence related to the knowledge-intensive sector in developing countries, such as in the Mid-East region, was noticed.

In the current study, the research model was created to fill the following gaps found in the previous studies:

1. The entire cycle of KM involving five KMPs (acquisition, creation, storage, sharing, and application) was addressed to test its effectiveness instead of selecting and studying specific KMPs.
2. Different human, organisational, and technological factors were analysed to examine their effects on the efficiency of the entire KM cycle since it was proved that KM barriers include three categories while previous studies focused on only one category or factor.
3. The relationship between the KM cycle and sustainable organisational performance is investigated where the sustainability aspect of performance is considered a recent topic that is not addressed in previous research models.
4. A specific test was performed in this study (Sobel test) to evaluate the mediating role of KMPs between human, organisational, and technological factors with sustainable organisational performance. This test was missing in previous studies.
5. The knowledge-intensive sector of auditing and consultancy in the Mid-East region was selected to fill the gap in the business sector and geographical area that was not previously considered.

Knowledge management processes. The most commonly studied KMPs, which are crucial for an efficient KM cycle, were examined. The spectrum of KMPs was prepared based on research of previous studies on KMPs since 1996, and interpretations of different processes by many scientists were analysed to identify the role of each KM process and its important role in the KM cycle within the organisation.

KMPs can be defined as all knowledge-related activities and practices (Dang et al., 2018; Migdadi, 2020; Ranjbarfard et al., 2014) carried out in organisations by internal or external parties (Kassaneh et al., 2021; K. Shahzad et al., 2016). KMPs allow the knowledge flow between individuals and groups (Mahdi et al., 2019) and involve the transformation of individual knowledge into corporate knowledge (Campanella et al., 2019; Sangari et al., 2015) that can be properly acquired (Al-Emran et al., 2020; Kianto et al., 2016; Obeidat

et al., 2014), created (Känsäkoski, 2017; Kim et al., 2022; Wee & Chua, 2013), stored (Mishra & Uday Bhaskar, 2011; Sumbal et al., 2017; Tongo, 2015), shared (Curado & Vieira, 2019; Ranjbarfard et al., 2014; Zhou et al., 2022), and applied (Al Saifi, 2015; Pandey et al., 2018) within the organisation. By integrating KMPs into daily activities, the knowledge available in the company would increase, permitting better and timely problem-solving and decision-making (Hegazy & Ghorab, 2015; Qandah et al., 2020), leading to the adoption of a new market environment (Acar et al., 2017; Kassaneh et al., 2021), improving the quality of products and services (Kianto et al., 2016; Rezaei et al., 2021), enhancing customer satisfaction (Anand et al., 2015; Ting et al., 2021), and achieving sustainability in performance (Abbas, 2020; Akram et al., 2018). In this study, KMPs are characterised by the different knowledge activities performed in the organisation, such as knowledge acquisition, creation, storage, sharing and application. The efficient implementation of these processes enhances problem-solving and decision-making in the organisation and leads to market uniqueness and sustainable organisational performance.

KMPs differ from one organisation to another, and the number of these processes is not agreed upon by scientists. Many researchers have studied different KMPs, classified according to Table 1.4: acquisition, capture; creation, generation; storage, retention; sharing, transfer, distribution; application; and reuse.

Table 1.4. The spectrum of KMPs (created by the author)

Author, year	Acquisition/ capture	Creation/ generation	Storage/ retention	Sharing/ transfer/dis- tribution	Applica- tion/ reuse
Kotnour, Proctor, 1996			X	X	X
Wiig, 1997		X			
Bhatt, 2001		X		X	X
Choi, Lee, 2002		X			
Ramesh, 2002			X	X	X
Sharkie, 2003		X			
Riege, 2005				X	
Aramburu et al., 2006		X			
Strach, Everett, 2006				X	
Franco, Mariano, 2007		X	X	X	X

End of Table 1.4

Author, year	Acquisition/capture	Creation/generation	Storage/retention	Sharing/transfer/distribution	Application/reuse
Raghu, Vinze, 2007			X	X	
Feghali, El-den, 2008			X		
Matsuo, Smith, 2008				X	
King, 2009				X	
Ramachandran et al., 2009	X	X	X	X	X
Fan, Ku, 2010		X			
Franco, Mariano, 2010			X		
Jelenic, 2011		X			
Mishra, Bhaskar, 2011		X	X	X	
Pacharapha, Ractham, 2012	X				
Liu et al., 2013					X
Wee, Chua, 2013		X		X	X
Obeidat et al., 2014	X			X	X
Ranjbarfard et al., 2014		X	X	X	X
Al Saifi, 2015		X		X	X
Chang, Lin, 2015		X	X	X	X
Tongo, 2015		X	X	X	X
Dang, McKelvey, 2016	X	X		X	
Kianto et al., 2016	X	X	X		
Kansakoski, 2017		X		X	X
Sumbal et al., 2017			X		
AlShamsi, Ajmal, 2018				X	
Pandey et al., 2018	X				X
Rafique et al., 2018				X	
Sirorei, Fombad, 2019		X			
Curado, Vieira, 2019				X	
Tripathi et al., 2020		X			
Al-Emran, Teo, 2020	X				
Derin et al., 2021				X	
Kim et al., 2022		X			
Zhou et al., 2022				X	

A summary of KMPs studied by different scientists between 1996 and 2022 revealed that most of them were investigating such main KMPs as acquisition, creation, storage, sharing, and application. The importance of these processes is that together they form a KM cycle, allowing an effective knowledge flow from finding to maintaining useful knowledge and sharing it at the time it is needed, which optimises the knowledge benefit in the organisation.

This applies to all sectors and industries, but it is specifically crucial in the knowledge-intensive sector, where knowledge constitutes the basis of work, and KM is necessary for work improvement. In this study, the auditing and consultancy industry is addressed as a knowledge-intensive sector where the whole KM cycle serves to satisfy customers and engage them in new projects, where new knowledge can be generated, and previous knowledge can be applied to reach the best possible results. The description of each knowledge process is analysed to determine its role in KM.

Knowledge acquisition is defined as the process of obtaining new knowledge from inside and outside the organisation (Al-Emran & Teo, 2020; Obeidat et al., 2014) by looking for, extracting, and organising the knowledge required in a particular area (Dang & Mckelvey, 2016).

The process of knowledge acquisition begins with recognising the organisation's main goals and then determining knowledge gaps to accumulate the knowledge needed from various resources to reach those goals and achieve the desired organisational performance (Kianto et al., 2016). There are different sources to acquire knowledge internally and externally (Al-Emran & Teo, 2020; Pandey et al., 2018). The internal sources include alliances with partners, newly hired employees or consultants, connections and interactions between individuals, and new experiments conducted in the organisation (Dang & Mckelvey, 2016; Ramachandran et al., 2009). External sources include the economic and social environment, suppliers, customers, and collaborations with other stakeholders (Al-Emran & Teo, 2020; Obeidat et al., 2014). Knowledge acquisition in the current study can be described as the process of knowledge accumulation that takes place in the context of internal and external interactions with an organisation to eliminate knowledge gaps to achieve sustainable organisational performance.

Knowledge creation is described as the ability of an organisation to generate new and valuable knowledge and insights concerning the organisation's goods, services, and procedures (Kianto et al., 2016; Sirorei & Fombad, 2019) and to develop new know-how and expertise (Ceptureanu et al., 2018; Wahba, 2015) for which the existing knowledge is a prerequisite (Mishra & Uday Bhaskar, 2011; Wang et al., 2006). Knowledge creation is a rising procedure in which motivation (Bhatt, 2001; Little & Deokar, 2016), lessons learned (Schenk et al., 2015; Wee & Chua, 2013), research and experimentation (Jelenic, 2011; Ranjbarfard et al.,

2014), and innovation (Kim et al., 2022; Tongo, 2015) play a main role in obtaining the new substance, which lessens the gap between the required and available knowledge (Jelenic, 2011). The process of knowledge creation requires using individual's abilities and skills (Schenk et al., 2015), multiple interactions and collaborations (Tripathi et al., 2020), licensing, mergers, and partnerships (Dang & Mckelvey, 2016) in addition to the means of technology (Sirorei & Fombad, 2019). Knowledge creation allows for identifying new opportunities and supports innovation (Kianto et al., 2016; Wee & Chua, 2013), contributes to the improvement of operations within the organisation (Mishra & Uday Bhaskar, 2011), and forms a source of the company's uniqueness (Choi & Lee, 2002; Fan & Ku, 2010). This study defines knowledge creation as the development of existing and new organisational competence (knowledge, know-how, abilities, and skills) to identify new opportunities, develop innovation, create value, and increase the uniqueness in the market to achieve sustainable organisational performance.

Knowledge storage is characterised by the knowledge-gathering process, selecting, accumulating, and updating knowledge existing in different forms (Dzenopoljac et al., 2018). Such can be newly acquired and created knowledge (Ranjbarfard et al., 2014) and organised knowledge available in repositories and recorded experiences (Chang & Lin, 2015) to manage employee turnover and avoid the loss of expertise when employees leave the organisation (Acharya & Mishra, 2017). Knowledge storage involves the formation of organisational memory, including the formal strategies, systems, and manual and electronic documents (Franco & Mariano, 2007), affected by the quality and the amount of knowledge exchanged and retained by individuals (Tongo, 2015). The use of IT tools, such as organisational repositories and databases, is necessary to protect knowledge from loss or theft (Kianto et al., 2016), turning knowledge into a resource for the organisation (Ceptureanu et al., 2018) and making it accessible for decision-making when needed (Feghali & El-Den, 2008; Mahdi et al., 2019). The proper storage of knowledge ensures security advancements to restrict unauthorised access to this knowledge (Sangari et al., 2015) and reduces knowledge redundancy and duplication (Chang & Lin, 2015), which improves the efficiency of KMPs (Sumbal et al., 2017). Knowledge storage in this study can be described as the selection, accumulation, and updating of valuable knowledge in an organisation by using various methods and technological tools to retain knowledge and keep it accessible for efficient decision-making and problem-solving processes to achieve sustainable organisational performance.

Knowledge sharing is the exchange of knowledge (Lee et al., 2016), experiences (Wee & Chua, 2013), skills (Chi n & Charles, 2020), best practices (Ranjbarfard et al., 2014), and know-how (Derin et al., 2021) through social interaction between different parties internally and externally (Al Saifi, 2015). The internal exchange could occur between individuals, groups, or departments within

the organisation, contributing their knowledge or absorbing the knowledge of others (Li, 2010; Zhou et al., 2022). In comparison, the external exchange takes place between partnerships, joint ventures, and other forms of relationships between companies or other stakeholders (Chi6n & Charles, 2020). Knowledge sharing includes customising and disseminating knowledge in a reasonable form for a determined purpose to meet a particular need (Ramachandran et al., 2009; Silva de Garcia et al., 2022). It plays the connecting role between different KMPs (Kotnour & Proctor, 1996; Tongo, 2015) affected by such different factors as the individual's contribution (Bhatt, 2001; Le & Lei, 2018), the organisational factors (Al-Alawi et al., 2007; K6ns6koski, 2017), and the means of technology (Obeidat et al., 2014). With IT integration, knowledge sharing changed from being informal to a formal process, successfully managed in companies with more flexible cultures, eliminating the lack of support from the top management and employee resistance to sharing their knowledge (Cant6 et al., 2009; Lam & Lambermont-Ford, 2010). Knowledge sharing is direct and indirect. Direct knowledge sharing uses different means of communication, such as face-to-face interaction and verbal contact (AlShamsi & Ajmal, 2018; Guechtouli et al., 2013). Indirect knowledge sharing uses knowledge storage intermediaries, such as databases and organisation repositories (Guechtouli et al., 2013; Matoskova & Smesna, 2017). The knowledge-sharing process is converted into individual and organisational advancement by enhancing employee productivity (Peralta & Saldanha, 2014; Rafique et al., 2018), increasing the efficiency of decision-making and problem-solving (Lee et al., 2016; Sangari et al., 2015), and achieving uniqueness (Peralta & Saldanha, 2014; Swanson et al., 2020). This study defines knowledge sharing as the process of exchanging knowledge, expertise, and skills between different parties within the organisation or among various organisations through different means of communication and interaction. Knowledge sharing contributes to enhancing goods and services, improving the efficiency of decision-making and problem-solving, and achieving sustainable organisational performance.

Knowledge application is the process of utilising the knowledge accumulated, generated, stored, and shared (Sangari et al., 2015; Tongo, 2015) in the organisation's goods, services, and procedures (Bhatt, 2001; Pandey et al., 2018) using different human, organisational, and technological means that decrease the knowledge misappropriation (Obeidat et al., 2014; Ramesh, 2002). Knowledge application constitutes a fundamental part of the overall KM cycle, as the acquisition and creation of knowledge would not be relevant if the organisation could not utilise this knowledge efficiently (Al Saifi, 2015). The main objective of knowledge application is to benefit from previous experiences, projects, and practices (Al Saifi, 2015; Liu et al., 2013) to reduce errors and improve the efficiency of the decision-making and problem-solving processes (Ranjbarfard et al., 2014; Wee & Chua, 2013), and enhance the organisational performance to achieve

uniqueness in the market (Chang & Lin, 2015; Lopez & Jose Esteves, 2013). This study describes knowledge application as the utilisation of knowledge that was acquired, created, and stored in the organisation's repositories. The knowledge application process makes knowledge more relevant and useful in enhancing the decision-making and problem-solving processes and achieving sustainable organisational performance.

This study addresses five KMPs, acquisition, creation, storage, sharing and application, identified as the most common processes constituting the KM cycle. As each of the processes plays an important role in contributing to organisational performance and could be considered separately, the five KMPs implemented as a cycle would support each other through the knowledge acquired, which is the basis for knowledge creation, where both should be stored to preserve the knowledge value, then shared and applied to benefit from the available knowledge. Thus, the KM objective could be attained by efficiently implementing the KM cycle, including the five KMPs, which would lead to developing the individual's skills and knowledge, improving the operations within the organisation, creating new opportunities, increasing innovation, forming a source of uniqueness, and achieving sustainable organisational outcomes. The relationship between the identified KMPs and sustainable organisational performance was considered in this study to examine the effects of these processes and their significance in the improvement of organisational performance and their contribution to reaching the sustainability aspect of performance, which ensures the satisfaction of the internal and external stakeholders through efficient management strategies and the delivery of quality goods and services making the company a leader in the market.

Sustainable organisational performance. Sustainability could be described as a systematic approach to gaining uniqueness (Akram et al., 2018) and leadership in the market (Lemmetty et al., 2020), manifested by cost reduction and revenue growth (Athayde et al., 2017), creation of a knowledge environment by generating best practices from cooperative activities (Zhang et al., 2019), and elaborating the organisation's capabilities to attain a knowledge strategy that satisfies the stakeholders' needs (Ochoa-Jiménez et al., 2021; Pablos & Lytras, 2018) while achieving superior performance (Akram et al., 2018) and delivering value in the long term (Lemmetty et al., 2020). According to the United Nations, sustainable development is characterised by meeting the needs of the present with maintaining the power to satisfy the needs the future generations (The Sustainable Development Goals Report 2020, 2020). Developing economies, like in the Mid-East region, are perceiving sustainable development (economic, environmental, and social) as an important milestone (Aldulaimi & Abdeldayem, 2022). Despite the awareness of the need for sustainable development (Dhaoui, 2022; Ghazaly

et al., 2013), the Mid-East region is still facing resistance caused by threats and uncertainties about the future and the political instability (Soliman, 2020), the lack of strategic plans and competitive capabilities (Zhao et al., 2022), in addition to the challenging social and economic situation (World Bank, 2009; 2020).

Scientific studies have demonstrated that business practitioners apply KM as an effective tool to attain sustainability in inner business processes (Hussain et al., 2022; Martins et al., 2019) and the unpredictable, rapidly changing business environment (Lee & Ha-Brookshire, 2018) with the intent of ensuring the efficient use of resources (Lega et al., 2013; Tajpour et al., 2022) to achieve economic prosperity for organisations (Caiado et al., 2018) without harmfully affecting the society and the environment (Abbas, 2020). Sustainable organisational performance depends on strategies and practices adopted by an organisation (Coutinho et al., 2018), which aim to incorporate the sustainability aspects in the decision-making process (Martins et al., 2019) and inspire the managers to consider their decisions' impact on the organisation and the society in the long term (Abbas, 2020). As a result of the increased emphasis on sustainability, companies are urged to re-evaluate their outcomes based on consistent sustainability aspects; the economic aspect related to the financial situation of the organisation (Lee & Ha-Brookshire, 2018), the social aspect related to the managerial practices, and the responsibility of the company towards its stakeholders (Abbas, 2020; Lega et al., 2013), and the environmental aspect related to the responsibility of the company towards the environment (Caiado et al., 2018). Organisations that succeed in achieving an advanced level of sustainable organisational performance are more likely to attain better employee productivity (Lega et al., 2013), fulfil stakeholder needs (Coutinho et al., 2018), and improve their outcomes (Lee & Ha-Brookshire, 2018). The current research examines the sustainability aspect of organisational performance by measuring the effects of the KMPs (acquisition, creation, storage, sharing, and application) and their contribution to improving sustainable organisational performance in Middle Eastern auditing and consultancy firms.

Scientists who examined the relationship between KM and sustainable organisational performance determined that companies can achieve sustainability in performance by employing efficient KMPs and integrating them into the organisation's strategies and activities (Aamir et al., 2021; Abbas, 2020; Akram et al., 2018; Athayde et al., 2017; López-Torres et al., 2019; Muñoz-Pascual et al., 2019; Saptta et al., 2021; Wang et al., 2022). However, evidence is still lacking on the impact of the whole KM cycle involving the five KMPs on sustainable organisational performance, as most of the previous studies addressed selected KMPs to examine their relationship with sustainable organisational performance.

Previous studies on the relationship between knowledge acquisition and sustainable organisational performance were conducted by López-Torres et al. (2019), Abbas (2020), and Shahzad et al. (2020). As per López-Torres et al.

(2019), the KM implementation and sustainability in operations were evaluated by different indicators with the integration of knowledge acquisition and the necessary learning and awareness sessions to increase operational sustainability. The results proved that knowledge acquisition positively influences sustainability in operations in small and medium-sized manufacturing enterprises in Mexico (López-Torres et al., 2019). Abbas (2020) evaluated the effect of knowledge acquisition on corporate sustainability with total quality management as an enabler in the manufacturing and services companies in Pakistan. The results revealed that knowledge acquisition positively affects corporate economic and environmental sustainability performance (Abbas, 2020). Shahzad et al. (2020) analysed the impact of knowledge acquisition on corporate sustainability in Pakistan's multinational manufacturing corporations. The results showed the positive impact of knowledge acquisition on sustainable corporate performance (Shahzad et al., 2020). The previous studies on knowledge acquisition and sustainable organisational performance revealed limitations in terms of the studied sectors and the geographical areas, such as manufacturing companies in Mexico and Pakistan.

To test the positive impact of knowledge acquisition on sustainable organisational performance in Middle Eastern auditing and consultancy firms, the following hypothesis was proposed:

H1: Knowledge acquisition positively affects sustainable organisational performance.

The relationship between knowledge creation and sustainable organisational performance was previously addressed by López-Torres et al. (2019) and Abbas (2020). López-Torres et al. (2019) evaluated KM implementation and sustainability in operations through the integration of knowledge creation. The study conducted in small and medium-sized manufacturing enterprises in Mexico proved that knowledge creation positively affects operational sustainability (López-Torres et al., 2019). Also, Abbas (2020) examined the relationship between knowledge creation and corporate sustainability in manufacturing and services companies in Pakistan. The results showed that knowledge creation positively affects corporate economic and environmental sustainability performance (Abbas, 2020). The previous research on knowledge creation and sustainable organisational performance showed limitations in terms of the sectors and geographical areas, such as the manufacturing enterprises in Mexico and manufacturing and services companies in Pakistan.

To test the positive impact of knowledge creation on sustainable organisational performance in Middle Eastern auditing and consultancy firms, the following hypothesis was proposed:

H2: Knowledge creation positively affects sustainable organisational performance.

Research on the relationship between knowledge storage and sustainable organisational performance was rarely conducted. For instance, Lin et al. (2016) determined a negative impact of knowledge storage on knowledge loss and, therefore, a positive effect on the departments' performance effectiveness in Taiwan (Lin et al., 2016). A lack of evidence has been found in previous studies related to examining the relationship between knowledge storage and sustainable organisational performance where relevant studies are not available.

In order to fulfil the deficiencies in previous research, this study examined the impact of knowledge storage on sustainable organisational performance in a knowledge-intensive sector as auditing and consultancy firms in the developing countries of the Mid-East, and the following hypothesis was proposed:

H3: Knowledge storage positively affects sustainable organisational performance.

Previous studies that addressed the relationship between knowledge sharing and sustainable organisational performance were conducted by Muñoz-Pascual et al. (2019), Abbas (2020), Shahzad et al. (2020), and Aamir et al. (2021). According to research results by Muñoz-Pascual et al. (2019), knowledge sharing within organisations and between stakeholders positively affects achieving sustainable financial, social, and environmental goals in Portuguese companies (Muñoz-Pascual et al., 2019). Abbas (2020) investigated the importance of knowledge sharing for corporate sustainability in manufacturing and services companies in Pakistan. The results revealed that knowledge sharing positively impacts corporate economic and environmental sustainability performance (Abbas, 2020). Shahzad et al. (2020) examined the impact of knowledge sharing on sustainable corporate performance. The research was conducted in Pakistan's multinational manufacturing corporations. The results revealed the positive effect of knowledge sharing on sustainable corporate performance (Shahzad et al., 2020). According to the study conducted by Aamir et al. (2021), knowledge sharing has a significant influence on sustainable performance in the manufacturing sector in Pakistan (Aamir et al., 2021). The previous studies on knowledge sharing and sustainable organisational performance resulted in limitations in terms of the analysed sectors and geographical areas, such as Portuguese companies and manufacturing companies in Pakistan.

To test the positive impact of knowledge sharing on sustainable organisational performance in Middle Eastern auditing and consultancy firms, the following hypothesis was proposed:

H4: Knowledge sharing positively affects sustainable organisational performance.

Previous research on the effect of knowledge application on sustainable organisational performance was performed by Abbas (2020) and Shahzad (2020).

Abbas (2020) evaluated the positive influence of knowledge application on sustainable organisational performance in Pakistan's manufacturing and services companies. The results revealed the positive effect of knowledge application on sustainable organisational performance (Abbas, 2020). Also, Shahzad et al. (2020) proved the positive impact of knowledge application on sustainable organisational performance in Pakistan's multinational manufacturing corporations (Shahzad et al., 2020). These research results are limited to specific industries in Pakistan.

To test the positive impact of knowledge application on sustainable organisational performance in Middle Eastern auditing and consultancy firms, the following hypothesis was proposed:

H5: Knowledge application positively affects sustainable organisational performance.

The previous studies demonstrated the significant effects of KMPs (acquisition, creation, storage, sharing, and application) on sustainable organisational performance in different sectors and countries, such as the manufacturing sector in Mexico and Pakistan and enterprises in Portugal and Taiwan. In this study, the knowledge-intensive sector in the Mid-East region is investigated to determine the effects of the whole KM cycle involving the five KMPs on sustainable organisational performance. The results of this study would fill the evidence gap related to the relationship between the KM cycle and sustainable organisational performance of a knowledge-intensive sector, such as auditing and consultancy in developing countries, especially the Mid-East region.

1.2. Human factors influencing knowledge management

KMPs are subject to the influence of different human, organisational, and technological factors. Many factors were previously studied by researchers, and this study considers the most common influential factors.

This section aims to analyse various human factors that have a significant influence on KMPs within organisations. Trust, interaction, and self-efficacy have been proved by many researchers (Table 1.5) to be the most common human factors affecting the efficient implementation of the KM cycle.

Employee motivation (Jimenez-Jimenez & Sanz-Valle, 2012) and building an environment where individuals can freely interact and communicate (Park & Kim, 2018) are important factors influencing the KM cycle. Since KM depends on the engagement of motivated employees taking an effective role in the KMPs (Runhaar & Sanders, 2016), the human factors constitute the primary means that influence the attitude and behaviour of the employees in the organisation

(Kmieciak, 2020) and affect their involvement in the KMPs (Ng, 2022). Therefore, the management of valuable and useful knowledge is impossible without human contribution to knowledge-based practices.

Table 1.5. Human factors affecting KMPs (created by the author)

Description	Authors
Trust	Peralta & Saldanha, 2014; Tangaraja et al., 2015; Rutten et al., 2016; Koohang et al., 2017; Park & Kim, 2018; Curado & Vieira, 2019; Kmieciak, 2020; Kacperska and Łukasiewicz, 2020; Ng, 2022.
Interaction	Lin, 2011; Chhim et al., 2017; Lashari & Rana, 2018; Lin et al., 2022.
Self-efficacy	Tangaraja et al., 2015; Runhaar & Sanders, 2016; Sedighi et al., 2016; Sedighi et al., 2018; Nguyen & Malik, 2020; Islam & Asad, 2021.

Trust is a relationship aspect between individuals based on their mutual confidence (Koohang et al., 2017), which is important for building and retaining interpersonal relationships (Peralta & Saldanha, 2014). It implies a mutual dependence on each other's skills and knowledge (Youssef et al., 2017) by expecting good actions from others (Le & Lei, 2018). Interpersonal trust creates a culture of caring (Alaarj et al., 2016), increases the individuals' willingness to share knowledge and expertise (Li et al., 2021), promotes KM practices (Kmieciak, 2020; Koohang et al., 2017) and facilitates their implementation (Dijk et al., 2016; Ng, 2022). By improving the collaboration between co-workers, the increased trust between them contributes to social integration and cooperation (Ho et al., 2014), increases productivity and creativity (Park & Kim, 2018), and enhances problem-solving and decision-making processes (Revilla & Knoppen, 2015). Trust is a human aspect that implies relying on the knowledge and capabilities of others, which strengthens the cooperation between individuals and facilitates the implementation of knowledge processes. Researchers have recognised the positive effect of trust on the KM cycle, but only a few processes were addressed, such as knowledge sharing.

Previous studies demonstrated a positive relationship between trust and knowledge sharing (Curado & Vieira, 2019; Kacperska & Łukasiewicz, 2020; Kmieciak, 2020; Koohang et al., 2017; Ng, 2022; Park & Kim, 2018; Peralta & Saldanha, 2014; Rutten et al., 2016; Tangaraja et al., 2015). The effect of trust on knowledge sharing in US organisations was examined by Peralta and Saldanha (2014). The results indicated that the knowledge-centred culture promotes knowledge sharing between employees with a high level of trust propensity (Peralta & Saldanha, 2014). A similar study was performed by Tangaraja et al. (2015) in the Malaysian public sector. The research results proved that trust positively influences knowledge sharing (Tangaraja et al., 2015). Rutten et al. (2016) proved

that trust significantly affects knowledge sharing in one financial organisation in the Netherlands (Rutten et al., 2016). The study conducted by Koohang et al. (2017) in some US states demonstrated that the elevation of trust contributes to effective KM implementation (Koohang et al., 2017). The research performed by Park and Kim (2018) indicated a direct positive impact of trust on knowledge sharing in one Korean manufacturing organisation (Park & Kim, 2018). The research carried out by Curado and Vieira (2019) in Portuguese SMEs verified that trust positively and significantly influences knowledge sharing (Curado & Vieira, 2019). A study by Kmiecik (2020) in a large Polish organisation confirmed that trust is positively associated with knowledge sharing (Kmiecik, 2020). According to Kacperska and Łukasiewicz (2020), trust is essential in sharing knowledge and plays a crucial role in achieving efficient performance in the tourism industry (Kacperska & Łukasiewicz, 2020). Research by Ng (2022) in private universities in Singapore proved a positive effect of trust on knowledge sharing (Ng, 2022). The previous research results revealed an absence of evidence concerning the impact of trust on KMPs, such as acquisition, creation, storage, and application. Additionally, previous research was limited to specific business sectors in selected countries.

To test the positive impact of trust on KMPs (acquisition, creation, storage, sharing, and application) in Middle Eastern auditing and consultancy firms, the following hypotheses were proposed:

H6a: Trust positively affects the knowledge acquisition process.

H6b: Trust positively affects the knowledge-creation process.

H6c: Trust positively affects the knowledge storage process.

H6d: Trust positively affects the knowledge-sharing process.

H6e: Trust positively affects the knowledge application process.

Previous studies have demonstrated a significant effect of trust on KMPs, especially knowledge sharing, in different sectors and countries, such as the Malaysian public sector, a financial organisation in the Netherlands, a manufacturing organisation in Korea, Portuguese SMEs, a Polish organisation, and universities in Singapore. In this study, the knowledge-intensive sector in the region of the Mid-East is investigated to fill the gap in studies on the relationship between trust and the whole cycle of KM in the intended sector and area.

Interaction is characterised by the degree to which employees communicate (Lashari & Rana, 2018) and coordinate together (Tangaraja et al., 2015). Communication refers to the information flow between individuals and groups through formal or informal activities in the organisation (Hsiao et al., 2011; Lin et al., 2022). In turn, coordination is identified by linking individuals and groups to accomplish the desired work (Lin et al., 2022). Interaction focuses on the internal experience of the individuals and takes the form of professional training (Sáenz et al., 2012), mentoring (Nordman, 2018), and other forms of communication,

which facilitate knowledge practices in organisations (Lashari & Rana, 2018; Sáenz et al., 2012). When individuals have access to knowledge and communication channels, the flow of knowledge would be easier, especially since the organisation's repositories cannot store some knowledge, such as tacit knowledge, which can be exchanged through communication and coordination between members by removing the barriers among different organisational units and allowing knowledge exchange (Sedighi et al., 2018; 2016). Furthermore, the interaction between employees improves their skills and capabilities, which support the proper implementation of knowledge practices (Asher & Popper, 2021; Hsiao et al., 2011), leading to new creative and innovative approaches to solving problems and improving organisational performance (Lin et al., 2022; Sáenz et al., 2012). Interaction is a trait of relationships between individuals supported by the channels of communication and coordination that contribute to their engagement in the knowledge processes. Interaction is recognised as an essential factor for facilitating KM practices, as proved in previous research.

Previous studies showed a positive impact of interaction on KM practices, such as knowledge implementation and reuse (Chhim et al., 2017; Lashari & Rana, 2018; Lin, 2011). Lin (2011) examined the effect of interaction on KM implementation in large organisations in Taiwan. The study results provide evidence that interaction takes part in the evolution of KM implementation (Lin, 2011). The study conducted by Chhim et al. (2017) in knowledge-intensive industries demonstrated that organisations should implement strategies to encourage interaction between employees because it leads to greater knowledge reuse (Chhim et al., 2017). Lashari and Rana (2018) studied the effect of interaction on KM in Pakistan's banking sector. The research results indicate that interaction is an essential factor for efficient KM and organisational performance (Lashari & Rana, 2018). However, the previous research revealed that some limitations concerning the KMPs addressed mostly knowledge implementation, the studied business sectors, and geographical areas.

To test the positive impact of interaction on KMPs (acquisition, creation, storage, sharing, and application) in Middle Eastern auditing and consultancy firms, the following hypotheses were proposed:

H7a: Interaction positively affects the knowledge acquisition process.

H7b: Interaction positively affects the knowledge-creation process.

H7c: Interaction positively affects the knowledge storage process.

H7d: Interaction positively affects the knowledge-sharing process.

H7e: Interaction positively affects the knowledge application process.

Previous studies have demonstrated a significant effect of interaction on specific KMPs like knowledge implementation and reuse in some sectors and countries, such as large organisations in Taiwan and the banking sector in Pakistan. In

this study, the knowledge-intensive sector in the region of the Mid-East is analysed to assess the relationship between interaction and the whole KM cycle.

Self-efficacy is described as the individual's confidence regarding their competencies and proficiencies in performing a specific task and achieving a desired level of performance (Runhaar & Sanders, 2016). It consists of the attitudes and autonomy that influence the individual's capabilities (Beasley & Bernadowski, 2019; Henttonen et al., 2016), reflected in the ability to generate new knowledge and share valuable knowledge with others (Sedighi et al., 2018; Tangaraja et al., 2015). Self-efficacy is a result of the continuous development of the individual's knowledge (Nisula & Olander, 2021; Runhaar & Sanders, 2016), which contributes to the improvement of knowledge practices and organisational performance. Researchers have recognised that individuals with a high sense of self-efficacy demonstrate proactive behaviour (Sedighi et al., 2016), perform challenging tasks (Sedighi et al., 2018), and contribute to problem-solving and dealing with work difficulties rather than avoiding those cases, which is in stark contrast to individuals with low self-efficacy (Beasley & Bernadowski, 2019). In addition, individuals are willing to perform more of the tasks in which they anticipate high competency and avoid the tasks in which their competency is low (Henttonen et al., 2016; Runhaar & Sanders, 2016). Self-efficacy is described as the human confidence in their capacities and skills, which affect their intention to contribute to the knowledge practices within the organisation.

Researchers have recognised the positive impact of self-efficacy on knowledge sharing (Islam & Asad, 2021; Nguyen & Malik, 2020; Runhaar & Sanders, 2016; Sedighi et al., 2018; 2016; Tangaraja et al., 2015). According to Tangaraja et al. (2015), knowledge self-efficacy is one of the factors predicting knowledge-sharing behaviour in the Malaysian public service sector (Tangaraja et al., 2015). For instance, the research conducted by Runhaar and Sanders (2016) in schools demonstrated a positive relationship between teachers' self-efficacy and knowledge sharing (Runhaar & Sanders, 2016). As to Sedighi et al. (2016, 2018), knowledge self-efficacy significantly impacts knowledge sharing in the energy sector (Sedighi et al., 2018, 2016). Furthermore, the study of Vietnamese companies by Nguyen and Malik (2020) indicated that self-efficacy significantly influences organisations' online knowledge-sharing behaviour, regardless of the organisation's public or private type (Nguyen & Malik, 2020). Islam and Asad (2021) investigated the effect of self-efficacy on knowledge sharing in IT-based organisations. The results proved that self-efficacy positively affects knowledge sharing (Islam & Asad, 2021). Overall, prior studies provide insufficient evidence related to KMPs other than knowledge sharing. In addition, the generalisability of the results is limited to a few business sectors and geographical areas.

To test the positive impact of self-efficacy on KMPs (acquisition, creation, storage, sharing, and application) in Middle Eastern auditing and consultancy firms, the following hypotheses were proposed:

H8a: Self-efficacy positively affects the knowledge acquisition process.

H8b: Self-efficacy positively affects the knowledge-creation process.

H8c: Self-efficacy positively affects the knowledge storage process.

H8d: Self-efficacy positively affects the knowledge-sharing process.

H8e: Self-efficacy positively affects the knowledge application process.

Previous studies have demonstrated a significant effect of self-efficacy on such specific KMPs as knowledge sharing in different sectors and countries, e.g., the public service sector in Malaysia, the education sector, the energy sector, Vietnamese companies, and IT-based organisations. In this study, the knowledge-intensive sector in the region of the Mid-East is investigated to determine the effects of self-efficacy on the whole KM cycle in auditing and consultancy firms.

Human factors, trust, interaction, and self-efficacy, selected in this study, were previously considered for their influence on such particular KMPs as knowledge sharing while ignoring other important knowledge processes in the KM cycle. Moreover, previous research did not address the mediating role of KMPs between human factors and organisational performance, and the knowledge-intensive sector in developing countries has still not been studied. To fill the gap found in the previous research, this study considered the effects of human factors on the whole KM cycle and the mediating role of the KMPs between the human factors and sustainable organisational performance in the knowledge-intensive sector of auditing and consultancy in the Mid-East developing countries.

1.3. Organisational factors influencing knowledge management

This section aims to examine the most significant organisational factors, such as rewards, organisational culture, teamwork, and organisational structure, proved by previous research (Table 1.6) to positively influence KMPs implementation within organisations.

Each organisation has its own culture and structure, determining the organisation's identity, vision, mission, and values and the way it conducts its business activities (Cavaliere & Lombardi, 2015; Gonzalez & de Melo, 2019), where the implementation of KMPs is mostly influenced by encouraging, supporting, and rewarding employees to contribute to organisational performance (Wahba, 2015; Youssef et al., 2017). Therefore, this study addressed the effects of rewards, organisational culture, teamwork, and organisational structure on KMPs.

Rewards are the financial and non-financial incentives separate from salaries that the employees receive in return for their work performance (Heninger et al., 2019; Mabaso & Dlamini, 2018).

Table 1.6. Organisational factors affecting KMPs (created by the author)

Description	Authors
Rewards	Lin & Lo, 2015; Podrug et al., 2017; Youssef et al., 2017; Sedighi et al., 2018; Rohim & Budhiasa, 2019; Nguyen & Malik, 2020; Wang et al., 2022.
Organisational culture	Sensuse et al., 2014; Cavaliere & Lombardi, 2015; Chang & Lin, 2015; Wei & Miraglia, 2017; Chion & Charles, 2020; Pham & Dinh, 2020; Ng, 2022.
Teamwork	Atapattu & Jayakody, 2014; Hanaysha, 2016; Gonzalez & de Melo, 2019.
Organisational structure	Ho et al., 2014; Wahba, 2015; Acharya & Mishra, 2017; Chion & Charles, 2020.

They can be classified as intrinsic and extrinsic (Dose et al., 2019; Miao et al., 2017). Intrinsic rewards consist of employees' morals and psychological mindsets, including personal recognition (Elmadağ & Ellinger, 2018), job promotion and security (Sedighi et al., 2018, 2016), or flexible work schedule (Miao et al., 2017). Extrinsic rewards are expressed by monetary and non-monetary compensations (Mabaso & Dlamini, 2018), including salary increases and bonuses that determine life quality (Dose et al., 2019). Hence, low-salaried employees face a lot of stress which may be reduced through extrinsic rewards (Podrug et al., 2017). Rewards are recognised as a powerful means of employee motivation (Caza et al., 2015; Mustafa & Ali, 2019) and a key aspect of an organisation's human resource management (De Gieter & Hofmans, 2015; Mabaso & Dlamini, 2018) which stimulates the required employee behaviours and attitudes (Francis Super et al., 2016; X. Zhang et al., 2020) and increases work engagement and job satisfaction, (Bachkirov & Shamsudin, 2017; Victor & Hoole, 2017). According to Jiang et al. (2019), leaders can establish a reward system to communicate their expectations and reward the employees who meet these expectations and, thus, achieve the organisation's strategy (Jiang et al., 2019). Similarly, rewarding involvement in knowledge-based activities and processes encourages employees (Andreeva et al., 2017; Razmerita et al., 2016); thus, many organisations tend to implement reward systems to motivate their employees to get engaged in KM practices (Lin & Lo, 2015; Youssef et al., 2017). Intrinsic and extrinsic types of rewards are incentives provided by the organisation to the employees to encourage them to enhance their performance. Implementing the appropriate rewards system

contributes to employee engagement in KM practices and, therefore, improves organisational outcomes.

Scientists have recognised the effect of rewards on KMPs, particularly knowledge sharing (Lin & Lo, 2015; Nguyen et al., 2020; Podrug et al., 2017; Rohim & Budhiasa, 2019; Sedighi et al., 2018; Wang et al., 2022; Youssef et al., 2017). The study conducted by Lin and Lo (2015) proved that rewards positively affect knowledge sharing in a healthcare organisation in Taiwan (Lin & Lo, 2015). Podrug et al. (2017) examined the influence of rewards on knowledge donation and collection in Croatian ICT companies. The results demonstrated that rewards have a positive effect on knowledge collection; however, they do not have the same effect on knowledge donation (Podrug et al., 2017). Youssef et al. (2017) confirmed the impact of rewards on knowledge sharing in emerging economies (Youssef et al., 2017). Another research performed by Sedighi et al. (2018) investigated how intrinsic and extrinsic rewards affect knowledge sharing in the energy industry, where intrinsic rewards influence restricted knowledge sharing more than extrinsic rewards, which play a more important role in general knowledge sharing (Sedighi et al., 2018). According to Rohim and Budhiasa (2019), such economic rewards as compensation, like employee performance allowance, have a significant positive effect on knowledge sharing in the public sector in Indonesia (Rohim & Budhiasa, 2019). Nguyen and Malik (2020) conducted their study on Vietnamese companies. The results demonstrated that intrinsic rewards affect online knowledge sharing in public companies, while extrinsic rewards are more efficient in private companies (Nguyen & Malik, 2020). Wang et al. (2022) examined the effect of rewards on knowledge sharing in virtual communities. The results proved a positive relationship between rewards and explicit knowledge sharing (Wang et al., 2022). The previous results demonstrate an absence of evidence regarding the relationship between rewards and KMPs, such as knowledge application, creation, acquisition, and storage, in addition to the limitation in terms of the studied sectors and countries.

To test the positive impact of rewards on KMPs (acquisition, creation, storage, sharing, and application) in Middle Eastern auditing and consultancy firms, the following hypotheses were proposed:

H9a: Rewards positively affect the knowledge acquisition process.

H9b: Rewards positively affect the knowledge-creation process.

H9c: Rewards positively affect the knowledge storage process.

H9d: Rewards positively affect the knowledge-sharing process.

H9e: Rewards positively affect the knowledge application process.

Previous studies have demonstrated a significant effect of rewards on knowledge sharing in different sectors and countries, such as healthcare organisations, ICT companies, and the energy industry in countries like Taiwan and Croatia, as well as emerging economies and virtual communities. In this study, the

knowledge-intensive sector in the region of the Mid-East is investigated to determine the effects of rewards on the whole KM cycle, including five processes.

Organisational culture is a unique characteristic of each organisation that reflects its identity as a result of the organisation's origin, history, experiences, and environment (Cavaliere & Lombardi, 2015; Low et al., 2020). It consists of the values and norms shared within the organisation (Fernandes, 2018; Hofstetter & Harpaz, 2015), which guide the organisation's activities and its members' attitudes and behaviours internally and externally to achieve the organisation's desired outcomes (Wei & Miraglia, 2017; Zgodavova et al., 2017). Organisational culture is reflected in such different dimensions as the flexibility that supports innovation and creativity (Jajja et al., 2019), the external focus that supports differentiation (Ogbonna, 2019), and the internal core that supports efficiency in business operations (Ogbonna & Harris, 2015). The organisational culture is driven by the leaders' values, setting the organisation's vision and mission and shaping the corporate culture (Frantz & Jain, 2017; Low et al., 2020), which links the organisation's strategy with its members. Organisational culture helps in adopting KMPs by determining how knowledge is managed, transferred, and integrated into different organisation's operations and units (Fernandes, 2018; Sensuse et al., 2014) and influences how people communicate and exchange knowledge, resulting in new corporate knowledge practices (Pham & Dinh, 2020; Wei & Miraglia, 2017). As an organisation's values and norms, organisational culture affects the employee behaviours and their engagement in the KMPs. Thus, KM's success is connected to building a supportive organisational culture which leads to improving organisational performance.

Previous research studied the effect of organisational culture on such KMPs as knowledge sharing, transfer, creation, and storage (Cavaliere & Lombardi, 2015; Chang & Lin, 2015; Chi6n & Charles, 2020; Ng, 2022; Pham & Dinh, 2020; Sensuse et al., 2014; Wei & Miraglia, 2017). Sensuse et al. (2014) verified that organisational culture could advocate the knowledge-sharing process in Indonesian healthcare organisations (Sensuse et al., 2014). The research completed by Cavaliere and Lombardi (2015) on manufacturing MNCs' subsidiaries in the Tuscan Italian region highlighted different roles of organisational culture. It partially supported the positive effects of each type on the two, i.e., knowledge donating and collecting (Cavaliere & Lombardi, 2015). Chang and Lin (2015) examined the effects of different organisational culture dimensions on knowledge creation, storage, transfer, and application in IT companies in Taiwan, where a significant positive impact of organisational culture on analysed processes is recognised (Chang & Lin, 2015). Wei and Miraglia (2017) found that organisational culture significantly affects knowledge transfer implementation in Chinese construction firms (Wei & Miraglia, 2017). Research by Chion and Charles (2020) indicated a significant effect of organisational culture on knowledge sharing in Ecuador's

food and beverage sector (Chi6n & Charles, 2020). The study conducted by Pham and Dinh (2020) in Foreign Direct Investment enterprises in Vietnam revealed that a culture of openness, the language ability of foreign managers, and communication distance have a significant effect on knowledge transfer (Pham & Dinh, 2020). Ng (2022) carried out his research in private universities in Singapore. The results proved the positive effect of organisational culture on knowledge sharing (Ng, 2022). All prior studies focused on the relationship between organisational culture and specific KMPs in particular business sectors and areas.

To test the positive impact of organisational culture on KMPs (acquisition, creation, storage, sharing, and application) in Middle Eastern auditing and consultancy firms, the following hypotheses were proposed:

H10a: Organisational culture positively affects the knowledge acquisition process.

H10b: Organisational culture positively affects the knowledge-creation process.

H10c: Organisational culture positively affects the knowledge storage process.

H10d: Organisational culture positively affects the knowledge-sharing process.

H10e: Organisational culture positively affects the knowledge application process.

Previous studies have demonstrated a significant effect of organisational culture on some KMPs in different sectors and countries, such as healthcare organisations in Indonesia, manufacturing MNCs in Italy, IT companies in Taiwan, construction firms in China, the food and beverage sector in Ecuador, Foreign Direct Investment enterprises in Vietnam, and universities in Singapore. In this study, the knowledge-intensive sector in the region of the Mid-East is investigated to determine the effects of organisational culture on the whole KM cycle.

Teamwork is described as a group of individuals with complementary skills, expertise, and shared principles (Fay et al., 2015; Trincher0 et al., 2020), communicating and collaborating (Bayo-Moriones et al., 2021; Ekmekcioglu et al., 2018), sharing ideas and competencies (Corsino et al., 2019; Giudici & Filimonau, 2019), working interdependently and acting as one entity (Gonzalez & de Melo, 2019; Hanaysha, 2016) to achieve common goals while standing accountable for their work outcomes (Ogbonna, 2019; Trincher0 et al., 2020). The objective of teamwork includes balancing the team members' different competencies and capacities (Ekmekcioglu et al., 2018; Justiniano et al., 2018) to increase their achievements (Konak et al., 2019; Ogbonna, 2019) since working in a team allows employees to be more productive (Atapattu & Jayakody, 2014; Corsino et al., 2019), creates an opportunity to exchange knowledge and expertise (Giudici & Filimonau, 2019; Humphrey et al., 2017), and facilitates the knowledge flow in

the organisation (Fay et al., 2015; Gonzalez & de Melo, 2019). Effective teamwork positively affects job satisfaction (Marlow et al., 2018; Sung & Choi, 2012), organisational commitment (Hanaysha, 2016; Justiniano et al., 2018), and employee engagement in knowledge practices (Atapattu & Jayakody, 2014; Gonzalez & de Melo, 2019). Teamwork is characterised by a group of individuals who work together, combining their skills and expertise to achieve a specific goal. Teamwork has a positive effect on the knowledge flow between individuals and different units of the organisation, improving the results of operations and enhancing organisational performance.

The influence of teamwork on KMPs in less-studied contexts was addressed by several researchers (Atapattu & Jayakody, 2014; Gonzalez & de Melo, 2019; Hanaysha, 2016). Atapattu and Jayakody (2014) studied the relationship between teamwork and KM in Sri Lanka. The results indicated that teamwork's impact on KM depends on employee characteristics (Atapattu & Jayakody, 2014). The study conducted by Hanaysha (2016) in higher education institutions in northern Malaysia revealed that teamwork activities could create an environment that facilitates the exchange of knowledge necessary for better job autonomy and employee satisfaction (Hanaysha, 2016). Gonzalez and Melo (2019) studied the effects of teamwork on knowledge absorption, generation, adaption, and storage in the service industry. The study concluded that teamwork plays a significant role in knowledge generation, absorption, and adaption, while it plays a passive role in the knowledge storage process (Gonzalez & Melo, 2019). These prior research results are limited to specific business sectors and geographical areas.

To test the positive impact of teamwork on KMPs (acquisition, creation, storage, sharing, and application) in Middle Eastern auditing and consultancy firms, the following hypotheses were proposed:

H11a: Teamwork positively affects the knowledge acquisition process.

H11b: Teamwork positively affects the knowledge-creation process.

H11c: Teamwork positively affects the knowledge storage process.

H11d: Teamwork positively affects the knowledge-sharing process.

H11e: Teamwork positively affects the knowledge application process.

Previous studies have demonstrated a significant effect of teamwork on some KMPs in different sectors and countries, such as the service industry, organisations in Sri Lanka, and higher education institutions in northern Malaysia. In this study, the knowledge-intensive sector in the region of the Mid-East is investigated to examine the effects of teamwork on the whole KM cycle.

Organisational structure shapes the flow of activities in the different organisational units (Shaw, 2019; Wahba, 2015) by dividing tasks and functions and distributing responsibilities between individuals (Singh et al., 2019; Szczepańska-Woszczyzna, 2018). Since organisations are seen as independent entities having their hierarchy, the organisational structure is based on several features, such as

the design of different units (Acharya & Mishra, 2017), the reporting process between departments (Singh et al., 2019), and the coordination of the various divisions (Shaw, 2019). The organisational structure can be divided into physical (size, hierarchy) and non-physical (centralisation, specialisation, and formalisation) aspects that determine members' behaviour and performance (Ho et al., 2014); for example, high structural centralisation decreases the opportunity for individuals to develop (Szczepańska-Woszczyzna, 2018), and high formalisation of organisational structure negatively affects innovation, creativity, and problem-solving (Singh et al., 2019). A balanced organisational structure increases cooperation between individuals (Voet, 2014), improves the decision-making process (Chión & Charles, 2020), and enhances the efficiency and effectiveness of business operations (Acharya & Mishra, 2017). The organisational structure could encourage or hinder the implementation of KM activities by determining how KMPs are coordinated and how knowledge practices are applied in daily business activities (Chión & Charles, 2020; Valmohammadi & Ghassemi, 2016). A flexible and less hierarchical organisational structure promotes KM practices (Acharya & Mishra, 2017), especially knowledge sharing, through maintaining social interaction and building communication channels between employees (Caimo & Lomi, 2015). The organisational structure is the allocation of work and authority in the organisation. It determines the hierarchy and the division of work within the departments, affecting the knowledge flow and the efficiency of knowledge practices.

The effect of organisational structure on knowledge circulation, sharing, and retention was previously analysed (Acharya & Mishra, 2017; Chión & Charles, 2020; Ho et al., 2014; Wahba, 2015). Ho et al. (2014) examined the impact of organisational structure on knowledge circulation in Taiwan-based enterprises. The results revealed that the formalised organisational structure positively affects the knowledge circulation process, while the autonomous organisational structure does not have such an impact (Ho et al., 2014). The study conducted by Wahba (2015) in the manufacturing and service sectors in the Egyptian context demonstrated a significant relationship between organisational structure and knowledge practices in the service sector more than in the product sector (Wahba, 2015). Acharya and Mishra (2017) observed that organisational structure significantly affects knowledge retention in the Indian infrastructure consultancy sector (Acharya & Mishra, 2017). The research by Chión and Charles (2020) in Ecuador's food and beverage sector indicated a considerable impact of organisational structure on knowledge sharing (Chión & Charles, 2020). Previous research results are limited to certain sectors in specific countries.

To test the positive impact of organisational structure on KMPs (acquisition, creation, storage, sharing, and application) in Middle Eastern auditing and consultancy firms, the following hypotheses were proposed:

H12a: Organisational structure positively affects the knowledge acquisition process.

H12b: Organisational structure positively affects the knowledge-creation process.

H12c: Organisational structure positively affects the knowledge storage process.

H12d: Organisational structure positively affects the knowledge-sharing process.

H12e: Organisational structure positively affects the knowledge application process.

Previous studies have demonstrated a significant effect of organisational structure on selected KMPs in different sectors and countries, such as Taiwan-based enterprises, manufacturing and service sectors in Egypt, the Indian infrastructure consultancy sector, and the food and beverage sector in Ecuador. This study investigates the knowledge-intensive sector in the region of the Mid-East to determine the effects of organisational structure on the whole KM cycle.

The organisational factors, rewards, organisational culture, teamwork, and organisational structure selected in this study were previously considered for their influence on specific KMPs. In addition, previous research did not address the mediating role of KMPs between organisational factors and organisational performance, and the knowledge-intensive sector in developing countries was not studied. To fill the gap found in the previous research, this study considered the effects of organisational factors on the whole KM cycle and the mediating role of the KMPs between the organisational factors and sustainable organisational performance in the knowledge-intensive sector of auditing and consultancy in the Mid-East developing countries.

1.4. Technological factors influencing knowledge management

The technological tools play an important role in the implementation of the KMPs, making the adoption of new technologies and interactive KM methods necessary for organisations. This section aims to overview the main technological factors affecting KMPs implementation based on previous studies (Table 1.7).

The efficient implementation of KMPs involves the use of adequate IT and social network tools as part of the organisational systems and networking. These tools establish a method of communication and connection between the individuals working in the organisation and the knowledge available, as they facilitate the accumulation and integration of knowledge from different sources into one location accessible by employees.

Table 1.7. Technological factors affecting KMPs (created by the author)

Description	Authors
IT	Al Alawi et al., 2007; Franco & Mariano, 2010; Moreno & Cavazotte, 2015; Valmohammadi & Ghassemi, 2016; Podrug et al., 2017; Chion & Charles, 2020; Ceci et al., 2021.
Social networks	Henttonen et al., 2013; Tangaraja et al., 2015; Jiang et al., 2019; Vyas & Pandey, 2020; Khamaksorn et al., 2022.

IT is a basic term primarily used to describe computers, programs, and telecommunications (Casimir et al., 2012; Podrug et al., 2017). IT is considered an enabler for KMPs (Dang et al., 2018; Wang et al., 2006), as it can manage the knowledge capital in the organisation (Muthukumar & Hedberg, 2005; Wei et al., 2022), eliminate knowledge barriers (Pinho et al., 2012; Valmohammadi & Ghassemi, 2016), and link individuals to the available knowledge (López & Alegre, 2012; Rathi et al., 2014) through databases and electronic forums that constitute useful knowledge storage mediums (Al-Alawi et al., 2007; Rathi et al., 2014). Thus, IT supports knowledge storage through the retention and codification of records, experiments, and knowledge of a company (Dang et al., 2018; Mehta, 2008), so when an employee leaves the organisation, their knowledge is stored in the repositories and databases accessible by other employees (Franco & Mariano, 2010; Moreno & Cavazotte, 2015). Furthermore, IT serves as a contributor to knowledge sharing by decreasing the barriers and the efforts needed to transfer knowledge between individuals and groups (Kim & Choi, 2018; Lee & Lee, 2007) and a facilitator of knowledge application as it enables utilising adequate knowledge when it is accessed (Dang et al., 2018; Khedhaouria & Jamal, 2015). IT is an important technological tool that helps to find, retrieve, and use the knowledge available in the organisation through electronic databases and repositories, increasing the efficiency of the organisation's operations and improving its performance.

Previous studies examined the impact of IT on KMPs, and most of them focused on a specific KM process instead of the whole KM cycle (Al-Alawi et al., 2007; Ceci et al., 2021; Franco & Mariano, 2010; Pinho et al., 2012; Podrug et al., 2017). Al-Alawi et al. (2007) investigated the IT effect on knowledge sharing in the public and private sectors in the Kingdom of Bahrain, where the results proved the positive relationship between IT and knowledge sharing (Al-Alawi et al., 2007). Franco and Mariano (2010) examined the effect of IT on knowledge storage. The study was conducted in Virginia, the USA, where the results revealed that IT positively affects knowledge storage (Franco & Mariano, 2010). Pinho et al. (2012) studied the influence of IT on such KMPs as acquisition, creation, storage, and dissemination. It was a theoretical study that concluded the positive

relationship between IT and the four KMPs (Pinho et al., 2012). The research conducted by Podrug et al. (2017) in large ICT companies in Croatia proved the positive impact of IT on knowledge sharing (Podrug et al., 2017). Ceci et al. (2021) examined the IT effect on knowledge sharing in the aerospace sector. The research results indicate a significant IT influence on knowledge sharing (Ceci et al., 2021). The previous studies on the IT impact on KMPs have certain limitations in terms of the KMPs addressed and the generalisability of the results based on specific sectors and countries.

To test the positive IT impact on KMPs (acquisition, creation, storage, sharing, and application) in Middle Eastern auditing and consultancy firms, the following hypotheses were proposed:

H13a: IT positively affects the knowledge acquisition process.

H13b: IT positively affects the knowledge-creation process.

H13c: IT positively affects the knowledge storage process.

H13d: IT positively affects the knowledge-sharing process.

H13e: IT positively affects the knowledge application process.

Previous studies have demonstrated a significant effect of IT on some KMPs in different sectors and countries, such as the public and private sectors in the Kingdom of Bahrain, companies in Virginia (USA), large ICT companies in Croatia, and the aerospace sector. This study recognises IT as a valuable instrument for an effective KM cycle involving five KMPs in the knowledge-intensive sector in the region of the Mid-East.

Social networks are considered a crucial source of reliable knowledge (Jones & Mahon, 2012), knowledge networks (Sedighi et al., 2018), and social media (Archer-Brown & Kietzmann, 2018). Knowledge in a particular context, such as the Internet, intranet, email, or groupware (Archer-Brown & Kietzmann, 2018; Štrach & Everett, 2006), driven by individuals and systems (Christensen, 2007), linking the knowledge provider and the knowledge recipient (Tangaraja et al., 2015) and permitting users to exchange knowledge or experiences by using a computer-mediated system (Sedighi et al., 2018). While previous means of communication emphasised one-to-one communication, social networks appeared to build a developed system for connecting individuals and groups and became the essential model for attaining knowledge across distance (Boyd, 2015). Succeeding the fast-growing popularity of social networks, companies became more interested in providing similar online platforms for their employees where they can experience new interaction types (Ding et al., 2013; Tangaraja et al., 2015), resulting in more effective communication, collaboration, and engagement in different projects and activities (Cetto et al., 2018; Jones & Mahon, 2012). These networks constitute feedback and communication channels (Pinho et al., 2012; Richter et al., 2016) that facilitate finding and exchanging the required knowledge and also enable real-time contact between individuals for discussions (Guechtouli et al., 2013; Jiang

et al., 2019). While explicit knowledge could be embedded in information repositories, tacit knowledge is embedded in the organisation's social networks, which influence the emotional and behavioural reactions of individuals (Cetto et al., 2018), and motivate them to share their knowledge through surpassing departmental and geographical boundaries (Huang, 2017), leading to more open communications with more participants who can select the individuals they want to connect with and the knowledge they intend to gather or share (Fish et al., 2019). In addition, social networks are enablers of KMPs since the direct connection between employees, customers, suppliers, and other stakeholders is the main aspect that allows the acquisition and creation of new knowledge and contributes to the accessibility and transfer of knowledge that could be useful for the organisation's performance improvement (Khamaksorn et al., 2022; Vyas & Pandey, 2020). Social networks are considered an important technological means of communication, linking knowledge providers and recipients through various platforms facilitating the connection and contributing to the KM cycle, which positively influences organisational performance.

Previous research results showed that social networks have a positive influence on such KMPs as knowledge sharing (Henttonen et al., 2013; Khamaksorn et al., 2022; Sedighi et al., 2018; Tangaraja et al., 2015; Vyas & Pandey, 2020). Henttonen et al. (2013) examined the effect of social networks on knowledge sharing in Finnish organisations, where the research results proved the positive impact of social networks on knowledge (Henttonen et al., 2013). According to Tangaraja et al. (2015), there is a positive relationship between social networks and knowledge sharing in the Malaysian public sector (Tangaraja et al., 2015). Sedighi et al. (2018) investigated the impact of social networks on knowledge sharing in a group of companies in the energy sector. The research results proved the positive effect of social networks on knowledge sharing (Sedighi et al., 2018). Vyas and Pandey (2020) studied the impact of social networks on knowledge sharing in the private service sector in India. The research results revealed that social networks positively influence knowledge sharing (Vyas & Pandey, 2020). The research performed by Khamaksorn et al. (2022) demonstrated the positive effect of social networks on knowledge transfer for international construction joint venture projects in Thailand (Khamaksorn et al., 2022). A review of the previous research revealed a lack of studies examining the influence of social networks on the whole KM cycle, and most of them specifically focused on knowledge sharing in addition to the limitation in terms of the studied sectors and business areas.

To test the positive impact of social networks on KMPs (acquisition, creation, storage, sharing, and application) in Middle Eastern auditing and consultancy firms, the following hypotheses were proposed:

H14a: Social networks positively affect the knowledge acquisition process.

H14b: Social networks positively affect the knowledge-creation process.

H14c: Social networks positively affect the knowledge storage process.

H14d: Social networks positively affect the knowledge-sharing process.

H14e: Social networks positively affect the knowledge application process.

Previous studies have demonstrated a significant effect of social networks on KMPs in different sectors and countries, such as the Finnish organisations, the Malaysian public sector, companies in the energy sector, the private service sector in India, and international construction joint ventures projects in Thailand. In this study, the knowledge-intensive sector in the region of the Mid-East is investigated to explore the impact of social networks on the whole KM cycle.

The technological factors, IT and social networks, selected in this study were previously considered for their influence on specific KMPs. In addition, previous research did not address the mediating role of KMPs between technological factors and organisational performance, and the knowledge-intensive sector in developing countries was not studied. To fill the gap found in the previous research, this study considered the effects of the technological factors on the whole KM cycle and the mediating role of the KMPs between the technological factors and sustainable organisational performance in the knowledge-intensive sector of auditing and consultancy in the Mid-East developing countries.

1.5. Models for measuring knowledge management processes

The purpose of this section is to assess the previously proposed models that constitute a basis for the measurement of KMPs between 2000 and 2022 to create an improved model for measuring KMPs in the knowledge-intensive sector of auditing and consultancy in the Mid-East region, which would satisfy the goal of this research. The purpose of each model, the business sector, and the area where it was tested, the studied variables with related indicators, the methods used to test the model, and the models' limitations, were addressed and presented in Table 1.8 to find the gaps and the areas for improvement, which would help to create the new, improved model.

Ehms and Langen (2002) proposed the KM maturity model that permits qualitative and quantitative results on the KM status in an organisation. The suggested indicators for measuring the KM activities in Siemens AG Corporate Technology business were the five maturity levels (initial, repeated, defined, managed, and optimising). A defined assessment process was used to create the model that resulted in effective communication of different views on KM problems and solutions and the motivation of the employees to enhance KM in the organisation.

Table 1.8. Previous models for measuring KMPs (created by the author)

KMPs model	Author, year	Model purpose	Business sector/ area	Analysed variables	Suggested indicators	Model method	Model limitations
KM maturity model	Ehms & Lange, 2002	The model enables qualitative and quantitative results on KM status in an organisation.	Siemens AG/ Corporate Technology.	KM activities.	Maturity levels (initial, repeated, defined, managed, and optimising).	The assessment process and analysis model.	One case study limits generalisability.
KM capability assessment	Kulkarni & Freeze, 2004	The model aims to determine the capability levels of a company in different knowledge areas.	A large semiconductor manufacturing organisation.	KM capabilities.	Capability levels (difficult, possible, encouraged, enabled, practiced, managed, and improved).	Survey method.	One single company limits the generalisability.
KM pyramid model and KM readiness model	Hung et al., 2005	The model assesses the KM capabilities possessed by an organisation, the maturity level of each KM capability, and the improvements that the organisation should be considering.	Companies in Taiwan.	Knowledge creation, storage, sharing, application, structure, culture, and technology.	Maturity levels (initial, repeated, defined, managed, optimising), process dimension, capability dimension, and infrastructure dimension.	The model is assessed using 12 scores based on the 5-point Likert scale.	Generalisability
Model of KM maturity	Khatibian et al., 2010	The model provides an instrument to assess organisations' KM maturity level.	Enterprises that produce software products.	Strategy, HR, KMPs, leadership, IT, culture, structure, evaluation.	Maturity levels (initial, repeated, defined, managed, and optimised).	Survey method.	Generalisability

End of Table 1.8

KMPs model	Author, year	Model purpose	Business sector/ area	Analysed variables	Suggested indicators	Model method	Model limitations
Specified maturity model	Jochem et al., 2011	The model enables organisations to determine their knowledge status to take action for the development of their business processes and to reach their KM goals.	Small and medium-sized enterprises (SMEs).	Knowledge-intensive business processes.	Maturity levels (initial, repeated, defined, managed, and optimised).	Self-assessment using survey method.	Generalisability
Integrated KM model	Yiu & Pun, 2014	The model presents an instrument that aligns the measures of KM performance to attain organisational goals.	Industrial enterprises in Trinidad and Tobago.	Leadership, KMPs, people development, and results orientation.	Integrated KM performance maturity status (Level 1 to 4).	Self-assessment using survey method.	Generalisability and limited enablers.
KM process	García-Fernández, 2015	The model helps future researchers in carrying out KM measurement.	Not tested.	Knowledge creation, transfer, storage, use, and application.	KM dimensions.	Literature review analysis.	The model is not tested, and the dimensions are not analysed.
KM system	Centobelli et al., 2019	The model suggests appropriate changes in the adoption of KM tools and practices to improve the process of KM development.	High-tech manufacturing and service industries.	Knowledge creation, storage, and transfer.	KM tools and practices intensity of use.	Field analysis using a semi-structured interview.	Generalisability

organisational performance is not presented in the model. In addition, the results are limited to one case study, which restricts their generalisability (Ehms & Langen, 2002). Kulkarni and Freeze (2004) suggested the KM capability assessment model that aims to determine the capability levels of a company in different knowledge areas. A survey method was used to determine the capability levels identified as difficult/impossible, possible, encouraged, enabled/practiced, managed, and continuously improved in a large semiconductor manufacturing organisation. Using the KM capability assessment, organisations can focus on some aspects of their KM capabilities through the efficient use of scarce organisational resources. The limitations of this model are that it does not specify the KMPs and does not present the relationship between KMPs and organisational performance.

The generalisability of the findings and the model implementation are limited to one single company (Kulkarni & Freeze, 2004). Hung et al. (2005) presented the KM pyramid model and KM readiness model that assess KM capabilities possessed by an organisation, the maturity level of the KM capabilities, and improvements to be considered by the organisation.

The model is assessed using scores based on the Likert scale from 0 to 5 points to determine the maturity level (initial, repeated, defined, managed, and optimising) of the KMPs supported by some factors, such as organisational structure, organisational culture, and technology factors in the Taiwanese companies. The presented model helps in assessing KM performance and provides maturity paths that organisations can follow to improve KMPs. However, empirical evidence is not provided, the supporting factors are limited to a few organisational and technological factors, and the relationship between KMPs and organisational performance is not presented. Also, the findings are limited to one country (Hung et al., 2005). Khatibian et al. (2010) proposed the KM maturity model with an assessment instrument to evaluate the maturity level. The survey method was used to determine the KM maturity levels (initial, repeated, defined, managed, and optimised) in enterprises producing software products. KMPs are not specified, and the relationship between KMPs and organisational performance is not presented in this model. In addition, the results are limited to one sector, which limits the generalisability (Khatibian et al., 2010).

Jochem et al. (2011) suggested a specified maturity model that enables organisations to assess their situation and take the needed actions for the efficient implementation of their KMPs, which contributes to the achievement of their KM goals. The method used to determine the maturity levels (initial, repeated, defined, managed, and optimising) of the knowledge-intensive business processes in small and medium-sized enterprises (SMEs) was the self-assessment instrument using the survey method. The advantage of this model is that it accounts for the needs of SMEs by incorporating the organisation's preference

over the assessed areas. However, KMPs are not specified, and the relationship between KMPs and organisational performance is not considered, while the generalisability of the results is limited to SMEs (Jochem et al., 2011). Yiu and Pun (2014) proposed the integrated KM model that measures KM performance to reach corporate organisational goals. The self-assessment instrument using the survey method was used as a method to determine the maturity levels of the integrated KM performance maturity status (levels 1 to 4) in the industrial enterprises in Trinidad and Tobago.

The integrated KM model adaptation and use for self-assessments could help industrial enterprises to improve their KM capabilities for reaching organisational goals. The limitations of this model are the generalisability of the model and the limited enablers, in addition to the small sample size, which constitutes a disadvantage (Yiu & Pun, 2014).

García-Fernández (2015) presented the KM process model to help future researchers in carrying out KM measurements. A literature review analysis was performed to set the dimensions of knowledge creation, transfer and storage, application, and use. The model can be used as a standard theoretical framework to attain better empirical research that can measure KM not only as a part of the process but as a whole. The limitation of this model is that it is not empirically tested, and the reliability and validity of the constructs are not analysed (García-Fernández, 2015). Centobelli et al. (2019) suggested the KM system model that is used to evoke appropriate changes in the adoption of KM practices to improve the process of KM development in high-tech manufacturing and service industries. A field analysis using semi-structured interviews was conducted to determine KM practice intensity of use, specifically knowledge creation, knowledge storage, and knowledge transfer. The results could help in detecting the weaknesses of the organisation's KM system and then identifying specific KM practices and appropriate technologies to improve their KMPs. Although selected KMPs are analysed, the KM cycle is still not considered, and the generalisability of the results is limited to a specific industry (Centobelli et al., 2019).

The analysis of the previously suggested models for measuring KMPs shows some limitations and gaps, where most of the previous models considered the KM practices as one variable without specifying the processes. Moreover, only some models addressed the factors affecting the KM practices, such as some organisational factors or technological factors. Most of the models were not empirically tested, which constitutes a disadvantage and reduces the reliability of the results. In addition, the models were tested in one sector or one country, which limits the generalisability of their implementation.

To fill the gaps found in previously proposed KMPs models, this study proposes a model that measures the efficiency of the KM cycle involving five

KMPs (acquisition, creation, storage, sharing and application) affected by different human (trust, interaction, and self-efficacy), organisational (rewards, organisational culture, teamwork, and organisational structure) and technological (IT and social networks) factors, empirically tested in a knowledge-intensive sector as auditing and consultancy firms in the developing countries of the Mid-East region.

1.6. Conclusions of the First Chapter

In the current dynamic and fast-changing environment, KM is acknowledged as an important factor that helps organisations to improve their performance and to achieve uniqueness and leadership in the market. KM is described as the systematic management of processes, methods, and tools, making full use of the organisation's knowledge potential for strategic goals, effective decisions, and value creation. The improvement of organisations' performance depends on their capacity to benefit from KMPs that would best support their strategies and can add value to their products or services and ensure sustainable organisational performance.

An analysis of previous studies in the KM field was conducted to determine the most significant KMPs and the factors affecting their efficient implementation in organisations. Most scientists and practitioners agreed that successful organisations were those that implemented the most important and beneficial KMPs, including knowledge acquisition, knowledge creation, knowledge storage, knowledge sharing, and knowledge application, which constitute the KM cycle in the organisation. By adopting the processes, organisations would be able to improve the delivery of their products and services and enhance their sustainable organisational performance. Different factors, categorised as human, organisational, and technological, have been recognised to help eliminate KM barriers and support the efficient implementation of the whole KM cycle. Among them are such human factors as trust, interaction, and self-efficacy; organisational factors, i.e., rewards, organisational culture, teamwork, and organisational structure; and technological factors, i.e., IT and social networks, which were found to be the most significant and were selected to be analysed in this study. The effects of these factors on the five KMPs (acquisition, creation, storage, sharing and application) and the effects of the latter on sustainable organisational performance were previously considered in different sectors and countries. However, a lack of research in the knowledge-intensive sector in developing countries was recognised, and a gap was found in most studies in the evidence related to the influence of different human, organisational, and technological factors on the whole KM cycle. This study was conducted in the Middle Eastern auditing and consultancy firms to fill the gap in

research in the Mid-East region and to test the relationship between human factors of trust, interaction, and self-efficacy, organisational factors of rewards, organisational culture, teamwork, and organisational structure, and technological factors, i.e., IT and social networks, with the entire KM cycle and the sustainable organisational performance.

2

Research on knowledge management processes in Middle Eastern auditing and consultancy firms

After conducting a thorough analysis of the scientific literature on the knowledge management processes, their effect on sustainable organisational performance and affecting factors, the Second Chapter outlines the framework for the methodology, specifically the quantitative methods and the SEM techniques used to generate the research results.

The findings of the Second Chapter have been published in scientific papers (Kordab et al., 2020; Raudeliuniene et al., 2021).

2.1. Research context and model

KM is a phenomenon and a research subject that has received considerable attention in the context of economies relying on knowledge as a source of innovation and growth (Kaur & Singh, 2016). While acknowledging the need for effective KM, developing economies, including the catching-up economies of the Mid-

East, are struggling with multiple economic and geopolitical constraints (Kassab, 2016). Such conditions make the KM phenomenon less explored within these developing countries, yet important to support their development and potential transition towards a sustainable knowledge-based model (AlShamsi & Ajmal, 2018). Sustainability transitions in the Mid-East region are resisted by vested concerns, uncertainties about the future amongst the populations, political instabilities, and the erosion of social services and systems of provision (Soliman, 2020). Most Mid-East countries are suffering from a shortage of strategic plans for sustainable development because of wars and armed conflicts, growing population, youth unemployment, corruption, limited entrepreneurship, water scarcity, pollution, urbanisation, and poverty (World Bank, 2009; 2020). Challenges faced by the Mid-East companies range from economic, such as global and local economic crises, to organisational cultural and social difficulties (World Bank, 2009), i.e., the lack of strategic alliances, economic opportunities, global cooperation, and reputation building to match the global international ranking (Khan et al., 2016).

Companies, particularly operating in the knowledge-intensive sector, provide knowledge-based activities by integrating and applying the generated knowledge while addressing changes related to environmental dynamics and industry (Consoli & Elche, 2013). Besides, the knowledge-intensive sector perceives intellectual resources as the organisation's primary asset (Kianto et al., 2016) that enables sustainable organisational performance through the effective management of knowledge (Wu & Chen, 2014), leading to a reduction in the human and infrastructure costs, and an enhancement in the efficiency and uniqueness of their operations (Chang & Lin, 2015). As a knowledge-intensive sector, auditing and consultancy firms face the challenge of allying the local cultural, social, and business norms with international standards, such as International Financial Reporting Standards (IFRS), International Accounting Standards (IAS), or International Standards Organisation (ISO) (Mezher et al., 2005; Tarek et al., 2017). In most cases, knowledge is obtained from abroad, which needs a rational shift toward a knowledge-based approach that supports social and economic development (Kassab, 2016). To achieve these alterations, multiple adjustments are required, such as modifying institutional plans that allow profiting from the knowledge available (Khan et al., 2016) while focusing on human and organisational KM enablers, as well as expanding the use of IT and platform-based social networks (Al-Roubaie, 2013; Al-Roubaie & Al-Ameen, 2015). Moreover, auditing and consultancy services need to integrate continuous organisational learning as the main component of their culture to achieve the desired sustainable organisational performance (Krafft et al., 2014). They invest in learning and growth opportunities for all members, leading to considerable impact and thriving in a dynamic culture of inclusion, collaboration, and high performance. However, one of the main chal-

allenges faced by auditing and consultancy firms in developing countries is the technological advancement that has changed the traditional systems to more developed systems relying on technology-enabled social networks for communication with the stakeholders and the exchange of the required knowledge. Also, IT and especially the accounting software is used for conducting daily operations (Tarek et al., 2017) and auditing processes, which consist of planning and designing the audit approach for the company undertaking the audit, performing the different audit tests and procedures, completing the audit and issuing the audit report to be communicated with the company's stakeholders (Arens et al., 2012). Auditing procedures are applied by certified auditors with the assistance of trainees working under the supervision of CPAs to acquire knowledge in the field. In addition to the practical part, the auditing and consultancy firms organise continuous workshops and seminars to exchange knowledge between the members and to share best practices for future problem-solving. An example of the methods used for knowledge exchange is a special platform implemented in Deloitte called the "knowledge exchange platform" that enables all the company's members to access it and gain or share new knowledge. To assess the acquired knowledge, the company conducts a challenge by sending emails to its members regarding specific knowledge shared on the platform to motivate them to access this platform frequently and benefit from the available knowledge. Furthermore, auditing and consultancy firms are required to keep specific documentation related to each project to serve as knowledge stored for later benefit. KMPs, which were proven to result in many advantages in different sectors and help organisations reach sustainable organisational performance based on the analysis of the literature, would also serve as a value-added to the knowledge resources in the auditing and consultancy firms. Hence, knowledge creation is illustrated by using new opportunities and providing new services to customers, especially through the automation of the auditing procedures, which would improve the efficiency of future project results. Knowledge acquisition is a continuous process in auditing and consultancy firms for gaining expertise and intelligence used to develop auditing procedures. Knowledge storage is a main requirement for benefiting from the experiences in previous projects, referring to any case documented and stored in the company's databases. Knowledge sharing is necessary since the auditing procedures are usually applied by different company members who can share their knowledge and experience to make the auditing process easier and more efficient. As for the knowledge application, it is reflected in the execution of the projects where the previous knowledge is converted into action plans and used to efficiently achieve the desired goals in new projects.

The Mid-East region was selected for this study for various reasons. First, the lack of research conducted in this area in the knowledge-intensive industry of auditing and consultancy. Second, globalisation's challenges in the Mid-East and

the possibilities to explore the KM potential in the knowledge-intensive industry for sustainable development. At the same time, the potential to reach awareness regarding the KM importance is high, especially in countries like Lebanon, where the human capital is increasing, and the education level of the young generation is high, leading to great human capacities and skills that are worth sharing between individuals for the benefit of the businesses and the economy. In addition, the economic, technological, and political challenges faced by developing countries create an opportunity to investigate the KM potential that would affect the development of these economies. Lebanon is an example of an economy facing fluctuations caused by wars and political, economic, and civil conflicts within the country and in the neighbouring territories, e.g., Syria and the Syrian crisis. The situation increases poverty, unemployment, and refugee flows (1.5 million Syrians since the conflict erupted in March 2011). At the same time, the human capital in Lebanon is characterised as increasing (World Bank, 2020). Therefore, the developing countries of the Mid-East, such as Lebanon, Syria, and Jordan, are interesting and yet unstudied contexts, while the field of auditing and consultancy firms offers a mixture of multinational and local companies to investigate the efficiency of KMPs. Researchers suggested that the Mid-East countries must engage in the implementation of KM practices to improve the capabilities and competitiveness of the Mid-East companies by increasing the innovation and effectiveness of their operations (AlShamsi & Ajmal, 2018; Elwany & Mahrous, 2016; Kassab, 2016). However, studies on the Mid-East region are very rare; thus, the effects of human, organisational, and technological factors on the KMPs implementation in the region's organisations is an important subject.

To fill the gap on significant factors affecting the KMPs in the developing countries of the Mid-East, this research was conducted to evaluate the influence of human (trust, interaction, and self-efficacy), organisational (rewards, organisational culture, teamwork, and organisational structure), and technological (IT and social networks) factors on the KM cycle involving five KMPs (acquisition, creation, storage, sharing, and application), and the effects of these processes on the sustainable organisational performance in the Middle Eastern auditing and consultancy firms.

According to the results of the literature review analysis, the study variables were identified, and the relationships between them were formed. To fill the gaps found in the previously proposed KMPs models, the model proposed in this study aims to examine the relationships between human (trust, interaction, and self-efficacy), organisational (rewards, organisational culture, teamwork, and organisational structure), and technological (IT and social networks) factors, and the KM cycle involving five KMPs (acquisition, creation, storage, sharing, and application), and the relationship between the KMPs and the sustainable organisational performance. Also, the mediating role of the KMPs between the studied factors

and sustainable organisational performance was addressed. The model was tested in a knowledge-intensive sector as auditing and consultancy firms in the developing countries of the Mid-East.

The study is divided into two parts. In the first part, the relationship between KMPs (acquisition, creation, storage, sharing, and application) and sustainable organisational performance was studied, with the KMPs depicting the independent variables and sustainable organisational performance as the dependent variable. In the second part, the relationship between human, organisational, and technological factors and the KMPs was studied, where different factors represent the independent variables, and the KMPs represent the dependent variables.

Accordingly, the hypothesised research model was created, showing all the relationships between the research variables (Fig. 2.1).

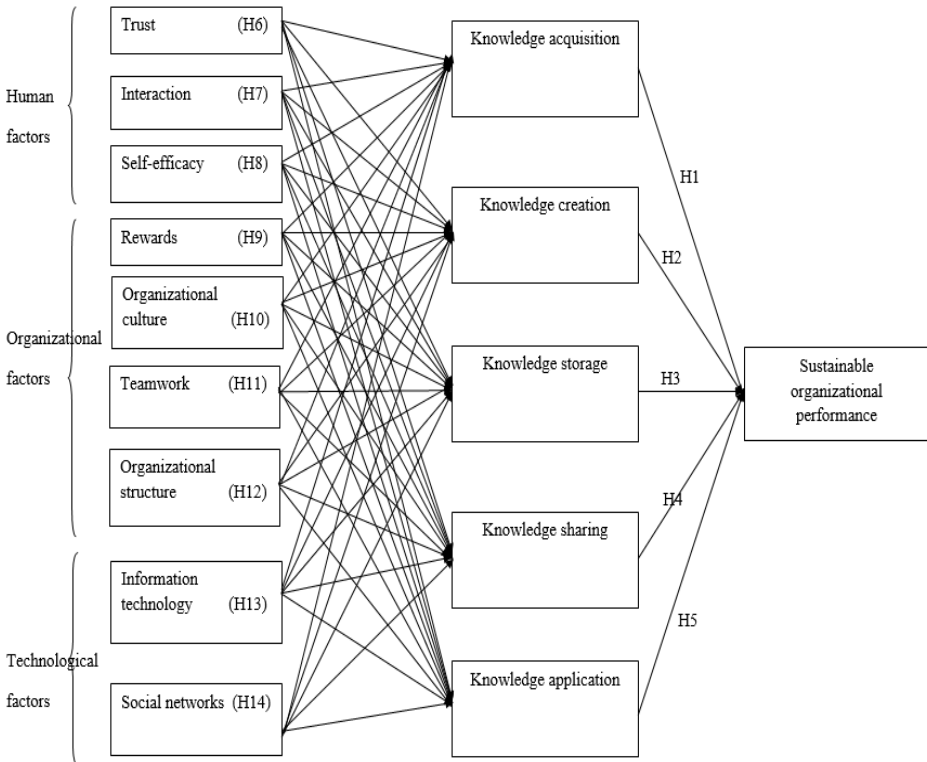


Fig. 2.1. Research model (created by the author)

Hypotheses H1, H2, H3, H4, and H5 were formulated to study the effects of the five KMPs (acquisition, creation, storage, sharing and application) on sustainable organisational performance. Hypotheses H6, H7, and H8 were formulated to

study the effects of human factors (trust, interaction, and self-efficacy) on the five KMPs. Hypotheses H9, H10, H11, and H12 were formulated to study the effects of organisational factors (rewards, organisational culture, teamwork, and organisational structure) on the five KMPs. Hypotheses H13 and H14 were formulated to study the effects of the technological factors (IT and social networks) on the five KMPs.

To test the formulated research hypotheses in Middle Eastern auditing and consultancy firms, appropriate research methods were applied.

2.2. Research methods

The data for the analysis were collected using a structured questionnaire that was prepared in English and Arabic, as the study was conducted in Arab countries. Online platforms like Google Forms and in-person communication were used to disseminate the questionnaire among auditing experts, either owners of auditing firms or senior managers and team leaders of local and multinational auditing and consultancy firms of the Mid-East region, specifically Lebanon, Syria, and Jordan, to test the research hypotheses. Auditing experts, such as Certified Public Accountants (CPAs), are affiliates in auditing associations who earned the status of a licensed expert after passing four professional examinations (auditing, financial accounting, business and managerial accounting, and taxation) and completing a minimum of two years of work experience under the supervision of licensed CPAs, who share their professional knowledge and experiences during the supervision period. The auditors' main responsibility is to evaluate all types of accounts and express opinions on the fair presentation of the financial reports. Their opinions serve as the source for decision-making and plans for internal and external stakeholders. As affiliates in the auditing associations, experts are committed to lifelong professional training and continuous education that enable them to improve their proficiencies through the entire KM cycle. To maintain their licenses, auditing associations require auditing experts to engage in professional development by joining workshops organised internally in their organisations or attending training with local or international, private or public academic, economic, or financial bodies and institutes.

This study took place between 2019 and 2020 when the total number of auditing experts in the associations' databases of Lebanon, Syria, and Jordan was around 4300. The questionnaire was filled by 379 respondents, constituting an acceptable sample size as per the robustness test at a confidence level of 95%. The sample is adequate as it is greater than 300 (15 X 20), and the number of variables in the study times 20 respondents. The participants were male (72%) and female (28%), aged from 25 to 35 (45.6%) and more than 45 (28.5%), master's degree

holders (38.5%), and certified public accountants (CPAs) (31.4%), upper managers (30.3%), and senior managers (26.7%), operating in local companies (73.4%) and multinational companies (26.6%) (Table 2.1).

Table 2.1. Demographic characteristics of the survey respondents (created by the author)

Category	Frequency	Percentage (%)
<i>Age</i>		
< 25	18	4.7%
≥ 25 and < 35	173	45.6%
≥ 35 and < 45	80	21.2%
≥ 45	108	28.5%
<i>Gender</i>		
Male	273	72.0%
Female	106	28.0%
<i>Education</i>		
Bachelor	113	29.8%
Master	146	38.5%
Certified public accountant (CPA)	119	31.4%
Other	1	0.3%
<i>Job position</i>		
Junior level	81	21.4%
Middle level	82	21.6%
Senior level	101	26.7%
Upper management	115	30.3%
<i>Type of organisation</i>		
Local	278	73.4%
Multinational	101	26.6%

The data analysis is a field study where respondents answered the survey questions based on a five-point Likert-scales “1” meaning “Strongly Disagree”, “2” meaning “Disagree”, “3” meaning “Neutral”, “4” meaning “Agree” to “5” meaning “Strongly Agree”. The elements used to assess the different indicators were obtained from previous scientific research, providing a valued source for data collection and measurement as their reliability and validity have been verified by prior research and peer reviews.

The knowledge acquisition process was assessed by acquiring knowledge for the development of specific programs, in addition to acquiring expertise and in-

telligence (Buheji, 2013; Ali et al., 2018); since knowledge is continuously increasing, knowledge acquisition became mandatory for the development and improvement of the companies' current programs. The knowledge creation process was assessed by using best practices to improve future projects, seeking new opportunities, and delivering new services (Lin, 2007; Buheji, 2013; Wu & Chen, 2014; Ali et al., 2018), as knowledge creation is deemed to add value to the organisational processes and contribute to the competitive advantage of the organisation. The knowledge storage process was assessed by accessing knowledge and customer databases (Lin, 2007; Ramachandran et al., 2009; Buheji, 2013; Yusr et al., 2017) since databases facilitate access to the available knowledge and, therefore, its benefit. The knowledge-sharing process was assessed among colleagues, business units, and stakeholders (Casimir et al., 2012; Buheji, 2013; Fullwood et al., 2013; Mura et al., 2013; Dijk et al., 2016; Ali et al., 2018) as there are several knowledge sources and knowledge sharing between different parties would be an advantage. The knowledge application process was assessed by converting knowledge into action plans and using knowledge to solve problems and reach desired goals (Lin, 2007; Ramachandran et al., 2009; Casimir et al., 2012; Buheji, 2013; Fullwood et al., 2013; Dijk et al., 2016; Ali et al., 2018), as knowledge application is the stage at which the organisation would benefit from the available knowledge ultimately to reach its goals.

The trust factor was assessed as counting on trustful individuals to create new knowledge, tending to acquire knowledge from trustful individuals, recording the knowledge acquired from trustful individuals, sharing knowledge with trustful colleagues, and letting trustful colleagues take responsibility for tasks critical to the team (Ali et al., 2018; Dijk et al., 2016; Fullwood et al., 2013; Mura et al., 2013), as interpersonal trust is an important factor in individuals' relationships which facilitates the flow of knowledge between them. The interaction factor was assessed as coming up with new ideas that could be used to improve the organisational performance, interacting with legal authorities to acquire new knowledge, interacting with colleagues to acquire new knowledge, recording the minutes of the team meetings with fellow project team members, holding interaction sessions that enhance knowledge sharing, and asking the help from each other for solving specific cases (Ali et al., 2018; Buheji, 2013; Dijk et al., 2016; Mura et al., 2013), where interaction is a means of communication with internal and external parties that could constitute a knowledge source. The self-efficacy factor was assessed as confidence driving employees to contribute to the knowledge creation process, the expertise allowing employees to acquire the needed knowledge, the expertise allowing employees to better record the knowledge needed for future use, the expertise allowing employees to share knowledge with members in the organisation, and the expertise allowing employees to use the available knowledge in the best

way possible, where self-efficacy allows individuals to better use their knowledge in the best way possible which benefits the organisation.

The rewards factor was assessed as having a well-defined policy for rewarding feasible, innovative ideas, rewarding employees who acquire new knowledge, properly record their knowledge, and use the knowledge efficiently to reach specific goals (Ali et al., 2018; Buheji, 2013; Casimir et al., 2012; Lin, 2007; Ramachandran et al., 2009; Yusr et al., 2017), as rewards are considered a motivation for employees to get more engaged in the KM cycle. The organisational culture factor was assessed as having a culture that supports best practices leading to new developments, encouraging employees to acquire and store knowledge in systems, promoting knowledge sharing, and encouraging the knowledge application in an efficient way for reaching specific goals (Buheji, 2013; Dijk et al., 2016; Ali et al., 2018), where leaders are responsible for adopting an organisational culture that encourages employees to create, share and apply knowledge effectively. The teamwork factor was assessed as enabling a teamwork atmosphere that serves the creation and acquisition of new knowledge, keeping records of all teams' experiences, making employees feel free to share their knowledge with others, and having all the facilities that encourage employees to work as a team to apply knowledge for solving cases (Buheji, 2013; Fullwood et al., 2013; Mura et al., 2013; Dijk et al., 2016; Yusr et al., 2017; Ali et al., 2018) since teamwork allows the communication between employees, facilitating knowledge exchange and contributing to enhancing organisational processes. The organisational structure factor was assessed as facilitating interdepartmental collaboration to create new knowledge, encouraging employees to go where they need for knowledge acquisition, facilitating the storage of any type of knowledge and its sharing across departmental boundaries, and facilitating the interdepartmental collaboration to use the knowledge in solving cases (Fullwood et al., 2013), where organisational structure can play a major role in facilitating the knowledge flow across different departments and among all members.

The IT factor was assessed as the use of IT to create and acquire knowledge, for easy access to knowledge, to facilitate sharing and applying knowledge (Ali et al., 2018; Buheji, 2013; Casimir et al., 2012; Fullwood et al., 2013; Ramachandran et al., 2009; Yusr et al., 2017), where IT is a facilitator for the knowledge flow and the implementation of the KMPs. The social networks factor was assessed as the use of internal and external social networks in the organisation to acquire new knowledge from various sources and share it for better knowledge storage and knowledge application (Ali et al., 2018; Buheji, 2013; Fullwood et al., 2013; Lin, 2007), as social networks are the means by which internal and external knowledge could be managed.

The study employed the SEM techniques, which use several model types to represent relationships among studied variables, with the main goal of providing

a quantitative test of a theoretical hypothesised model. Many theoretical models can be tested using SEM that hypothesise how sets of variables describe constructs and how these constructs are related to each other. The SEM technique was used in this study because it allows to test the complex theoretical models with multiple variables, which cannot be examined using simple statistical techniques like regression analysis, and to test the mediating or moderating effects of variables in a model, which is useful for understanding the underlying mechanisms that drive relationships between variables. As so, this technique fits best for testing the research model of the current study.

To generate the results and analyse this research, Statistical Package for Social Science (SPSS), SPSS Amos, and Statistics and Data (Stata) software for statistics and data science were used.

The structure of different tests is as follows: (1) descriptive statistics, (2) comparative analysis, (3) quantitative analysis (reliability and validity of constructs; model goodness of fit measurements; collinearity test; Pearson's correlation between the variables; SEM results), (4) SEM results, and (5) Sobel test.

2.3. Descriptive statistics

The mean values and the standard deviation (SD) for each indicator, knowledge acquisition, creation, sharing, storage, and application, in addition to human (trust, interaction, and self-efficacy), organisational (rewards, organisational culture, teamwork, and organisational structure) and technological (IT and social networks) factors and the sustainable organisational performance were generated to assess the average of responses and the amount of dispersion between values. A low standard deviation indicates that values tend to be close to the mean of the set for each construct, while a high standard deviation indicates that values are spread out over a wider range. Furthermore, all the constructs included in the distributed questionnaire, which are related to the five KMPs, in addition to all the constructs related to human, organisational and technological factors and sustainable organisational performance, were assessed using factor analysis. The indicators which resulted in factor loadings of less than 0.60 were eliminated, and the remaining constructs analysed in this study have factor loadings between 0.60 and 0.98, all greater than or equal to the threshold of 0.60 (Table 10).

Certified public accountants highly agreed with the following constructs, describing the implementation of the KM cycle: sharing knowledge among colleagues (4.20), matching knowledge to problem-solving (4.12), applying knowledge to achieve the organisation's goals (4.10), keeping accessible customer database (4.07), sharing knowledge among business units (4.06), employ-

ing new opportunities to provide the clients with better services (4.06), maintaining databases to access knowledge (4.03), transforming knowledge into actions (3.89), acquiring knowledge for the development of specific programs (3.87), generating best practices to enhance future projects (3.87), delivering new services based on the market needs (3.85), acquiring an expertise (3.78), and sharing knowledge with the stakeholders (3.78). A lower agreement was recognised for acquiring intelligence (3.70) (Table 2.2). As a result, participants believed the most noticeable were internal communication and openness, quick response to external factors (markets, stakeholders), and related absorbent capacity.

Table 2.2. Descriptive statistics of KMPs indicators and variables (created by the author)

Variable	Mean	S.D.	Factor loadings
Knowledge acquisition			
Construct 1	3.87	0.87	0.70
Construct 2	3.78	0.92	0.87
Construct 3	3.70	0.89	0.94
Knowledge creation			
Construct 1	3.87	0.80	0.82
Construct 2	4.06	0.73	0.80
Construct 3	3.85	0.82	0.81
Knowledge storage			
Construct 1	4.07	0.82	0.80
Construct 2	4.03	0.89	0.81
Knowledge sharing			
Construct 1	4.20	0.77	0.60
Construct 2	3.78	1.05	0.85
Construct 3	4.06	0.72	0.90
Knowledge application			
Construct 1	3.89	0.90	0.60
Construct 2	4.12	0.73	0.87
Construct 3	4.10	0.65	0.94

These results attest to an emphasis on adaptability (particularly in such items as “match”, “quickly uses”, and salient “knowledge sharing” within the organisation and beyond organisational borders), which could be relevant to the turbulent market of the Mid-East.

In addition, high agreement with the following human factor constructs was recognised: employee expertise allows them to use the available knowledge in the best way possible (4.32), employee expertise allows them to acquire the knowledge needed in the organisation (4.31), employee confidence in their expertise allows them to share their knowledge with other members in the organisation (4.30), employees ask for help from each other to solve specific cases (4.18), employees are comfortable letting trustful colleagues take responsibility for tasks which are critical to the team (4.16), employee confidence in their expertise drives them to contribute to the knowledge creation process in the organisation (4.14), employee expertise allows them to better record the knowledge needed for future use (4.10), employees frequently interact with their colleagues to acquire new knowledge (4.07), employees tend to acquire knowledge from most trustful individuals (4.03), employees interact to come up with new ideas that can be used to improve organisation performance (4.02), employees count on trustful individuals in creating new knowledge (4.00), employees record the knowledge acquired from trustful resources (3.96), and employees share knowledge with most trustful colleagues (3.94). A lower agreement with the following statements was recognised; the organisation has interaction sessions that enhance knowledge-sharing (3.62), and the organisation records minutes of the team meetings with fellow project team members (3.52) (Table 11).

Participants highly agreed with the following constructs, which describe organisational factors: enabling a teamwork atmosphere that serves the acquisition of knowledge (4.11), encouraging employees to acquire knowledge (4.10), enabling a teamwork atmosphere that serves the creation of new knowledge (4.08), having all facilities that encourage employees to work as a team to apply knowledge for solving cases (4.07), encouraging the efficient application of knowledge to reach specific goals (4.06), enabling a teamwork atmosphere that makes employees feel free to share their knowledge (4.02), having a culture that supports best practices leading to new developments (3.99), promoting knowledge sharing (3.97), encouraging employees to store the knowledge in the organisation's systems (3.88), keeping records of all the experiences generated from the work of the teams (3.86). A lower agreement with the following statements was recognised; the organisational structure facilitates the interdepartmental collaboration to use the knowledge in solving cases (3.74), The organisational structure facilitates the interdepartmental collaboration to use the knowledge in solving cases (3.68), the organisational structure facilitates knowledge sharing across departmental boundaries (3.66), the organisation encourages employees to go where they need for knowledge acquisition regardless of organisational structure (3.66), the organisational structure facilitates the storage of any type of knowledge (3.61), the organisation rewards the employees who acquire new knowledge (3.59), the organisation has well-defined policy for rewarding feasible innovative ideas

(3.55), the organisation rewards the employees who use efficiently the knowledge to reach specific goals (3.44), the organisation rewards the employees who properly record their knowledge (3.42), and the organisation rewards the employees who share their knowledge (3.40) (Table 2.3).

Table 2.3. Descriptive statistics of the indicators and human factor variables (created by the author)

Variable	Mean	S.D.	Factor loadings
Construct 1	4.03	0.77	0.77
Construct 2	4.00	0.78	0.63
Construct 3	3.96	0.79	0.73
Construct 4	3.94	0.79	0.60
Construct 5	4.16	0.69	0.77
Construct 6	4.07	0.85	0.92
Construct 7	4.02	0.84	0.74
Construct 8	3.52	1.01	0.80
Construct 9	3.62	0.97	0.60
Construct 10	4.18	0.71	0.65
Construct 11	4.31	0.67	0.81
Construct 12	4.14	0.74	0.80
Construct 13	4.10	0.85	0.81
Construct 14	4.30	0.80	0.90
Construct 15	4.32	0.71	0.83

Moreover, participants highly agreed with the following constructs related to technological factors: using IT for acquiring a wide range of knowledge (4.22), using repositories for easy access to knowledge stored (4.20), facilitating the creation of knowledge (4.19), facilitating the application of knowledge (4.13), enabling employees to share knowledge (4.07), using social networks as a means of communication (3.75).

A lower agreement with the following statements was recognised; having internal social networks to share knowledge regularly (3.71), social networks enabling the acquisition of new knowledge from various sources (3.65), having external social networks to share knowledge (3.64), having suitable social networks that support innovative capabilities, and enable better application of the knowledge available (3.45), social networks serve as a system for knowledge storage (3.28) (Table 2.4).

Table 2.4. Descriptive statistics of the indicators and variables of organisational factors (created by the author)

Variable	Mean	S.D.	Factor loadings
Construct 1	3.59	1.10	0.96
Construct 2	3.55	1.07	0.77
Construct 3	3.42	1.06	0.92
Construct 4	3.40	1.04	0.97
Construct 5	3.44	1.04	0.93
Construct 6	4.10	0.90	0.96
Construct 7	3.99	0.93	0.89
Construct 8	3.88	1.02	0.96
Construct 9	3.97	1.02	0.91
Construct 10	4.06	0.94	0.91
Construct 11	4.11	0.81	0.95
Construct 12	4.08	0.87	0.85
Construct 13	3.86	0.94	0.87
Construct 14	4.02	0.87	0.84
Construct 15	4.07	0.75	0.86
Construct 16	3.66	1.10	0.82
Construct 17	3.68	1.10	0.97
Construct 18	3.61	1.10	0.95
Construct 19	3.66	1.12	0.98
Construct 20	3.74	1.05	0.89

Additionally, participants highly agreed with the following constructs describing sustainable organisational performance: providing a high quality of services (4.33), adopting new service opportunities (4.25), competing in the current market (4.23), delivering effective services (4.12), adapting quickly to unanticipated changes (4.06), and being profitable (4.03) (Table 2.5). The highly agreed constructs are mainly related to the knowledge search scope, which may indicate that broader access to knowledge and defeating the knowledge asymmetries might present the major KM tasks in the studied context (Iorio et al., 2017).

Table 2.5. Descriptive statistics of the indicators and variables of technological factors (created by the author)

Variable	Mean	S.D.	Factor loadings
Construct 1	4.22	0.82	0.89
Construct 2	4.19	0.91	0.86
Construct 3	4.20	0.80	0.88
Construct 4	4.07	0.85	0.90
Construct 5	4.13	0.84	0.92
Construct 6	3.75	1.02	0.77
Construct 7	3.65	0.91	0.87
Construct 8	3.45	0.93	0.87
Construct 9	3.28	0.98	0.82
Construct 10	3.71	0.92	0.85
Construct 11	3.64	0.91	0.82
Construct 12	3.45	1.00	0.92

Table 2.6. Descriptive statistics of the indicators and variables of sustainable organisational performance (created by the author)

Variable	Mean	S.D.	Factor loadings
Construct 1	4.33	0.60	0.63
Construct 2	4.25	0.72	0.70
Construct 3	4.12	0.87	0.81
Construct 4	4.06	0.76	0.78
Construct 5	4.23	0.60	0.87
Construct 6	4.03	0.69	0.60

That might additionally highlight the context of developing and turbulent economies, where the knowledge on professional services is sourced from overseas with a challenge to recognise what particular pieces of that knowledge might be specifically relevant for such a different local context and how to adapt to the international standards. The remaining constructs demonstrate a lower level of participants' agreement, mostly related to internal knowledge acquisition and processing, which might be considered less developed or yet more challenging aspects for the studied context.

2.4. Comparative analysis

The purpose of this analysis is to identify how the support of human (trust, interaction, and self-efficacy), organisational (rewards, organisational culture, teamwork, and knowledge structure), and technological (IT and social networks) factors for the five KMPs (acquisition, creation, storage, sharing, and application), differ between local and multinational auditing and consultancy firms in the Mid-East. In the group of participants, 278 auditors represented local firms, and 101 auditors represented such multinational firms as the Big Four (Deloitte, PWC, EY, and KPMG). The fact that the number of participants from local firms exceeded that from multinational firms is related to the limited number of multinational auditing and consultancy firms in the Mid-East region. The research focused on integrating specific human, organisational, and technological factors in both types of companies to support the KM cycle involving the five KMPs (acquisition, creation, storage, sharing, and application) and sustainable organisational performance. The comparison of means, standard deviation values, and the independent samples t-test was conducted to explore the difference between local and multinational companies (Table 2.7).

The significance of the means difference varied depending on the relationship between the variables. The t-values with a positive degree of freedom and p-values of less than 0.05 indicate that the means differences are statistically significant. The p-values greater than 0.05 indicate that the means differences are less significant, such as the case of a trust with knowledge acquisition ($p = 0.73$), interaction with knowledge creation ($p = 0.92$), and knowledge application ($p = 0.49$), self-efficacy with knowledge acquisition ($p = 0.29$), knowledge creation ($p = 0.78$), knowledge storage ($p = 0.35$), organisational culture with knowledge acquisition ($p = 0.63$), and knowledge application ($p = 0.32$). The results revealed greater means for multinational companies than for local companies, demonstrating higher support for all the studied factors in multinational auditing and consultancy firms. These results could be associated with the fact that multinational companies are more equipped and capable of integrating human, organisational, and technological factors into their activities to encourage their employees to implement KMPs efficiently.

That is not the case for local companies lacking the resources and capabilities to contribute to the KM cycle. Nevertheless, local companies tend to orient their organisational culture towards supporting KMPs by encouraging their employees to acquire new knowledge as well as promoting knowledge sharing.

As per AlShamsi and Ajmal (2018), some countries in the Mid-East are taking steps to create awareness about the importance of KMPs in the attempt to develop their economies (AlShamsi & Ajmal, 2018).

Table 2.7. Human, organisational, and technological factors supporting KMPs in local and multinational auditing and consultancy firms (created by the author)

		Acquisition		Creation		Storage		Sharing		Application	
Factor	Indicator/ type of firms	L	M	L	M	L	M	L	M	L	M
1	2	3	4	5	6	7	8	9	10	11	12
Trust	Mean	4.01	4.04	3.91	4.25	3.91	4.1	3.75	4.01	4.11	4.31
	SD	0.81	0.76	0.86	0.43	0.84	0.62	0.8	0.77	0.74	0.5
	t	-0.33		-5.07		-2.41		-2.87		-2.89	
	df	170.27		340.22		239.43		171.96		262.31	
	p	0.73		<0.01		<0.01		0.02		<0.01	
Interaction	Mean	3.95	4.4	3.88	4.4	3.44	3.73	3.4	4.24	4.1	4.4
	SD	0.91	0.53	0.84	0.71	1.03	0.92	0.93	0.8	0.75	0.53
	t	-5.82		-5.99		-5.59		-8.63		-4.25	
	df	304.23		209.56		197.23		204.17		250.5	
	p	<0.01		0.92		<0.01		<0.01		0.49	
Self-efficacy	Mean	4.2	4.6	4.03	4.45	3.99	4.41	4.24	4.48	4.31	4.37
	SD	0.7	0.49	0.75	0.64	0.87	0.71	0.86	0.57	0.69	0.77
	t	-6.3		-5.33		-4.78		-3.07		-0.64	
	df	251.42		206.93		216.67		265.21		161.83	
	p	0.29		0.78		0.35		<0.01		0.01	
Rewards	Mean	3.47	3.9	3.42	3.91	3.25	3.86	3.25	3.82	3.3	3.94
	SD	1.16	0.81	1.15	0.68	1.08	0.89	1.1	0.72	1.07	0.72
	t	-4.02		-5.07		-5.53		-5.85		-7.61	
	df	301.12		255.82		212.17		268.87		264.99	
	p	<0.01		<0.01		0.02		<0.01		<0.01	
Organisational culture	Mean	4.06	4.22	3.94	4.14	3.86	3.93	3.9	4.17	4.03	4.12
	SD	0.92	0.86	0.96	0.83	1.02	1.03	1.05	0.89	0.96	0.85
	t	-1.57		-1.97		-0.63		-2.49		-0.84	
	df	189.65		202.71		175.68		207.89		199.51	
	p	0.63		0.03		<0.01		<0.01		0.32	

End of Table 2.7

1	2	3	4	5	6	7	8	9	10	11	12
Team-work	Mean	4.01	4.39	3.94	4.46	3.78	4.07	3.97	4.15	4.05	4.14
	SD	0.87	0.53	0.93	0.54	1.01	0.71	0.92	0.69	0.8	0.6
	t	-5.12		-6.66		-3.07		-2.04		-1.19	
	df	291.32		305.52		250.79		232.35		236.78	
	p	0.04		<0.01		<0.01		0.04		<0.01	
Or-gani-sa-tional struc-ture	Mean	3.51	4.08	3.56	3.98	3.41	4.16	3.49	4.13	3.59	4.16
	SD	1.18	0.69	1.16	0.8	1.11	0.88	1.17	0.81	1.12	0.7
	t	-5.75		-3.93		-6.78		-5.99		-5.84	
	df	302.71		259.08		222.85		257.34		281.49	
	p	<0.01		<0.01		<0.01		<0.01		<0.01	
IT	Mean	4.08	4.58	3.97	4.78	4.06	4.58	3.98	4.31	4.03	4.4
	SD	0.88	0.49	0.95	0.42	0.8	0.68	0.86	0.81	0.86	0.71
	t	-6.94		-11.5		-6.24		-3.4		-4.16	
	df	312.21		364.97		206.73		187.26		214.33	
	p	<0.01		<0.01		<0.01		<0.01		<0.01	
Social net-works	Mean	3.48	4.12	3.33	3.77	3.12	3.73	3.58	4.08	3.31	3.82
	SD	0.87	0.87	0.92	0.89	0.96	0.89	0.9	0.89	1.03	0.81
	t	-6.33		-4.25		-5.78		-4.82		-4.99	
	df	176.08		181.57		190.03		180		222.59	
	p	<0.01		<0.01		<0.01		<0.01		<0.01	

*L = Local; M = Multinational; SD = standard deviation, df = degree of freedom.

Auditors in multinational auditing and consultancy firms have the opportunity to attend training sessions and workshops to gain knowledge about the latest trends and techniques in the professional field and obtain new knowledge outsourced from the most developed countries, which is not available in local companies in the Mid-East. Furthermore, the ability of multinational companies to invest in technology exceeds that of local companies that face a shortage of resources, which is characteristic of all developing countries, where the latest technology for the shift from traditional audit methods to advanced technological methods is less affordable.

2.5. Quantitative analysis

The quantitative analysis consisted of (1) the reliability and validity tests; (2) the model goodness of fit measurement; (3) the collinearity test; and (4) Pearson's correlation analysis.

Reliability and validity of constructs. Reliability and validity tests were conducted for the five KMPs, different human, organisational, and technological factors, and sustainable organisational performance. To test the reliability indicating the internal consistency between the survey's constructs, Cronbach's alpha coefficients that range from 0 to 1 were generated, where a value closer to 1 indicates greater reliability (Al Ahababi et al., 2019; Mahdi et al., 2019). For an acceptable internal consistency that leads to effective results, Cronbach's alpha should exceed 0.7 (Akbari & Ghaffari, 2017; Al Ahababi et al., 2019; Dzenopoljac et al., 2018; Mahdi et al., 2019; Mirzaee & Ghaffari, 2018). The constructs under the five KMPs (acquisition, creation, storage, sharing, and application), the studied human, organisational, and technological factors, and the sustainable organisational performance constructs indicated a great internal consistency with each other and Cronbach's alpha values ranging between 0.782 and 0.965, supporting the strong reliability and internal consistency between constructs (Table 2.8).

Table 2.8. Reliability and validity tests (created by the author)

Variable	Cronbach's alpha	Average Variance Extracted (AVE)
Knowledge acquisition	0.890	0.58
Knowledge creation	0.833	0.64
Knowledge storage	0.782	0.52
Knowledge sharing	0.869	0.71
Knowledge application	0.858	0.74
Trust	0.803	0.69
Interaction	0.827	0.63
Self-efficacy	0.910	0.86
Rewards	0.958	0.91
Organisational culture	0.965	0.87
Teamwork	0.933	0.79
Organisational structure	0.963	0.83
IT	0.943	0.91
Social networks	0.941	0.76
Sustainable organisational performance	0.869	0.54

The Average Variance Extracted (AVE) was computed to validate the convergent validity of the questionnaire and the studied variables. The measured AVE values of the five KMPs (acquisition, creation, storage, sharing, and application), the studied human, organisational, and technological factors, and the sustainable organisational performance ranged from 0.52 to 0.91, higher than 0.5 being the AVE threshold (Al Ahabbi et al., 2019; Khosravi et al., 2018; Mahdi et al., 2019; Mirzaee & Ghaffari, 2018), demonstrating a great convergent validity of the studied variables (Table 16).

Furthermore, Harman's single factor test was computed to detect common method variance and detect any common variance bias. The percentage of variance determined for this study was 41.48%, less than 50%, indicating no common variance problem in this study.

Model goodness of fit measurements. Chi-square and Root Mean Square Error (RMSE) were generated to evaluate the model's goodness of fit. The Chi-square values for the model variables have a positive degree of freedom (df) with p-values lower than 0.01, indicating the significance of the results. The minimum discrepancy Chi-square's absolute fit index could be ignored in case the sample size of the study is greater than 200 (Mahdi et al., 2019). Besides, the Root Mean Square Error (RMSE) for the studied variables is between 0.029 and 0.052, lower than the threshold value of 0.08 (Table 2.9). Based on the model's goodness of fit indices, each of the studied variables, including the five KMPs (acquisition, creation, storage, sharing, and application), in addition to the human, organisational and technological factors and the sustainable organisational performance, created a good fit and the model is statistically significant.

Table 2.9. Model goodness of fit (created by the author)

Construct/ indices	Chi-square	p-value	Degree of freedom (df)	Root Mean Square Error (RMSE)
Knowledge acquisition	97.97	<0.01	9	0.042
Knowledge creation	404.03	<0.01	9	0.035
Knowledge storage	229.22	<0.01	6	0.040
Knowledge sharing	454.38	<0.01	9	0.039
Knowledge application	369.09	<0.01	8	0.035
Trust	289.43	<0.01	14	0.030
Interaction	206.75	<0.01	15	0.035
Self-efficacy	357.12	<0.01	11	0.033

End of Table 2.9

Construct/ indices	Chi-square	p-value	Degree of freedom (df)	Root Mean Square Error (RMSE)
Rewards	317.39	<0.01	17	0.051
Organisational culture	502.35	<0.01	16	0.046
Teamwork	459.12	<0.01	13	0.039
Organisational structure	422.51	<0.01	16	0.052
IT	459.95	<0.01	11	0.039
Social networks	328.55	<0.01	22	0.042
Sustainable organisational performance	204.15	<0.01	12	0.029

The structural model's quality was evaluated by generating the R-Squared (R^2) for the dependent variables. R^2 characterises the percentage of the variance of the dependent variable that has been accounted for by the independent variables in the structural model, and it indicates how well the unseen samples are likely to be predicted by the model. R^2 values range between 0 and 1, while the higher values demonstrate a better model prediction capability (Khosravi et al., 2018). Three values of R^2 are recognised as a criterion, 0.19, 0.33, and 0.67, representing, respectively, a low, moderate, and high value (Mirzaee & Ghaf-fari, 2018).

The R^2 values generated for the KMPs and the sustainable organisational performance as the dependent variables in this study are as follows: knowledge acquisition (0.64), knowledge creation (0.63), knowledge storage (0.67), knowledge sharing (0.55), knowledge application (0.68), and sustainable organisational performance (0.37) (Fig. 2.2).

The results explain high R^2 for the KMPs and average R^2 for the sustainable organisational performance, which indicates that the proposed path models of the study are statistically appropriate.

Collinearity test. In this study, the human factors, including trust, interaction, and self-efficacy, and organisational factors, including rewards, organisational culture, teamwork, and organisational structure, and technological factors, including IT and social networks, are considered independent variables in studying their effect on the KMPs, while the KMPs, including knowledge acquisition, creation, storage, sharing, and application, are considered independent variables in studying their effect on the sustainable organisational performance.

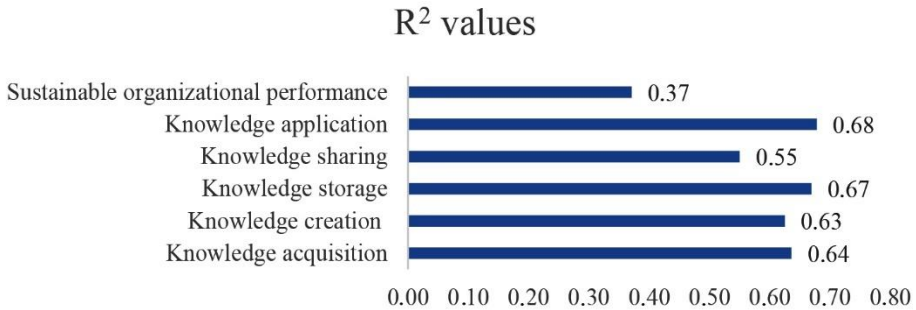


Fig. 2.2. R² values (created by the author)

Accordingly, the collinearity assessment for the independent variables is conducted to detect any collinearity issue between the variables. The results of the collinearity evaluation revealed the following tolerance values: knowledge acquisition (0.30), knowledge creation (0.37), knowledge storage (0.52), knowledge sharing (0.51), knowledge application (0.44), trust (0.30), interaction (0.30), self-efficacy (0.39), rewards (0.37), organisational culture (0.44), teamwork (0.23), organisational structure (0.20), IT (0.35), and social networks (0.44), all greater than the threshold value of 0.2 (Fig. 2.3).

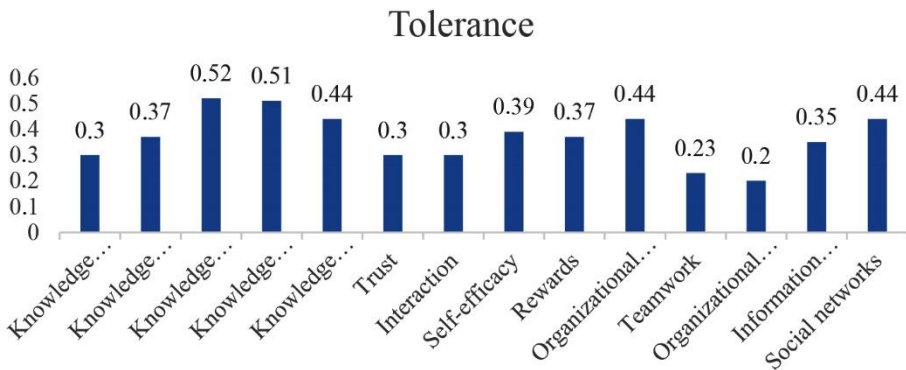


Fig. 2.3. Tolerance assessment (created by the author)

In addition, the following Variance Inflation Factor (VIF) values were generated: knowledge acquisition (3.41), knowledge creation (2.68), knowledge storage (1.92), knowledge sharing (1.96), knowledge application (2.27), trust (3.32), interaction (3.28), self-efficacy (2.55), rewards (2.72), organisational culture

(2.26), teamwork (4.28), organisational structure (4.97), IT (2.83), and social networks (2.27) (Fig. 4), which are less than the threshold value of 5 (Khosravi et al., 2018). The results demonstrate that there are no collinearity issues between the independent variables, and there is no construct that needs elimination from the model because the measurement criteria of both tolerance and VIF were met in this study.

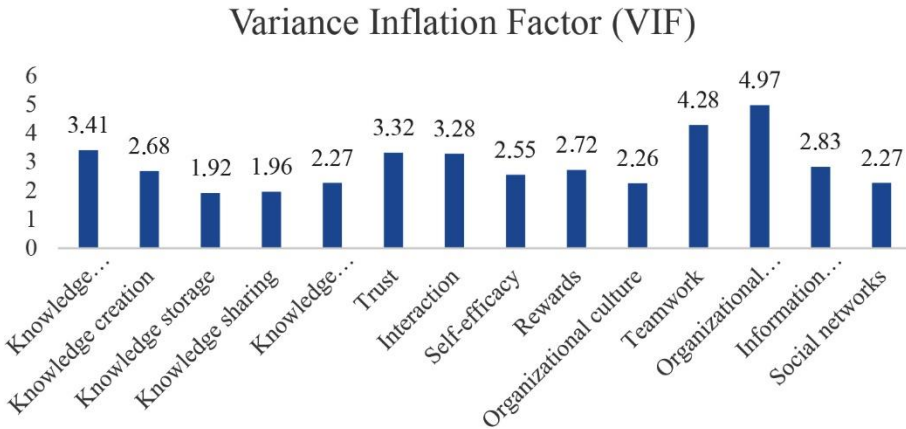


Fig. 2.4. Variance inflation factor (created by the author)

Pearson’s correlation between the variables. The correlation coefficients of the human factors, including trust, interaction, and self-efficacy, and organisational factors, including rewards, organisational culture, teamwork, and organisational structure, and technological factors, including IT and social networks, and the sustainable organisational performance with the five KMPs (acquisition, creation, storage, sharing, and application) were generated to assess the relationships between the variables. The coefficient of correlation ranges between -1 and $+1$, where the negative value indicates a negative relationship, and the positive value indicates a positive relationship between the variables. The higher the correlation coefficient value, the more significant and stronger the relationship between the variables, and the 0 value indicates a null relationship. Values less than 0.3 indicate a weak association, values between 0.3 and 0.7 indicate a moderate association and values greater than 0.7 indicate a strong association between the variables (Table 2.10).

The human factors, including trust, interaction, and self-efficiency, have a positive correlation with knowledge acquisition, creation, storage, sharing, and application. The strength of the association varied between the components.

Table 2.10. Pearson's correlation of the five KMPs with the studied human, organisational and technological factors and the sustainable organisational performance (created by the author)

Factors	Acquisition	Creation	Storage	Sharing	Application
Trust	0.573**	0.434**	0.514**	0.505**	0.530**
Interaction	0.617**	0.373**	0.435**	0.516**	0.742**
Self-efficacy	0.570**	0.679**	0.706**	0.429**	0.574**
Rewards	0.483**	0.372**	0.145**	0.418**	0.365**
Organisational culture	0.510**	0.355**	0.190**	0.439**	0.366**
Teamwork	0.626**	0.617**	0.427**	0.568**	0.636**
Organisational structure	0.694**	0.624**	0.508**	0.641**	0.624**
IT	0.546**	0.608**	0.387**	0.284**	0.473**
Social networks	0.578**	0.495**	0.487**	0.552**	0.483**
Sustainable organisational performance	0.548**	0.537**	0.351**	0.436**	0.488**

**p-value < 0.01

The trust had a moderate correlation with knowledge acquisition (0.573), knowledge application (0.530), knowledge storage (0.514), knowledge sharing (0.505), and knowledge creation (0.434). The interaction had a strong correlation with knowledge application (0.742), a moderate correlation with knowledge acquisition (0.617), knowledge sharing (0.516), knowledge storage (0.435), and knowledge creation (0.373). Self-efficiency had a strong correlation with knowledge storage (0.706) and a moderate correlation with knowledge creation (0.679), knowledge application (0.574), knowledge acquisition (0.570), and knowledge sharing (0.429).

The organisational factors, including rewards, organisational culture, teamwork, and organisational structure, have a positive correlation with knowledge acquisition, creation, storage, sharing, and application. The strength of the association varied between the components. Rewards had a moderate correlation with knowledge acquisition (0.483), knowledge sharing (0.418), knowledge creation (0.372), and knowledge application (0.365) and a lower correlation with knowledge storage (0.145). Organisational culture had a moderate correlation with knowledge acquisition (0.510), knowledge sharing (0.439), knowledge application (0.366), knowledge creation (0.355), and a lower correlation with knowledge storage (0.190). Teamwork had a moderate correlation with

knowledge application (0.636), knowledge acquisition (0.626), knowledge creation (0.617), knowledge sharing (0.568), and knowledge storage (0.427). The organisational structure had a moderate correlation with knowledge acquisition (0.694), knowledge sharing (0.641), knowledge creation (0.624), knowledge application (0.624), and knowledge storage (0.508).

Technological factors, including IT and social networks, have a positive correlation with knowledge acquisition, creation, storage, sharing, and application. The strength of the association varied between the components. IT had a moderate correlation with knowledge creation (0.608), knowledge acquisition (0.546), knowledge application (0.473), and knowledge storage (0.387) and a lower correlation with knowledge sharing (0.284). Social networks had a moderate correlation with knowledge acquisition (0.578), knowledge sharing (0.552), knowledge creation (0.495), knowledge storage (0.487), and knowledge application (0.483).

Sustainable organisational performance has a positive correlation with knowledge acquisition, creation, storage, sharing, and application. Sustainable organisational performance shows a moderate correlation with knowledge acquisition (0.548), knowledge creation (0.537), knowledge application (0.488), knowledge sharing (0.436), and knowledge storage (0.351). The p-values of less than 0.01 prove that all the correlation coefficients are significant (Table 2.9).

SEM results. SEM technique was employed to test the research hypotheses and study the complex relationship between the variables. While analysing the results, a critical ratio of less than 1.96 shows a p-value of less than 0.05 which indicates that the proposed hypothesis is supported. However, a critical ratio greater than 1.96 shows a p-value greater than 0.05, which indicates that the proposed hypothesis is not supported.

The SEM results demonstrated that the five KMPs (acquisition, creation, storage, sharing, and application) have a positive and significant association with sustainable organisational performance with a p-value of less than 0.05 (Table 2.11). Accordingly, H1, H2, H3, H4 and H5 hypotheses were supported. The results describe an intensive knowledge-intensive sector of auditing and consultancy firms in the Mid-East. Similar studies were previously performed in manufacturing companies in Pakistan and Mexico, service companies in Pakistan, and companies in Portugal, where a positive relationship between selected KMPs and sustainable organisational performance was revealed (Abbas, 2020; López-Torres et al., 2019; Muñoz-Pascual et al., 2019; Shahzad et al., 2020).

The effects of the human factors (trust, interaction, and self-efficacy) on the five KMPs as dependent variables were analysed. The trust factor has a positive effect on the efficiency of the KMPs (acquisition, creation, storage, sharing, and application) in the knowledge-intensive sector of auditing and consultancy firms operating in the region of the Mid-East.

Table 2.11. Structural Equation Modeling with the research proposed paths (created by the author)

Research proposed paths	Standardised estimates	Critical ratio	p-value	Empirical evidence
KMPs				
Acquisition (H1)	0.102	2.60	0.009	Supported
Creation (H2)	0.259	6.63	<0.001	Supported
Storage (H3)	0.074	2.08	0.037	Supported
Sharing (H4)	0.102	3.08	0.002	Supported
Application (H5)	0.159	4.31	<0.001	Supported
Human factors				
<i>Trust</i>				
H6a	0.321	7.32	<0.001	Supported
H6b	0.110	2.96	0.003	Supported
H6c	0.084	2.37	0.018	Supported
H6d	0.317	6.91	<0.001	Supported
H6e	0.286	8.28	<0.001	Supported
<i>Interaction</i>				
H7a	0.132	3.57	<0.001	Supported
H7b	0.159	5.04	<0.001	Supported
H7c	0.214	7.08	<0.001	Supported
H7d	0.021	0.53	0.591	<i>Not supported</i>
H7e	0.611	20.87	<0.001	Supported
<i>Self-efficacy</i>				
H8a	0.228	5.89	<0.001	Supported
H8b	0.414	12.62	<0.001	Supported
H8c	0.588	18.65	<0.001	Supported
H8d	0.225	5.54	<0.001	Supported
H8e	0.251	8.22	<0.001	Supported
Organisational factors				
<i>Rewards</i>				
H9a	0.116	4.55	<0.001	Supported
H9b	0.072	3.32	<0.001	Supported
H9c	0.043	2.05	0.040	Supported
H9d	0.136	5.07	<0.001	Supported
H9e	0.032	1.61	0.109	<i>Not supported</i>

End of Table 2.11

Research proposed paths	Standardised estimates	Critical ratio	p-value	Empirical evidence
<i>Organisational culture</i>				
H10a	0.044	1.57	0.116	<i>Not supported</i>
H10b	0.152	6.42	<0.001	Supported
H10c	0.090	3.95	<0.001	Supported
H10d	0.101	3.46	<0.001	Supported
H10e	0.111	5.06	<0.001	Supported
<i>Teamwork</i>				
H11a	0.171	5.13	<0.001	Supported
H11b	0.200	7.08	<0.001	Supported
H11c	0.096	3.54	<0.001	Supported
H11d	0.081	2.33	0.020	Supported
H11e	0.162	6.17	<0.001	Supported
<i>Organisational structure</i>				
H12a	0.099	4.01	<0.001	Supported
H12b	0.155	7.43	<0.001	Supported
H12c	0.126	6.26	<0.001	Supported
H12d	0.142	5.51	<0.001	Supported
H12e	0.046	2.34	0.019	Supported
Technological factors				
<i>IT</i>				
H13a	0.001	0.002	0.998	<i>Not supported</i>
H13b	0.191	6.85	<0.001	Supported
H13c	0.091	3.39	<0.001	Supported
H13d	0.418	12.10	<0.001	Supported
H13e	0.081	3.11	0.002	Supported
<i>Social networks</i>				
H14a	0.139	4.53	<0.001	Supported
H14b	0.123	4.74	<0.001	Supported
H14c	0.320	12.83	<0.001	Supported
H14d	0.279	8.69	<0.001	Supported
H14e	0.017	0.70	0.483	<i>Not supported</i>

Accordingly, the hypotheses H6a, H6b, H6c, H6d, and H6e were supported with a p-value of less than 0.05. Similar results were previously generated concerning the positive influence of trust on knowledge sharing in organisations in the USA, the public sector in Malaysia, a financial organisation in the Netherlands, and a manufacturing organisation in Korea (Koohang et al., 2017; Park & Kim, 2018; Peralta & Saldanha, 2014; Rutten et al., 2016; Tangaraja et al., 2015). The results indicate that trust between individuals in Middle Eastern auditing and consultancy firms contributes to the flow of knowledge and the implementation of the entire KM cycle.

The interaction factor has a positive influence on the efficiency of the KMPs (acquisition, creation, storage, and application) in the knowledge-intensive sector as the auditing and consultancy firms operating in the region of the Mid-East. An exception was found concerning the effect of interaction on knowledge sharing, which was demonstrated to be less significant in the studied sector. Accordingly, the hypotheses H7a, H7b, H7c, and H7e were supported with a p-value of less than 0.05. However, H7d was not supported with a p-value of 0.591, greater than 0.05. Similar results were previously generated concerning the positive influence of interaction on KMPs within organisations in some countries such as Taiwan and Pakistan (Chhim et al., 2017; Lashari & Rana, 2018; Lin, 2011). The results demonstrate that the interaction with internal and external parties constitutes a source of knowledge for Middle Eastern auditing and consultancy firms contributing to the knowledge acquisition, creation, storage, and application processes.

The self-efficacy factor has a positive influence on the efficiency of the KMPs (acquisition, creation, storage, sharing, and application) in the knowledge-intensive sector as the auditing and consultancy firms operating in the region of the Mid-East. Accordingly, H8a, H8b, H8c, H8d, and H8e were supported with a p-value of less than 0.05. Similar results were previously generated concerning the positive influence of self-efficacy on knowledge sharing in different business sectors, such as education, public service, and the energy sector (Runhaar & Sanders, 2016; Sedighi et al., 2018; 2016; Tangaraja et al., 2015). The results proved that self-efficacy, as the employees' confidence in their knowledge, allows them to efficiently participate in the KM cycle in the Middle Eastern auditing and consultancy firms.

Considering the research results, the human factors (trust, interaction, and self-efficacy) have a positive influence on the efficient implementation of the KMPs (acquisition, creation, storage, sharing, and application) in the Middle Eastern auditing and consultancy firms, except for the relationship between interaction and knowledge sharing H7d, that was not supported in this study. Based on the expert evaluation that was conducted using the survey method, the reasons behind these results could be related to the lack of interaction sessions and facilities that

could enhance knowledge sharing between individuals in different units of auditing and consultancy firms.

The effects of the organisational factors (rewards, organisational culture, teamwork, and organisational structure) on the five KMPs as dependent variables were analysed.

The rewards factor has a significant positive association with the KMPs (acquisition, creation, storage, and sharing) with a p-value of less than 0.05. Accordingly, H9a, H9b, H9c and H9d were supported. However, rewards association with knowledge application H9e was not supported with a p-value of 0.109 greater than 0.05. Similar results were previously demonstrated about the positive effect of rewards on knowledge sharing in other sectors, such as healthcare organisations, ICT companies, and the energy industry, in countries like Taiwan and Croatia and emerging economies (Lin & Lo, 2015; Podrug et al., 2017; Sedighi et al., 2018; Youssef et al., 2017). The results indicate that rewards as motivation to employees in Middle Eastern auditing and consultancy firms may contribute to their engagement in the processes of knowledge acquisition, creation, storage, and sharing.

The organisational culture factor has a significant positive association with the KMPs (knowledge creation, storage, sharing, and application) with a p-value of less than 0.05. Accordingly, H10b, H10c, H10d and H10e were supported. However, organisational culture association with knowledge acquisition H10a was not supported, with a p-value of 0.116 greater than 0.05. Previous studies proved the positive impact of organisational culture on knowledge sharing in healthcare organisations in Indonesia, manufacturing subsidiaries in Italy, IT companies in Taiwan, and construction companies in China (Cavaliere & Lombardi, 2015; Chang & Lin, 2015; Sensuse et al., 2014; Wei & Miraglia, 2017). The results demonstrate that human resource practices and leaders' tendency to encourage employees to participate in the KM cycle would lead to fruitful results in the implementation of the KMPs in Middle Eastern auditing and consultancy firms.

The teamwork factor has a significant positive association with the KM cycle, including the KMPs (acquisition, creation, storage, sharing, and application) with a p-value of less than 0.05. Accordingly, H11a, H11b, H11c, H11d and H11e. The positive effect of teamwork on KMPs was previously demonstrated in a few countries, e.g., Sri Lanka and Malaysia, and in business sectors, i.e., education and services (Atapattu & Jayakody, 2014; Gonzalez & Melo, 2019; Hanaysha, 2016). The results indicate the importance of teamwork and employee communication and collaboration as a contribution to the efficient implementation of the KM cycle in Middle Eastern auditing and consultancy firms.

The organisational structure factor has a significant positive association with the KM cycle, including the KMPs (acquisition, creation, storage, sharing, and

application) with a p-value of less than 0.05. Accordingly, H12a, H12b, H12c, H12d and H12e were supported. Previous studies proved similar results in various sectors, such as manufacturing, service, and infrastructure consultancy sectors in countries like Taiwan and India (Acharya & Mishra, 2017; Ho et al., 2014; Wahba, 2015). The results demonstrate that an organisation's structure allows for an efficient knowledge flow across the boundaries of the auditing and consultancy firms and contributes to the efficient implementation of the KM cycle.

The results of the study indicate that the organisational factors (rewards, organisational culture, teamwork, and organisational structure) in the Middle Eastern auditing and consultancy firms have a positive influence on the efficient implementation of the KMPs (acquisition, creation, storage, sharing, and application), except for the relationship of rewards with knowledge application (H9e), and organisational culture with knowledge acquisition (H10a) that were not supported in this study. Based on the expert evaluation that was conducted using the survey method, the reasons behind these results could be referred to the nature of these organisations that do not have a defined policy for rewarding the efficient use of the knowledge to reach goals. The culture of these organisations does not support best practices that lead to new developments that would benefit the organisations proving the inability of the Middle Eastern auditing and consultancy firms to convert knowledge into action plans, match resources of knowledge to problem-solving, and efficiently apply the available knowledge to reach the desired goals. This could be associated with the peculiarities of the economy and business environment in developing countries and the shortage of available resources that would allow managers to motivate and engage their employees in the KM cycle, which would contribute to sustainable organisational performance.

The effects of the technological factors (IT and social networks) on the five KMPs as dependent variables were analysed.

IT factor has a significant positive association with the KMPs (knowledge creation, storage, sharing, and application). Accordingly, the hypotheses H13b, H13c, H13d, and H13e were supported with a p-value of less than 0.05. However, hypothesis H13a related to the association of IT with knowledge acquisition was not supported with a p-value of 0.998, greater than 0.05. Previous studies demonstrated the positive relationship between IT and KMPs in specific sectors in the Kingdom of Bahrain, Virginia, the USA, and Croatia (Al-Alawi et al., 2007; Franco & Mariano, 2010; Pinho et al., 2012). The results demonstrate that IT serves as a facilitator for the implementation of knowledge creation, storage, sharing, and application in Middle Eastern auditing and consultancy firms.

The social networks factor has a significant positive association with the KMPs (acquisition, creation, storage, and sharing). Thus, the hypotheses H14a, H14b, H14c, and H14d were supported with a p-value of less than 0.05. However, hypothesis H14e, the association of social networks with knowledge application,

was not supported with a p-value of 0.483, greater than 0.05. Previous studies demonstrated the positive relationship between social networks and KMPs in Finnish organisations, the Malaysian public sector, the private service sector in India, and a group of companies in the energy sector (Henttonen et al., 2013; Sedighi et al., 2018; Tangaraja et al., 2015; Vyas & Pandey, 2020). The results proved that social networks constitute a means in the Middle Easter auditing and consultancy firms that contribute to the implementation of the knowledge acquisition, creation, storage, and sharing processes.

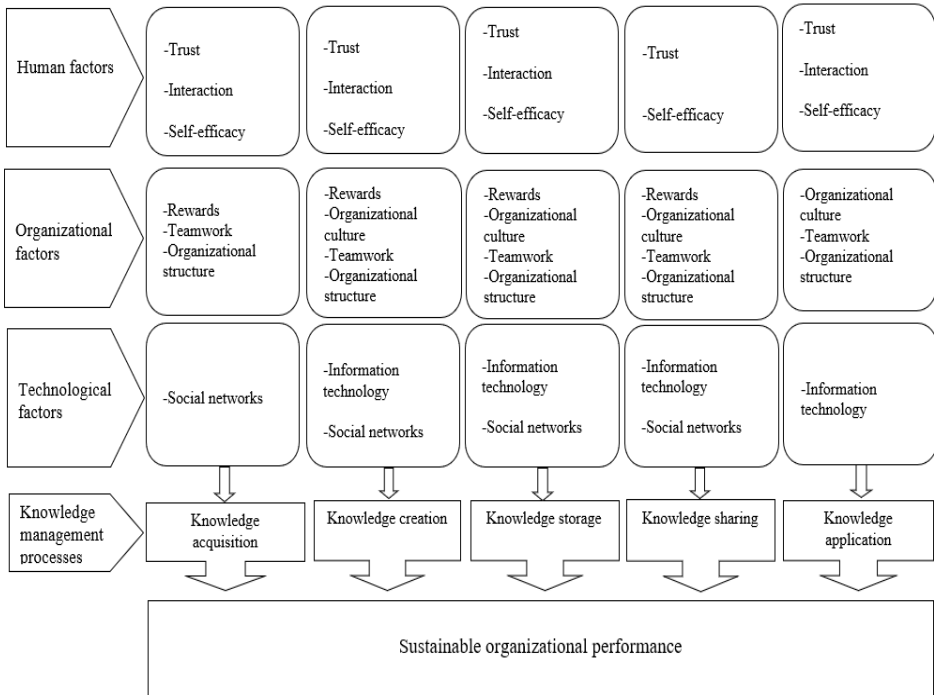


Fig. 2.5. Illustration of research results (created by the author)

The reasons behind these results could be related to the lack of capabilities and technological resources that enable the generation and application of knowledge. Local companies could potentially learn the principles of introducing and adopting IT and social networks to their context and practices of KM by relying on the best practices of their multinational counterparts but may not afford to implement them efficiently.

The research results are illustrated in Fig. 2.5. These results are the basis for creating the model for measuring KMPs in Middle Eastern auditing and consultancy firms, which will help top management in making decisions to enhance KMPs implementation by considering the most influential factors to reach sustainable organisational performance.

Sobel test is the test of mediating factors that was conducted to examine the significance of the mediating role of the five KMPs between the independent variables as human, organisational, and technological factors, and sustainable organisational performance in the Middle Eastern auditing and consultancy firms.

Table 2.12. Sobel test statistic (created by the author)

Factor/ mediator	Acquisition	Creation	Storage	Sharing	Application
Trust	5.62*	6.12*	0.99 (p = 0.159)	3.52*	4.58*
Interaction	6.54*	5.91*	2.23*	3.83*	2.29*
Self-efficacy	6.52*	5.81*	0.51 (p = 0.305)	4.84*	5.11*
Rewards	8.36*	6.57*	4.06*	6.45*	6.18*
Organisational culture	7.66*	6.03*	3.98*	5.67*	5.79*
Teamwork	6.61*	6.37*	3.20*	4.08*	4.94*
Organisational structure	7.34*	6.09*	3.17*	4.28*	5.87*
IT	8.06*	8.30*	4.64*	4.71*	6.61*
Social networks	8.41*	7.47*	4.70*	6.26*	6.57*

*p-value < 0.05

The Sobel test results in Table 2.12 demonstrate that each of the five KMPs (acquisition, creation, storage, sharing, and application) has a significant mediating role between the factors (trust, interaction, self-efficacy, rewards, organisational culture, teamwork, organisational structure, IT and social networks), and the sustainable organisational performance in the Middle Eastern auditing and consultancy firms, with p-values of less than 0.05, which indicate the significance of the results. Two exceptions were recognised: the mediating role of knowledge storage between (1) trust and (2) self-efficacy with the sustainable organisational performance were less significant according to the results, which indicate that among the five KMPs, knowledge storage is less supported by the human factors and have the least effect on the sustainable organisational performance of the auditing and consultancy firms in the Mid-East with the support of these factors.

2.6. Conclusions of the Second Chapter

The research conducted in the knowledge-intensive sector of auditing and consultancy in the developing countries of the Mid-East (Lebanon, Syria, and Jordan) considered the effects of the human (trust, interaction, and self-efficacy), organisational (rewards, organisational culture, teamwork, and organisational structure) and technological (IT and social networks) factors, on the KM cycle involving the five KMPs (acquisition, creation, storage, sharing, and application) and the relationship between these processes and the sustainable organisational performance. To test the research hypotheses, a structured questionnaire was formed and distributed to collect the data from experts and members of the audit associations in the Mid-East countries, Lebanon, Syria, and Jordan. The collected data were quantitatively analysed and interpreted using different methods to test the research constructs and hypotheses. First, the factors were assessed using factor analysis, and factor loadings were generated for all the questionnaire constructs to continue the analysis with the constructs having factor loadings greater than the threshold of 0.6. Then, the descriptive statistics were generated through the mean and standard deviation of each construct. The tests of validity, reliability, and collinearity were conducted to ensure no issues between the studied variables and their indicators in this regard. Afterwards, the model goodness of fit was measured, resulting in a statistically significant model. Furthermore, Pearson's correlation between all the research variables was generated, indicating a positive relationship between the studied variables. The SEM technique was applied to study the effects of the independent variables on the dependent variables. The SEM results proved the significant positive influence of the KMPs on sustainable organisational performance and the significant positive effects of trust, interaction, self-efficacy, rewards, organisational culture, teamwork, organisational structure, IT, and social networks on the five KMPs with some exceptions related to the effects of interaction on knowledge sharing, rewards on knowledge application, organisational culture on knowledge acquisition, IT on knowledge acquisition and social networks on knowledge application. Additionally, the mediating role of the KMPs between the studied human, organisational and technological factors and sustainable organisational performance was tested through the Sobel test to support the research results. Also, a comparative analysis was performed to identify the difference between local and multinational auditing and consultancy firms concerning the factors supporting the KMPs, where it was concluded that the multinational companies are more supported, equipped, and aware of the importance of KMPs implementation.

The research results are critical for growing the knowledge-intensive sector in developing countries, specifically Middle Eastern auditing and consultancy

firms. The developing countries of the Mid-East that are facing enormous economic and geopolitical constraints are urged to pay considerable attention to the efficient implementation of the KM cycle to achieve sustainable organisational performance, which would influence the development of the economies as a whole.

3

Model for measuring knowledge management processes in auditing and consultancy firms

The purpose of this chapter is to propose a model for measuring KMPs in Middle Eastern auditing and consultancy firms based on the research results analysed in the First and Second Chapters. This model aims to assist managers of auditing and consultancy firms to self-assess the KMPs status in their organisations and find the supporting factors helping to enhance the efficiency of these processes.

The findings of the Third Chapter have been published in a scientific paper (Raudeliuniene et al., 2021).

3.1. Structure of the research leading to model creation

This section provides an overview of the current research structure that led to the research results used in this chapter to create the model for measuring KMPs in Middle Eastern auditing and consultancy firms. This research was conducted in the knowledge-intensive sector of auditing and consultancy in the developing

countries of the Mid-East to measure the efficiency of the KMPs (acquisition, creation, storage, sharing, and application) and to investigate the effects of the human (trust, interaction, and self-efficacy), organisational (rewards, organisational culture, teamwork, and organisational structure) and technological (IT and social networks) on the KM cycle involving the five KMPs and examine the effects of those processes on the sustainable organisational performance. The quantitative analysis and SEM results revealed the effects of the studied factors on each of the five KMPs and were used to create the model for measuring KMPs in Middle Eastern auditing and consultancy firms.

The research started with a previous literature analysis related to KM and KMPs to identify the research variables. The analysis proved that the most commonly studied KMPs that form the KM cycle and would have a significant effect on sustainable organisational performance were knowledge acquisition, creation, storage, sharing, and application. Based on the analysis of various factors affecting the KMPs, the following were identified as the most recognised: human (trust, interaction, and self-efficacy), organisational (rewards, organisational culture, teamwork, and organisational structure), and technological (IT and social networks) factors. Afterwards, the research hypotheses were proposed, and the hypothesised research model was formed to examine the effects of various factors on the KM cycle and the effects of the latter on sustainable organisational performance.

Once dependent and independent research variables were identified, and the research hypotheses were proposed, the questionnaire was constructed with reference to previous studies in the field, and the validity and reliability of the constructs were tested. Then, experts from the auditing associations in Lebanon, Syria, and Jordan were selected and contacted to fill out the prepared survey. Data was collected from experts constituting an acceptable sample size for the study. Comparative analysis, quantitative analysis, and SEM were conducted to generate the research results and examine the relationship between the variables (Fig. 3.1).

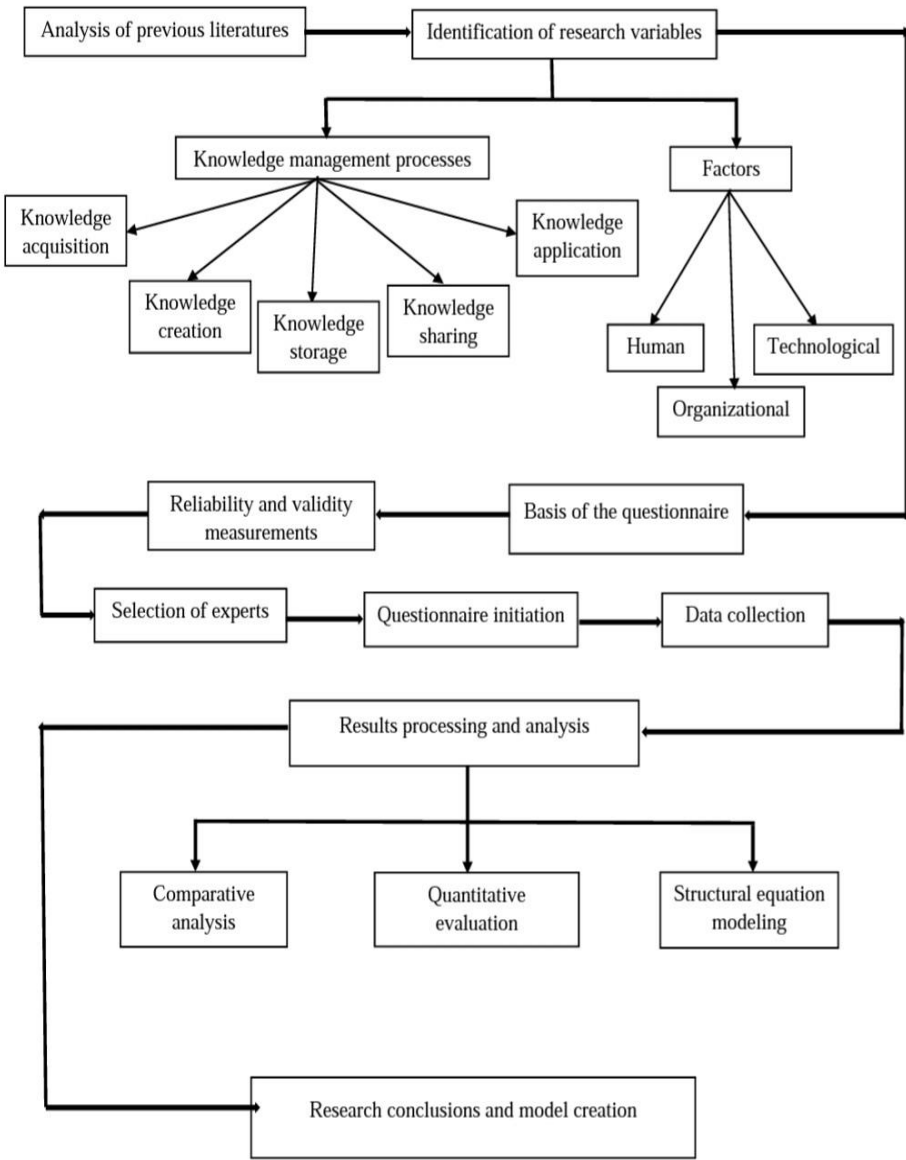


Fig. 3.1. Research structure (created by the author)

3.2. The general model for measuring knowledge management processes

This section aims to provide an explanation of how the KM maturity model is designed and the basis for proposing the model for measuring the efficiency of the KMPs in organisations.

Maturity models consider the development of organisations over time until they reach the optimised performance level, highlighting the requirement to achieve this level and the sequence of the process. Researchers and scientists have proposed KM maturity models by measuring the degree to which knowledge is effectively controlled and managed (Ehms & Langen, 2002; Hung et al., 2005; Jochem et al., 2011; Khatibian et al., 2010; Kulkarni & Freeze, 2004). The maturity models are based on the capability maturity models that cover activities for planning and managing the improvement path for the organisation to reach its objectives related to cost, quality, and overall sustainable performance. They involve fast-moving technology, such as software development which requires high skills, professional individuals, and a high level of creativity and innovation. Accordingly, the maturity model should be applied to the processes that affect the organisation's capability of providing high-quality services and contributing to their efficient performance. The maturity model framework creates an environment in which practices can be repeated, and best practices can be transferred and continuously improved to enhance performance. As per Robinson et al. (2006), measuring KMPs can help companies to restructure KMPs and benchmark their implementation by facilitating the development of the business processes through the focus on three aspects: people, process, and technology (Robinson et al., 2006).

The model for measuring KMPs is based on the knowledge maturity assessment, which helps the organisation to determine the current KM maturity and develop its KM-related vision and identify the areas for improvement, as well as evaluate the effectiveness of the organisation in managing its available knowledge (International Atomic Energy Agency (IAEA), 2012). After determining the KMPs' maturity and capability and assessing the human, organisational, and technological factors affecting KMPs, companies can develop strategic decisions to improve the efficient implementation of KMPs and reach sustainable organisational performance (Fig. 3.2).

The previously proposed models for measuring KM and self-assessment of KM maturity depend on the following components: attributes grouped by categories, a simple assessment scale for measuring each category, and simple questions for the organisation's staff discussion. It is necessary for any organisation that depends on KM to have a clear road map resulting from the maturity model that

provides a clear description of the path and means for the organisation to enhance KM efficiency and improve the company’s performance and growth.

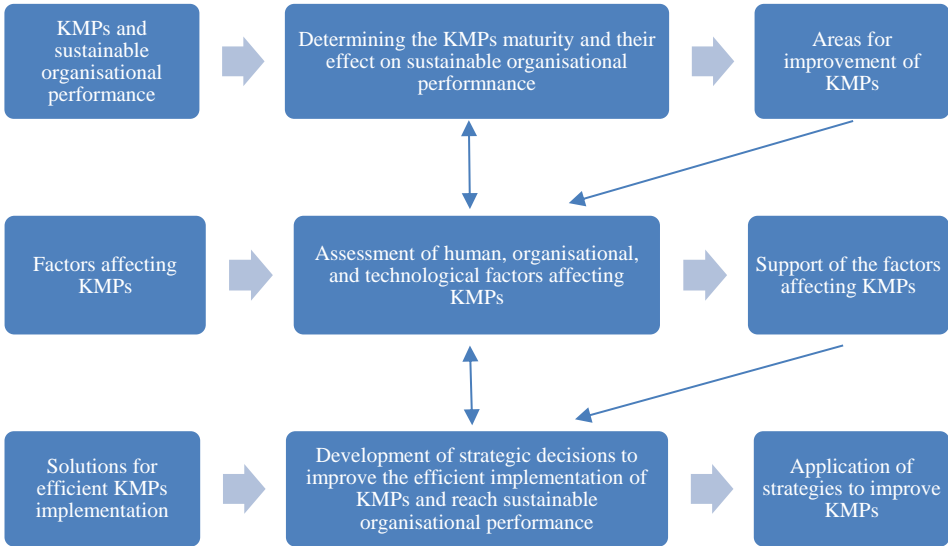


Fig. 3.2. General model for measuring KMPs (created by the author)

An illustration of the maturity level assessment of the KMPs supported by nine factors is presented in Fig. 3.3. The KMPs’ maturity level is self-assessed by the auditing and consultancy firms based on the rating scale (1–5) allows for identifying the knowledge capabilities and assess the areas for improvement. The self-assessment is a crucial tool that assists in evaluating the current situation and identifying areas for future improvement and setting the basis for formulating KMPs policies and strategies. It could be considered a starting point for KMPs policies as it enables identifying the difference between the current KMPs maturity level and the targeted level.

Accordingly, companies could develop KM strategies and policies for the implementation of the KMPs that better suit their objectives with the integration of human, organisational, and technological aspects that contribute to this process. The rating scale (1–5) is based on the previous KM maturity model proposed by Hung et al. (2005), which consists of three components: maturity levels, KMPs, and KM capabilities or enablers. The model by Hung et al. (2005) expands the KMPs into four subprocesses of creation, storage, sharing, and application. The knowledge enablers include technology, culture, and structure, while the five maturity levels are (1) Initial, (2) Repeated, (3) Defined, (4) Managed, and (5) Optimising (Hung et al., 2005). The new proposed model is expanded to include five

KMPs (acquisition, creation, storage, sharing, and application) and nine factors (trust, interaction, self-efficacy, rewards, organisational culture, teamwork, organisational structure, IT, and social networks) while adapting the same five maturity levels (initial, repeated, defined, managed, and optimising).

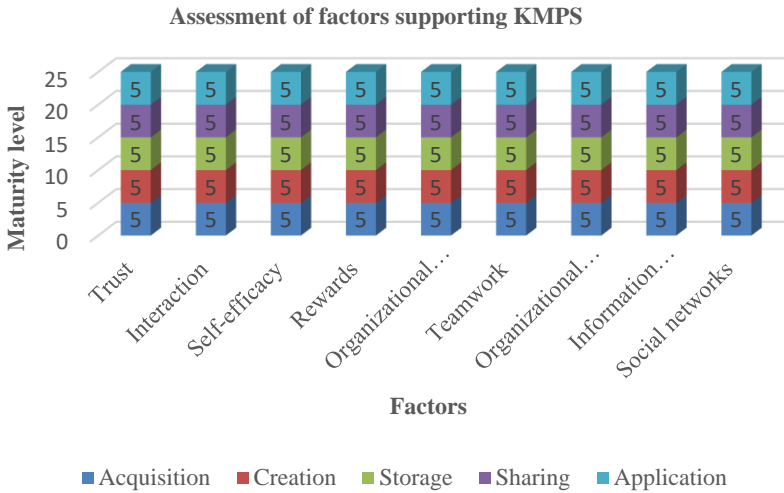


Fig. 3.3. Assessment of factors supporting KMPs (created by the author)

By summing up the results for each process, the total will range between 9 (9 times 1) and 45 (9 times 5), where the higher result indicates greater support of the nine enablers for each KM process and, thus, the higher efficiency of the process in the evaluated company.

3.3. Methodology for applying the proposed model for measuring KMPs in auditing and consultancy firms

This section aims to present the methodology and steps in applying the model for measuring KMPs in auditing and consultancy firms, starting from the self-assessment of the KMPs’ efficiency status and the application of different formulas to identify the problems in the factors supporting the KMPs implementation and the sustainable organisational performance, which will be a decision-making tool for managers for improving the KM cycle.

The first step is the self-assessment using a survey distributed among the concerned members of the auditing and consultancy company evaluating the efficiency of the KMPs and the supporting enablers. Based on the survey results, the weighted average is computed for each of the human, organisational, and technological factors and each of the addressed KMPs, as shown in Tables 21, 22, 23 and 24 below. Each construct of the survey is rated (1– 5) based on the maturity levels described in the previously applied KM maturity models as follows: 1 – Initial, 2 – Repeated, 3 – Defined, 4 – Managed, and 5 – Optimising. The weight of each construct is considered in the formula by multiplying the factor loadings generated in this research by the rate obtained from the self-assessment. The average of each factor will range from 1 to 5. Table 3.1 includes the constructs to assess the KMPs.

Table 3.1. Assessment of KMPs (created by the author)

KMPs				
Acquisition	Creation	Storage	Sharing	Application
– Having the ability to acquire knowledge that is used to develop specific programs P_1^1 – Having a clear process for acquiring expertise P_1^2 – Having a clear process for acquiring intelligence P_1^3	– Generating best practices from previous projects to improve future projects P_2^1 – Using new opportunities to serve our clients P_2^2 – Providing new services depending on the market demands P_2^3	– Writing case notes on all executed projects P_3^1 – Keeping a customer information database that is easy to access P_3^2 – Having a knowledge database that is easy to access P_3^3	– Sharing with our colleagues the knowledge necessary for projects on hand P_4^1 – Sharing knowledge with its stakeholders P_4^2 – Sharing relevant knowledge among business units P_4^3	– Having processes for converting knowledge into action plans P_5^1 – Having processes for matching sources of knowledge to problem-solving P_5^2 – Applying knowledge efficiently to reach its goals P_5^3
$P_1 = \sum_{t=1}^{n=3} \omega_t^1 P_1^t / n$	$P_2 = \sum_{t=1}^{n=3} \omega_t^2 P_2^t / n$	$P_3 = \sum_{t=1}^{n=3} \omega_t^3 P_3^t / n$	$P_4 = \sum_{t=1}^{n=3} \omega_t^4 P_4^t / n$	$P_5 = \sum_{t=1}^{n=3} \omega_t^5 P_5^t / n$

* P stems for indicators related to process evaluation.

* ω is the factor loading for each indicator resulting from this research.

$P1$ indicates the mean of the knowledge acquisition process, $P2$ – the mean of the knowledge creation process, $P3$ – the mean of the knowledge storage process, $P4$ – the mean of the knowledge sharing process, and $P5$ – the mean of the knowledge application process. ω represents the factor loading for each of the constructs in the group, and n represents the number of respondents in the company under evaluation.

Table 3.2 includes the constructs to assess the human factors affecting the KMPs, where $F1$ indicates the mean of the trust factor, $F2$ – the mean of the interaction factor, and $F3$ – the mean of the self-efficacy factor. ω represents the factor loading for each of the constructs in the group, and n represents the number of respondents in the company under evaluation.

Table 3.2. Assessment of human factors with KMPs (created by the author)

Human factors		
<p>Trust</p> <ul style="list-style-type: none"> – Counting on trustful people in creating new knowledge F_1^1 – Acquiring knowledge from trustworthy people F_1^2 – Recording knowledge acquired from trustful people F_1^3 – Sharing knowledge with trustful colleagues F_1^4 – Letting trustful colleagues take responsibility for tasks critical to the team F_1^5 $F_1 = \sum_{t=1}^{n=5} \omega_t^1 F_1^t / n$	<p>Interaction</p> <ul style="list-style-type: none"> – Interacting to come up with new ideas F_2^1 – Interacting to acquire new knowledge F_2^2 – Recording the minutes of the team meetings F_2^3 – Conducting sessions to enhance knowledge sharing F_2^4 – Interacting with each other to solve specific cases F_2^5 $F_2 = \sum_{t=1}^{n=5} \omega_t^2 F_2^t / n$	<p>Self-efficacy</p> <ul style="list-style-type: none"> – Self-efficacy contributes to the knowledge creation process F_3^1 – Self-efficacy allows for better acquisition of the needed knowledge F_3^2 – Self-efficacy allows for better recording of the needed knowledge F_3^3 – Self-efficacy contributes to the knowledge-sharing process F_3^4 – Self-efficacy allows for better usage of the available knowledge F_3^5 $F_3 = \sum_{t=1}^{n=5} \omega_t^3 F_3^t / n$

* F stems for indicators related to factor evaluation.

* ω is the factor loading for each indicator resulting from this research.

Table 3.3 includes the constructs to assess the organisational factors affecting the KMPs, where $F4$ indicates the mean of the rewards factor, $F5$ – the mean of the organisational culture factor, $F6$ – the mean of the teamwork factor, and $F7$ – the mean of the organisational structure factor. ω represents the factor loading for

each of the constructs in the group, and n represents the number of respondents in the company under evaluation.

Table 3.3. Assessment of organisational factors with KMPs (created by the author)

Organisational factors			
Rewards	Culture	Teamwork	Structure
<ul style="list-style-type: none"> – Rewarding feasible innovative ideas F_4^1 – Rewarding the acquisition of new knowledge F_4^2 – Rewarding the proper record of knowledge F_4^3 – Rewarding the knowledge sharing in the organisation F_4^4 – Rewarding the efficient use of knowledge F_4^5 $F_4 = \sum_{t=1}^{n=5} \omega_4^t F_4^t / n$	<ul style="list-style-type: none"> – Supporting best practices for new developments F_5^1 – Encouraging the acquisition of new knowledge F_5^2 – Encouraging employees to store the knowledge in its systems F_5^3 – Promoting knowledge sharing F_5^4 – Encouraging the efficient application of knowledge F_5^5 $F_5 = \sum_{t=1}^{n=5} \omega_5^t F_5^t / n$	<ul style="list-style-type: none"> – The teamwork serves the creation of new knowledge F_6^1 – The teamwork serves the acquisition of new knowledge F_6^2 – Keeping a record of all the experiences generated from the work of its teams F_6^3 – The atmosphere of teamwork facilitates knowledge sharing F_6^4 – Working in teams to apply knowledge for solving cases F_6^5 $F_6 = \sum_{t=1}^{n=5} \omega_6^t F_6^t / n$	<ul style="list-style-type: none"> – Facilitating the inter-departmental collaboration to create new knowledge F_7^1 – Encouraging employees to acquire knowledge F_7^2 – Facilitating the storage of any type of knowledge F_7^3 – Facilitating knowledge sharing across departmental boundaries F_7^4 – Facilitating the inter-departmental collaboration to use the knowledge in solving cases F_7^5 $F_7 = \sum_{t=1}^{n=5} \omega_7^t F_7^t / n$

* F stems for indicators related to factor evaluation.

* ω is the factor loading for each indicator resulting from this research.

Table 3.4 includes the constructs to assess the technological factors affecting the KMPs, where $F8$ indicates the mean of the IT factor, and $F9$ – the mean of the social networks factor. ω represents the factor loading for each of the constructs in the group, and n represents the number of respondents in the company under evaluation.

The self-assessment results are used to measure the mediating role of KMPs between the factors and sustainable organisational performance and the relationship between each factor with each KM process using the correlation formula that

shows the degree of association between the processes and the enablers in the evaluated company.

Table 3.4. Assessment of technological factors with KMPs (created by the author)

Technological factors	
<p>IT</p> <ul style="list-style-type: none"> – Use of IT to facilitate the process of knowledge creation F_8^1 – Use of IT to acquire a wide range of knowledge F_8^2 – Use of repositories to store knowledge for easy access F_8^3 – Use of IT that allows sharing knowledge F_8^4 – Use of IT to facilitate the application of knowledge F_8^5 $F_8 = \sum_{t=1}^{n=5} \omega_8^t F_8^t / n$	<p>Social networks</p> <ul style="list-style-type: none"> – Availability of social networks F_9^1 – Having social networks that support innovative capabilities F_9^2 – Having social networks that enable acquiring new knowledge from many sources F_9^3 – Having social networks system for knowledge storage F_9^4 – Having social networks system for knowledge sharing F_9^5 – Having social networks that enable better application of the knowledge available F_9^6 $F_9 = \sum_{t=1}^{n=5} \omega_9^t F_9^t / n$

* F stems for indicators related to factors evaluation.

* ω is the factor loading for each indicator resulting from this research.

The following models illustrate the relationship between the human, organisational and technological factors with KMPs and sustainable organisational performance based on the research results in Middle Eastern auditing and consultancy firms (Figs 3.5, 3.6, 3.7, 3.8, 3.9 and 3.10).

To measure the degree of association between human, organisational and technological factors with the five KMPs, the correlation formula (3.1) is used, as suggested by Ahlgren et al. (2003):

$$r = \frac{n(\sum FP) - (\sum F)(\sum P)}{\sqrt{[n \sum F^2 - (\sum F)^2][n \sum P^2 - (\sum p)^2]}} \tag{3.1}$$

where r is the correlation coefficient, n is the number of respondents for the assessed company, F represents the factor average (1–5), and p represents the KM process average (1–5) affected by the factors. The value of r is between -1 and $+1$, where a positive value indicates a positive relationship, a negative one indicates a negative relationship between the variables, and a zero value indicates no relationship between the variables. The closer the value to one, the greater the relationship.

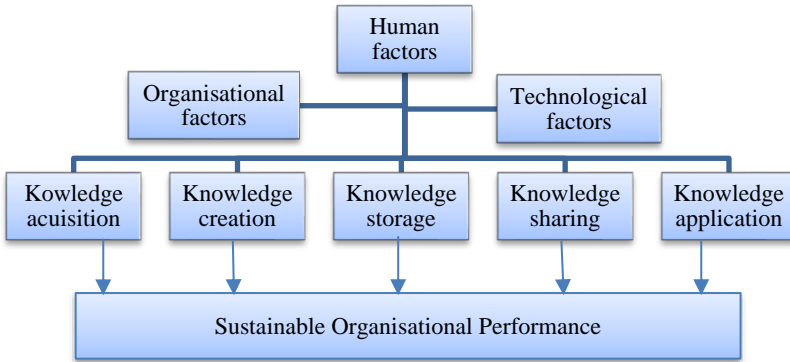


Fig. 3.5. KMPs’ mediating role between factors and sustainable organisational performance

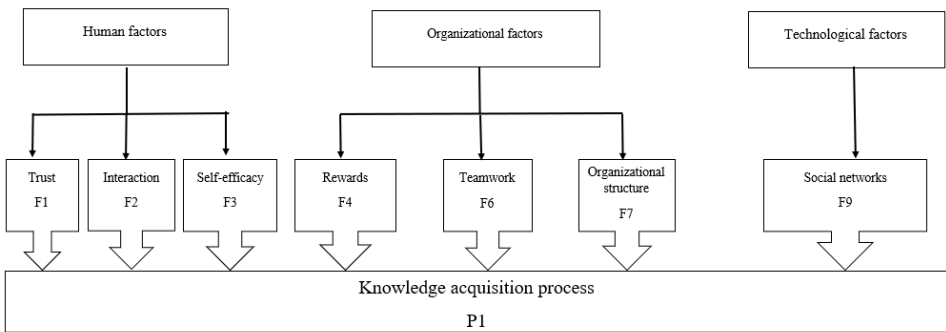


Fig. 3.6. Relationship between factors and the knowledge acquisition process (created by the author)

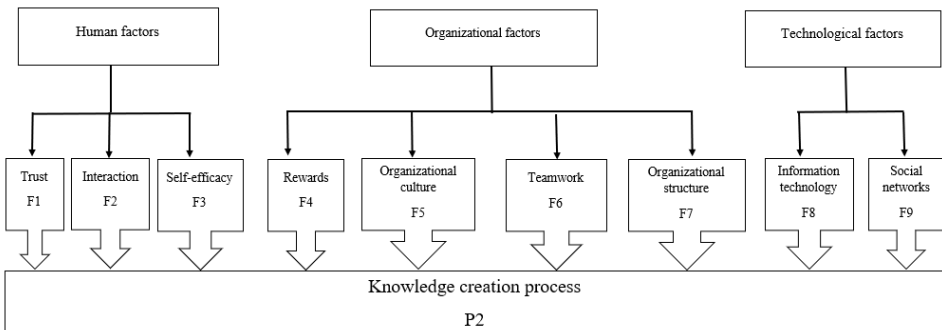


Fig. 3.7. Relationship between factors and the knowledge creation process (created by the author)

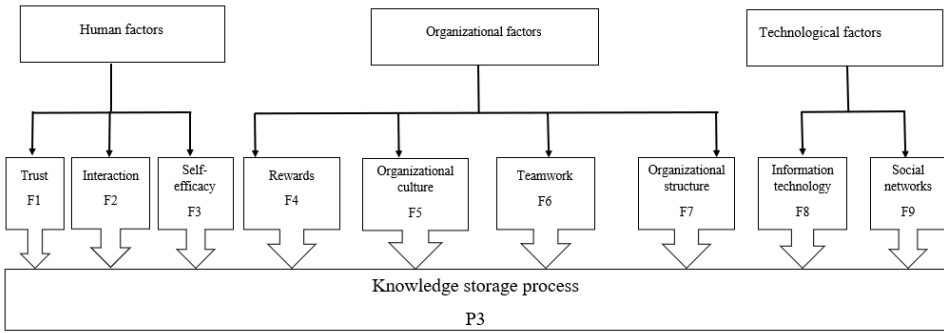


Fig. 3.8. Relationship between factors and the knowledge storage process (created by the author)

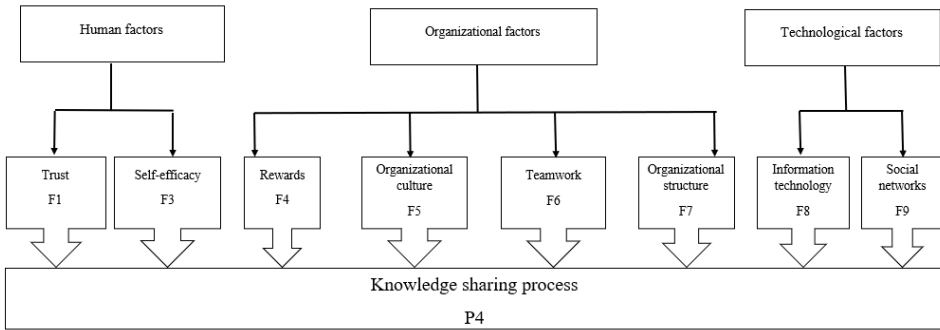


Fig. 3.9. Relationship between factors and the knowledge-sharing process (created by the author)

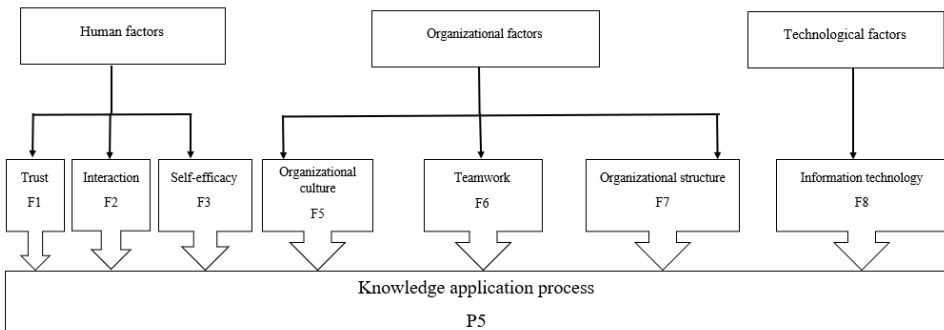


Fig. 3.10. Relationship between factors and the knowledge-application process (created by the author)

In a further measurement of the relationship between the variables and to decide on which factors to emphasise in the process of improving the implementation of the KM cycle, the regression analysis is applied to measure the effects of different factors on the KMPs by applying the following formula (3.2):

$$P = aF + b, \tag{3.2}$$

where P represents the dependent variable as the KM process in this study, and F represents the independent variable as the factors affecting the KM process, while a and b are calculated as follows (3.3) and (3.4), and n is the number of respondents in each company:

$$a = \frac{(\sum F)(\sum P) - n\sum FP}{(\sum F)^2 - n\sum F^2}; \tag{3.3}$$

$$b = \frac{(\sum F)(\sum FP) - (\sum P)(\sum F^2)}{(\sum F)^2 - n\sum F^2}. \tag{3.4}$$

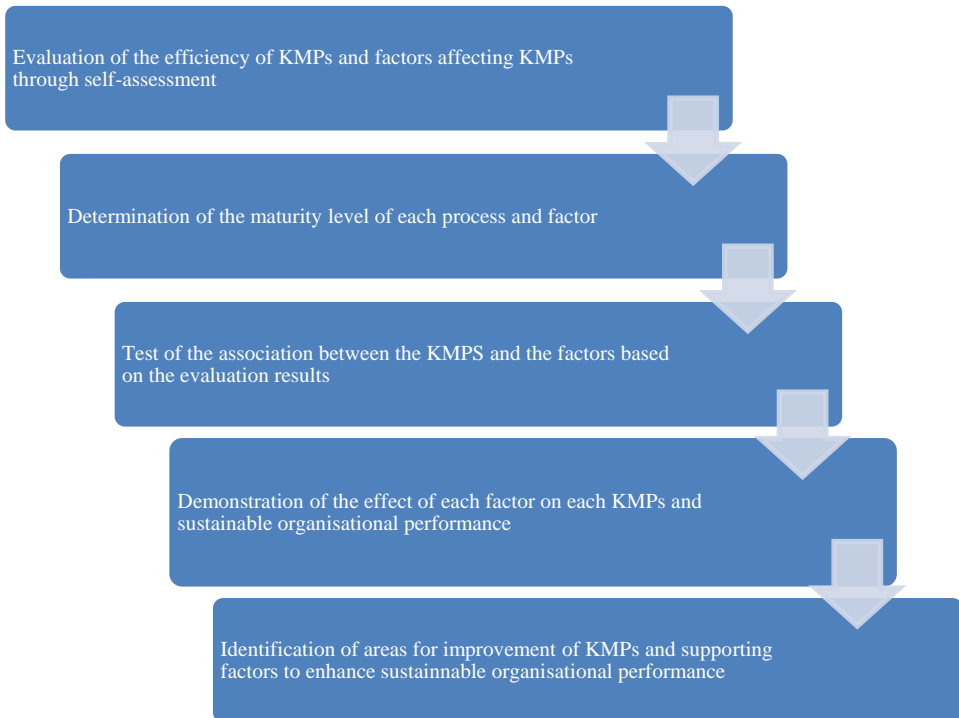


Fig. 3.11. Methodology for applying the model for measuring KMPs

Once the self-assessment, correlation, and regression results are obtained, a company can determine the efficiency and maturity level of the KMPs, in addition to the effects of the nine studied factors. According to the results, managers can identify areas for improvement in KMPs implementation.

The methodology and the different steps in applying the model for measuring KMPs in auditing and consultancy firms are illustrated in Fig. 3.11. First, managers determine what needs to be changed based on the results of the evaluation, then required changes are made, and ways are developed to sustain the changes in the KMPs implementation by focusing on the enhancement of the human, organisational and technological factors with the highest correlation and regression results and which would have the most impact to support those processes to achieve the desired outcomes and reach the sustainable organisational performance.

3.4. Conclusions of the Third Chapter

The Third Chapter presented the research structure leading to the model creation to reflect the procedures applied in the First Chapter, theoretical aspects of KM, and the Second Chapter, research on KMPs in Middle Eastern auditing and consultancy firms. Based on the research results generated in the Second Chapter, after studying the effects of the selected human, organisational, and technological factors on the efficient implementation of KMPs, the model for measuring KMPs in auditing and consultancy firms is proposed. This model aims to measure the maturity and efficiency level of the KMPs in a specific company supported by different human, organisational, and technological enablers. The self-assessment method is used with a survey distributed among evaluated company's members to assess the level of the KMPs (acquisition, creation, storage, sharing, and application) and the enablers (trust, interaction, self-efficacy, rewards, organisational culture, teamwork, organisational structure, IT and social networks). The responses are gathered, and the weighted average for each construct is calculated using the factor loading generated in this study. Afterwards, the correlation between the enablers and the KMPs is quantitatively assessed using the correlation formula, helping the managers to emphasise the factors with a higher relationship with the KMPs. Then, the regression equation is applied to recognise the factors affecting the KMPs the most, based on the responses of the company's members. According to the results of the correlation and regression analysis, auditing and consultancy firm managers can set the organisational strategy focused on supporting and improving factors and enablers that could help more efficiently implement the KMPs depending on the company's needs and in line with the current research results, which proved a significant positive influence of the KMPs on sustainable organisational performance and the significant positive effects of trust, interaction, self-

efficacy, rewards, organisational culture, teamwork, organisational structure, IT and social networks on the five KMPs with some exceptions related to the effect on knowledge sharing, rewards on knowledge application, organisational culture on knowledge acquisition, IT on knowledge acquisition and social networks on knowledge application.

To reach sustainable organisational performance, companies are encouraged to implement an efficient KM cycle supported by different human, organisational, and technological enablers. Thus, companies are recommended to apply the following: (1) create an environment of trust and interaction between their members to be able to share their knowledge and expertise and to benefit from the self-efficacy of each one of them in the KM cycle; (2) build an efficient reward system to compensate employee efforts in implementing the KM cycle and encouraging them to work in teams through different units and levels to engage in the KMPs by integrating continuous organisational learning as part of the organisational culture; and (3) invest in the required technology that facilitates the knowledge flow in the organisation and leads to improving the KMPs and, therefore, the efficient and sustainable performance of the company.

General conclusions

1. The review of scientific literature on the various approaches to knowledge resources, KM, and KMPs revealed five main processes that constitute the KM cycle (acquisition, creation, storage, sharing, and application) and three humans (trust, interaction, and self-efficacy), four organisational (rewards, organisational culture, teamwork, and organisational structure) and two technological (IT and social networks) factors that are most influential in affecting KMPs implementation and sustainable organisational performance. A gap is found in the evidence related to the effects of the nine factors on the whole KM cycle in the knowledge-intensive sector of auditing and consultancy firms of the developing countries in the Mid-East region.
2. The research conducted in the Middle Eastern auditing and consultancy field used SEM techniques to quantitatively test the research hypotheses. The results of this study in the developing economies of the Mid-East region (Lebanon, Syria, and Jordan) revealed a positive and significant impact of the five KMPs on sustainable organisational performance. It also proved the significant positive effects of trust, interaction, self-efficacy, rewards, organisational culture, teamwork, organisational structure, IT, and social networks on the KMPs, with some exceptions, such as the

effects of interaction on knowledge sharing, rewards on knowledge application, organisational culture on knowledge acquisition, IT on knowledge acquisition and social networks on knowledge application. Additionally, the results demonstrated the significant mediating role of KMPs between the studied factors and sustainable organisational performance.

3. Based on the results generated in this study and to fill the gaps found in the previously proposed models, the model for measuring KMPs was proposed, and the methodology for applying the proposed model was provided to help organisations operating in the knowledge-intensive sector in general and the auditing and consultancy firms in particular, to evaluate the KMPs and the factors that support the efficient KMPs implementation and make strategic decisions to improve the KM cycle to accomplish their objectives and reach sustainable organisational performance.
4. This study contributes to the scarce body of scientific literature on the Mid-East context by offering a holistic quantitative perspective on the field of auditing and consultancy firms. The results indicate the awareness of experts and top management in the Middle Eastern auditing and consultancy firms as to the importance of the KMPs implementation and their tendency to adopt the factors that would contribute to employee motivation to participate in the KM cycle for efficient results and improved performance.
5. This research has some limitations: first, the research context may have affected the findings since the study focused on the knowledge-intensive sector in the developing countries of the Mid-East region. Thus, the generalisability of the findings may be bound by contextual factors. However, the respondents represent domestic and international companies of different sizes, which makes the findings applicable to the entire sector where knowledge is an important asset. Consequently, the theoretical model could be applied to other contexts with different construct operationalisation, and future studies could validate the current framework in other sectors and cultural contexts. Second, the method applied for collecting data was limited to using a structured questionnaire disseminated among experts in the field of auditing and consultancy. Third, it would be possible that other factors also affect the KM cycle while specific human, organisational, and technological factors were considered in this study. These limitations create an opportunity for future studies to test the research model in other sectors and different geographical areas, in addition to evaluating other factors' influence on the KM cycle.

Recommendations

This study reveals some recommendations that would enhance the practical implications of the research results. Thus, recommendable are the following:

- Promoting KMPs among the employees through building reward systems that compensate and motivate them to participate in the KM cycle.
- Enabling a teamwork atmosphere and a learning organisation environment that serves the implementation of KMPs.
- Supporting best practices that lead to new developments, facilitating interdepartmental collaboration, and promoting knowledge across departments.
- Setting the organisational culture and building the organisational structure that would motivate individuals and teams to take part in the KM cycle.
- Adopting IT and social networks as a means to support the KMPs to enhance organisational performance.
- Using the proposed model to measure the maturity and efficiency level of KMPs in the organisations by conducting self-assessment and, according to the results, making the required decisions for areas of improvement.

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Summary in Lithuanian

Įvadas

Problemos formulavimas

Globalizacija ir technologijų plėtra sukūrė daug iššūkių verslui (Bem Machado et al., 2022; Limsangpetch et al., 2022), o inovacijos padidino kūrybiškumo ir unikalumo poreikį bei prisidėjo prie augančios konkurencijos rinkoje (Lin et al., 2022; Raudeliūniene & Szarucki, 2019), kuri skatina organizacijas ieškoti naujų galimybių patenkinti suinteresuotųjų šalių poreikius ir pagerinti organizacijos veiklą (Chang & Lin, 2015; Spanellis et al., 2021). Šie pokyčiai turi įtakos ne tik visuomenės informaciniams poreikiams, bet ir organizacijų struktūrinėms valdymo problemoms, kurios kėlė daug grėsmių organizacijoms, siekiančioms prisitaikyti prie naujų technologinių, ekonominių ir socialinių tendencijų (Migdadi, 2020; Pawlowski & Bick, 2012), kurti ir plėtoti unikalumą, kad būtų galima įveikti didėjančią konkurenciją sudėtingoje ir dinamiškoje aplinkoje (Raudeliūnienė et al., 2018). Organizacijos žiniomis grįstas požiūris intelektinius išteklius traktuoja svarbiu organizacijos turtu, kuris palaiko konkurencingumą ir unikalumą (Mahdi et al., 2019). Dėl to žinios tapo pagrindiniu diferenciacijos ir strateginiu šaltiniu, pakeitusiu konkurencijos taisyklės (Ogbonna & Harris, 2015), valdymo praktikas (Rezaei et al., 2021) ir strategijos formavimo procesą (Szczepeńska-Woszczyzna, 2018). Tokiu atveju organizacijos yra skatinamos plėtoti ir stiprinti žinių valdymo ciklą, siekiant efektyviai valdyti ir išsaugoti žinias (Shahzad et al., 2016), pagerinti organizacinę veiklą (Youssef et al., 2017) ir siekti unikalumo bei lyderystės sudėtingomis rinkos sąlygomis (Valmohammadi & Ghassemi, 2016). Organizacijoms svarbu investuoti laiką ir finansinius išteklius naujoms žinioms

kurti, organizuoti ir efektyviai jas pritaikyti (Akbari & Ghaffari, 2017; Valmohammadi & Ghassemi, 2016). Kuo daugiau organizacija gebės įgyti, kurti, išsaugoti, dalytis ir pritaikyti žinias, tuo labiau ji galės siekti ilgalaikės organizacijos strategijos, padedančios plėtoti inovacijas, didinti veiklos efektyvumą ir išsaugoti konkurencinį pranašumą (Mahdi et al., 2019). Pasaulio bankas kasmet į žinių paslaugas investuoja daugiau nei 600 mln. dolerių, o apie 4 mlrd. dolerių per metus išleidžiama paskoloms, biudžetui ir partnerystės veiklai žinių valdymo paslaugoms teikti, tačiau, nepaisant šių investicijų į žinių valdymo sistemas, organizacijos kasmet patiria apie 31,5 mlrd. nuostolių. Tyrimai rodo, kad dauguma žinių valdymo sistemų nepasiteisino, nes organizacijos nesugebėjo tinkamai nustatyti žinių valdymo reikalavimų ir įgyvendinti juos atitinkančių strategijų (Spanellis et al., 2021). Todėl organizacijoms vis dar yra iššūkių, kaip plėtoti ir įgyvendinti žinių valdymo praktikas, siekiant tvarių organizacinės veiklos rezultatų.

Darbo aktualumas

Vis svarbesnis žinių, kaip unikalios šaltinio, turinčio teigiamą poveikį organizacijos veiklai, vaidmuo paskatino organizacijas vertinti žinių valdymą kaip veiksmingą priemonę XXI a., kai 80 proc. didžiausių pasaulio įmonių įsidiegė žinių valdymo procesus (Hegazy & Ghorab, 2015; Migdadi, 2020; Ward & Aurum, 2004). Žinių valdymas kaip disciplina pradėta nagrinėti XX a. 10-ojo dešimtmečio pradžioje (Pauleen & Wang, 2017) ir per tam tikrą laikotarpį žinių valdymu kaip disciplina ir valdymo praktika susidomėjo įvairūs mokslininkai ir verslo praktikai (Kianto et al., 2016; López-torres et al., 2019), tyrinėję žinių valdymo procesus ir jų poveikį įvairioms organizacijų veikloms (Duke et al., 2022; Massingham & Al Holaibi, 2017). Dauguma tyrėjų pripažino, kad žinių valdymas yra vienas iš esminių organizacijos sėkmės veiksnių (Kavalić et al., 2021; Mehta, 2008), teigiamai veikiančių darbuotojų ir klientų pasitenkinimą (Kianto et al., 2016; Victor & Hoole, 2017) ir efektyviai didinančių tvarios organizacinės veiklos rezultatus (Chang & Lin, 2015; Mageswari et al., 2017). Tai lemia organizacijos unikalumo kūrimą dinamiškoje aplinkoje (Matoskova & Smesna, 2017; Qandah et al., 2020), darbuotojų įsitraukimą į organizacijos žinių procesus (Acharya & Mishra, 2017; Lashari & Rana, 2018).

Tokiu būdu buvo išskirtas individo vaidmuo įgyvendinant žinių valdymo procesus, dėl ko išaugo individo žinių svarba organizacijose (Rezaei et al., 2021; Runhaar & Sanders, 2016), veikiančiose žinioms imliuose sektoriuose, kuriuose darbuotojų įsitraukimas yra labai aukštas ir žinios yra verslo veiklos pagrindas (Consoli & Elche, 2013; Kianto et al., 2016). Be to, reikia pažymėti ir organizacinius veiksnius, turinčius įtakos darbuotojų įsitraukimui ir jų polinkiui efektyviai įgyvendinti žinių valdymo praktiką (Migdadi, 2020; Tangaraja et al., 2015) ir informacines technologijas, kurios padeda integruoti žinių valdymo procesus, ypač besivystančiose šalyse, kur individai ir organizacijos vis dar nelinkę įsitraukti į žinių valdymo procesus (Koochang et al., 2017; Razmerita et al., 2016). Atlikti tyrimai parodė organizacijos strategijos vaidmenį formuojant efektyvų žinių valdymo ciklą, integruojant skirtingus žmogiškuosius, organizacinius ir technologinius veiksnius (Fernandes, 2018; Gonzalez & Melo, 2019). Šie veiksniai skirti darbuotojams motyvuoti ir žinių valdymo praktikos įgyvendinimui užtikrinti, siekiant gerinti organizacinius veiklos rezultatus (Low et al., 2020; Podrug et al., 2017). Vidurinių Rytų regione, ypač besivystančiose šalyse, organizacijos vis dar nenoriai įgyvendina žinių valdymo procesus

(Kassab, 2016) ir nepalaiko darbuotojų motyvacijos bei įsipareigojimo dalyvauti žinių valdymo cikle (Elwany & Mahrous, 2016). To priežastys yra mokslinės ir technologinės infrastruktūros trūkumas (Qandah et al., 2020), tarptautinio ir strateginio bendradarbiavimo nebuvimas (Al-Roubaie, 2013), kuriuos nulėmė geopolitiniai konfliktai ir daugybė socialinių ir ekonominių padarinių regione (Al-Roubaie & Al-Ameen, 2015). Žinių valdymo praktika kaip naujovė neseniai buvo pradėta taikyti Vidurinių Rytų šalių įmonėse, kurios yra potencialios žinių valdymo praktikos taikytojos pereinant prie žinių ekonomikos (Kassab, 2016). Šių praktikų taikymas įpareigoja įmones kurti atitinkamas strategijas ir infrastruktūras, integruojančias veiksmingą žinių valdymo procesų įgyvendinimą, tačiau turimos žinios, kaip efektingai ir veiksmingai kurti žinių strategijas ir taikyti žinių valdymo praktikas, vis dar ribotos (Alayoubi et al., 2020; Saeed et al., 2013). Šiame tyrime pasirinktų Vidurinių Rytų besivystančių šalių žinioms imlaus sektoriaus kontekstas yra naudingas užpildant nagrinėtą tyrimų spragą, nes vertinama tiek vietinių, tiek tarptautinių audito ir konsultavimo įmonių žinių valdymo praktika. Žinių valdymo procesų vertinimas yra svarbus šioms organizacijoms, siekiant efektyviai valdyti žinias ir užtikrinti, kad žinių valdymo iniciatyvos būtų suderintos su bendraisiais verslo tikslais (Centobelli ir kt., 2019).

Tyrimo objektas

Tyrimo objektas – žinių valdymo procesų vertinimas audito ir konsultavimo įmonėse.

Darbo tikslas

Darbo tikslas – sukurti modelį, skirtą žinių valdymo procesams įvertinti, leidžiantį kompleksiskai išmatuoti skirtingus žmogiškuosius, organizacinius ir technologinius veiksnius, turinčius įtakos žinių valdymo procesams, ir formuoti sprendimus, siekiant gerinti šių procesų įgyvendinimą Vidurinių Rytų audito ir konsultavimo sektoriuje, kas siejasi su tvarios organizacinės veiklos gerinimu.

Darbo uždaviniai

1. Atlikti mokslinės literatūros analizę, susietą su žinių valdymu, žinių valdymo procesais, žinių valdymo procesų veiksniais ir kriterijais, siekiant nustatyti atliktų tyrimų spragas ir suformuoti tyrimo modelį.
2. Įvertinti Vidurinių Rytų audito ir konsultavimo sektorių, siekiant iširti žinių valdymo procesų santykį su šių įmonių veiklos rezultatais ir skirtingais veiksniais, darančiais įtaką žinių valdymo procesams.
3. Patikrinti Vidurinių Rytų audito ir konsultavimo įmonių žinių valdymo procesų tyrimo rezultatus, taikant bendrąjį žinių valdymo procesų vertinimo modelį.

Tyrimo metodologija

Siekiant iširti tyrimo objektą, buvo taikyti šie tyrimo metodai:

- Teorinė darbo dalis: atlikta mokslinė literatūros analizė, nagrinėjant ankstesnių tyrėjų požiūrius ir tyrimų rezultatus, susijusius su žinių valdymo procesais ir veiksniais, turinčiais įtakos šiems procesams. Atlikta sisteminė ir lyginamoji analizė, siekiant nustatyti svarbiausius žinių valdymo procesus, turinčius reikšmingą įtaką tvariai organizacinei veiklai. Taip pat buvo nagrinėti žmogiškieji, organizaciniai ir technologiniai veiksniai, siekiant identifikuoti tuos veiksnius, kurie turi didžiausią įtaką žinių valdymo procesams organizacijose. Tyrimo hipotezės buvo suformuluotos remiantis mokslinių tyrimų rezultatais.
- Analitinė darbo dalis: sukurtas hipotezėmis grįstas tyrimo modelis ir pasiūlytos hipotezės buvo patikrintos taikant kiekybinius metodus. Buvo sudarytas struktūrizuotas klausimynas bei pateiktas audito ir konsultavimo įmonių ekspertams, siekiant surinkti reikalingus duomenis analizei atlikti. Tyrimui atlikti buvo taikyti tokie statistiniai metodai, kaip koreliacijos ir struktūrinis lygčių modeliavimas, siekiant gauti kiekybinius tyrimų rezultatus iš Vidurinių Rytų audito ir konsultavimo įmonių.
- Projektinė darbo dalis: šioje darbo dalyje buvo patikrintas tyrimo modelis ir gauti Vidurinių Rytų audito ir konsultavimo įmonių tyrimų rezultatai. Buvo sukurtas žinių valdymo procesų vertinimo modelis, skirtas skirtingiems žmogiškiems, organizaciniams ir technologiniams veiksniams įvertinti, turintiems įtakos žinių valdymo procesams Vidurinių Rytų audito ir konsultavimo įmonėse, veikiančiose žinioms imliuose sektoriuose.

Darbo mokslinis naujumas

Žinių valdymo procesų vertinimas Vidurinių Rytų audito ir konsultavimo įmonėse yra vienas iš nedaugelio tyrimų, nagrinėjančių žinių valdymo procesus Vidurinių Rytų regione, kur žinių valdymas laikomas nauju ir retai nagrinėjamu konceptu tiriamajame regione. Šis tyrimas sudaro prielaidas nustatyti esminius žinių valdymo procesų optimizavimo veiksnius žinioms imliame sektoriuje, ypač audito ir konsultavimo įmonėse, siekiant gerinti savo veiklos rezultatus ir įgyti žiniomis pagrįstą tvarų konkurencinį pranašumą.

Nepaisant to, kad buvo atlikta keletas ankstesnių tyrimų, nagrinėjančių žinių valdymo praktikų įtaką organizacijų veiklos našumui, vis dar trūksta išsamių studijų, tiriančių visą žinių valdymo ciklą, integruojantį penkis žinių valdymo procesus ir jų poveikį tvariai organizacinei veiklai, taip pat įvairių žmogiškųjų, organizacinių ir technologinių veiksnių įtaką žinių valdymo procesų įgyvendinimui, ypač žinioms imliuose sektoriuose, tokiuose kaip auditas ir konsultavimas besivystančiose Vidurinių Rytų regiono ekonomikose.

Tyrimo rezultatų praktinė vertė

Mokslinių tyrimų rezultatų praktinė vertė susijusi su naujo požiūrio plėtojimu, skirtu žinių valdymo procesų efektyvumui vertinti ir žinių ciklo valdymui žinioms imliame sektoriuje, ypač audito ir konsultavimo įmonėse. Vadovaujantis šiuo požiūriu dėmesys sutelkiamas į tam tikrus žmogiškuosius veiksnius (pasitikėjimas, tarpusavio sąveika ir saviveiksmingu-

mas), organizacinius veiksmus (atlygis, organizacinė kultūra, komandinis darbas ir organizacinė struktūra) ir technologinius veiksmus (informacinės technologijos ir socialiniai tinklai).

Įgyvendinant šio tyrimo rezultatus ir atkreipiant dėmesį į pagrindinius veiksmus, turinčius teigiamą poveikį žinių valdymo ciklui, audito ir konsultavimo įmonių vadovai gali labai pagerinti organizacinių procesų efektyvumą, suinteresuotiesiems asmenims siekiant ne tik geresnių veiklos rezultatų, bet ir tvaresnės organizacinės veiklos.

Ginamieji teiginiai

1. Efektyvus žinių valdymo ciklo, apimančio penkis žinių valdymo procesus (įgijimą, kūrimą, išsaugojimą, dalijimąsi žiniomis ir taikymą), įgyvendinimas organizacijos veikloje leidžia pagerinti besivystančių šalių žinioms imliame sektoriuje veikiančių organizacijų tvarią organizacinę veiklą.
2. Žmogiškieji, organizaciniai ir technologiniai veiksniai, tokie kaip pasitikėjimas, tarpusavio sąveika, saviveiksmingumas, atlygis, organizacinė kultūra, komandinis darbas, organizacinė struktūra, informacinės technologijos ir socialiniai tinklai, turi reikšmingą teigiamą poveikį žinių valdymo procesų (įgijimas, kūrimas, išsaugojimas, dalijimasis žiniomis ir taikymas) veiksmingam įgyvendinimui organizacijose, veikiančiose besivystančių šalių žinioms imliuose sektoriuose. Tai tiesiogiai susiję su tvarios organizacinės veiklos gerinimu.
3. Žinių valdymo procesų vertinimo modelis turi reikšmingą įtaką vadovų sprendimui sustiprinti žmogiškuosius, organizacinius ir technologinius veiksmus, kurie teigiamai veikia žinių valdymo ciklo efektyvų įgyvendinimą siejamą su tvaria organizacine veikla.

Darbo rezultatų apibavimas

Disertacijos tematika buvo publikuoti penki moksliniai straipsniai, iš jų keturi mokslo straipsniai publikuoti recenzuojamuose periodiniuose leidiniuose, vienas – recenzuojamame konferencijų straipsnių rinkinyje. Tyrimo rezultatai taip pat buvo pristatyti septyniuose tarptautinėse konferencijose, iš jų keturios vyko Lietuvoje ir trys – užsienyje.

Disertacijos struktūra

Disertaciją sudaro šios pagrindinės dalys: įvadas, trys skyriai (1 skyrius: literatūros analizė; 2 skyrius: tiriamoji darbo dalis; 3 skyrius: projektinė darbo dalis), bendrosios išvados, literatūros sąrašas, autorės publikacijų sąrašas ir pranešimai tarptautinėse konferencijose, disertacijos santrauka lietuvių kalba ir priedai. Daktaro disertacijos apimtis – 149 puslapiai be priedų, pateiktos 4 sunumeruotos formulės, 24 lentelės, 15 paveikslų ir 306 literatūros šaltinių.

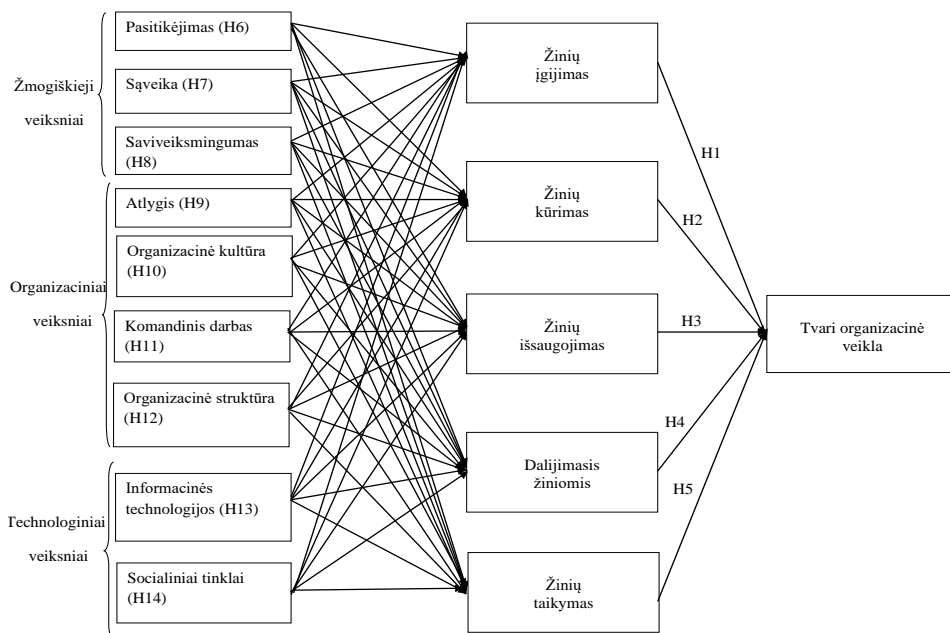
1. Teoriniai žinių valdymo procesų aspektai ir veikiantys veiksniai

Dinamiškoje ir greitai kintančioje aplinkoje žinių valdymas laikomas svarbiu veiksniu, padedančiu organizacijoms gerinti savo veiklą ir siekti išskirtinumo bei lyderystės rinkoje. Žinių valdymas apibūdinamas kaip sistemingas procesų, metodų ir įrankių valdymas, siekiant visapusiškai naudoti organizacijos žinių potencialą strateginiams tikslams ir efektyviems sprendimams formuoti bei vertei kurti. Organizacinių veiklų gerinimas priklauso nuo jų gebėjimo pasinaudoti žinių valdymo procesais, kurie geriausiai atitiktų jų bendrąsias strategijas ir suteiktų pridėtinę vertę jų produktams ar paslaugoms bei užtikrintų tvarią organizacinę veiklą. Siekiant nustatyti reikšmingiausius žinių valdymo procesus ir veiksnius, darančius įtaką efektyviam procesų įgyvendinimui, buvo atlikta ankstesnių mokslinių studijų žinių valdymo srityje analizė. Tyrimo metu buvo nustatyta, kad dauguma mokslininkų ir verslo praktikų atkreipia dėmesį į tai, kad sėkmingos organizacijos yra tos, kurios įgyvendino savo organizacinėse veiklose žinių valdymo ciklą, integruojantį žinių įgijimą, žinių kūrimą, žinių išsaugojimą, dalijimąsi žiniomis ir žinių taikymą. Šie penki žinių valdymo procesai sudaro žinių valdymo ciklą. Organizacijos, taikydamos šiuos procesus, gali ne tik pagerinti kuriamus produktus ir teikiamas paslaugas, bet ir daryti teigiamą įtaką tvariai organizacinei veiklai. Tyrimo metu buvo identifikuoti įvairūs žmogiškieji, organizaciniai ir technologiniai veiksniai, padedantys pašalinti žinių valdymo kliūtis ir efektyviai įgyvendinti žinių valdymo ciklą. Žmogiškųjų veiksmų grupėje išskirti tokie esminiai veiksniai: pasitikėjimas, tarpusavio sąveika ir saviveiksmingumas. Organizacinių veiksmų grupėje koncentruojamasi į tokius veiksnius: atlygis, organizacinė kultūra, komandinis darbas ir organizacinė struktūra. Technologinių veiksmų grupėje buvo išskirti tokie esminiai veiksniai veikiantys žinių valdymo procesus: informacinės technologijos ir socialiniai tinklai. Mokslinės literatūros analizė parodė, kad šių veiksmų poveikis buvo fragmentiškai nagrinėjamas skirtingiems žinių valdymo procesams (žinių įgijimas, žinių kūrimas, žinių išsaugojimas, dalijimasis žiniomis ir žinių taikymas) ir tvariai organizacinei veiklai įvairiose šalyse ir sektoriuose. Tyrimo metu buvo nustatyta, kad besivystančiose šalyse išsamių žinioms imlių sektorių tyrimų vis dar trūksta, nes daugumoje tyrimų buvo nagrinėti tik pavieniai žinių valdymo procesai. Siekiant užpildyti identifikuotas mokslinių studijų spragas, šis tyrimas buvo atliktas Vidurinių Rytų audito ir konsultavimo įmonėse siekiant patikrinti skirtingų žmogiškųjų, organizacinių ir technologinių veiksmų ryšį su visu žinių valdymo ciklu ir jo poveikiu tvariai organizacinei veiklai.

2. Žinių valdymo procesų tyrimas Vidurinių Rytų audito ir konsultavimo įmonėse

Besivystančios ekonomikos, įskaitant besivejančią Vidurinių Rytų ekonomiką, nors ir pripažįsta veiksmingo žinių valdymo poreikį, tačiau kovoja su daugybe ekonominių ir geopolitinių suvaržymų (Kassab, 2016). Dėl susiklosčiusių aplinkybių žinių valdymo objektas šiose besivystančiose šalyse yra mažiau ištirtas, tačiau svarbus, siekiant paspartinti šių šalių vystymąsi ir galimą jų perėjimą prie žiniomis grįsto modelio (AlShamsi & Ajmal, 2018). Šiame tyrime buvo atlikta analizė žinioms imliame audito ir konsultavimo sektoriuje besivystančiose Vidurinių Rytų šalyse (Libane, Sirijoje ir Jordanijoje), siekiant

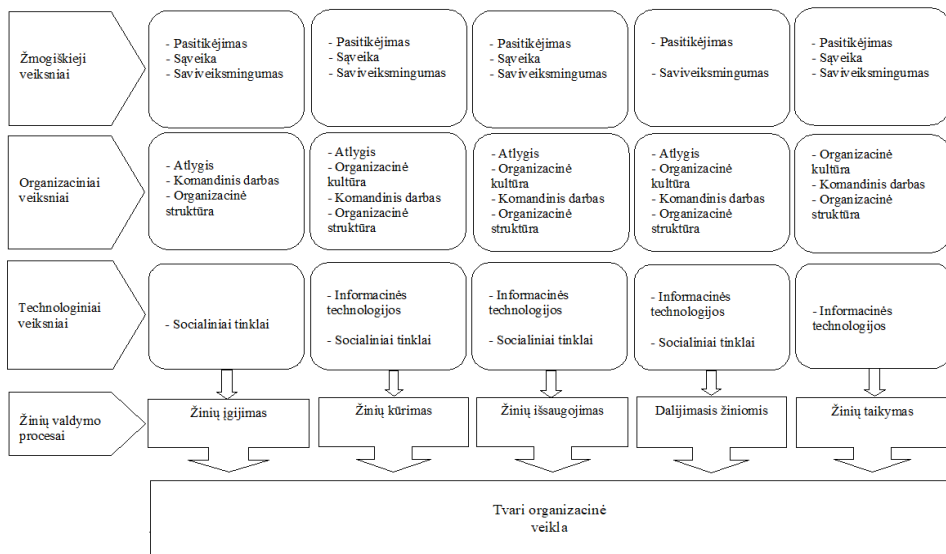
nustatyti, kokie žmogiškieji (pasitikėjimo, tarpusavio sąveikos ir saviveiksmingumo), organizaciniai (atlygis, organizacinė kultūra, komandinis darbas ir organizacinė struktūra) ir technologiniai veiksniai (informacinės technologijos ir socialiniai tinklai) turi didžiausią poveikį žinių valdymo ciklui (žinių įgijimas, kūrimas, išsaugojimas, dalijimasis žiniomis ir taikymas) ir tvariai organizacinei veiklai. Tyrimas buvo suskirstytas į dvi dalis. Pirmoje dalyje buvo tiriama ryšys tarp žinių valdymo procesų (žinių įgijimo, kūrimo, išsaugojimo, dalijimosi žiniomis ir taikymo) ir tvarios organizacinės veiklos, kur žinių valdymo procesai vertinami kaip nepriklausomieji kintamieji, o tvarus organizacinės veiklos efektyvumas yra priklausomasis kintamasis. Antroje tyrimo dalyje buvo tiriama ryšys tarp žmogiškųjų, organizacinių ir technologinių veiksnių ir žinių valdymo procesų, kuriame skirtingi veiksniai reprezentuoja nepriklausomuosius kintamuosius, o žinių valdymo procesai – priklausomuosius kintamuosius. Atitinkamai buvo sudarytas tyrimo modelis, integruojantis visus tarpusavio ryšius tarp tyrimo kintamųjų (S.2.1 pav.).



S.2.1 pav. Tyrimo modelis (sukurtas autorės)

Tyrimo iškeltoms hipotezėms patikrinti buvo sudarytas ir išplatintas struktūrizuotas klausimynas, skirtas reikiamiems duomenims iš ekspertų surinkti, kurie yra audito asociacijų nariai Vidurinių Rytų šalyse (Libane, Sirijoje ir Jordanijoje). Surinkti duomenys buvo analizuojami ir interpretuojami skirtingais statistiniais metodais, siekiant patikrinto tyrimo hipotezes. Tyrimo modelyje pateikti veiksniai buvo įvertinti pasitelkiant faktorinę analizę su tam tikrais koreliacijos koeficientais, siekiant tęsti analizę su konstruktais, kurių koreliacijos koeficientai buvo didesni nei 0,6 slenkstis. Pagrįstumo, patikimumo ir kolinearumo testai buvo atlikti siekiant užtikrinti, kad tarp tiriamų kintamųjų ir jų rodiklių šiuo atžvilgiu nekiltų problemų. Vėliau buvo išmatuotas modelio tinkamumo gerumas ir gautas

statistiškai reikšmingas modelis. Taip pat buvo sukurta Pearsono koreliacija tarp visų tyrimo kintamųjų, rodančių teigiamą ryšį tarp tiriamų kintamųjų. Struktūrinis lygčių modeliavimas (angl. SEM) buvo pritaikytas nepriklausomųjų kintamųjų poveikiui priklausomiesiems kintamiesiems iširti. Šio tyrimo rezultatai patvirtino reikšmingą teigiamą žinių valdymo procesų įtaką tvariai organizacinei veiklai ir reikšmingą teigiamą pasitikėjimo, tarpusavio sąveikos, saviveiksmingumo, atlygio, organizacijos kultūros, komandinio darbo, organizacinės struktūros, informacinių technologijų ir socialinių tinklų poveikį penkiems žinių valdymo procesams, išskyrus aspektus, susijusius su tarpusavio sąveikos poveikiu dalijimuisi žiniomis, atlygio poveikiu žinių taikymui, organizacinės kultūros poveikiu žinių įsigijimui, informacinių technologijų poveikiu žinių įsigijimui ir socialinių tinklų poveikiu žinių taikymui (S.2.2 pav.).



S.2.2 pav. Tyrimo rezultatų atvaizdavimas (sukurta autorės)

Žinių valdymo procesų tarpininkavimas tarp tiriamų žmogiškųjų, organizacinių ir technologinių veiksnių bei tvarios organizacinės veiklos buvo patikrintas Sobelio testu. Taip pat buvo atlikta lyginamoji analizė, siekiant identifikuoti žinių valdymo procesus veikiančius veiksnius ir jų ypatumus tarp vietinių ir tarptautinių audito bei konsultavimo įmonių. Tyrimo rezultatai parodė, kad tarptautinės įmonės geriau suvokia žinių valdymo procesų įgyvendinimo svarbą, labiau yra palaikomos vadovybės ir geriau aprūpintos infrastruktūra žinioms valdyti. Tyrimo rezultatai sudarė prielaidas teigti, kad besivystančios Vidurinių Rytų šalys, susiduriančios su ekonominiais ir geopolitiniais suvaržymais, raginamos daugiau dėmesio skirti žinių valdymo ciklo įgyvendinimui, siekiant tvarių organizacinių veiklų rezultatų, kurie turėtų įtakos ir visos ekonomikos vystymuisi.

3. Žinių valdymo procesų vertinimo modelis audito ir konsultavimo įmonėse

Remiantis empiriniais tyrimų rezultatais buvo sukurtas žinių valdymo procesų vertinimo modelis, skirtas Vidurinių Rytų audito ir konsultavimo įmonėms, veikiančioms žiniomis imliame sektoriuje (S.3 pav.). Pasiūlytas modelis susideda iš tokių pagrindinių etapų: žinių valdymo procesų brandos lygio ir jų poveikio tvariam organizacinės veiklos rezultatui nustatymas; žmogiškųjų, organizacinių ir technologinių veiksnių, turinčių įtakos žinių valdymo procesams, vertinimas; strateginių sprendimų, skirtų efektyviai įgyvendinti žinių valdymo procesus siekiant tvarios organizacinės veiklos, kūrimas (S.3.1 pav.).



S.3.1 pav. Žinių valdymo procesų vertinimo modelis (sukurtas autorės)

Dauguma modelių, kurie anksčiau buvo pasiūlyti kitų tyrėjų žinių valdymui vertinti ir žinių valdymo brandai įsivertinti, priklauso nuo šių komponentų: pagal kategorijas sugrupuoti požymiai, paprastos vertinimo skalės kiekvienai kategorijai įvertinti ir nesudėtingi klausimai, skirti diskusijoms tarp organizacijos darbuotojų. Tačiau svarbu kiekvienai organizacijai, vykdančiai žinių valdymo praktikas, turėti aiškų gairių žemėlapi, sudarytą iš brandos modelio, kuriame būtų aiškiai aprašytas kelias ir priemonės kaip organizacijai didinti žinių valdymo efektyvumą ir pagerinti įmonės veiklą. Pirmasis siūlomo modelio žingsnis yra savęs įsivertinimas pagal skalę [1, 5], sudarantis prielaidas nustatyti žinių gebėjimus ir įvertinti sritis, kurias reikia tobulinti. Atsižvelgdamos į tai, įmonės galėtų kurti žinių valdymo strategijas ir politiką žinių valdymo procesams įgyvendinti, kurie geriau atitiktų įmonės tikslus, integruojant žmogiškuosius, organizacinius ir technologinius aspektus. Kiekvienas tyrimo konstruktas vertinamas pagal skalę [1, 5] remiantis brandos lygiais, aprašytais anksčiau taikytuose žinių valdymo brandos modeliuose, kur 1 – pradinis, 2 – kartotinis, 3 – apibrėžtas, 4 – valdomas, 5 – optimizuojantis lygiai. Kiekvieno

veiksnių reikšmingumas formulėje sugeneruotas ω padauginus iš rodiklio, gauto įvertinus įmonės įsivertinimo rezultatus. Kiekvieno veiksnio vidurkis svyruoja skalėje nuo 1 iki 5:

$$F = \sum_{t=1}^{n=5} \omega t F_t / n, \quad (1)$$

čia F – kiekvieno veiksnio vidurkis; ω – kiekvieno iš grupės konstruktų veiksnio reikšmingumas (penki konstruktai kiekvienam veiksmiui); n – respondentų skaičius vertinamoje įmonėje.

$$P = \sum_{t=1}^{n=3} \omega t P_t / n, \quad (2)$$

čia P – žinių proceso vidurkis; ω – kiekvieno iš grupės konstruktų veiksnio reikšmingumas (trys konstruktai kiekvienam procesui); n – respondentų skaičius vertinamoje įmonėje.

Įsivertinimo rezultatai bus naudojami siekiant išmatuoti žinių valdymo procesų tarpininkavimo vaidmenį tarp veiksmių ir tvarios organizacinės veiklos, taip pat kiekvieno veiksnio ryšį su kiekvienu žinių valdymo procesu, naudojant koreliacijos formulę, kuri parodys ryšį tarp procesų ir veiksmių vertinamoje įmonėje.

Norint įvertinti žmogiškųjų, organizacinių ir technologinių veiksmių ryšį su penkiais žinių valdymo procesais Ahlgren *et al.* (2003) siūlo taikyti šią koreliacijos formulę:

$$r = \frac{n \sum F P - \sum F \sum P}{\sqrt{[n \sum F^2 - (\sum F)^2][n \sum P^2 - (\sum P)^2]}}, \quad (3)$$

čia r – koreliacijos koeficientas; n – respondentų skaičius vertinamojoje įmonėje; F – veiksnio vidurkis skalėje [1, 5]; p – žinių valdymo proceso vidurkis skalėje [1, 5], veikiamas veiksmiui; r reikšmė yra nuo -1 iki $+1$, čia teigiama reikšmė rodo teigiamą ryšį, neigiamoji – neigiamą ryšį tarp kintamųjų, o nulinė reikšmė rodo, kad nėra ryšio tarp kintamųjų. Kuo vertė artimesnė vienetui, tuo stipresnis ryšys. Siekiant išmatuoti ryšį tarp kintamųjų ir nuspręsti, kuriuos veiksmius akcentuoti tobulinant žinių valdymo ciklą, regresinė analizė taikoma įvairių veiksmių poveikiui žinių valdymo procesams įvertinti taikant šią formulę:

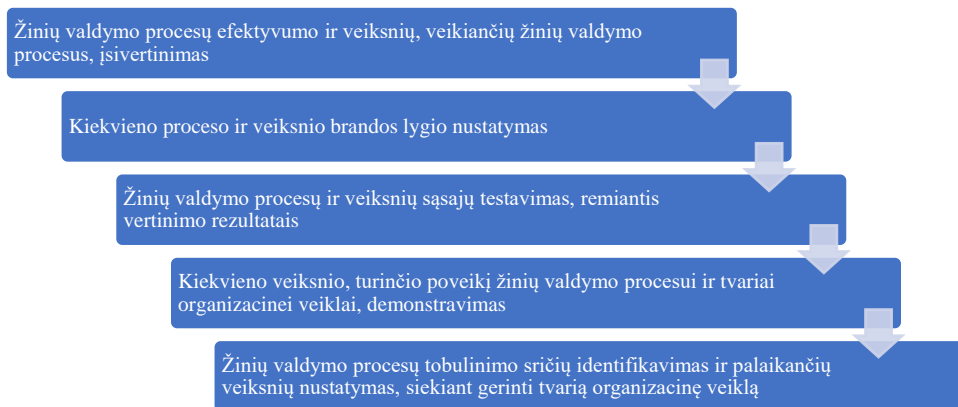
$$P = aF + b, \quad (4)$$

čia P – priklausomasis kintamasis – žinių valdymo procesas šiame tyrime; F – nepriklausomasis kintamasis – veiksniai, turintys įtakos žinių valdymo procesui; a ir b apskaičiuojami toliau pagal pateiktas formules; n – respondentų skaičius kiekvienoje įmonėje:

$$a = \frac{(\sum F)(\sum P) - n \sum FP}{(\sum F)^2 - n \sum F^2}, \quad (5)$$

$$b = \frac{(\sum F)(\sum FP) - (\sum P)(\sum F^2)}{(\sum F)^2 - n \sum F^2}. \quad (6)$$

Po įsivertinimo proceso, gavus koreliacijos ir regresijos analizės rezultatus, kiekviena įmonė gali nustatyti žinių valdymo procesų efektyvumą ir brandos lygį. Remdamiesi gautais tyrimų rezultatais, vadovai gali atitinkamai nustatyti žinių valdymo procesų įgyvendinimo tobulinimo sritis (S.3.2 pav.).



S.3.2 pav. Metodologija, taikytina žinių valdymo procesų vertinimo modeliui (sukurta autorės)

S.3.2 paveiksle iliustruojami pagrindiniai žingsniai, sudarantys prielaidas atlikti žinių valdymo procesų vertinimą ir priimti sprendimus žinių valdymo ciklui tobulinti.

Bendrosios išvados

1. Remiantis mokslinės literatūros analize ir skirtingais žinių valdymo ir žinių valdymo procesų požiūriais, nustatyti penki pagrindiniai procesai, sudarantys žinių valdymo ciklą (žinių įgijimas, kūrimas, išsaugojimas, dalijimasis žiniomis ir taikymas), trys žmogiškieji veiksniai (pasitikėjimas, tarpusavio sąveika, saviveiksmingumas), keturi organizaciniai veiksniai (atlygis, organizacinė kultūra, komandinis darbas, organizacinė struktūra) ir du technologiniai veiksniai (informacinės technologijos ir socialiniai tinklai). Tai esminiai veiksniai, darantys įtaką žinių valdymo ciklo įgyvendinimui ir tvariai organizacinei veiklai. Mokslinių tyrimų rezultatai parodė, kad trūksta tyrimų, susijusių su devynių veiksnių poveikiu visam žinių valdymo ciklui besivystančiose Vidurinių Rytų regiono įmonėse, veikiančiose žinioms imliuose sektoriuose, tokiuose kaip auditas ir konsultavimas.
2. Atliktas tyrimas Vidurinių Rytų regiono audito ir konsultavimo sektoriuje, taikant struktūrinį lygčių modeliavimą, leido kiekybiškai patikrinti tyrimo hipotezes. Šio tyrimo rezultatai besivystančiose Vidurinių Rytų regiono ekonomikose (Libane, Sirijoje ir Jordanijoje) atskleidė teigiamą ir reikšmingą penkių žinių valdymo procesų įtaką tvariai organizacinei veiklai.

Taip pat buvo patvirtintas reikšmingai teigiamas pasitikėjimo, tarpusavio sąveikos, saviveiksmingumo, atlygio, organizacinės kultūros, komandinio darbo, organizacinės struktūros, informacinių technologijų ir socialinių tinklų poveikis žinių valdymo procesams, išskyrus aspektus, susijusius su tarpusavio sąveikos poveikiu dalijimuisi žiniomis, atlygio poveikiu žinių taikymui, organizacinės kultūros poveikiu žinių įsigijimui, informacinių technologijų poveikiu žinių įsigijimui ir socialinių tinklų poveikiu žinių taikymui. Tyrimo rezultatai parodė, kad žinių valdymo procesai turi reikšmingą tarpininkavimo vaidmenį tarp nagrinėtų veiksnių ir tvarios organizacinės veiklos.

3. Remiantis empiriniais tyrimo rezultatais ir siekiant užpildyti spragas, identifiкуotas ankstesniuose pasiūlytuose modeliuose, buvo pasiūlytas žinių valdymo procesų vertinimo modelis ir pateikta metodologija šiam siūlomam modeliui taikyti. Ji padėtų organizacijoms, veikiančioms žinioms imliuose sektoriuose, ypač audito ir konsultavimo, įvertinti žinių valdymo procesus ir veiksnius, darančius įtaką efektyviam žinių valdymo procesų įgyvendinimui, suformuoti strateginius sprendimus žinių valdymo ciklui gerinti, norint pasiekti organizacinius tikslus ir užtikrinti tvarų organizacijos veikimą.
4. Šis tyrimas padeda užpildyti ribotą mokslinių studijų apie Vidurinių Rytų kontekstą, nes šiame tyrime pateikiama holistinė kiekybinė perspektyva audito ir konsultavimo įmonių srityje. Tyrimo rezultatai parodė Vidurinių Rytų audito ir konsultavimo įmonių ekspertų ir aukščiausiosios vadovybės pripažinimą apie žinių valdymo procesų įgyvendinimo svarbą ir jų intencijas atkreipti dėmesį į veiksnius, kurie padėtų motyvuoti darbuotojus dalyvauti žinių valdymo cikle, siekiant efektyvių organizacinių rezultatų.
5. Šis tyrimas turi tam tikrų ribotumų: pirma, tyrimo kontekstas gali turėti įtakos rezultatams, nes tyrime buvo orientuojamasi į žinioms imlų sektorių besivystančiose Vidurinių Rytų šalyse. Tokiu atveju tyrimo rezultatų apibendrinimas gali būti siejamas su kontekstiniais veiksniais. Tačiau respondentai atstovauja įvairaus dydžio šalies ir tarptautinėms įmonėms, todėl tyrimo rezultatai gali būti pritaikomi visam sektoriui, kuriame žinios yra svarbus turtas. Atsižvelgiant į tai, tyrimo teorinis modelis gali būti pritaikytas ir kituose kontekstuose su skirtingu konstrukcijų operacionalizavimu, o būsimos studijos galėtų patvirtinti esamą modelį kituose sektoriuose ir kultūriniuose kontekstuose. Antra, taikytas duomenų rinkimo metodas apsiribojo struktūrizuotu klausimynu išplatintu tarp audito ir konsultavimo srities ekspertų. Trečia, žinių valdymo ciklui poveikį gali daryti ir kiti veiksniai, nenagrinėti šiame tyrime. Šie ribotumai sudaro galimybes įvertinti tyrimo modelį kituose sektoriuose ir skirtingose geografinėse vietovėse bei ištirti kitų veiksnių poveikį žinių valdymo ciklui.

Rekomendacijos

Šio tyrimo praktinės rekomendacijos yra tokios:

- Skatinti žinių valdymo praktiką tarp darbuotojų, kuriant atlygio sistemą, kuri kompensuotų ir motyvuotų juos dalyvauti žinių valdymo cikle.

- Sukurti komandinio darbo atmosferą ir besimokančios organizacijos aplinką, kuri padėtų įgyvendinti žinių valdymo ciklą.
- Palaikyti geriausias praktikas, skatinančias naujas plėtros galimybes, palengvinančias departamentų bendradarbiavimą ir skatinančias žinias skirtinguose departamentuose.
- Formuoti organizacinę kultūrą ir kurti organizacinę struktūrą, kurios motyvuotų individus ir komandas dalyvauti žinių valdymo cikle.
- Pritaikyti informacines technologijas ir socialinius tinklus kaip priemones žinių valdymo procesams palaikyti, siekiant padidinti organizacinės veiklos efektyvumą.
- Taikyti pasiūlytą modelį žinių valdymo procesų brandos ir efektyvumo lygiui įvertinti atliekant įsivertinimą ir atsižvelgiant į gautus rezultatus formuoti sprendimus nustatytoms spragoms pašalinti.

Annex

Expert questionnaire

Personal Information

- 1- Age < 25
≥ 25 and < 35
≥ 35 and < 45
≥ 45
- 2- Gender Male
Female
- 3- Education Bachelor
Master
Certified Public Accountant
Other (specify) _____
- 4- Years of experience in the auditing and consultancy field _____

5- Years of work in this organization _____

6- Your current position Junior level
 Middle level
 Senior level
 Upper management
 Other (specify) _____

7- Type of your organization Local
 Multinational

Below questions are measured with a five-point scale (Strongly Disagree [1] – Strongly Agree [5]).

Sustainable organizational performance:

- 8- Our organization provides high-quality services
- 9- Our organization provides quality services at a low cost
- 10- Our organization provides quality services with high speed
- 11- Our organization is able to adopt new services opportunities
- 12- Our organization performs well in improving the efficiency of services delivered
- 13- Our organization adapts quickly to unanticipated changes
- 14- Our organization ensures compliance with customer needs through processes that are designed to deliver the right skills and capacities
- 15- Our organization is able to cope with the current market
- 16- Our organization is considered profitable in the industry

Knowledge management processes:

Creation

- 17- Our organization generates best practices from previous projects to improve future projects
- 18- Our organization quickly uses new opportunities to serve our clients
- 19- Our organization provides new services depending on the market demands

Acquisition

- 20- Our organization has the ability to acquire knowledge that is used to develop specific programs
- 21- Our organization has a clear process for acquiring expertise
- 22- Our organization has a clear process for acquiring intelligence

Storage

- 23- In our organization we often write case notes on all executed projects
- 24- In our organization we keep a customer information database that is easy to access
- 25- In our organization we have knowledge database that is easy to access

Sharing

- 26- We personally share with our colleagues the knowledge necessary for projects on hand
- 27- Our organization always shares its knowledge with its stakeholders
- 28- Our organization has the capability to share relevant knowledge among business units

Application

- 29- Our organization has processes for converting knowledge into action plans
- 30- Our organization has processes for matching sources of knowledge to problem-solving
- 31- Our organization applies knowledge efficiently to reach its goals

Factors:

Trust

- 32- I count on trustful people in creating new knowledge
- 33- I tend to acquire knowledge from the people I trust the most
- 34- I always record the knowledge acquired from trustful people
- 35- I often share my knowledge with the colleagues I trust the most
- 36- I am comfortable letting my trustful colleagues take responsibility for tasks that are critical to the team

Interaction

- 37- Through interaction we often come up with new ideas that can be used to improve our organization performance
- 38- We have frequent interaction with legal authorities to acquire new knowledge
- 39- We have frequent interaction with our colleagues to acquire new knowledge
- 40- We record the minutes of the team meetings with fellow project team members
- 41- Our organization has interaction sessions that enhance knowledge sharing
- 42- In our organization we ask the help of each other for solving specific cases

Self-efficacy

- 43- The confidence in my expertise drives me to contribute to the knowledge creation process in our organization
- 44- My expertise allows me to acquire the knowledge needed in our organization
- 45- My expertise allows me to better record the knowledge needed for future usage
- 46- I share my knowledge with the members of my organization because I have confidence in my expertise
- 47- My expertise allows me to use the available knowledge in the best way possible

Rewards

- 48- Our organization has a well-defined policy for rewarding feasible innovative ideas
- 49- Our organization rewards the employees who acquire new knowledge
- 50- Our organization rewards the employees who properly record their knowledge
- 51- Our organization rewards the employees who share their knowledge
- 52- Our organization rewards the employees who use efficiently the knowledge to reach specific goals

Organizational culture

- 53- Our organization has a culture that supports best practices that lead to new developments
- 54- Our organization encourages employees to acquire new knowledge

- 55- Our organization encourages employees to store the knowledge in its systems
- 56- Our organization has a culture that tends to promote knowledge sharing
- 57- Our organization has a culture that encourages the application of knowledge in an efficient way for reaching specific goals

Teamwork

- 58- In our organization the atmosphere of teamwork serves the creation of new knowledge
- 59- In our organization the atmosphere of teamwork serves the acquisition of new knowledge
- 60- Our organization keeps record of all the experiences generated from the work of its teams
- 61- In our organization the atmosphere of teamwork makes employees feel free to share their knowledge with others
- 62- Our organization has all the facilities that encourage employees to work as a team in order to apply knowledge for solving specific cases

Organizational structure

- 63- The organizational structure facilitates the interdepartmental collaboration to create new knowledge
- 64- Our organization encourages employees to go where they need for knowledge acquisition regardless of organizational the structure
- 65- The organizational structure facilitates the storage of any type of knowledge
- 66- The organizational structure facilitates knowledge sharing across departmental boundaries
- 67- The organizational structure facilitates the interdepartmental collaboration to use the knowledge in solving cases

Information technology

- 68- Our organization uses information technology to facilitate the process of knowledge creation
- 69- Our organization uses information technology to acquire a wide range of knowledge
- 70- Our organization uses repositories to store knowledge for easy access by all the employees who need it
- 71- Our organization uses information technology that allows employees to share knowledge

- 72- Our organization uses information technology to facilitate the application of knowledge

Social networks

- 73- In our organization we use social networks (such as groupware, intranet, virtual communities, internet, etc.) for communication
- 74- Our organization has suitable social networks that support innovative capabilities
- 75- The social networks in our organization enable us to acquire new knowledge from many sources
- 76- The social networks in our organization are considered a system for knowledge storage
- 77- In our organization we have internal social networks for sharing knowledge on a regular basis
- 78- In our organization we have external social networks for sharing knowledge on a regular basis
- 79- The social networks in our organization enable us to better apply the knowledge available

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IN AUDITING AND CONSULTANCY FIRMS

Doctoral Dissertation

Social sciences,
Management (S 003)

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IR KONSULTAVIMO ĮMONĖSE

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