Contents lists available at ScienceDirect



**Research** Article

International Journal of Information Management

journal homepage: www.elsevier.com/locate/ijinfomgt



# Role of entrepreneurial orientation, information management, and knowledge management in improving firm performance

# Rafał Kusa<sup>\*,1</sup>, Marcin Suder<sup>2</sup>, Joanna Duda<sup>3</sup>

AGH University of Krakow, Faculty of Management, Gramatyka 10, 30-067 Krakow, Poland

#### ARTICLE INFO

#### ABSTRACT

Keywords: Information management Knowledge management Entrepreneurial orientation Performance PLS-SEM FsQCA Qualitative study Small furniture manufacturers Entrepreneurship is one of the most common strategies that are followed by companies. In parallel, each company needs to effectively manage information and knowledge to successfully implement its strategy. Thus, this study focuses on the points where knowledge, information, and entrepreneurial management meet, with special attention paid to the relationship between information management (IM) and knowledge management (KM) as well as their mediating roles in shaping firm performance. This study aims to identify the role of information management (IM) and knowledge management (KM) in shaping performance in entrepreneurial firms. Moreover, the study aims to examine the causal relationship between IM and KM. Our sample consisted of 150 small and medium-sized firms that manufacture furniture in Poland. This is a mix-method study; it uses structural equitation modeling (SEM), fuzzy-set qualitative comparative analysis (fsQCA), and interview-based qualitative analysis to examine the associations among entrepreneurial orientation (EO), IM, KM, and firm performance. In particular, three types of outcomes are analyzed; namely, firm competitiveness (FC), firm growth (FG), and financial performance (FP). The results unveiled the impact of IM on KM; the findings also showed the positive role of EO in shaping IM and KM as well as firm performance. In general, IM and KM impact firm performance; however, their individual impacts depend on the performance type (when they interact, they constitute a sufficient condition for achieving a high level of performance regardless of the type). These findings contribute to the IM and KM literature as well as entrepreneurship and small business research.

# 1. Introduction

Understood as a pursuit of opportunities (Stevenson & Jarillo, 1990), entrepreneurship is one of the organizational characteristics that determine success in a changing environment. To identify these opportunities and subsequently exploit them, information and knowledge are needed. The role of information and knowledge is crucial – and not only from an entrepreneurial perspective. Kettinger et al. (2021) posited that information management (IM) improves business performance. Similarly, Prajogo et al. (2018) argued that IM drives process management and impacts operational performance and productivity. Knowledge and knowledge management (KM) are also perceived as sources of competitive advantage (Wang et al., 2023) as well as innovation and performance improvement (Shekhar & Valeri, 2023); this also refers to small and medium-sized enterprises (SME) (Mostafiz et al., 2023). Despite the numerous studies on IM and KM (Deng et al., 2022; Durst et al., 2023; Mazaheri et al., 2020), there are still many areas of KM that are unexplored (Pereira & Bamel, 2021), and research that is focused on the relationships between IM and KM is limited (Al-Emran et al., 2018); rather, the existing studies tend to focus on the differences between KM and IM (Krcal & Kubis, 2016). Thus, the causal relationships between IM and KM still remain under-explored and constitutes a research gap – this is addressed in this study.

This gap has been recently increased by the COVID-19 pandemic, which was a booster for the application of IT and affected the IM and KM processes (Barnes, 2020; Dwivedi et al., 2020); this was also true in small firms (Priyono et al., 2020). The pandemic also brought new challenges; for example, working from home can lead to information transfers outside a company's internal network, which challenges the cybersecurity solutions of an organization (Dwivedi et al., 2020).

#### https://doi.org/10.1016/j.ijinfomgt.2024.102802

Received 4 July 2023; Received in revised form 22 April 2024; Accepted 29 April 2024 Available online 17 May 2024

0268-4012/© 2024 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

<sup>\*</sup> Corresponding author.

E-mail address: rkusa@agh.edu.pl (R. Kusa).

<sup>&</sup>lt;sup>1</sup> ORCID: 0000-0002-9819-897X.

<sup>&</sup>lt;sup>2</sup> ORCID: 0000-0001-6279-7359.

<sup>&</sup>lt;sup>3</sup> ORCID: 0000-0002-4349-6179.

Therefore, the changes in IM and KM that were induced by the pandemic crisis also require further examination (Ameen et al., 2022).

Additionally, most studies on IM and KM have focused on large companies (Durst et al., 2023). Consequently, our understanding of IM and KM in SMEs is limited – there is still a need for deeper research on the associations between KM and entrepreneurship (Audretsch et al., 2020). Thus, this study focuses on the mechanism by which entrepreneurial orientation (EO, which reflects entrepreneurship at the organizational level) determines IM and KM, which in turn impact firm performance.

In particular, this study addresses three research questions. First, what is the causal relationship between IM and KM? Second, how is EO associated with IM and KM? And third, how do IM, KM, and EO interact to shape firm performance? Specifically, the study aims to identify the role of KM in the IM/performance relationship and the role of IM and KM in the EO/performance relationship. To better understand these relationships, three types of performance will be examined; namely, firm competitiveness (FC), firm growth (FG), and firm financial performance (FP).

These relationships are investigated with a sample that consisted of 150 small and medium-sized firms that manufactured furniture in Poland; the sample is representative. The study used structural equitation modeling (SEM) to examine the mediating effects and fuzzy-set qualitative comparative analysis (fsQCA) to confirm the paths of the relationships that were identified with SEM. Additionally, a qualitative study was conducted to deepen the results from survey-based analyses and develop the managerial implications

This study intends to contribute to the literature on IM and KM by explaining the causal relationship between them and their roles in strengthening firm performance. Additionally, this study aims to explain the associations between EO and IM/KM; these observations can add value to both the IM/KM and entrepreneurship literature. Additionally, this study intends to contribute to the literature on small businesses by unveiling the determinants of the performance of small manufacturers of furniture and the roles of IM and KM in the industry (which is not perceived as being knowledge-intensive).

The remaining part of the paper begins with a literature review and the identification of particular relationships, which are expressed in the hypotheses and all together in a theoretical model. Then, the methodology will be introduced. Next, the results will be presented and discussed. The paper concludes by indicating the contributions along with the limitations of the study.

# 2. Literature review

According to the resource-based view (RBV) theory (Barney, 1991; Wernerfelt, 1984), an organization is a collection of resources and competencies, and a company's performance (e.g., profits, revenues, sales) results from its access to valuable, rare, inimitable, and organized resources (Barney, 1991; Kraaijenbrink et al., 2010). This approach corresponds with the earlier work of Penrose (1959), who described how the growth of an enterprise is created by the use of its resources. Enterprise resources are understood very broadly and include both tangible and intangible resources. Tangible resources include cash, equipment, and plants, for example (Barney et al., 2010; Marshall & Standifird, 2005; Wheelen et al., 2018), while intangible resources include managerial skills, technology, customer trust, organizational culture (Itami, 1987), and the capabilities, organizational processes, information, knowledge (among others) that are controlled by a company and enable the implementation of strategies that are aimed at developing organizational agility and effectiveness (Barney, 1991; Theeke and Lee, 2017) and enhance innovation (Alexy et al., 2018).

The development of knowledge and knowledge management (KM) has a long history (Deng et al., 2022). Knowledge has been managed since organizations have existed – even when the concept of KM had not yet been defined (Anumba et al., 2008). Knowledge has been discussed

and researched by many scholars and practitioners. Research on this topic intensified in the mid-1990 s, coinciding with the development of modern enterprises (Deng et al., 2022). At that time, the importance of knowledge (as a broader category than just competence or intellectual property) was recognized; this became the basis for modifying the resource approach and formulating the knowledge-based view of a firm (KBV) approach. Within KBV, knowledge has been recognized as one of the most influential resources that affect competitiveness (Kianto et al., 2017).

The development of KM is still being comprehensively and thoroughly studied (Deng et al., 2022). Therefore, there are many contradictory definitions of KM, and this causes confusion for companies with conflicting interpretations of KM and failures to distinguish it from information management (IM) (Edwards, 2022; Jääskeläinen et al., 2022). They also fail to distinguish IM and KM systems (Carrillo & Chinowsky, 2006).

This study distinguishes information and knowledge and, consequently, information management (IM) and knowledge management (KM). Information is 'data endowed with relevance and purpose' (Drucker, 1994, 202). In the organizational context, data is a set of discrete objective facts about events or an ordered record of transactions (Davenport & Prusak, 1998). Knowledge, in turn, is a composite of information, experience, and values (Davenport & Prusak, 1998). Thus, information and knowledge are intrinsically related (Kebede, 2010). To transfer data and information into knowledge, people's engagement is needed (Davenport & Prusak, 1998). Many definitions of knowledge indicate that it encompasses much more than just information. This knowledge must be evaluated based on its ultimate use and/or the context of its application. Knowledge can be viewed as the component of a system that performs a task (Chen et al., 2023). Both information and knowledge are among the crucial resources that lead to the success of an organization; thus, their development is one of the organization's strategic goals (Nonaka & Toyama, 2015) - especially at the early stages of their development (De Clercq & Arenius, 2006; Masango & Marinova, 2014). Moreover, information is substantial for building the core skills of an organization (Nonaka & Toyama, 2015). Thus, organizations strive to develop and effectively manage their information and knowledge. IM and KM overlap; their main objective is, by analogy, to facilitate a better sharing of information and knowledge. Edwards (2022) defined six aspects of the intersection of knowledge and information management: people, processes, technology, culture, structure, and performance/result measurement. This study corresponds with the latter dimension - examining the impact of IM/KM on performance.

Information management (IM) is concerned with controlling how information is created, organized, stored, distributed, and used (Detlor, 2009). IM focuses on securing timely and relevant information (Devaraj et al., 2007). In particular, IM practices include sensing, collecting, organizing, processing, and maintaining information (Kettinger et al., 2021).

IM is largely comprised of the management of information technology (IT) and information systems (IS) (Prajogo et al., 2018). IS consists of the digital infrastructure, data, and application systems that are used by qualified personnel (Davis, 2000). For example, companies are increasingly using business-intelligence systems to analyze internal and external processes. These systems involve the provision of accurate real-time information within a company and support the management of a company's internal processes (including coordination between the company's functional departments) (Marchand et al., 2000). Owing to the continuous development of IT, these technologies (including mobile applications, virtual reality, the cloud, artificial intelligence, and big data [Gallego Gómez & Vaquero Frías, 2022; Vial, 2019; Wiesböck & Hess, 2019; Yeow et al., 2018) are also available for organizations with limited resources (including small and medium-sized enterprises) (Soni et al., 2021; Ameen et al., 2022).

Knowledge management (KM) is more complex than IM; it is comprised of strategic, marketing, and human components (Petrov et al., 2020). KM is defined as a systematic process of acquiring, sharing, and effectively using knowledge (Davenport, 1994; Mahdi et al., 2019); knowledge sharing is the most researched topic in KM (Edwards, 2022). KM includes transforming data into knowledge or valuable information for a company's advancement (Koehler et al., 2019) as well as optimizing its organizational knowledge in order to achieve predetermined goals, such as increasing innovation and efficiency in project delivery (Chen et al., 2023). KM combines data processing and information gathering with people's abilities to invent, innovate, and be creative (Malhotra, 1998). To a large degree, this happens within teams and depends on team members and the relationships among them (Ajmal et al., 2009). Such understanding of KM is reflected in its operationalizations, which include activities that are related to knowledge generation (e.g., R&D activity, employee involvement), knowledge storage (e. g., classification, updating and availability of knowledge), and knowledge usage and sharing (e.g., improvement of operations and products. means of communication) (Acar et al., 2017; Kmieciak & Michna, 2018; Mao et al., 2016; YahiaMarzouk & Jin, 2023). Nonaka and Takeuchi (1995) distinguished tacit knowledge (which is unwritten and hidden in people's minds) and explicit knowledge (which is written and can be articulated, transferred, verbalized, or codified). According to the authors, KM is a process through which tacit knowledge is converted into explicit knowledge; this process is crucial for creating new knowledge and subsequently introducing innovation. Thus, KM is also perceived as a philosophy and framework - not only a management tool (Nonaka & Toyama, 2015). Similar to IM, KM is related to IS (Palvia et al., 2004); along with IT, IS generally increases the efficiency of KM (O'Leary, 1998) and contributes to the evolution of KM (Deng et al., 2022). Thus, it can be concluded that both IM and KM are supported by IS (Al-M-Sloum & Alharbi, 2022; Cerchione & Esposito, 2017; Dwivedi et al., 2020). However, the acceleration of incorporating them into organizational processes appears to be an up-to-date challenge for organizations because of the dynamic development of digital technologies and the emergence of new technologies (Dwivedi et al., 2020).

Based on the above consideration, this study proposes that IM includes the processes of gaining and storing the information and data that are related to different functions (e.g., customer service, supply, logistics) as well as providing access to one's employees regarding the necessary information and data, whereas KM includes the processes of gaining knowledge from suppliers, customers, and other partners, creating new knowledge, followed by distributing it inside one's business and using it to develop new products and services.

Information plays an important role in an entrepreneurial strategy. Entrepreneurship is exhibited in pursuing opportunities, and knowledge allows entrepreneurs to identify and exploit these opportunities (Acs et al., 2009; D'Souza, 2010; Stevenson & Jarillo, 1990; Shane, 2000); this enhances firm entrepreneurship (Hughes et al., 2022). On the other hand. entrepreneurial behaviors affect the informationand knowledge-related processes (Braunerhjelm et al., 2010) and magnifies the impact of knowledge-based resources on firm performance (Wiklund & Shepherd, 2003). In particular, entrepreneurship can facilitate knowledge to spill over (Block et al., 2013) by serving as a conduit for knowledge spillovers (Audretsch et al., 2006). This is also visible at a strategic level (Agarwal et al., 2010). These associations are explained by the knowledge spillover theory of entrepreneurship (Audretsch et al., 2006; Ferreira et al., 2017).

One of the most common conceptualizations of entrepreneurship at the organizational level is entrepreneurial orientation (EO). EO is comprised of several dimensions; namely, risk-taking, proactiveness, innovativeness (Covin & Slevin, 1989), autonomy, and competitive aggressiveness (Lumpkin & Dess, 1996). EO demonstrates how a firm is organized (Wiklund & Shepherd, 2003) to best take advantage of opportunities (Zhao et al., 2011). EO is also understood as a disposition to engage in entrepreneurial behaviors (Giraud Voss et al., 2005). This study employs the concept of EO in order to investigate the role of IM and KM in the entrepreneurial context.

# 3. Research design

This was a three-stage mix-method study. First, several interviews were conducted with managers to verify the research concept and theoretical model as well as validate the questionnaire and its items. Second, the survey was conducted to gather the data, and the data was then analyzed using two methodological approaches. Third, several interviews were again conducted to clarify and deepen our understanding of the results from the previous stage.

This study used a mixed method approach. In particular, it used structural equitation modeling (SEM), fuzzy-set qualitative comparative analysis (fsQCA), and interview-based qualitative analysis. The use of multiple research methods (i.e., methodological triangulation) was a response to the demands that have been raised in contemporary management; namely, to mutually correct and verify the obtained results with different methods (Knott et al., 2022; Martínez de Miguel et al., 2022; Sułkowski, 2016).

Structural equation modeling (SEM) constitutes a category of multidimensional parametric statistical models that enable the examination of research hypotheses that are characterized by high levels of complexity in the associations among the latent variables.

Fuzzy-set qualitative comparative analysis (fsQCA) is a social science technique of data analysis that is based on set theory. FsQCA is used to examine the relationship between the conditions and the outcome. It was developed in order to combine case-oriented and variable-oriented quantitative and qualitative analyses.

Both methods (SEM and fsQCA) are used in the analysis of cause-andeffect relationships, among others; due to their different approaches in relationship-seeking research, they can be considered to be complementary methods and are used simultaneously in managerial studies (e. g., Hernández-Perlines et al., 2020, 2021; Saha et al., 2022; Kusa et al., 2023; Suder, 2023). In particular, this enables the study of both the impacts of single conditions on endogenous variables (as in PLS-SEM) and the impacts of configurations of conditions on the outcomes (as in fsQCA).

The third method (that is, an individual in-depth interview) is an example of a qualitative approach (Gubrium et al., 2012). In the social sciences, an interview is considered to be a useful research method for learning about the phenomena that occur in the consciousnesses of the respondents (Kvale, 1996; McNamara, 1999). In particular, the purpose of an interview is to broaden the knowledge of a topic of interest by asking exploratory questions that help clarify and understand this topic. An interview is often used as a stand-alone research method or can be used complementary with quantitative methods (Knott et al., 2022). The latter is the case of this study. Specifically, the conducted interviews combined with the results of our quantitative research helped us understand the behaviors and decisions of entrepreneurs regarding IM/KM and develop recommendations for other entrepreneurs (which we have included in our implications for practice).

The results of the research are presented in three parts (separately for each method that was used): the first part presents the results of the PLS-SEM-based analysis (Study 1); the second part presents the results from fsQCA (Study 2); and the third part presents the results of our interviewbased qualitative investigation (Study 3).

# 4. Study 1: survey-based study

#### 4.1. Conceptual model and hypothesis development

#### 4.1.1. EO and performance

Extensive research has indicated the impact of EO on firm performance; the majority of the evidence has indicated the positive impact (e. g., Kraus et al., 2012). However, the relationship between EO and firm performance can be affected by other factors like firm strategy (Moreno & Casillas, 2008), market uncertainty (Rosenbusch et al., 2013), or market dynamics (Wójcik-Karpacz et al., 2019). EO can impact various aspects of firm performance, including firm competitiveness (Dess et al., 2003), firm growth (Block et al., 2013; Gupta & Sebastian, 2017; Karimi et al., 2021), and the financial performance of a company (Veselinović et al., 2021). Thus, research that is focused on EO/performance relationships in different contexts is required in order to build the complete picture that reflects this relationship.

A firm's entrepreneurship (reflected in EO) represents one of the capabilities that determine its firm competitiveness (FC). This type of outcome measure is particularly important for small and medium-sized enterprises, for which competing for customers and the local markets are significant aspects of their operations. Depending on the strategy that is followed by a firm (i.e., cost leadership or differentiation), however, particular dimensions of EO play different roles (Tajeddini et al., 2023). The relevance of EO in a firm's competitiveness can also be explained through the resource-based view. Accordingly, a firm's competitive advantage stems from firm-specific resources and capabilities that are costly for rivals to copy; e.g., those that are valuable, rare, imperfectly imitable or non-substitutable (Barney, 1991); EO reflects those abilities and behaviors that meet these conditions to a high degree.

The impact of EO on a firm's competitiveness has been confirmed in previous research. Tajeddini et al. (2023) reported that EO (as well as entrepreneurial bricolage) positively impacts sustained competitive advantages in retail and consumer service firms, while differentiation advantage and risk management mediate this relationship. They argued that EO leads to sustained competitive advantages in the long run by creating dynamic abilities. Similarly, the study of Kiyabo and Isaga (2020), Mahmood and Hanafi (2013), and Suder (2024) also showed that EO positively influences competitive advantage. This can also be observed in the SME context. The study by Anwar et al. (2022), which reached 316 Pakistani enterprises, confirmed the positive and significant impact of EO on FC. Dayan et al. (2023) examined 145 small and medium-sized enterprises (SMEs) that operated in the United Arab Emirates (UAE); using comparisons to competitors as the dependent variable, they demonstrated the positive influence of EO on firm competitiveness. Based on the above information, we propose the following hypothesis:

# **Hypothesis** H1<sub>FC</sub>. : Entrepreneurial orientation positively impacts firm competitiveness.

As entrepreneurship is about pursuing new opportunities, looking for innovative solutions, and anticipating future trends, it can contribute to the growth of a firm, which is considered to be an indicator of the condition and success of the company (Kuratko, 2009). Additionally, this growth enables SMEs to compete with larger corporations and enhances their resilience (Kuratko, 2009). Therefore, the growth of a company is a widely used tool for measuring the effects of the entrepreneurial activity that is reflected in EO (Wales et al., 2023). Indeed, numerous studies have examined the relationship between EO and firm growth (e.g., Lechner & Dowling, 2003; Reijonen et al., 2015) and confirmed the positive relationships between them (Covin et al., 2006; Moreno & Casillas, 2008). This has also been observed in SMEs; for example, Ferreira et al. (2011) observed that EO as well as an entrepreneur's networks positively affected the growth of small Portuguese manufacturing firms, Soininen et al. (2012) observed a similar effect in Finnish SMEs, and Martins (2016) found the same in manufacturing SMEs in Spain. Basco et al. (2020) demonstrated the positive impact of EO on FG by separately examining SMEs in three countries; namely, China, Mexico, and Spain. Meanwhile, Hamzah et al. (2023) showed the positive influence of EO on firm growth using hierarchical regression for more than 400 small businesses that operated in Malaysia. Based on a review of several studies, Rauch et al. (2009) concluded that entrepreneurial firms (characterized by high EO) developed faster. These observations were in line with well-grounded concepts of firm growth, where the role of entrepreneurship is highlighted in the initial phases of development (e.g., Quinn & Cameron, 1983). Based on the above evidence, we propose the following hypothesis:

 $Hypothesis \ H1_{FG}.$  : Entrepreneurial orientation positively impacts firm growth.

Financial performance is the key to the development and survival of a company - especially small businesses; this is due to the fact that it determines their operational strengths and growth potentials (Adomako & Danso, 2014). Thus, numerous studies have focused on those factors that influence financial performance (Ahinful et al., 2023). Among the considered determinants, EO has proven to be a major subject in the literature; the relationship between EO and financial performance has been the subject of many prior studies (e.g., Falahat et al., 2021; Zahra & Covin, 1995). The positive impact of EO on financial performance has been confirmed in different contexts; for example, in biotechnology firms (e.g., Wilson & Perepelkin, 2022), women's entrepreneurship (Fuentes-Fuentes et al., 2015), and SMEs (Adomako, 2018). Tajeddini and Mueller (2019) found that this positive impact of EO is enhanced in a highly dynamic environment. There has been substantial evidence on the positive impact of EO on financial performance in the SME context; for example, this could be observed in the manufacturing industry in Iran (Jalali et al., 2013), small family firms that operated in Belgium (Schepers et al., 2014), and in small firms in Indonesia (Uno et al., 2019). Based on the above information, we propose the following hypothesis:

**Hypothesis** H1<sub>FP</sub>. : Entrepreneurial orientation positively impacts a firm's financial performance.

### 4.1.2. Interactions among EO, IM, and KM

As stated in the previous subchapter, EO is perceived to be a strategic posture that is focused on the pursuit of opportunities. An entrepreneur needs relevant information and knowledge in order to successfully recognize an opportunity (Minniti & Bygrave, 2001; Shane, 2000; Shane & Venkataraman, 2000; Song et al., 2017) and exploit it (Acs et al., 2009; Fuentes Fuentes et al., 2010; Wiklund & Shepherd, 2003). Knowledge is essential to EO (Bouguerra et al., 2023); thus, taking an entrepreneurial approach results in the development of processes that are focused on gaining the necessary information and knowledge. Additionally, these processes help organizations respond to any environmental changes while still creating value (Dwivedi et al., 2020); this can also be perceived as an entrepreneurial characteristic. Consequently, entrepreneurial organizations need to develop their IM and KM systems along with IS. This in turn creates a new space for opportunities and entrepreneurial activity (which can be called 'digital entrepreneurship') (Kraus et al., 2019; Paul et al., 2023). This process was accelerated by the COVID-19 pandemic, which affected consumer behavior; that is, the increased use of digital platforms and digital commerce by customers (Dwivedi et al., 2020). Similar to EO, IS is strongly associated with human activities (Avgerou & McGrath, 2007; Davenport, 1994) as well as the management of an organization (Davis, 2000; Parent, 2020).

Previous research has indicated that EO impacts the utilization of knowledge (Głodowska et al., 2019), knowledge acquisition (Dung et al., 2021) and organizational learning (Kreiser, 2011; Zhao et al., 2011). Additionally, EO enhances the relationship between knowledge-based resources and firm performance (Wiklund & Shepherd, 2003). This leads us to an inquiry into the relationship between IM/KM and entrepreneurship at an organizational level.

Research that explores the factors that influence IM has not been conducted very often. In the work of Dwivedi et al. (2020), the authors discussed theoretical and practical issues that were related to the impact of the COVID-19 pandemic on IM. In a different but related vein, Makori and Osebe (2016) demonstrated the effect of enterprise resource-planning systems on IM. Using a case study analysis for a bank in Malaysia, Hussin et al. (2015) examined several determinants for IM, including government support, industry pressure, demand from competitive markets, information technology, business strategies, and information infrastructure; the authors successfully demonstrated their

#### impact.

Although the publications that were mentioned in the introduction to this paragraph quite clearly indicated a relationship between entrepreneurship (including EO) and IM, it should be noted that attempts to empirically verify the relationship between EO and IM are rare. One of the few studies that investigated the impact of EO on IM was the work by Rodrigues and Raposo (2011). The authors surveyed 10 % of the population of SMEs from the manufacturing sector of Portugal and provided evidence that ΕO positively affected IM in а human-resource-management context. The above premises encouraged us to formulate the following hypothesis:

# **Hypothesis H2.** : Entrepreneurial orientation positively impacts information management.

Similar to the relationship that was described in the previous hypothesis, EO as a determinant of KM has not frequently been considered by scholars. However, the majority of the research that has been conducted in this area indicated significant associations between these variables, thus highlighting the positive impact of EO. Specifically, Latif et al. (2021) demonstrated the positive influence of EO on KM by studying 222 project workers in information technology projects. Similarly, Madhoushi et al. (2011) confirmed the significance of the EO/KM relationship by examining 164 Iranian small enterprises, also showing that EO positively affected KM. Empirical evidence for the positive impact of EO on KM was also provided by Adam and Mahadi (2018); in their study, significant path coefficients for the EO/KM relationship were obtained by examining 381 active e-businesses in Malaysia. Lee and Sukoco (2007), who studied 152 Taiwanese enterprises, also concluded that EO effectively predicted KM. More-detailed research in this area was presented by Nasution et al. (2021), who conducted research on the influence of the individual dimensions of EO (innovativeness, proactiveness, and risk-taking) on KM for 131 businesses that were engaged in e-commerce in North Sumatra; their findings indicated that two of these EO dimensions positively influenced KM (namely, proactiveness, and risk-taking). On the other hand, Gupta and Moesel (2007) conducted research on 2142 small and medium-sized high-technology firms that were based in the U.S.; their results indicated the positive impact of EO on some dimensions of KM (specifically, knowledge creation, and knowledge acquisition). The examples of the studies that were cited above led us to the following hypothesis:

**Hypothesis H3.** : Entrepreneurial orientation positively impacts knowledge management.

## 4.1.3. IM/KM relationship

The previous descriptions of IM (along with IT) and KM show that both fields are strongly connected. Despite the extensive research on IM and KM (investigated separately or together), the causal relationships between them are not clear (moreover, their definitions are sometimes not disjunctive; c.f. Carrillo & Chinowsky, 2006; Edwards, 2022). Additionally, the relationship between IM and KM is indistinct, as they largely comprise IT and IS (Prajogo et al., 2018; Deng et al., 2022); this improves their efficiency (O'Leary, 1998). Moreover, the interactions between IS and KM are bilateral; that is, the KM processes play a significant role in the implementation of various forms of IS (Al-Emran et al., 2018). Consequently, the necessity of distinguishing and clarifying the relationship between IM and KM has been highlighted by several researchers, including Bouthillier and Shearer (2002), Davenport and Marchand (2000), Edwards (2022) and Krčál and Kubiš (2016).

Thus, IM and KM are distinguished in this study (and are represented by separated indices, which are presented in Table 3). Based on the assumption that knowledge is derived from information (Davenport & Prusak, 1998) and the position that effective IM is perceived as a necessary precondition for KM strategies (Sewdass, 2005), we propose that KM is affected by IM. Thus, the following hypothesis will be tested:

Hypothesis H4. : Information management positively impacts

knowledge management.

#### 4.1.4. Impact of IM and KM on performance

As stated in the introduction, the roles of IM and KM increase in the managerial context (along with their impacts on various aspects of company operations). Specifically, the literature has provided evidence that IM facilitates process management (and its impact on operational and overall outcomes; see, e.g., Kettinger & Marchand, 2011; Prajogo et al., 2018) and positively affects firm performance (see, e.g., Mithas et al., 2011). Researchers have also studied the impact of KM on various factors; among other things, these studies showed that KM was a significant positive determinant of organizational management performance (Games and Rendi, 2019; Rossi et al., 2022; Urban & Matela, 2022), innovation management (Dickel & de Moura, 2016), and entrepreneurial capital (Rossi et al., 2020). Similar to EO, both IM and KM have been considered to be variables that influence various outcomes of a company (Cerchione et al., 2016; Opoku, 2015). In this study, we focus on the three dimensions of performance; namely, firm competitiveness, firm growth, and the financial performance of a company. The literature provides poor direct evidence regarding the impacts of IM and KM on these particular dimensions of performance; however, an in-depth analysis of those studies that were focused on the impact of IM or KM on performance revealed that some of these studies were indeed related to particular dimensions of performance despite the outcomes being generally identified as 'performance.'.

Rodrigues and Raposo (2011) analyzed the impact of IM (as was related to human resources) on the performance of small and medium-sized manufacturing enterprises in Portugal. They demonstrated that IM positively influenced the performances of these enterprises; their performance construct consisted of indicators that were related to competition. Kathuria et al. (2016) also considered a model in which one of the determinants for firm performance was IM. Their research was conducted on 600 enterprises that operated in India. The explanatory variable was a construct that included references to competitive outcomes; the results confirmed that IM enhanced this dimension of firm performance. Devece et al. (2017) studied competitive position, which can be interpreted as being equivalent to firm competitiveness. Their empirical evidence on the positive impact of IM on competitive position was based on their studies on 135 enterprises in the IT industry in Spain. The above-mentioned research encouraged us to propose the following hypothesis:

**Hypothesis**  $HS_{FC}$ : Information management positively impacts firm competitiveness.

Other studies on IM have been related to firm growth. Tarigan et al. (2020) studied 57 enterprises from Indonesia. Using structural equation modeling, the authors demonstrated that internal information management positively influenced the performance of their surveyed enterprises (including their growth). This positive impact of IM on firm growth can also be inferred from an earlier work of Rodrigues and Raposo (2011), where the outcome variable was based on growth indicators. Furthermore, Altındağ and Öngel (2021) showed the positive effect of IM on growth performance; specifically, in the cases of Turkish IT sector enterprises. Based on this foundation, we propose the following hypothesis:

# Hypothesis $H5_{FG.}$ : Information management positively impacts firm growth.

As improving IM and KM processes requires large financial expenditures (Holste & Fields, 2010), the influence of IM and KM on financial performance is not obvious (especially in the short term); however, there has been evidence of their positive impact. Kathuria et al. (2016) examined 147 firms that operated in India in terms of their abilities to manage information and observed that it had a significant positive impact on the financial aspects of their performances. Extensive research on the impact of IM on various enterprise outcomes was conducted by Mithas et al. (2011). In this study, the authors used a rare archival data set from a conglomerate business group. The results of the research led to the conclusion that IM positively affected financial performance (which was one of the explained variables). Similarly, this dependent variable included elements of financial outcomes in the studies by Altındağ and Öngel (2021) and Tarigan et al. (2020) that were previously mentioned; these studies provided empirical evidence of the positive impact of IM on performance. Based on the above, we propose the following:

**Hypothesis** H5<sub>FP</sub>. : Information management positively impacts financial performance.

Similar to the previous hypotheses on the impact of IM on firm performance (Hypotheses H5), we considered the influence of KM on performance. In particular, KM is associated with firm competitiveness; according to Ghasemi et al. (2021), KM is one of the main sources of achieving a world-class competitive advantage. Knowledge that is accessible for an organization (specifically, for the decision-makers in the organization) is a strategic resource of the company and must be properly managed for the company to succeed (Bolisani & Bratianu, 2017). An organization's intellectual assets can be used to increase productivity and competitiveness as well as to create new value (Choi, 2000). Researchers that have represented RBV theory have posited that knowledge resources were necessary for achieving a sustainable competitive advantage (see, e.g., Battisti & Deakins, 2017; Braganza et al., 2017; Ferreira & Fernandes, 2017). Consequently, a knowledge-management capability is positively related to a competitive advantage (Mao et al., 2016) as well as to a sustainable competitive advantage (Holsapple & Singh, 2001); according to Mahdi et al. (2019), the effective use of knowledge is the only way to achieve a sustainable competitive advantage in the market. Based on the above arguments, we propose the following hypothesis:

**Hypothesis**  $H6_{FC}$ . : Knowledge management positively impacts firm competitiveness.

KM can also be relevant in the context of firm growth (Chae & Bloodgood, 2006; Sahoo et al., 2022). Companies that create new combinations of knowledge show higher growth (Kang et al., 2019), and knowledge diversification drives the growth (Garcia-Vega, 2006; Lin & Chang, 2015). Interestingly, not only do high-growth companies benefit enormously from the use of combinatorial knowledge bases, but slow-growth companies do as well; this also refers to SMEs (Grillitsch et al., 2019). Numerous research has strived to explain the mechanism of the impact of KM on growth. For example, research has shown that a concentration of specific knowledge leads to innovation and firm growth due to the learning effects and economies of scale (Breschi et al., 2003; Dierickx & Cool, 1989). However, Grillitsch et al. (2019) emphasized that the relationship between KM and firm growth was not so obvious, as there are limits to the positive relationship; they posited that increasing investments in specific knowledge bases beyond a certain limit leads to declining firm growth. Therefore, we pose the following hypothesis (which is in line with discussions in the literature):

Hypothesis  $H6_{FG}$ . : Knowledge management positively impacts firm growth.

Finally, KM affects financial performance. Knowledge is an essential resource that enhances the productivity and long-term survival of a company (Malhotra, 2005). There is empirical evidence that KM contributes to positive financial performance (Forstenlechner et al., 2009), including increased financial performance (in terms of added value), net profits, market shares, and returns on investment (Luhn et al., 2017). Srivastava et al. (2006) posited that, under changing and dynamic market conditions, the creation and use of knowledge prevents failure yet also increases profit. Chaithanapat et al. (2022) proved that customer-knowledge management had a significant positive effect on performance – including financial performance (as well as marketing

and operational performance) in SMEs. Based on the above consideration, we propose the following hypothesis about the impact of KM on FP.

**Hypothesis** H6<sub>FP</sub>. : Knowledge management positively impacts financial performance.

# 4.1.5. Mediating roles of IM and KM

The previously proposed H5 and H6 hypotheses (which relate to the impact of IM and KM on performance) are well-grounded in the literature. However, they do not fully reflect the relationships among IM, KM, and performance. Numerous studies have indicated that these relationships can be indirect, and the examined factors can play the roles of moderators or mediators there.

In particular, the role of KM can be complex in the context of firm performance. For example, KM mediates the relationship between EO and innovation performance (Madhoushi et al., 2011), or green innovation (Shehzad et al., 2023). More-specific studies show that the EO/performance relationship can be mediated bv the knowledge-creation process (Li et al., 2009), knowledge acquisition (Dung et al., 2020), knowledge-combination capability (Song et al., 2019), organizational learning (Horng et al., 2023; Wang, 2008), experimental learning (in the international performance context) (Karami & Tang, 2019), knowledge integration (in the alliance-performance context) (Jiang et al., 2021), and in family firms that are affected by knowledge-based fault lines (Calabro et al., 2021). Additionally, KM fully mediates the social capital and EO of SMEs in the tourism industry (Liu & Lee, 2015). However, EO and KM can be associated in other ways as well; for example, EO enhances the relationship between knowledge-based resources and firm performance (Wiklund & Shepherd, 2003), whereas EO can play the role of a negative moderator in the relationship between knowledge acquisition and opportunity recognition (Song et al., 2017). In turn, weak exploitative learning strongly affects the EO/performance relationship (Hughes et al., 2007).

The roles of IM and KM are also visible in the context of innovation quality and performance (which are strongly associated with entrepreneurship) and is one of the dimensions of EO. For example, the mediating role of customer-knowledge management can be observed in the relationship between knowledge-oriented management leadership and innovation quality (Chaithanapat et al., 2022). KM abilities mediate the relationship between knowledge-oriented leadership and open innovation (Naqshbandi & Jasimuddin, 2018). The intensity of the relationship with external sources of knowledge mediates the relationships between innovation barriers and innovation performance (Torres de Oliveira et al., 2022).

The above review of the different roles of IM and KM in the entrepreneurial and performance contexts showed the complexity of these associations. This observation has encouraged us to empirically test the mediating roles of IM and KM. Following the order in which the earlier hypotheses were introduced, the relationship that incorporates EO will be considered first. As stated before, EO can affect both IM and KM; these relationships were assumed in Hypotheses H2 and H3, respectively. In Hypothesis H4 we further assumed that IM positively impacts KM. All three of these hypotheses indicate that IM can play a role in the relationship between EO and KM. Contrary to the direct relationships between each pairing of the three variables (i.e., EO, IM, and KM), the mediating relationships among them have been not examined. Since such an examination could offer additional explanations regarding the relationships among EO, IM, and KM, we propose a test of the following hypothesis:

**Hypothesis H7.** : Information management can mediate the relationship between entrepreneurial orientation and knowledge management.

As stated previously, IM plays an important role in shaping firm performance. Despite the fact that we can expect this role to be complex,

research on the mediating role of IM has rarely been described in the literature. As the sole example of the research that addressed the mediating role of IM in the EO/PERF relationship, the article by Rodrigues and Raposo (2011) can be mentioned. In this study, the authors demonstrated that EO affected performance through IM, with the mediation that was shown being partial. Another example of a work in which IM served as a mediator (though not in the EO/PERF relationship) is the article by Altındağ and Öngel (2021). These authors examined nearly 500 IT firms that operated in Turkey; they tested the mediating role of IM between organizational intelligence and a firm's innovation performance as well as its financial and growth performance. Out of the two indirect paths that were tested, one was confirmed - that which concerned the mediating role of IM for the impact of organizational intelligence on financial and growth performance (indicating partial mediation). However, there have been premises in the literature that justify further research in this area. In particular, Edwards (2022) pointed out several avenues for IM research in his study, including measuring the impact of IM on firm performance. On the other hand, some scholars have argued that the impact of EO on firm performance is not direct and that mediating variables should be sought for this relationship (Covin and Wales, 2019; Anwar et al., 2022). Therefore, we propose a test on the following research hypothesis considering the above postulates and the presence of direct relationships; namely, the impacts of EO on PERF, EO on IM, and IM on performance (discussed and described when formulating Hypotheses H1, H2, and H4, respectively):

**Hypothesis H8.** : Information management can mediate the relationship between entrepreneurial orientation and firm performance; in particular, firm competitiveness ( $H8_{FC}$ ), firm growth ( $H8_{FG}$ ), and financial performance ( $H8_{FP}$ ).

KM also plays a role in the impact of other factors on firm performance. For example, KM mediates the impact of an organizational culture on sustainable performance (as can be observed in Bangladesh's textile sector) (Hossain et al., 2022). Along with EO, knowledge creation mediates the effect of gamification on firm performance (Elidjen et al., 2022). IT can also play a mediating role; for example, IT capabilities mediate the relationship between green supply chain-management efforts and organizational performance (both operational and environmental) (Shahzad et al., 2020). In projects, the impact of entrepreneurial leadership on project success is mediated by KM processes (Latif et al., 2020). Finally, KM facilitates the implementation and efficient use of IS (Al-Emran et al., 2018). Some researchers have also considered the mediating role of KM in the relationship between EO and performance. For example, Madhoushi et al. (2011) demonstrated that KM served as a partial mediator in this relationship; this was observed in small enterprises in Iran. Similarly, KM was also found to be a partial mediator for the impact of EO on performance in active e-businesses in Malaysia (Adam & Mahadi, 2018). Based on the above arguments, we propose the following hypotheses regarding mediating role of KM:

**Hypothesis H9.** : Knowledge management can mediate the relationship between entrepreneurial orientation and firm performance; in particular, firm competitiveness ( $H9_{FC}$ ), firm growth ( $H9_{FG}$ ), and financial performance ( $H9_{FP}$ ).

KM facilitates the sharing and utilization of information among individuals (Herman et al., 2020) and aids companies in leveraging information – both internally and externally (Kumar & Mokha, 2022); it enables rapid responses to customer needs and adaptability to market changes (Masud et al., 2021; Salameh et al., 2020). Furthermore, KM and organizational commitment significantly impact the effectiveness of customer-relationship management (CRM), influencing a firm's profitability and customer loyalty directly (and indirectly) through customer satisfaction (Gazi et al., 2024). In addition to the direct link between KM and firm performance, previous research has also investigated the mediating roles of KM in various contexts. For instance, Chaithanapat et al. (2022) demonstrated that, in SMEs, customer-knowledge management mediated the relationship between knowledge-oriented leadership and innovation quality. The relationship between IM and KM is relatively underexplored, leading to a lack of studies on KM's mediating role between IM and performance (PERF). Recognizing the role of KM as a mediator between IM and PERF builds on two premises; that is, the substantiated relationships between IM and KM as well as KM and PERF (and the literature examples that have suggested KM's mediating role). Based on these, we propose that KM acts as a mediator between IM and PERF and propose a test of the following hypothesis:

**Hypothesis H10.** : Knowledge management can mediate the relationship between information management and firm performance; in particular, firm competitiveness ( $H10_{FC}$ ), firm growth ( $H10_{FG}$ ), and financial performance ( $H10_{FP}$ ).

Recent studies on EO as well as on IM/KM have indicated that their impact on performance is complex; specifically, this impact can be mediated or moderated by other factors, or it can be a part of those wider relationships that include other dependent and/or independent variables (e.g., Kollmann & Stöckmann, 2014; Song et al., 2017; Sok et al., 2017; Song et al., 2019). Consequently, the examined factors can impact performance through sequential relationships.

Such sequential mediations can occur in an entrepreneurial context; sequential mediation models have been analyzed in studies on SMEs (Khan et al., 2024; Xia et al., 2024). Many of these have examined the indirect influence of entrepreneurship (measured, for example, by EO) on firm performance, with various factors and variables being analyzed as mediators. For instance, Aloulou (2024) focused on absorptive capacity and innovation capability, Jeong et al. (2019) looked at adaptive organizational cultures and people-centered management, and Cruz Rincon et al. (2023) applied market orientation and marketing capabilities as mediators.

However, the mediating role of IM in the relationship between EO and PERF (especially as one of the mediators in sequential mediation) has been not examined (to the best knowledge of the authors of this study). Only in one study was IM tested as one of the moderators in the sequence; however, the significance of the proposed indirect sequential pathway was not confirmed (Altındağ & Öngel, 2021). Based on the relationships that were reflected in the previous hypotheses on the EO/PERF, EO/IM, EO/KM, IM/KM, IM/PERF, and KM/PERF relationships as well as the mediating relationships (EO/IM/KM, EO/IM/PERF, EO/KM/PERF, and IM/KM/PERF), we can assume that those relationships that involve EO, IM, KM, and PERF can be sequential. Therefore, we propose the following hypothesis:

**Hypothesis H11.** : The relationship between entrepreneurial orientation and firm performance (in particular, firm competitiveness  $[H11_{FC}]$ , firm growth  $[H11_{FG}]$ , and financial performance  $[H11_{FP}]$ ) can be sequentially mediated by information management and knowledge management.

# 4.1.6. Research model

The relationships that are described in the hypotheses that were proposed above are presented in the theoretical model that is depicted in Fig. 1.

#### 4.2. Methodology

#### 4.2.1. Sample and data collection

The study's population was comprised of small and medium-sized enterprises that operated in the furniture manufacturing industry in Poland. The sample was selected using simple random sampling without replacement from a database that was provided by the Dun & Bradstreet company. The respondents were owners or people who were employed in top managerial positions. The data for the study was collected by interviewers using a survey questionnaire (PAPI). The questionnaire had



Fig. 1. Theoretical model. Note: This study examines three models that differ with dependent variable (Performance): in Model 1, Performance = Firm competitiveness; in Model 2, Performance = Firm growth; and in Model 3, Performance = Financial performance.

been previously validated during preliminary interviews with the owners of several companies that were operating in the Lesser Poland region. The data was collected between August and October 2022. As a result of the survey, correctly filled-out questionnaires were gathered from 150 companies, which constituted our study sample. Using  $G^*Power 3.1.9.7$  software (Faul et al., 2007), we determined that the statistical power of the 150-element sample was 0.986 when applying the parameters that were proposed by Cohen (1988). This value was higher than the required 0.8, which indicates the acceptable statistical power of the sample analyzed. Other survey parameters are included in Table 1, while Table 2 presents the basic characteristics of the survey sample.

#### 4.2.2. Variables

Our independent variables were entrepreneurial orientation (EO), information management (IM), and knowledge management (KM), and our dependent variables were firm competitiveness (FC), firm growth (FG), and financial performance (FP). EO is a three-dimensional construct that consists of risk-taking, innovativeness, and proactiveness. The EO construct was adapted from previous entrepreneurship research (Hughes & Morgan, 2007; Kusa et al., 2021). IM and KM were four-item constructs; they were inspired by previous research on information management (Kettinger et al., 2021) and knowledge management (Acar et al., 2017; Mao et al., 2016). All of the constructs were reflective latent variables.

Regarding the research model, two control variables were considered; these were firm age and size. Three analyses were performed, and

#### Table 1

Fieldwork technical sheet.

Property	Value
Population size	1480
Scope	Poland
Sample size	150
Sampling method	Simple random without replacement
Confidence level	95 %, $p = 50$ %; $\alpha = 0.05$
Percentage of population	10.14 %
Sample error	7.61 %
Statistical power of sample	0.986
Data-collection period	August–October 2022

Table 2			
Characteristics	of	sam	ple.

Variable	Range	Percentage
Firm age	0–10	27.30 %
	10-20	33.40 %
	20-30	27.30 %
	over 30	12.00 %
Firm size	small	88.70 %
	medium	11.30 %
Family enterprise	yes	66.70 %
	no	33.30 %
Member of formal local network	yes	18.70 %
	no	81.30 %
Active in industrial cluster	yes	24.70 %
	no	75.30 %

their results compared; namely, without control variables, with all control variables, and with those control variables that were significantly related to the dependent variable. The results of these analyses indicated that firm age and size did not significantly affect the examined relationships that comprised the research model. Thus, following Bernerth and Aguinis (2016), the control variables were not included in the final analysis.

4.2.2.1. Common method bias. To detect common method bias (CMB), we use Harman's single-factor test (Podsakoff & Organ, 1986). Because the total variance that was extracted by one factor equaled 34.228 % (see Appendix 1) and was less than the 50 % threshold, CMB did not affect our data; this indicated that the model was free from common method bias (Fuller et al., 2016).

# 4.2.3. Methods

Structural equation modeling (SEM) provided a means to assess the research hypotheses that were characterized by complex relationships among their variables (Jöreskog, 1978; Wold, 1982). SEM combines elements of factor analysis and multiple regression analysis and offers an advantage when analyzing structural relationships among both observed and latent variables. In this study, we employed the PLS-SEM method, which adopts a predictive rather than confirmatory approach (unlike the CB-SEM method) (Hair et al., 2022). This approach allowed

us to maximize the explained variance of the endogenous constructs and, consequently, construct a model with predictive capabilities (Gefen et al., 2011). Unlike other SEM techniques, PLS-SEM is more lenient in terms of the number of cases that must be analyzed (Reinartz et al., 2009) and the characteristics of the indicators that are used to construct the variables (Ali et al., 2018). PLS-SEM is a method that can be successfully used to verify models by taking mediating effects into account (Kusa, 2023; Nitzl et al., 2016; Suder et al., 2022a).

Given our study's focus on identifying variables with significant impacts on the outcomes, the relatively limited dataset, the exploratory nature of the research, and the presence of a mediator in the model, the choice of PLS-SEM was justified for our analysis.

In the PLS-SEM analysis, the latest version of SmartPLS v.4.0.8.7 software (Ringle et al., 2022) was used to evaluate the proposed model (see Fig. 1) and test the hypotheses. A bootstrap procedure with 5000 iterations was used to verify the statistical significance of the path coefficients. Due to the one-sided hypotheses, a one-tailed test with a standard 5 % significance level was used in their verification. In addition, the verification of the significance of the path coefficients was based on the 'confidence interval bias corrected' measure. PLS-SEM made it possible to determine the strength of the influence and its significance for the individual exogenous variables on the endogenous variables (not only for direct relationships but also for indirect effects). Such an approach made it possible to verify whether the mediation effect that was assumed in the model occurred and, if so, whether it was full or partial mediation (Nitzl et al., 2016; Ramayah et al., 2018). In addition, coefficient of determination R<sup>2</sup> and effect size measure f<sup>2</sup> were determined in order to assess the predictive capabilities of the considered models.

#### 4.3. Results

The PLS-SEM analysis was conducted by following the guidelines that were proposed by Hair et al. (2022). In particular, the measurement models were first validated, and then the research hypotheses were tested using the structural models. Since EO was treated as a multidimensional construct, it was operationalized as a second-order composite (Sarstedt et al., 2019) and obtained in two stages using latent variable scores.

Table 3 provides the basic statistics for the indicators of each construct. In addition, there is information on the outer loadings of the indicators in the measurement models as well as the variance inflation factors (VIFs), which allow us to verify the existence of a collinearity problem between the indicators.

For the vast majority of the indicators, outer loadings were well above the 0.7 threshold, which is commonly considered to be highly satisfactory regarding the indicators' reliability (Chin, 2010). For two risk-taking items and one innovation item, the loading values were between 0.6 and 0.7, which is also acceptable given their strong contribution to the substantive construction of these constructs (Hair et al., 2022).

All VIF values are close to 3 or below (see Table 3), which is a very satisfactory result for this type of analysis (Kock, 2015); these values prove that there was no collinearity problem for the indicators that were included in each construct.

The validation of a measurement model implies the assessment of the reliability, discriminant validity, and relevance of the constructs (Campbell & Fiske, 1959; Roldan & Sanchez-Franco, 2012). In order to evaluate these properties in the constructs, we followed the recommendations of Hair et al. (2022). All of the measures that were used (see Table 3) had expected values; namely, Cronbach's alpha, the reliability coefficient, and the composite reliability were within a range of 0.7–0.9, and the average variance extracted was greater than 0.5.

Since EO was operationalized as a second-order construct by using the latent variables that were obtained in the first stage of the analysis, the validity of the EO construct was verified (see Table 4). All of the

#### Table 3

Measurement model evaluation results.

Constructs/Indicators	Mean	St. dev.	Loading	VIF
Risk-taking (R): $\alpha = 0.706$ , rho_A - 0.708, CR - 0.791, AVF - 0.512				
We can accept a high level of risk if it offers a chance for above-average profits	3.76	1.77	0.721	1.579
The term 'risk taker' is considered a positive	3.77	1.75	0.623	1.445
Our employees are encouraged to take reasonable risk when implementing new	4.15	1.84	0.653	1.179
ideas. We appreciate the role of exploring and experimenting in discovering new	4.56	1.92	0.788	1.218
Innovativeness (IN): $\alpha = 0.837$ , rho_A - 0.844, CR - 0.894, AVE - 0.680				
Our organization seeks out new ways to do things.	5.13	1.83	0.672	1.362
We actively introduce improvements and innovations in our organization	5.35	1.53	0.886	2.635
We are innovative in the way we run our business	4.68	1.49	0.898	3.029
Innovation is the source of our success. <b>Proactiveness (PR):</b> $\alpha = 0.782$ , rho_A - 0.781, CR $- 0.791$ , AVE $- 0.605$	4.00	1.66	0.823	2.211
We analyze our external environment	4.99	1.55	0.783	1.753
We excel in identifying opportunities and	4.72	1.50	0.814	1.910
We strive to identify future trends.	4.98 3.79	1.56	0.792	1.612
organizations respond.	5.79	1.50	0.720	1.554
$\alpha = 0.822$ , rho <sub>A</sub> = 0.843, CR = 0.884, AVF = 0.658				
Our business manages information and data that is related to all fields of our activity	4.55	1.72	0.812	1.757
Our business has implemented processes to gain information and data that is related	3.93	1.68	0.860	2.502
to different functions (e.g., customer service, supply, logistics).				
Our business has implemented processes to store necessary information and data	3.85	1.85	0.895	2.681
Our employees have full access to necessary information and data	5.05	1.86	0.656	1.362
Knowledge management (KM): $\alpha = 0.851$ , rho A = 0.860, CB = 0.9.				
AVE = 0.693	9 71	1 0 2	0.751	1 560
gain knowledge from our suppliers,	5.71	1.65	0.751	1.500
Our business has developed the ability to create new knowledge based of that which	4.78	1.60	0.839	2.043
was accessed previously. Our business has implemented processes to	4.01	1.87	0.878	2.423
distribute knowledge inside the business. Our business has implemented processes to use knowledge to develop new products	4.19	1.77	0.857	2.090
and services. <b>Firm competitiveness (FC):</b> $\alpha = 0.702$ , <b>rho</b> A = 0.715, CR = 0.807, AVE				
= 0.512 We are one of the leading companies on our	4.00	1.61	0.751	1.375
market in terms of our business. Relative to competing products, our products are more successful in terms of	4.06	1.21	0.751	1.677
We have been able to attract new customers	4.57	1.66	0.700	1.163
Our customers are more satisfied than our	4.71	1.33	0.654	1.430
Firm growth (FG): $\alpha = 0.804$ , rho_A = 0.839. CR = 0.871. AVF - 0.631				
We are developing faster than our competitors	3.97	1.42	0.662	1.659
		(con	tinued on nex	ct page)

#### Table 3 (continued)

Constructs/Indicators	Mean	St. dev.	Loading	VIF
We are strongly focused on the growth of our company (e.g., increasing turnover, employment, market share).	4.43	1.76	0.828	2.592
We are developing much faster than expected.	3.73	1.61	0.894	1.829
Our sales are growing much faster than we expected.	3.43	1.63	0.776	1.399
Financial performance (FP): α = 0.806, rho_A = 0.850, CR = 0.870, AVE = 0.629				
Compared to our competitors, we achieve better economic results.	3.67	1.21	0.745	1.611
Our operational costs are lower than those of our competitors.	3.78	1.39	0.674	1.546
Our profitability has increased.	3.72	1.58	0.876	2.325
Our profits are much higher than we	3.20	1.65	0.861	2.337

**Note:**  $\alpha$  = Cronbach's Alpha; CR = Composite reliability; AVE = Average Variance Extracted: rho\_A = reliability coefficient,  $\lambda$  = outer loadings, VIF = variance inflation factor.

#### Table 4

Collinearity, reliability, and validity of EO as second-order construct.

Constructs/Indicators	Mean	St. dev.	Loading	VIF
Entrepreneurial orientation (EO): $\alpha = 0.751$ ; rho_A = 0.763; CR = 0.858; AVE = 0.669				
Risk-taking	4.05	1.26	0.747	1.331
Innovation	4.80	1.24	0.831	1.662
Proactivity	4.63	1.16	0.870	1.767

**Note:**  $\alpha$  = Cronbach's Alpha; CR = Composite reliability; AVE = Average Variance Extracted: rho\_A = reliability coefficient,  $\lambda$  = outer loadings, VIF = variance inflation factor.

determined indicators and measures were also at acceptable levels for this construct.

The next step in verifying the measurement models was to evaluate discriminant validity; for this, the Fornell-Larcker and Henseler criteria were used. Discriminant validity is appropriate if the square root of the AVE of each construct is greater than its correlations with the other constructs in the model (Fornell & Larcker, 1981) and the heterotrait-monotrait ratio (HTMT) is less than 0.85 (Henseler et al., 2015). In the measurement models, these conditions were met (see Table 5), which indicates the discriminant validity of the constructs.

As a final step in verifying the measurement models, their fit to the data was examined. For this purpose, an SRMR measure (i.e., standardized root mean squared residual) was determined. Henseler et al. (2015) suggested that SRMR values that are below 0.085 should be considered to be acceptable. For the tested models, SRMR values of 0.08, 0.082, and 0.076, respectively, were obtained; this means that an adequate level of the fit of the proposed models to the data was

Table 5	
Discriminant validit	y

Construct	Construct Fornell-Larcker criterion					HTMT criterion			
	EO	IM	KM	СР	FG	FP	EO	IM	KM
EO IM	0.818 0.61	0.811					0.699		
KM	0.563	0.554	0.832	0 716			0.650	0.554	0.481
FG	0.686	0.545	0.547	x	0.794		0.792	0.545	0.547
FP	0.45	0.384	0.387	х	x	0.793	0.52	0.384	0.387

Elements in bold on diagonal show square roots of AVE.

achieved. The results of the measurement model validation indicate that the model was suitable for the analyzed data.

Fig. 2 shows the modeling results for the three structural models that were considered. The diagrams show the standardized values of the path coefficients along with the indicated significance level. In addition, the value of coefficient of determination  $R^2$  is given for the endogenous variables. Tables 6 and 7 provide more-detailed results of the analysis for the direct and indirect relationships, respectively. In addition, the effect size values are also provided.

The three direct relationships that were included in the research model (i.e., EO $\rightarrow$ IM, EO $\rightarrow$ KM, and IM $\rightarrow$ KM) did not depend on the type of PERF variable. The results that pertained to these relationships (cf. Table 6) fully confirmed Hypotheses H2 and H3, which indicated that EO had a positive impact on IM and KM, respectively. EO had a positive impact on both of the considered factors, with the path strength of the effect of EO on IM expressed by path coefficient  $\beta_2 = 0.610$  (p < 0.05); this is substantially higher than the path coefficient for the EO $\rightarrow$ KM relationship, which was  $\beta_3 = 0.358$ . Additionally, the value of the  $f^2$  index for the first relationship indicated a large effect size ( $f^2 = 0.592$ ), and for the second, a low one ( $f^2 = 0.131$ ) (Cohen, 1988).

The linear relationship between IM and KM (assumed on the basis of theoretical considerations and adopted in the model) where IM affected KM was also statistically significant; the value  $\beta_4=0.335$  that reflected the strength of the impact was statistically significant (p<0.05), with an  $f^2=0.115$  value that indicated a small effect size.

Since the indirect relationship of EO on KM through IM was statistically significant (see Table 7), this means that IM should be considered to be a partial mediator of the effect of EO on KM. The levels of the variance explanation ( $R^2$ ) for IM and KM were at similar levels (37.2 % and 38.7 %, respectively – cf. Fig. 2); this should be considered to be moderate, albeit substantial (Cohen, 1988; Falk & Miller, 1992; Kock, 2014).

In Model 1, in which firm competitiveness (FC) was considered to be the dependent variable, Hypothesis  $H_{1FC}$  was confirmed; a high level of EO leads to a high level of FC ( $\beta_{1FC}=0.377;\,p<0.05$ ) with a significant (but low) effect size. Based on the estimated parameters and their significance testing, it can be concluded that FC was directly as well as positively and significantly affected by KM ( $\beta_{6FC}=0.231;\,p=0.003<0.05$ ), while IM did not significantly affect FC ( $\beta_{5FC}=0.122;\,p=0.184>0.05$ ). This means that the level of FC is directly shaped by EO and KM.

The results of the indirect relationship analysis for Model 1 (see Table 7) lead us to the conclusion that KM is a mediator for the impact of EO on FC ( $\beta = 0.083$ ; p = 0.011) and the impact of IM on FC ( $\beta = 0.077$ ; p = 0.016), with a partial mediation in the former case and a full mediation in the latter. Significance was also obtained for the path coefficient of the effect of EO on FC with the two mediators (IM and KM). The level of explaining the variation for endogenous variable FC by the three exogenous variables (EO, IM, KM) was R<sup>2</sup> = 34.8 %, which reflects its average explanation by the proposed model.

In Model 2 (where FG was considered to be the dependent variable), all of the paths' coefficients were significant. In particular, EO had a positive effect on FG because the value of the path coefficient for this



Fig. 2. Structural models.

# Table 6 Structural model results for direct effects.

Type of model	Path	Original Sample (β)	Bootstrapping				f <sup>2</sup>	Results	
			Sample Mean (M)	T Statistics	P Values	Confidence interval bias corrected			
						LL	UL		
Models 1,2,3	$\rm EO \rightarrow IM$	0.610	0.611	12.725	0.000	0.524	0.680	0.592	H2 confirmed
	$\rm EO \rightarrow KM$	0.358	0.362	4.899	0.000	0.232	0.473	0.131	H3 confirmed
	$\mathrm{IM} \to \mathrm{KM}$	0.335	0.333	4.342	0.000	0.207	0.459	0.115	H4 confirmed
Model 1	$\rm EO \rightarrow FC$	0.377	0.380	4.759	0.000	0.240	0.499	0.121	H1 <sub>FC</sub> confirmed
	$IM \rightarrow FC$	0.070	0.066	0.900	0.184	-0.056	0.199	0.004	H5 <sub>FC</sub> not confirmed
	$KM \rightarrow FC$	0.231	0.232	2.788	0.003	0.105	0.383	0.050	H6 <sub>FC</sub> confirmed
Model 2	EO→FG	0.494	0.491	6.646	0.000	0.370	0.610	0.584	H1 <sub>FG</sub> confirmed
	$\text{IM} \rightarrow \text{FG}$	0.138	0.134	2.004	0.023	0.024	0.250	0.131	H5 <sub>FG</sub> confirmed
	$\mathrm{KM} \rightarrow \mathrm{FG}$	0.192	0.197	2.274	0.011	0.061	0.336	0.047	H6 <sub>FG</sub> confirmed
Model 3	$\rm EO \rightarrow FP$	0.287	0.283	2.683	0.004	0.112	0.463	0.060	H1 <sub>FP</sub> confirmed
	$\text{IM} \to \text{FP}$	0.122	0.122	1.096	0.137	-0.058	0.306	0.011	H5 <sub>FP</sub> not confirmed
	$KM {\rightarrow} FP$	0.158	0.159	1.464	0.072	-0.021	0.334	0.020	${\rm H6}_{\rm FP}$ not confirmed

# Table 7

Structural model results for indirect effects.

Type of model	Path	Original Sample (β)	Bootstrapping					Results
			Sample Mean (M)	T Statistics	P Values	Confidence interval bias corrected		
						LL	UL	
Models 1,2,3	$\rm EO \rightarrow IM {\rightarrow} KM$	0.205	0.203	4.116	0.000	0.129	0.291	H7 confirmed
Model 1	$EO \rightarrow IM \rightarrow FC$	0.043	0.040	0.886	0.188	-0.033	0.124	H8 <sub>FC</sub> not confirmed
	$EO \rightarrow KM \rightarrow FC$	0.083	0.084	2.291	0.011	0.035	0.155	H9 <sub>FC</sub> confirmed
	$IM \rightarrow KM \rightarrow FC$	0.077	0.078	2.143	0.016	0.032	0.155	H10 <sub>FC</sub> confirmed
	$\rm EO \rightarrow IM \rightarrow KM {\rightarrow} FC$	0.047	0.048	2.065	0.019	0.020	0.097	H11 <sub>FC</sub> confirmed
Model 2	$EO \rightarrow IM \rightarrow FG$	0.084	0.082	1.914	0.028	0.014	0.161	H8 <sub>FG</sub> confirmed
	$EO \rightarrow KM \rightarrow FG$	0.069	0.072	1.875	0.030	0.020	0.137	H9 <sub>FG</sub> confirmed
	$\text{IM} \rightarrow \text{KM} {\rightarrow} \text{FG}$	0.065	0.068	1.831	0.034	0.020	0.139	H10 <sub>FG</sub> confirmed
	$\mathrm{EO} \to \mathrm{IM} \to \mathrm{KM} {\to} \mathrm{FG}$	0.039	0.041	1.792	0.037	0.013	0.086	H11 <sub>FG</sub> confirmed
Model 3	$EO \rightarrow IM \rightarrow FP$	0.074	0.076	1.058	0.145	-0.034	0.196	H8 <sub>FP</sub> not confirmed
	$EO \rightarrow KM \rightarrow FP$	0.056	0.057	1.382	0.084	-0.002	0.131	H9 <sub>FP</sub> not confirmed
	$IM \rightarrow KM \rightarrow FP$	0.053	0.056	1.260	0.104	-0.002	0.137	H10 <sub>FP</sub> not confirmed
	$\mathrm{EO} \to \mathrm{IM} \to \mathrm{KM} {\to} \mathrm{FP}$	0.033	0.034	1.227	0.110	-0.001	0.086	$H11_{FP}$ not confirmed

relationship was  $\beta=0.494$  and was statistically significant (p <0.05), which confirms Hypothesis H\_{1FG}. Hypotheses H\_{5FG} and H\_{6FG} were also confirmed in this model, as IM ( $\beta_{5FG}=0.138; p=0.023$ ) and KM ( $\beta_{5FG}=0.197; p=0.011$ ) were also found to be significant determinants of FG. The size effect for the direct EO  $\rightarrow$ FG relationship was large (greater than

0.35) and was small for the other relationships (within a range of 0.02–0.15). In Model 2, all of the path coefficients for the indirect relationships were found to be significant, which means that all of the considered mediating effects in the model were partial. The level of explaining the variance of the dependent variable FG that was expressed

by the coefficient of determination was 52 %; in the social sciences, such a level is considered to be relatively high.

The results of the analysis for Model 3 confirmed that EO was a significant determinant of financial performance (FP) ( $\beta_{1FP} = 0.287$ ; p = 0.004). However, the strength of the effect of EO on FP was significantly lower than that of the other outcomes that were considered (i.e., FC and FG). This fact was also confirmed by the fact that, for the EO $\rightarrow$ FG relationship,  $f^2 = 0.06$ ; this meant a small effect size. The other direct relationships that were considered were statistically insignificant ( $\beta_{5FP} = 0.138$ ; p = 0.137;  $\beta_{6FP} = 0.158$ ; p = 0.072). Thus, neither IM nor KM had a significant impact on FP in the examined companies; therefore, all of the path coefficients for the intermediate relationships were not statistically significant (see Table 7). Thus, there is no question of IM or KM being a mediator for the impact of EO on FP. The coefficient of determination for the FP score in the model was 22.1 %; this means that the tested model explained the variability of FP to a lower degree than it did for the variabilities of FC and FG.

# 5. Study 2: FsQCA-based analysis

# 5.1. Purpose

The fsQCA analysis was conducted for two reasons: the first was to confirm the results that were obtained with PLS-SEM (for this purpose, the values of the relevant measures for all combinations of factors were determined and then interpreted), while the second was to complement and extend the results that were obtained from the earlier analysis. This was done by identifying the configurations of factors that constituted sufficient conditions for increased performance.

#### 5.2. Method

Primarily, the fundamental objective of fsQCA is to perform a comparative evaluation of examined cases with a specific aim of revealing the causal connections among any adopted conditions and an expected outcome (Fiss, 2011). As opposed to regression analysis, a significant advantage that is associated with this approach is its capacity to accommodate the asymmetric relationships among, the equifinality of, and the complexity of the causes (Ragin, 2008; Woodside, 2013). Furthermore, this methodology has proven to be particularly valuable for analyses of data sets of modest to moderate sizes that do not meet the necessary prerequisites for applying regression-based models or more-extensive structural equation models (Ragin, 2008).

In this study, fsQCA was conducted basing on the same sample as in the case of the PLS-SEM analysis (namely, 150 small and medium-sized enterprises that operated in the furniture manufacturing industry in Poland; the data was collected by interviewers who solicited information from owners or people who were employed in top managerial positions by using a survey questionnaire (PAPI) from August through October 2022).

In the fsQCA analysis, we used fsQCA v.3.1 software (Ragin & Sean, 2016), which allowed us to perform the completed procedure (starting from the calibration to building a truth table to determining the necessary and sufficient conditions). The selection of the necessary parameters for performing the stages of fsQCA (i.e., threshold values for calibration, frequency cutoff, and consistency cutoff) was made on the basis of the recommendations of Pappas and Woodside (2021). When analyzing the sufficient conditions, we used an intermediate solution as was recommended by Ragin (2008). The fsQCA method did not provide the opportunity to study the mediating effects; however, it enabled us to determine the factors or combinations of factors that were necessary to achieve the high level of the outcome due to the analysis of the necessary conditions (which is central to fsQCA). On the other hand, the analysis of the sufficient conditions made it possible to assess the impact of the individual conditions and their different configurations on the outcome considered. To evaluate this impact in accordance with the

recommendations of Schneider and Wagemann (2012), we employed the standard measures that are used in QCA analysis; namely, consistency and coverage. Such a procedure has been used in previous studies (e.g., Palacios-Marques et al., 2017; Ruiz-Palomino et al., 2019; Suder et al., 2022b).

# 5.3. Results

#### 5.3.1. Calibration and necessary condition analysis

At the first stage of fsQCA, the data was calibrated; the results of this calibration and the values of the thresholds that were adopted in the calibration procedure (0.95 - full member; 0.5 - cross-over point; 0.05 - full non-member) are included in Fig. 3.

The next step is to verify the presence of those conditions that are necessary for obtaining a high level of the considered outcome; the results of this analysis are presented in Table 8.

Schneider and Wagemann (2012) proposed that a condition must have a consistency level that exceeds 0.9 in order for it to be considered necessary; however, none of the conditions in Table 8 achieved values that surpassed this threshold. This indicated that there were no necessary conditions.

Based on results of the calibration and the necessary condition analysis, all of the calibrated variables were used in the following steps of the examination.

# 5.3.2. Analysis of configurations in terms of consistency

This part of the fsQCA analysis aimed to confirm the results that were obtained with PLS-SEM. Table 9 shows results of analysis of the sufficient conditions. To interpret the results from the analysis of the sufficient conditions, we used the indications of Ragin (2008) and Eng and Woodside (2012); according to these, a model is informative if the consistency is greater than 0.75. In particular, this means that the combinations of conditions or the condition alone for which an assumption is met are considered to be sufficient for obtaining a high outcome.

In the case of the relationship among EO, IM, and KM, the results of the analysis indicated that EO was a sufficient condition for high IM and KM; these were explained in about 80 % of the cases (see Table 9). For the relationship of IM to KM, the consistency score was 0.787; this means that a high level of IM should be considered to be a sufficient factor for a high level of KM. fsQCA showed that, in 87.7 % of the cases, the joint occurrence of high EO and IM led to high KM, while for EO alone, the rate was lower (just above 80 %). This part of the fsQCA results fully confirmed the conclusions from the PLS-SEM analysis and additionally indicated that, when high EO is present along with the presence of IM, they explain the high level of KM to a greater degree.

For Model 1, EO and KM were sufficient conditions for a high level of FC (the consistency was greater than 0.75). Additionally, all of the combinations that included at least two of the three conditions were also sufficient. These results were consistent with results that were obtained with PLS-SEM.

The fsQCA results for Model 2 provided a partial confirmation for the results that were obtained by the PLS-SEM analysis. In particular, EO and KM were sufficient conditions for high FG, which indicated the substantial impacts of these individual conditions on FG. In this model, the results of the fsQCA analysis did not confirm a high level of IM as a sufficient factor for a high level of FG (consistency = 0.733 < 0.75); in this regard, the results of fsQCA differed from those that were obtained in the PLS-SEM analysis. However, the fact that the high level of IM explained the high level of FG may be sourced in the fact that the consistency of EO\*IM was much higher than for EO alone. Additionally, this condition was also met for all of the configurations in which at least two factors were present.

For Model 3, the fsQCA results fully confirmed the conclusions from PLS-SEM. In particular, a high level of EO could be considered to be a sufficient condition for a high level of FP, with EO explaining more than



Fig. 3. Parameters and results of data calibration.

#### Table 8

Analysis of necessary conditions.

Conditions	Firm competitiveness		Firm growth		Financial performance	
	Cons.	Cov.	Cons.	Cov.	Cons.	Cov.
EO	0.719	0.786	0.779	0.807	0.688	0.759
~EO	0.507	0.498	0.479	0.446	0.540	0.535
IM	0.722	0.720	0.775	0.733	0.736	0.740
$\sim IM$	0.497	0.535	0.459	0.468	0.500	0.542
KM	0.760	0.745	0.811	0.754	0.740	0.732
~KM	0.511	0.560	0.486	0.505	0.519	0.574

Cons. = consistency; Cov. = coverage.

#### Table 9

Analysis of sufficient conditions from fsQCA.

Type of model	Condition/outcome	Consistency	Coverage
Models 1,2,3	$\mathrm{EO} \to \mathrm{IM}$	0.798	0.727
	$EO \rightarrow KM$	0.806	0.722
	$IM \rightarrow KM$	0.787	0.774
	$EO*IM \rightarrow KM$	0.877	0.627
Model 1	$EO \rightarrow FC$	0.786	0.719
	IM→FC	0.72	0.722
	KM→FC	0.753	0.761
	EO * IM→FC	0.826	0.607
	EO * KM→FC	0.833	0.614
	IM * KM→FC	0.797	0.628
	EO * IM * KM $\rightarrow$ FC	0.854	0.546
Model 2	$EO \rightarrow FG$	0.807	0.779
	IM→FG	0.733	0.776
	KM→FG	0.754	0.812
	EO * IM→FG	0.849	0.653
	EO * KM→FG	0.864	0.671
	IM * KM→FG	0.823	0.685
	EO * IM * KM $\rightarrow$ FG	0.876	0.591
Model 3	$EO \rightarrow FP$	0.773	0.714
	IM→FP	0.741	0.736
	KM→FP	0.732	0.74
	EO * IM→FP	0.817	0.591
	EO * KM→FP	0.811	0.592
	IM * KM $\rightarrow$ FP	0.791	0.618
	EO * IM * KM $\rightarrow$ FP	0.840	0.532

77 % of the cases that had high levels of FP. In contrast, IM and KM separately could not be considered to be sufficient factors for a high FP level due to the fact that their consistencies were lower than 0.75.

An important result that was obtained in the fsQCA analysis was that, in all three models, the consistency for the IM\*KM configuration was above 0.75. This means that the joint occurrence of IM and KM (without

EO) can be considered to be a sufficient condition for obtaining a high level of outcome (performance) regardless of the type of performance.

#### 5.3.3. Analysis of configurations that led to presence of performance

The aim of this part of fsQCA was to complement and extend the results that were obtained from the earlier analysis. In particular, the configurations of the factors that constituted sufficient conditions for increased performance were identified. This part of the analysis was performed using a truth table and logical minimization. The final results and threshold values are presented in Table 10.

The results from fsQCA indicated several combinations that led to performance; these involved EM, IM, and KM and confirmed their contributing roles in enhancing all of the examined dimensions of performance. Specifically, the combination of EO and KM led to the presence of FC (Combination S1a), FG (S1b), and FP (S2c). Another combination that was relevant to all of the dimensions of performance was comprised of EO and IM. In particular, the presence of EO accompanied by the presence of IM led to the presence of FC (S2a), FG (S2b), and FP (S1c). Additionally, the presence of IM combined with the presence of KM led to the presence of FG (Solution S3b).

It is worth noting that EO was present in almost every configuration that led to performance. In light of the fsQCA results, however, EO alone did not lead to performance. This observation confirmed the findings from previous studies that relevant information and knowledge is needed in entrepreneurial activity (in particular, recognizing opportunity [Minniti & Bygrave, 2001; Shane, 2000; Shane & Venkataraman, 2000; Song et al., 2017] and exploiting it [Acs et al., 2009; Fuentes-Fuentes et al., 2010; Wiklund & Shepherd, 2003]).

The above propositions are the specific results from the fsQCA study; these also indicate potential directions of future research.

#### Table 10

Solutions that led to presence of performance.

Conditions	Sets/Solutions						
	Presence of FC		Presence of FG			Presence of FP	
	S1a	S2a	S1b	S2b	S3b	S1c	S2c
EO	•	•	•	•		•	•
IM		•		•	•	•	
KM	•		•		•		•
Consistency	0.83295	0.83286	0.86374	0.84894	0.822502	0.817315	0.81109
Raw coverage	0.6135	0.60732	0.671289	0.65321	0.684747	0.590654	0.592058
Solution coverage	0.675084			0.827624		0.650281	
Solution consistency	0.816835		0.803484			0.79392	
Frequency cutoff	7		7			7	
Consistency cutoff	0.82		0.84			0.82	

#### 6. Study 3: qualitative study

#### 6.1. Purpose

This study aims to deepen our understanding of the role of IM and KM in shaping firm performance as well as the role of entrepreneurial posture in implementing IM and KM. The results from PLS-SEM and fsQCA showed that the relationships among the examined variables can be complex; in particular, they can include mediating effects, and the variables can interact in different combinations. Consequently, a performance improvement that is based on EO, IM, and KM is challenging, as it requires us to understand these relationships. Therefore, a qualitative study was performed.

Specifically, this study focuses on the following research questions: What are the relationships between IM and KM? What is the role of entrepreneurial posture in developing IM and KM? How is IM/KM implemented in a company (including expectations and motivations, the impact of IM and KM on competitiveness, growth, and financial performance, and the obstacles when implementing IM and KM)?

Special attention was paid to practices at the organizational level regarding IM and KM in the EO context. This was because the interviews were also expected to clarify the managerial implications and recommendations that were retrieved from the results from the PLS-SEM and fsQCA examinations.

# 6.2. Method

As mentioned before, in-depth interviewing (which belongs to the group of quantitative methods) was used as a complement to the quantitative methods (i.e., SEM and fsQCA). In contrast to quantitative research with the use of a questionnaire, this type of research is characterized by greater flexibility, which allows us to capture more aspects of the scope of the research and, thus, gain a better understanding of the studied problem. Due to the rationale for the use of interviews (which have already been justified), standardized open-ended interviews were used in the study (Gubrium et al., 2012). In this type of interview, all of the respondents were asked the same questions; this approach facilitated interviews that could be analyzed and compared more easily. During each interview, however, the entrepreneurs were able to refer to the discussed issue regardless of the formulated questions.

In this part of the study, six entrepreneurs who represented the furniture industry were interviewed. All of the participating enterprises were members of the Polish Chamber of Commerce of Furniture Manufacturers. These interviews were structured; they lasted 25–50 min. The respondents were asked several questions that were divided into three thematic groups. The first part was about understanding the nature of IM and KM and the relationship between IM and KM in the examined company. The second group of questions concerned the implementation and improvement of IM and KM in the company and the links between IM/KM processes and the firm's entrepreneurial mindset and activities.

The third group dealt with the motivations for implementing IM/KM and their impact on financial performance, firm competitiveness, and firm growth as well as the barriers and impediments that they encountered when implementing IM/KM. Finally, we also asked the respondents about their recommendations regarding the implementation of IM/KM in a company. All of the interviews were recorded, and transcripts of each were prepared.

# 6.3. Results

#### 6.3.1. Utilization of IM and KM

The results showed that all of the examined companies used IM and KM, albeit to different degrees. For example, one of the examined companies described this as follows:

"The flow of information lays the basis of our functioning. We have introduced in our schedule regular meetings and conferences where the entire key staff discusses the most important issues and establishes action plans (annual, semi-annual) for lower-level staff. They also define indicators and indicator matrices. We believe that a proper flow of information ensures consistent expectations within our company."

Our qualitative research confirmed that the entrepreneurs understood and applied the concept of KM (as evidenced by the following statement):

"Access to knowledge is essential for the development of a company. We, for example, distribute industry press among employees, participate in training and fairs. People participating in training or fairs pass on the acquired knowledge to their teams. We learn how to communicate without violence, how to acquire knowledge on your own, how to manage your time."

Our respondents also stated that there was a relationship between IM and KM by saying the following:

"IM and KM are crucial for our further development."

One manager said the following:

"KM and IM are different areas – they are not the same, but they are related. In our company, there are many areas that are related to KM and IM (e.g., sales, logistics, relationships with clients and suppliers, accounting, HR). We use different tools (for example, click view) to manage knowledge and information. These tools allow us, among others, to collect data in adequate databases and generate reports that are accessible to the respective employees (not everyone has access to everything). We use the Intranet for communication within the company. We also use a second database (the VOLT tool) for storing and managing technological knowledge regarding the production of our products. We also have an ERP system that contains technological paths and a material base (i.e., information about the furniture that is produced, how it is made, and what materials it is

#### R. Kusa et al.

made of, information about the use of machines – this information is also used by the planning departments). We also have an internal MAA system where we store knowledge for the accounting department, document workflow; we have established access paths to information within IM."

The manager of the next company also distinguishes the concepts of KM and IM and confirmed that there was a relationship between them by saying the following:

"IM is about providing the right information to the right people. For us, IM is a reaction; KM is a creation, not a reaction – it should also be an element of work, and it is more long-term. It shapes the strategic goals of the company. Access to external knowledge is important. As part of KM, we organize workshops and project teams whose task is to develop strategic and task plans. We organize operational meetings where the leaders of each functional area share information. As part of IM, notes from each meeting are prepared and distributed, but we also have databases in which we describe clients, we have job cards, descriptions of results, and information on health and safety."

One respondent pointed out that IM was easier to implement than KM. He explained the following:

"People assimilate information and perform tasks with relative ease, while KM (which involves knowledge-seeking and learning) is more difficult because not every employee takes initiatives, and many employees have a passive nature."

As some of our respondents represented small firms, sometimes they used simple tools and processes to manage both information and knowledge. One manager said the following:

"We see the importance of both information and knowledge, but for us they are a part of our everyday activity. As we do not have formal processes or procedures that are related to IM and KM, our managers practice it in a rather intuitive way and use meetings, e-mails, and whiteboards to share information. Maybe there are some tools that can improve these practices, but we have no money to invest in them at the moment. On the other hand, we are a small firm, and it works."

The above evidence shows that IM and KM play important roles in the furniture industry despite the fact that this industry is perceived as a low-technology entity.

# 6.3.2. Motivations for implementing IM/KM

The managers indicated numerous motivations for implementing IM/KM in their companies. One of the interviewees distinguished internal and external motivation:

"Due to the need to match market standards, we decided to streamline our delivery processes and certify them in accordance with ISO. This started a complex process that showed how important internal (managers' and employees') motivation was as well. In our case, it was the willingness to share knowledge. It is not easy to convince employees to do this, so it is important to create an organizational culture based on knowledge-sharing. It is important to remember that KM and IM are continuous processes – they never end...they are not one-time activities. It is also important that lowerlevel employees understand that KM is important and that they want to share knowledge, that they feel the need to do so. The biggest challenge is to stimulate initiative and manage disappointment, because every business activity is fraught with risk – not everything works out, and the result is not always what we expect."

Another manager also pointed out that knowledge-sharing is very important, saying "we share knowledge during meetings; for example, the head of production shares knowledge with employees" and "we make the employee aware that sharing knowledge does not endanger them but builds our team and is key to the company's success." The development of IM and KM can be forced by business partners. In one company, this was described as follows:

"One of our existing customers demanded that we implement specific IM and KM solutions before we started collaborating; additionally, they required us to obtain ISO certification."

For other companies, the implementation of IM and KM is a condition for improving the other processes and developing the company. One manager said the following:

"It is impossible to function efficiently at the operational and strategic levels without access to the necessary information. With the development of IM and KM, we can make the right decisions at these levels. In addition, IM and KM lead to a reduction in the cost of doing business (e.g., by reducing business travel costs). Efficient IM and KM are also a prerequisite for effective quality control (our databases include information for reducing employee mistakes). In addition, IM and KM systems make it possible to improve communication (reducing the time that is needed for communication) and eliminate some of the errors in the transmission of information. Finally, IM and KM enhance the organization's culture based on knowledge-sharing; all employees know that they are working together as a team (not competing with each other), which improves the efficiency of the teamwork."

The implementation of IM can be triggered by a crisis in a company; such a situation was described by one of the interviewees:

"The company grew, and this caused a temporary crisis – we wanted to do something to come out of the crisis stronger. The company's desire for change motivated us to launch the IM and KM processes. We started with an analysis of our human resources, then we hired an HR specialist; they pointed out a problem with our information flow to us. We then determined which problems we had. As a first step, we conducted a series of training sessions, organized the structure in the company, delegated authority down the hierarchy, created information-flow procedures, created teams, and appointed key employees (e.g., production manager, sales manager, marketing specialist). After implementing IM, we are now a different company; IM has allowed us to grow by organizing our information flow."

# 6.3.3. Impact of IM and KM on FC, FG, and FP

The respondents confirmed the impact of IM/KM on the competitiveness, growth, and financial performance of their companies. In particular, one manager stated the following:

"Implementing KM systems and their relevant certifications enhanced our competitiveness in the eyes of our clients."

Sharing knowledge played an important role here:

"Information as well as knowledge is widely available today, but it is up to us how we use the knowledge and information. Information has to be able to be extracted and synthesized, and analyzing the wrong data is harmful. It is IM that allows us to acquire good information and analyze it. And this translates into a competitive position, because if, for example, the marketing team shares knowledge about customer expectations with the production department, then this translates into company results. The same goes for, for example, the development research department; if they share knowledge about what customers will expect in the future, this will translate into the company's bottom line, growth, and competitive position."

Other managers highlighted the positive impact on their cost structures:

"Thanks to our improvements in IM and KM, we could reduce our costs; this enabled us to be competitive in term of the prices of our products." Additionally, "KM (especially knowledge-sharing) has

R. Kusa et al.

helped us minimize risks and failure rates, which has had a positive impact on our outcomes."

Most of the interviewed managers confirmed the positive impact of IM and KM on firm growth:

"It is very important to constantly expand knowledge by acquiring and sharing it. I am constantly looking for knowledge that will broaden my horizons, which allows me to improve my current business, but also to discover new directions for the company. For us, an important opportunity to gain knowledge is through contacts with other entities. We value the openness of our partners. And on the other hand, we avoid relationships in which other entrepreneurs do not want to share knowledge and do not want to say anything about their experiences."

One manager indicated the positive impact of knowledge on their employees' postures:

"We see that more knowledge encourages people to be willing to make decisions. If they do not have knowledge, they are afraid to make decisions, and if they have knowledge, they are not afraid."

Interestingly, one of them exposed the crisis context:

"KM and IM allow us to survive not only when the market is stable but also in crisis situations, like the COVID-19 pandemic or the war in Ukraine. To a high degree, KM and IM allowed us to better prepare for these crises."

Finally, interviewees confirmed the association between IM/KM and entrepreneurial posture:

"Access to knowledge and information allows us to capture market opportunities faster. KM and IM allow us to mitigate risks and introduce new solutions more boldly. This is one of the pillars of our innovation. With access to knowledge and information databases, we can quickly make calculations and compare our offers with our competitors. Consequently, we act faster than our competitors."

Another manager said "when people are entrepreneurial, they look for knowledge." Furthermore, they declared that they "encourage employees to learn and look for knowledge all of the time" and "it is the need of the moment (understood as catching changes and opportunities in the market) that make us look for new knowledge."

Another manager emphasized that "the willingness to change in the company, rooted in the entrepreneurial posture of the owners, had an impact on IM and KM; it is the entrepreneurial posture of the owners and managers that initiates IM and KM."

Some managers defined their recommendations regarding the implementation of IM/KM in a company. They are presented in the section 'Implication for practice'.

The use of methods that represented the different approaches ensured the reliability of the results. Most of the hypotheses that were confirmed in the PLS-SEM analysis were also supported by the results of the fsQCA analysis. Additionally, fsQCA augmented the PLS-SEM results with analyses of the impact of each configuration of conditions on the outcome (FC, FG, FP). Finally, the in-depth interviews during the quantitative stage of the study allowed us to collect detailed explanations as well as recommendations regarding the examined variables and the many associations among them.

# 7. Discussion

This study's findings (of both PLS-SEM and fsQCA as well as from the qualitative research investigation) correspond with several fields of research. In its quantitative part, the study tested several hypotheses with PLS-SEM. The first set of hypotheses were related to the impact of EO on firm performance. Hypothesis  $H_{1FC}$  proposed that EO positively impacts firm competitiveness; it was supported by the results of the PLS-

SEM analysis. This is in line with the previous research that reported such an impact (see, e.g., Kiyabo & Isaga, 2020; Mahmood & Hanafi, 2013; Tajeddini et al., 2023), including on SMEs (see, e.g., Anwar et al., 2022; Dayan et al., 2023; Suder, 2024). The impact of EO on firm competitiveness confirms the strategic role of EO and its long-term consequences.

The results of the PLS-SEM analysis supported Hypothesis  $H1_{FG}$ , which posited that EO positively affects firm growth. This confirmed the previous observations in this regard (see, e.g., Covin et al., 2006; Ferreira et al., 2011; Martins, 2016; Moreno & Casillas, 2008; Soininen et al., 2012). The evidence regarding the impact of EO on firm growth showed that opportunity-seeking (which is at the heart of entrepreneurship) improved the development of a company, with a special role being played by EO in the development of small firms (as was shown in previous studies; see, e.g., Basco et al., 2020; Hamzah et al., 2023).

Finally, Hypothesis  $H1_{FP}$  indicated the positive impact of EO on financial performance; this was supported by the results of the SEMbased quantitative analysis. This observation corresponds with previous studies in this field (see, e.g., Adomako, 2018; Fuentes-Fuentes et al., 2015; Tajeddini & Mueller, 2019; Wilson & Perepelkin, 2022). The results regarding financial performance showed that it is also worth acting entrepreneurially and pursuing opportunities from the point of view of current profits. This also refers to small firms despite their limited resources; this observation supports the poor evidence in this regard (see, e.g., Jalali et al., 2013; Schepers et al., 2014; Uno et al., 2019).

Overall, the result of the quantitative analysis supported the position that EO positively impacts firm performance (as was proposed by Kraus et al., 2012). As the discussion on the relationship between EO and performance continues, this evidence contributes to it by specifying the impact of EO on selected dimensions of performance (i.e., FC, FG, and FP) in the context of small companies.

The results of the PLS-SEM analysis supported Hypothesis H2's assertion that EO positively impacts IM. Previous studies had indicated links between EO and KM, including the role of knowledge in recognizing opportunities (see, e.g., Shane, 2000; Shane & Venkataraman, 2000; Song et al., 2017) and exploiting them (see, e.g., Acs et al., 2009; Fuentes Fuentes et al., 2010; Wiklund & Shepherd, 2003). However, we had limited knowledge about the direct linkages between EO and IM. Thus, this study augments the previous evidence that was provided by Rodrigues and Raposo (2011) and confirmed the assumption that was built on the premises from the studies that were related to IM (see, e.g., Dwivedi et al., 2020; Hussin et al., 2015; Makori & Osebe, 2016). Our study clearly showed that EO directly impacts IM.

The impact of EO on KM (Hypothesis H3) was also tested with PLS-SEM; the results showed the positive impact and supported Hypothesis H3. This finding corresponds with the numerous studies that were focused on the linkages between EO and KM that highlighted the supportive role of KM in entrepreneurial activity (see, e.g., Acs et al., 2009; Fuentes Fuentes et al., 2010; Shane, 2000; Shane & Venkataraman, 2000; Song et al., 2017; Wiklund & Shepherd, 2003) and exposed the impact of EO on knowledge-related processes (see, e.g., Dung et al., 2021; Głodowska et al., 2019; Gupta & Moesel, 2007; Kreiser, 2011; Zhao et al., 2011) and knowledge-based resources (as was proposed by Wiklund & Shepherd, 2003). Finally, this study supports the observations on the positive impact of EO on KM (see, e.g., Adam & Mahadi, 2018; Latif et al., 2021; Lee & Sukoco, 2007; Madhoushi et al., 2011; Nasution et al., 2021).

This study also provides support for Hypothesis H4, which stated that IM positively impacts KM. The results corroborated the impact of IM on KM, which justified the distinction between IM and KM and confirmed the approach that was based on the differentiation of information and knowledge (which was proposed by Davenport and Prusak, 1998). As previous studies did not compare IM and KM in terms of the causal relationships between them in the entrepreneurial context, the revealed impact of IM on KM contributes to the literature; the presented results can help formulate disjunctive definitions of both terms.

This study tested the hypothesis on the impact of IM on performance; in particular, the impacts on the three dimensions of performance were examined: firm competitiveness (H5<sub>FC</sub>), firm growth (H5<sub>FG</sub>), and financial performance (H5<sub>FP</sub>). The PLS-SEM results only provided support for H5<sub>FG</sub>, which was related to the impact of IM on firm growth. In general, this is consistent with the numerous studies that posited the influence of IM on operational and general performance (see, e.g., Kettinger & Marchand, 2011; Mithas et al., 2011; Prajogo et al., 2018). However, the results of this study specified the dimension of performance (that is, firm growth) that was affected by IM; this relationship was only previously reported in a few studies (see, e.g., Rodrigues & Raposo, 2011; Tarigan et al., 2020; Altındağ & Öngel, 2021). The positive impact of IM on firm growth accompanied by the lack of its significant influence on firm competitiveness and financial performance can be associated with the role of IS (along with IT and ICT) in IM; their development supports the growth of a company. Due to the extensive investments that are required for developing IS, however, financial performance and firm competitiveness may be negatively affected especially in the short term (Holste & Fields, 2010).

The impact of KM on performance that was posited in Hypothesis H6 was also tested with PLS-SEM; again, the three dimensions of performance were considered (that is, firm competitiveness  $[H6_{FC}]$ , firm growth [H6<sub>FG</sub>], and financial performance [H6<sub>FP</sub>]). The result of the quantitative examination provided support for H6<sub>FC</sub> (with respect to firm competitiveness) and H6<sub>FG</sub> (with respect to firm growth). In general, this is in line with the previous studies on the role of KM in enhancing firm performance (e.g., Games and Rendi, 2019; Rossi et al., 2020; Urban & Matela, 2022) and, in particular, firm competitiveness (see, e.g., Ghasemi et al., 2021; Holsapple & Singh, 2001; Mao et al., 2016; Mahdi et al., 2019) and firm growth (see, e.g., Garcia-Vega, 2006; Grillitsch et al., 2019; Lin & Chang, 2015; Kang et al., 2019). The observed lack of an impact on financial performance was contrary to the previous evidence in this regard (see, e.g., Chaithanapat et al., 2022; Forstenlechner et al., 2009; Luhn et al., 2017; Srivastava et al., 2006). This result can be connected with high cost of developing KM; this suggests that, when developing KM, companies should not expect increases in financial performance (especially in the short term) due to the investments that are necessary for developing an IS infrastructure that supports KM (similar to the development of IM). The observed differences in the results regarding the impacts of IM and KM on performance provided additional arguments for distinguishing IM and KM and examining their impacts separately.

This study tested several hypotheses that reflected mediating effects. Hypothesis H7 posited that IM could mediate the relationship between EO and KM; the results from PLS-SEM provided support for this hypothesis. This showed the existence of links between IM and KM in the EO context and justified distinguishing IM from KM. This finding corresponds with the previously discussed studies on the links between EO and IM as well as between EO and KM (see, e.g., Acs et al., 2009; Fuentes Fuentes et al., 2010; Shane, 2000; Shane & Venkataraman, 2000; Song et al., 2017; Wiklund & Shepherd, 2003). This adds value to the previous studies by revealing the complexity of the links among EO, IM, and KM (including the mediating role of IM).

The remaining hypotheses were related to the mediating roles of IM and KM in the context of entrepreneurial performance. These corresponded to the position that the impact of EO on firm performance is not direct and that mediating variables should be considered (Anwar et al., 2022; Covin and Wales, 2019) as well as that the impact of IM on firm performance should be explored (Edwards, 2022). Thus, Hypothesis H8 proposed that IM can mediate the relationship between EO and firm performance (H8); in particular, firm competitiveness (H8<sub>FG</sub>), firm growth (H8<sub>FG</sub>), and financial performance (H8<sub>FP</sub>). The PLS-SEM based examination revealed partial mediation regarding firm growth (thus, supporting H8<sub>FG</sub>). This means that EO can affect firm growth directly (according to H1<sub>FG</sub>) or through IM. This confirmed the supportive role of IM in strengthening the growth that is derived from entrepreneurial activities (as was previously reported by Rodrigues and Raposo, 2011). The sub-hypotheses that pertained to firm competitiveness ( $H8_{FC}$ ) and financial performance ( $H8_{FP}$ ) were not supported. These should be interpreted in the same way as in the cases of Hypotheses  $H5_{FC}$  and  $H5_{FP}$ .

Hypothesis H9 posited that KM can mediate the relationship between EO and firm performance; in particular, firm competitiveness (H9<sub>FC</sub>), firm growth (H9<sub>FG</sub>), and financial performance (H9<sub>FP</sub>). The results of the quantitative examination provided support for H9<sub>FC</sub> and H9<sub>FG</sub>; a partial mediation of KM could be observed in the case of the impact of EO on firm competitiveness and firm growth, respectively. These findings were in line with the previous studies that showed the mediating role of KM in the relationship between EO and performance (Adam & Mahadi, 2018) as well as between EO and specific outcomes of a company such as innovation performance (Madhoushi et al., 2011) or green innovation (Shehzad et al., 2023). These findings also corresponded with those studies that posited the mediating roles of knowledge-related characteristics (such as the knowledge-creation process, knowledge acquisition, or organizational learning in the EO/performance relationship; see, e.g., Dung et al., 2020; Horng et al., 2023; Li et al., 2009).

Furthermore, the mediating role of KM in the IM/performance relationship was tested; Hypothesis H10 posited that KM could mediate the relationship between IM and firm performance (in particular firm competitiveness [H10<sub>FC</sub>], firm growth [H10<sub>FG</sub>], and financial performance [H10<sub>FP</sub>]). The results from PLS-SEM revealed the full mediation of KM in the impact of IM on firm competitiveness (thus, H10<sub>FC</sub> was supported). In the case of firm growth, a partial mediation could be observed (therefore, H10<sub>FG</sub> was supported). These findings confirmed the previous observations that KM could play mediating roles in different contexts (see, e.g., Chaithanapat et al., 2022; Hossain et al., 2022) as well as a supportive role regarding information-related processes (see, e.g., Herman et al., 2020; Kumar & Mokha, 2022) and, finally, various aspects of the managerial process, including the adaptability to market changes (see, e.g., Masud et al., 2021; Salameh et al., 2020) or customer loyalty and firm profitability (see, e.g., Gazi et al., 2024). This study provides detailed evidence on the dimensions of performance that are affected by IM through the mediation of KM (i.e., firm competitiveness and growth). In line with Hypothesis H6<sub>FP</sub>, the results from PLS-SEM did not provide support for Hypothesis H10<sub>FP</sub>; this means that the impact of IM on financial performance is not mediated by KM.

Finally, Hypothesis H11 posited that the relationship between EO and firm performance (in particular, firm competitiveness  $[H11_{FC}]$ , firm growth  $[H11_{FG}]$ , and financial performance  $[H11_{FD}]$ ) could be sequentially mediated by IM and KM. This hypothesis was supported in terms of firm competitiveness (H11<sub>FC</sub>) and firm growth (H11<sub>FG</sub>); the results from PLS-SEM revealed the partial mediations of IM and KM. This observation confirmed the fact that the roles of IM and KM in strengthening entrepreneurial efforts for increasing performance can be complex (as previous research has suggested; see, e.g., Kollmann & Stöckmann, 2014; Song et al., 2017; Sok et al., 2017; Song et al., 2019). The confirmed sequential relationships revealed the complexity of the links among EO, IM, KM, and performance. Moreover, the examined relationships did not occur in the cases of all of the examined dimensions of performance; these were not confirmed in the case of financial performance (consequently, H11<sub>FP</sub> was not supported by the results from PLS-SEM). This showed that sequential relationships should not be treated as obvious contrary, their appearances are rather unique due to the number of conditions that must be met. This part of the study was in line with other efforts to reflect the complexity of entrepreneurial performance, which can be affected by other factors that play moderating or mediating roles (see, e.g., Aloulou, 2024; Cruz Rincon et al., 2023; Jeong et al., 2019), including those that are focused on SMEs (see, e.g., Khan et al., 2024; Xia et al., 2024).

Based on the study's findings (from PLS-SEM, fsQCA, and the qualitative survey) as well as the review of the literature, we formulated several propositions regarding research on EO, IM, KM, and

performance as well as the relationships among them. The central position in the theoretical model belongs to IM and KM. The findings confirmed a strong tie between IM and KM and their roles in shaping firm performance. Regarding the relationship between IM and KM, the findings confirmed the assumption that KM is affected by IM (as proposed in H4), which was retrieved from the proposition of Davenport and Prusak (1998) that knowledge is derived from information. The causal role of IM in the relationship between IM and KM reflected and confirmed the above-mentioned relationship between information and knowledge to some degree as well as the strength of this tie (Kebede, 2010) and the role of information in knowledge-focused activities (Edwards, 2022). The unveiled impact of IM on KM questions the collective treatment of IM and KM (c.f. Carrillo & Chinowsky, 2006) and highlights the need to clearly distinguish IM from KM in IM or KM studies. In the combinations that were unveiled via fsOCA. IM and KM accompany EO in leading to FC, FG, and FP. In the case of FG, however, the combination of IM and FG (without EO) can also lead to increased performance. The qualitative study indicated that, in small firms, some managers distinguished IM and KM and others did not. This also challenges the research on IT and IS, as their impacts (as well as how they are affected) can be different depending on the IM or KM context. Similarly, such a distinction can be important in innovation-focused studies.

Furthermore, this research showed that KM could mediate the impact of IM on performance. In particular, the results of PLS-SEM proved that KM fully mediated the impact of IM on FC and partially mediated the impact of IM on FG (as posited in Hypotheses  $H10_{FC}$  and  $H10_{FG}$ , respectively); these observations showed that the impact of IM on performance could be also indirect. Thus, we propose the following:

**Proposition 1.** As IM and KM constitute separated constructs, the interactions between them (including their mediating roles) should be considered.

The findings indicated that IM impacted firm performance (as proposed in H5). This confirmed the previous studies that showed that firm performance was positively affected by IM (e.g., Gligor & Holcomb, 2012; Kettinger & Marchand, 2011; Khan et al., 2020; Mithas et al., 2011; Prajogo et al., 2018). FsQCA indicated that, when accompanied by EO, IM can lead to FG, FC, and FP. Also, the qualitative study showed that managers value IM as a facilitator of the performances of their firms. However, the detailed findings from PLS-SEM showed that the impact varied depending on the type of outcome. In particular, IM impacted only one of the three examined dimensions of performance (namely, FG). IM did not impact CF nor FP.

The findings indicated that KM also impacted firm performance (as posited in H6). This was in line with previous studies that showed that firm performance was positively affected by KM (see, e.g., Forstenlechner et al., 2009; Ghasemi et al., 2021; Luhn et al., 2017). FsQCA showed that, when accompanied by EO, KM can lead to all of the examined dimensions of performance. Also, the qualitative study indicated that KM was perceived by managers as an important determinant of firm performance; this can be especially significant during a crisis. However, the detailed examination with PLS-SEM showed that KM affected FG and FC; this confirmed the previous findings of Al-Sa'di et al. (2017); Holsapple and Singh (2001); Malhotra (1998). KM did not affect FP. This can be associated with the increased costs of developing IM and KM processes (Holste & Fields, 2010).

The observation that IM and KM impacted firm performance was somehow in line with numerous works that indicated that both information and knowledge were among the crucial resources that increased firm performance (De Clercq & Arenius, 2006; Masango & Marinova, 2014; Nonaka & Toyama, 2015). This was also evidenced by the results of the qualitative research. The managers indicated that they used the appropriate IT tools to manage the large amounts of information that cover different areas of the business. However, information and knowledge need to be sufficiently managed in order to enable them to contribute to firm performance. The detailed analysis of the impact of IM and KM on the particular dimensions of firm performance led us to posit the following:

**Proposition 2.** IM and KM affects performance in different ways, and their impacts vary depending on the dimension of performance. In particular, both IM and KM positively affect FG and do not affect FP; in terms of FC, only KM has an impact.

The results regarding IM and KM showed that they were affected by EO (as proposed in H2 and H3, respectively). Specifically, this was visible in the results from PLS-SEM, the analysis of the sufficient conditions, and the qualitative study. For example, the managers confirmed during their interviews that, when people are entrepreneurial, they search for knowledge. These results were in line with previous evidence regarding the utilization of knowledge (Głodowska et al., 2019), knowledge acquisition (Dung et al., 2021) and organizational learning (Kreiser, 2011; Zhao et al., 2011), which were all influenced by EO. Owing to the distinguishment of IM and KM, this study additionally confirmed the impact of EO on IM. The findings regarding IM and KM were consistent with knowledge spillover theory of entrepreneurship (Audretsch et al., 2006; Ferreira et al., 2017) according to which entrepreneurship can facilitate knowledge to spill over (Block et al., 2013) by serving as a conduit for knowledge spillovers (Audretsch et al., 2006). The same findings emerged from the interviews, during which the interviewees indicated that they had introduced rules within KM and IM for their employees in order to share the knowledge that was gained in their companies. The study's findings also unveiled the fact that IM can partially mediate the impact of EO on KM. This corresponds with the reasoning that information about a market needs to be transformed into relevant knowledge (Davenport & Prusak, 1998) in order to enable an entrepreneur to identify an opportunity (as proposed by Acs et al., 2009; D'Souza, 2010; Shane, 2000; Stevenson & Jarillo, 1990) - entrepreneurial posture (expressed in EO) can be a source of motivation for searching for information and knowledge and developing relevant solutions (i.e., IM and KM).

# Proposition 3. Both IM and KM are affected by EO.

The study's findings showed that EO positively affected performance in all of the examined dimensions, namely, FC, FG, and FP (as proposed in Hypotheses  $H1_{FC}$ ,  $H1_{FG}$ , and  $H1_{FP}$ ). These findings provided strong support for the other studies that have indicated a positive EO/performance relationship (e.g., Block et al., 2013; Dess et al., 2003; Gupta & Sebastian, 2017; Kraus et al., 2012; Veselinović et al., 2021). Concurrently, the findings are contrary to those studies that suggested that the impact of EO on performance is irrelevant or negative. However, we should remember the role that was played by the context when considering this relationship and be aware of the scope of the examined sample in this study.

In particular, the results from PLS-SEM and fsQCA confirmed the positive impact of EO on FC (as proposed in Hypothesis H1<sub>FC</sub>). This finding was in line with previous research on EO and competitive advantage (as reported by Mahmood and Hanafi (2013) and Kiyabo and Isaga (2020) and sustained competitive advantages (Tajeddini et al., 2023). Similarly, the previous evidence on the relationship between EO and FG (e.g., Lechner & Dowling, 2003; Reijonen et al., 2015) was confirmed with fsQCA and the qualitative study, whereas the positive impact of EO on firm growth (reported by, e.g., Covin et al., 2006; Ferreira et al., 2011; Martins, 2016; Moreno & Casillas, 2008; Soininen et al., 2012, and Omisakin & Adegoke, 2022) was confirmed with the PLS-SEM analysis that referred to Hypothesis H1<sub>FG</sub>. Regarding the impact of EO on FP (proposed in Hypothesis H1<sub>FP</sub>), the findings from PLS-SEM were in line with those studies that reported the positive impact (e.g., Adomako, 2018; Fuentes-Fuentes et al., 2015; Tajeddini & Mueller, 2019, and Wilson & Perepelkin, 2022). Additionally, the findings from fsQCA revealed the presence of EO in combinations that led to FP.

The same analysis could be observed from the perspective of those

factors that led to performance. The observation that EO impacted all of the examined dimensions of performance (supported by the evidence regarding the links among IM, KM, and performance) led to a general proposition regarding the associations among EO, IM, KM and the dimensions of firm performance. The fsQCA results suggested three specific propositions about combinations that could lead to increased performance. In particular, fsOCA showed that the combination of EO and KM led to the presence of FC, FG, and FP; that is, all of the dimensions of firm performance that were examined. This showed that this combination was quite universal in terms of efficiency. During the qualitative study, the managers also reported the positive impact of KM on performance. With respect to FC and FG, this was confirmed by the PLS-SEM analysis; it showed that EO and KM affected both of these dimensions of performance. However, KM did not affect FP (nor mediated the impact of EO). As stated above, the absence of the impact of KM on FP could be connected with a high level of financial investment in the development of KM, which mitigated the increase in FP in the short term. Nonetheless, the interviews with managers and the results of the fsQCA results encouraged us to make a specific proposition (as follows):

# **Proposition 4a.** : When accompanied by the presence of KM, the presence of EO is essential to the presence of FC, FG, and FP.

Furthermore, fsQCA showed that the presence of EO accompanied by the presence of IM led to the presence of all of the dimensions of performance that were examined (that is, FC, FG and FP). This result deepened our understanding of the factors that affected firm performance. Regarding FG, these results were in line with the results from PLS-SEM, which showed that IM impacted FG and partially mediated the impact of EO on FG; EO also influenced FG. Thus, the combination of EO and IM that was unveiled with fsQCA confirmed the role of both of the interactions between EO and IM in shaping FG. In the case of FC and FP, the results from PLS-SEM showed the absence of a significant impact of IM (and, consequently, the absence of the mediating role of IM in the EO/FC and EO/FP relationships). However, the results from fsQCA added explanations that IM could still be relevant in the FC and FP context despite the lack of its impact, as it can lead to the presence of both of these dimensions of performance when accompanied by EO. The managers who were interviewed during the qualitative study also confirmed the positive role of IM in strengthening firm performance. Consequently, we propose the following:

**Proposition 4b.** : When accompanied by the presence of IM, the presence of EO is essential to the presence of FC, FG, and FP.

Additionally, fsQCA showed the role of IM and KM in stimulating FG; that is, when a combination of IM and KM was present, the presence of FG was observable. Concurrently, this combination did not lead to the presence of FC and FP. These observations were in line with the results from PLS-SEM that showed that IM affected only FG, whereas KM influenced both FC and FG; FP was not affected by IM nor KM. Therefore, these differences regarding the impact of IM and KM on FC were clarified, whereas the lack of an impact on FP was confirmed by the results from fsQCA. The results of the qualitative part of the study were similar (but not as specific); the managers reported that both IM and KM could affect performance; however, they did not specify which dimension of performance. Moreover, the interviews revealed that some managers did not distinguish IM and KM in their managerial practices. Thus, fsQCA helped clarify that both IM and KM were important and, when interacting, could lead to increased FG. To conclude, the presence of a combination of IM and KM was sufficient for the presence of FG regardless of EO. Based on the clarification that was provided by fsQCA, we can posit the following proposition:

**Proposition 4c.** : When accompanied by the presence of KM, the presence of IM is essential to the presence of FG.

This study examined the relationships among EO, IM, KM, and performance. In the case of the EO/IM/KM relationship, the result from the analysis of the sufficient conditions (performed as a part of fsQCA) indicated that EO was a sufficient condition for both IM and KM. The results of the qualitative study also provided arguments for considering the associations among the three factors (i.e., EO, IM, and KM); however, they did not clarify the details of this relationship. Thus, the finding from PLS-SEM that clarified that IM mediated the relationship between EO and KM (as proposed in Hypothesis H7) was crucial.

Additionally, the study investigated the mediating effects in the relationship between EO and performance. Owing to this examination, this study corresponds with the research on the factors that affect the relationship between EO and performance (e.g., Moreno & Casillas, 2008; Rosenbusch et al., 2013; Wójcik-Karpacz et al., 2019). In this regard, this study provides in-depth explanations of the roles that are played by the particular variables. Thus, PLS-SEM showed that IM mediates the relationship between EO and firm growth (as posited in H8<sub>FG</sub>) but does not play a mediating role in the case of FC and FP. Among the solutions that were identified with fsQCA, there are those that consist of EO and IM as factors that lead to increases of all of the examined dimensions of firm performance; these indicate the interactions of EO and IM in shaping performance.

PLS-SEM showed that KM mediates the relationships between EO and FC as well as between EO and FG (as proposed in H9<sub>FC</sub> and H9<sub>FG</sub>, respectively) but does not in relationship between EO and FP. The results from fsQCA showed that combination of EO and KM lead to increases in FC, FG, and FP; these results confirmed the role of the interaction between EO and KM in enhancing performance. Furthermore, the managers indicated during the qualitative study that the entrepreneurial roots and motivations of their decisions on strengthening IM and KM were ways to increase performance.

PLS-SEM showed that the relationship between EO and FC (as well as between EO and FG) can be sequentially mediated by IM and KM (as proposed in  $H11_{FC}$  and  $H11_{FG}$ , respectively); the sequential mediation was not relevant in the case of FP. The results from fsQCA showed that two combinations (namely, EOxIM and EOxKM) led to increases in each of the examined dimension of performance; however, there was no combination of EOxIMxKM. These results indicated that the roles of EO, IM, and KM can be complex in shaping performance. Also, the qualitative study supported the findings regarding the sequential mediation to some extent. Namely, the interviewed managers indicated the significance of both IM and KM in enhancing the performances. The above observations (along with the previously discussed mediating role of KM in the IM/performance relationship) led to the following proposition:

**Proposition 5.** The relationships among EO, IM, KM, and performance are complex and may include mediating effects.

The latter proposition indicates the necessity of employing sophisticated models and methodologies in order to examine the relationships among EO, IM, KM, and performance.

The study's results on the mediating effects of both IM and KM regarding the impact of EO on performance (specifically, FG and FC) were consistent with the general observation that IM and KM play roles in EO/performance relationships (e.g., Dung et al., 2020; Li et al., 2009; Karami & Tang, 2019).

#### 7.1. Theoretical contributions and implications

This study contributes to two research streams; namely, IM/KM, and entrepreneurship theory. The study confirms the roles of IM and KM in shaping firm performance. Additionally, it indicates the roles of IM and KM in entrepreneurial activity that is aimed at increasing performance; in particular, it unveils the partial mediation of IM in the EO/FG relationship and the partial mediation of KM in the EO/FC and EO/FG relationships. Also, the study shows that KM fully mediates the impact of IM on FC and partially mediates the impact of IM on FG. It also indicates that IM and KM do not affect FP. Additionally, fsQCA showed that both conditions (IM and KM) present together were sufficient conditions that led to a high level of performance (FC, FG, FP). This confirmed their importance regardless of the entrepreneurial strategy background. When considering the sample context, one more contribution arises; this is the fact that IM and KM can play important roles in low knowledgeintensity industries (in this case, in furniture manufacturing). However, the most original and valuable contribution to this field might lie in exploring a relationship that is placed in the middle of the theoretical model among the other relationships - this is the impact of IM on KM. Both IM and KM (as well as their ties) have been the subjects of numerous studies (mixed or separated), but their association has yet to be examined through a cause-and-effect analysis. This study proposes a theoretical model that distinguishes KM from IM and provides empirical evidence that IM impacts KM. This finding explains the ambiguities regarding the relationship between IM and KM and are indications for future studies that strive to deepen our understanding of the determinants of the efficiency of IM and KM (also in the context of their associations with IT and IS). Nowadays, the increasing volume of information and its role in managing organizations challenge all information- and knowledge-related processes. Thus, any research on IM, KM, and IS that can contribute to their development would be quite valuable.

This study also contributes to entrepreneurship literature. It confirms the impact of EO on firm performance and unveils the mediating roles of IM and KM in improving FC and FG; concurrently, it shows that IM and KM do not play mediating roles in EO's impact on FP. Additionally, this examination contributes to small business studies, as it clarifies the roles of EO, IM, and KM in small companies. As KM has mainly been examined in large companies (Durst et al., 2023), this contribution is valuable. This study also contributes to the emerging knowledge-based theory of entrepreneurial firms (Mostafiz et al., 2023) by providing evidence from small manufacturing firms regarding the roles of IM and KM in the EO context.

#### 7.2. Implications for practice

This study offers several implications for managerial practice. First, this study shows that, in order to increase performance, managers should improve EO, IM, and KM. Our study shows that this is also relevant in the cases of companies that operate in traditional industries where the knowledge intensity is low (as the findings were obtained in a sample that represented such an industry). The qualitative part of this study provided several practical recommendations in this regard; these were based on the experiences of the interviewed managers regarding the implementation, management, and development of IM and KM in their companies. Some of them highlighted the importance of management determination in implementing IM and KM; i.e., a company's managers must have an entrepreneurial attitude, be willing to make changes, and take the associated risks. Since the development of IM and KM is a complex and long-term process, it is necessary to choose one area to start with and define their medium- and long-term goals so that it is not a one-time task. It is important to choose a key area of change to start with and then form a project team that will be responsible for preparing and implementing KM and IM. One respondent recommended several steps in implementing IM/MK in a company. First, it is necessary to define the information areas in the company and then create databases with technical information and link them to the material base and price calculations as well as to supplier and customer information. The next step is to gather knowledge of the company's resources (personnel, physical, and material). And finally, it is necessary to determine what the company has at its disposal (which resources) in order to identify any bottlenecks; this will allow the company to use its resources efficiently and produce competitive products. In another company, the first step was to organize the organizational structure so that the flow of information was smooth (that is, information arrived where it needed to

reach by the shortest route); this required changes at every level. After this, it was necessary to establish procedures that ensured the quality of the performed actions and minimize any risks and wasted time. For the above to be successful, it was necessary to inform all of the employees in the company about the planned changes and their purposes. In particular, it was necessary to explain to the employees that the changes were not aimed at worsening their positions in the company but rather at improving the company's operations. Working on building trust within the team and preparing employees for teamwork would be very helpful in this process. An important element of IM and KM is the proper division of work and the delegation of tasks to the lower levels of an organization. This is an important issue in small and medium-sized companies - especially those that have been developed by the owners from the beginning. In such companies, the owners still often try to control all of the processes despite the growth of the company, but they should only focus on strategic processes. Another important factor is to promote knowledge-sharing among employees; this can require the creation of a culture of knowledge-sharing at all levels of an organizational structure. A manager should share knowledge with his/her employees, and the employees should also share this knowledge with their colleagues on the team; in this way, a synergistic effect can be achieved. Working in knowledge-based organizations requires employees (including managers) to learn continuously. For some of them, this could be challenging; therefore, a company needs to support them. In one examined company, an external company that specialized in HR was engaged to provide coaching for its employees. Some managers pointed out that, without the right IT tools, information and knowledge cannot be managed effectively, so it is necessary to determine which tools will be used to collect and analyze the data. Finally, some managers pointed to the impact of current regulations on the development of IM and KM in their companies. Due to the high cost of introducing new solutions in this area, tax regulations play a special role. Two of the interviewed companies benefited from public support in developing their KM systems; this support, they said, was crucial in making decisions on KM development (which proved to be very successful). This observation provides guidance for policymakers in creating conditions that encourage small businesses to invest in and develop IM and KM.

Second, this study implies that, depending on specific performancerelated objectives, managers should focus on different factors. For example, whereas EO positively influences all of the considered dimensions (i.e., FC, FG, and FP), KM and IM are not so universal, and they do not affect FP. In particular, when managers focus their efforts on enhancing firm competitiveness or financial performance, they should improve EO and KM; IM is not relevant in terms of affecting competitiveness. When managers want to support firm growth, they can additionally develop IM, because EO, IM, and KM all impact firm growth; moreover, these three factors together represent more than 50 % of the variability of growth. To improve KM, managers should enhance EO and IM. Finally, managers need to develop EO in order to improve IM; moreover, they should remember the sequential relationships (which are relevant in the cases of the competitiveness and growth of their companies) that are as follows: improving EO can enhance IM, which in turn positively affects firm growth and KM (which affect FC and FG). The presence of these chain relationships is an additional argument for developing EO and IM, which directly affect performance as well as the other factors that have an impact on performance (thus, EO and IM also affect performance in an indirect manner).

Third, this study shows that the relationship between EO, IM, KM and performance can be complex which means that, in practice, improving performance through the development of EO, IM and KM can be difficult for entrepreneurs. In particular, managers should consider the interactions among these factors. This study provides three recommendations for managers regarding the improvement of firm performance. Regardless of any expected results (namely, the competitiveness, growth, or financial performance of a company), managers should develop their entrepreneurial orientation along with information management or knowledge management; these combinations (i.e., EOxIM and EOxKM) can lead to increases in FC, FG, and FP. In the case of improving firm growth, one more combination can be expected; namely, IM and KM; if IM and KM interact with each other, the presence of EO is not required. Therefore, managers should be aware of the interactions among the factors that are expected to lead to increases in performance.

# 7.3. Limitations and future research directions

When interpreting the findings of this study, its limitations should be considered. This study presents the results of a survey that examines a non-diverse sample; the companies that were included in the sample represent only one country (Poland), one industry (furniture manufacturing), and two size categories (small and medium). The sample characteristics can affect the obtained results; thus, future studies are recommended for examining the relationships among EO, IM, KM, and performance in other locations, industry, and organizational contexts (or with a diverse sample). This study distinguishes IM from KM and proposes the original operationalization of both factors; however, the implementations of other operationalizations that reflect other understandings or scopes of the variables can lead to results that vary from those that were obtained in this analysis. Even though this study employed three methods that represented different approaches (i. e., PLS-SEM, fsQCA, and an interview-based qualitative study) to augment and ensure the reliability of the obtained results, implementing other methods or research procedures may unveil other findings. This study tests a model that reflects the mediating roles of IM and KM in the relationships between EO and performance. However, other configurations (resulting in other models) can be considered as well. For example, IM and KM can be tested as moderators, and the relationship between IM and KM can be considered to be bilateral (and reflected in the model as correlation). Thus, it is recommended to replicate this study in other contexts and with other methods in order to confirm and deepen the findings that were provided by this study.

# 8. Conclusions

This study confirmed the importance of EO, IM, and KM in improving small firm performance; it revealed the interdependencies among them as well as the mediating roles that are played by IM and KM. Moreover, the study showed that the impacts of the tested factors (both direct and indirect) vary depending on the type of performance (in this case, competitiveness, growth, and financial performance). This wide branch of the findings corroborates the relevance of studies on IM and KM in the

#### Appendix A. Single factor test

context of entrepreneurial orientation and performance. Additionally, it indicates several aspects that merit the attention of researchers that include other entrepreneurial behaviors (e.g., competing or networking) and dimensions of IM and KM (e.g., acquiring or sharing) that can interact and determine firm performance (which also includes other dimensions of performance, such as sales or sustainability). This study confirmed the usefulness of both quantitative and qualitative approaches that can be employed in future investigations.

# Funding

This work has been supported by the AGH University of Krakow, Poland (funds for the maintenance and development of the research capacity of the Faculty of Management of the AGH University of Krakow and grant received by Rafał Kusa under "Excellence initiative – research university" for the AGH University of Krakow) and HORIZON EUROPE Framework Programme (Award Number: HORIZON-MSCA-2021-SE-01–1 / Project 101086381).

# CRediT authorship contribution statement

**Rafal Kusa:** Writing – review & editing, Writing – original draft, Validation, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Marcin Suder:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Joanna Duda:** Writing – review & editing, Writing – original draft, Validation, Supervision, Resources, Methodology, Investigation, Formal analysis, Conceptualization.

## **Declaration of Competing Interest**

None.

# Acknowledgements

This submission is part of the virtual special issue (VSI) on "The role of emerging technologies for business growth (VSI: Emerging Tech)." The authors wish to thank the guest editors and reviewers for their constructive and timely review comments and valuable suggestions, which helped to significantly develop this submission. The authors are also grateful to the Polish Chamber of Commerce of Furniture Manufacturers for its support in conducting the interviews for the qualitative part of the study.

Component	Initial eigenval	Initial eigenvalues			Extraction sums of squared loadings			
	Total	% of Variance	% Cumulative	Total	% of Variance	% Cumulative		
1	10.953	34.228	34.228	10.953	34.228	34.228		
2	2.697	8.427	42.655					
3	1.870	5.844	48.498					
4	1.734	5.419	53.918					
5	1.501	4.691	58.609					
6	1.242	3.882	62.491					
7	1.143	3.571	66.062					
8	0.997	3.115	69.177					
9	0.847	2.647	71.823					
10	0.803	2.508	74.332					
11	0.764	2.388	76.719					
12	0.708	2.212	78.931					
13	0.635	1.986	80.917					
14	0.625	1.953	82.869					
15	0.543	1.696	84.565					

# (continued)

Component	Initial eigenvalues			Extraction sums of squared loadings			
	Total	% of Variance	% Cumulative	Total	% of Variance	% Cumulative	
16	0.503	1.572	86.137				
17	0.481	1.502	87.639				
18	0.461	1.440	89.079				
19	0.431	1.347	90.427				
20	0.366	1.142	91.569				
21	0.352	1.099	92.668				
22	0.313	0.977	93.645				
23	0.300	0.938	94.583				
24	0.278	0.869	95.452				
25	0.240	0.751	96.204				
26	0.226	0.707	96.911				
27	0.210	0.657	97.568				
28	0.195	0.609	98.176				
29	0.190	0.593	98.770				
30	0.162	0.508	99.277				
31	0.128	0.399	99.676				
32	0.104	0.324	100.000				

Note: Principal Component Analysis is a Extraction method.

#### References

- Acar, M. F., Tarim, M., Zaim, H., Zaim, S., & Delen, D. (2017). Knowledge management and ERP: Complementary or contradictory? *International Journal of Information Management*, 37(6), 703–712.
- Acs, Z. J., Braunerhjelm, P., Audretsch, D. B., & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, 32, 15–30.
- Adam, S., & Mahadi, B. (2018). The mediating role of knowledge management in ebusiness in Malaysia. Asia-Pacific Management Accounting Journal, 13(3), 1–25.
- Adomako, S. (2018). The moderating effects of adaptive and intellectual resource capabilities on the relationship between entrepreneurial orientation and financial performance. *International Journal of Innovation Management*, 22(3), 1850026.
- Adomako, S., & Danso, A. (2014). Financial literacy and firm performance: The moderating role of financial capital availability and resource flexibility. *Journal of Management and Organizational Studies*, 3(4), 1–15.
- Agarwal, R., Audretsch, D., & Sarkar, M. (2010). Knowledge spillovers and strategic entrepreneurship. Strategic Entrepreneurship Journal, 4, 271–283.
- Ahinful, G. S., Boakye, J. D., & Osei Bempah, N. D. (2023). Determinants of SMEs' financial performance: evidence from an emerging economy. *Journal of Small Business & Entrepreneurship*, 35(3), 362–386.
- Ajmal, M. M., Kekäle, T., & Takala, J. (2009). Cultural impacts on knowledge management and learning in project-based firms. *The Journal of Information and Knowledge Systems*, 39(4), 339–352.
- Al-Emran, M., Mezhuyev, V., Kamaludin, A., & Shaalan, K. (2018). The impact of knowledge management processes on information systems: A systematic review. *International Journal of Information Management*, 43, 173–187.
- Alexy, O., West, J., Klapper, H., & Reitzig, M. (2018). Surrendering control to gain advantage: Reconciling openness and the resource-based view of the firm. *Strategic Management Journal*, 39(4), 1704–1727.
- Al-MSloum, A. S. H., & Alharbi, I. M. (2022). Application and trends in information management system using artificial intelligence. *Materials Today: Proceedings*. https://doi.org/10.1016/j.matpr.2021.03.308
- Al-Sa'di, A. F., Abdallah, A. B., & Dahiyat, S. E. (2017). The mediating role of product and process innovations on the relationship between knowledge management and operational performance in manufacturing companies in Jordan. *Business Process Management Journal*, 23(2), 349–376.
- Ali, F., Rasoolimanesh, S. M., Sarstedt, M., Ringle, C. M., & Ryu, K. (2018). An assessment of the use of partial least squares structural equation modeling (PLS-SEM) in hospitality research. *International Journal of Contemporary Hospitality Management*, 30 (1), 514–538.
- Aloulou, W. J. (2024). Entrepreneurial orientation and innovation performance of Saudi firms: A sequential mediation model of absorptive capacity and innovation capability. *FIIB Business Review*, 23197145231220426.
- Altındağ, Ö., & Öngel, V. (2021). Information Management, organizational intelligence, and innovation performance triangle: Empirical research on Turkish It firms. Sage Open, 11(4), 21582440211052550.
- Ameen, N., Choudrie, J., Jones, P., & Anand, A. (2022). Innovative technologies and small-medium sized enterprises in times of crisis. *Information Systems Frontiers*, 24, 1055–1060.
- Anumba, C. J., Egbu, C., & Carrillo, P. (Eds.). (2008). Knowledge Management in Construction. John Wiley & Sons.
- Anwar, M., Clauss, T., & Issah, W. B. (2022). Entrepreneurial orientation and new venture performance in emerging markets: The mediating role of opportunity recognition. *Review of Managerial Science*, 16(3), 769–796.
- Audretsch, D. B., Keilbach, M. C., & Lehmann, E. E. (2006). Entrepreneurship and Economic Growth. Oxford University Press,.

- Audretsch, D. B., Belitski, M., Caiazza, R., & Lehmann, E. E. (2020). Knowledge management and entrepreneurship. *International Entrepreneurship and Management Journal*, 16, 373–385.
- Avgerou, C., & McGrath, K. (2007). Power, rationality, and the art of living through sociotechnical change. MIS Quarterly, 295–315.
- Barnes, S. J. (2020). Information management research and practice in the post-COVID-19 world. International Journal of Information Management, 55, Article 102175.
- Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120.
- Barney, J. B., Ketchen, D. J., Wright, M., Wan, W. P., Haskisson, R. E., Short, J. C., & Yiu, D. W. (2010). Resource-based theory and corporate diversification:
- Accomplishments and opportunities. *Journal of Management, 37*(5), 1335–1368. Basco, R., Hernández-Perlines, F., & Rodríguez-García, M. (2020). The effect of
- entrepreneurial orientation on firm performance: A multigroup analysis comparing China, Mexico, and Spain. *Journal of Business Research*, 113, 409–421.
- Battisti, M., & Deakins, D. (2017). The relationship between dynamic capabilities, the firm's resource base and performance in a post-disaster environment. *International Small Business Journal*, 35(1), 78–98.
- Bernerth, J. B., & Aguinis, H. (2016). A critical review and best-practice
- recommendations for control variable usage. *Personnel Psychology*, 69(1), 229–283. Block, J. H., Thurik, R., & Zhou, H. (2013). What turns knowledge into innovative products? The role of entrepreneurship and knowledge spillovers. *Journal of*
- Evolutionary Economics, 23, 693–718. Bolisani, E., & Bratianu, C. (2017). Knowledge strategy planning: An integrated approach
- to manage uncertainty, turbulence, and dynamics. Journal of Knowledge Management, 21(2), 233–253.
   Bouguerra, A., Hughes, M., Cakir, M. S., & Tatoglu, E. (2023). Linking entrepreneurial
- Bouguerra, A., Hugnes, M., Cakr, M. S., & Latogu, E. (2023). Linking entrepreneurnal orientation to environmental collaboration: A stakeholder theory and evidence from multinational companies in an emerging market. *British Journal of Management, 34* (1), 487–511.
- Bouthillier, F., & Shearer, K. (2002). Understanding knowledge management and information management: The need for an empirical perspective. *Information Research*, 8(1), 8–1.
- Braganza, A., Brooks, L., Nepelski, D., Ali, M., & Moro, R. (2017). Resource management in big data initiatives: Processes and dynamic capabilities. *Journal of Business Research*, 70, 328–337.
- Braunerhjelm, P., Acs, Z. J., Audretsch, D. B., & Carlsson, B. (2010). The missing link: knowledge diffusion and entrepreneurship in endogenous growth. *Small Business Economics*, 34(2), 104–125.
- Breschi, S., Lissoni, F., & Malerba, F. (2003). Knowledge-relatedness in firm technological diversification. *Research Policy*, 32(1), 69–87.
- Calabrò, A., Santulli, R., Torchia, M., & Gallucci, C. (2021). Entrepreneurial orientation and family firm performance: The moderating role of TMT identity-based and knowledge-based faultlines. *Entrepreneurship Theory and Practice*, 45(4), 838–866.
- Campbell, D., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, *54*, 297–312.
- Carrillo, P., & Chinowsky, P. (2006). Exploiting knowledge management: the engineering and construction perspective. *Journal of Management in Engineering*, 22(1), 2–10.
- Cerchione, R., & Esposito, E. (2017). Using knowledge management systems: A taxonomy of SME strategies. *International Journal of Information Management*, 37(1), 1551–1562.
- Cerchione, R., Esposito, E., & Spadaro, M. R. (2016). A literature review on knowledge management in SMEs. Knowledge Management Research & Practice, 14, 169–177.
- Chae, B., & Bloodgood, J. M. (2006). The paradoxes of knowledge management: An eastern philosophical perspective. *Information and Organization*, 16(1), 1–26.
- Chaithanapat, P., Punnakitikashem, P., Oo, N. C. K. K., & Rakthin, S. (2022). Relationships among knowledge-oriented leadership, customer knowledge

#### R. Kusa et al.

management, innovation quality and firm performance in SMEs. Journal of Innovation & Knowledge, 7, Article 100162.

- Chen, S., Zeng, Y., Majdi, A., Salameh, A. A., Alkhalifah, T., Alturise, F., & Ali, H. E. (2023). Potential features of building information modelling for application of project management knowledge areas as advances modeling tools. *Advances in Engineering Software*, 176, Article 103372.
- Chin, W. W. (2010). How to write up and report PLS analyses. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares: Concepts, methods and applications* (pp. 655–690). Heidelberg, Dordrecht, London, New York: Springer.
- Choi, Y. S. (2000). An empirical study of factors affecting successful implementation of knowledge management. Lincoln, United States: University of Nebraska (Ph.D. Thesis).

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Mahwah, NJ: Lawrence Erlbaum.

- Covin, J. G., Green, K. M., & Slevin, D. P. (2006). Strategic process effects on the entrepreneurial orientation – Sales growth rate relationship. *Entrepreneurship Theory* and Practice, 30(1), 57–81.
- Covin, J. G., & Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments. Strategic Management Journal, 10(1), 75–87.
- Covin, J. G., & Wales, W. J. (2019). Crafting high-impact entrepreneurial orientation research: Some suggested guidelines. *Entrepreneurship Theory and Practice*, 43(1), 3–18.
- Cruz Rincon, M. L., Agredo Diaz, M. L., & Puente, R. C. (2023). Is entrepreneurship enough to achieve superior performance in SMEs in emerging countries? Multiple mediation of market orientation and marketing capabilities. *Journal of Entrepreneurship in Emerging Economies*, 15(5), 945–966.

Davenport, T. H. (1994). Saving IT's Soul: Human centered information management. Harvard Business Review, 72(2), 119–131.

- Davenport, T. H., & Marchand, D. A. (2000). Is KM just good information management? In D. Marchand, A. Davenport, T. H., & T. Dickson (Eds.), *Financial times mastering information management*. London: Financial Times/Prentice Hall.
- Davenport, T. H., & Prusak, L. (1998). Working knowledge: How organizations manage what they know. Boston: Harvard Business School Press.
- Davis, G. B. (2000). Information systems conceptual foundations: Looking backward and forward. In Organizational and social perspectives on information technology (pp. 61–82). Boston, MA: Springer.
- Dayan, M., Ng, P. Y., Husain, Z., & Zacca, R. (2023). Effects of constructive politics and market turbulence on entrepreneurial orientation–performance relationship: A moderated mediation model. *European Management Journal*, 41(3), 385–394.
- De Clercq, D., & Arenius, P. (2006). The role of knowledge in business start-up activity. *International Small Business Journal*, 24, 339–358.
- Devece, C., Palacios, D., & Martinez-Simarro, D. (2017). Effect of information management capability on organizational performance. *Service Business*, 11, 563–580.
- Deng, H., Xu, Y., Deng, Y., & Lin, J. (2022). Transforming knowledge management in the construction industry through information and communications technology: A 15year review. Automation in Construction, 142, Article 104530.
- Dess, G. G., Ireland, R. D., Zahra, S. A., Floyd, S. W., Janney, J. J., & Lane, P. J. (2003). Emerging issues in corporate entrepreneurship. *Journal of Management*, 29(3), 351–378.
- Detlor, B. (2009). Information management. In *Encyclopedia of library and information sciences*. Taylor & Francis,
- Devaraj, S., Krajewski, L., & Wei, J. C. (2007). Impact of eBusiness technologies on operational performance: The role of production information integration in the supply chain. *Journal of Operations Management*, 25, 1199–1216.
- Dickel, D. G., & de Moura, G. L. (2016). Organizational performance evaluation in intangible criteria: a model based on knowledge management and innovation management. *RAI Revista de Administraçã. o e Inovação, 13*(3), 211–220.

Dierickx, I., & Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. *Managerial Science*, 35(12), 1504–1511.

D'Souza, R. (2010). Opportunity Identification: Role of Knowledge Heterogeneity and Opportunity Identification Process. Proceedings of ICSB World Conference, Cincinnati 2010.

Drucker, P. F. (1994). The New Realities. London-New York: Routledge.

Dung, T. Q., Bonney, L. B., Adhikari, R. P., & Miles, M. P. (2020). Entrepreneurial orientation, knowledge acquisition and collaborative performance in agri-food value-chains in emerging markets. *Supply Chain Management*, 25(5), 521–533.

Dung, T. Q., Bonney, L. B., Adhikari, R., & Miles, M. P. (2021). Entrepreneurial orientation and vertical knowledge acquisition by smallholder agricultural firms in transitional economies: The role of interfirm collaboration in value-chains. *Journal of Business Research*, 137, 327–335.

Durst, S., Edvardsson, I. R., & Foli, S. (2023). Knowledge management in SMEs: A followup literature review. Journal of Knowledge Management, 27(11), 25–58.

Dwivedi, Y. K., Hughes, D. L., Coombs, C., Constantiou, I., Duan, Y., Edwards, J. S., Gupta, B., Lal, B., Misra, S., Prashant, P., Raman, R., Rana, N. P., Sharma, S. K., & Upadhyay, N. (2020). Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life. *International Journal of Information Management*, 55, Article 102211.

Edwards, J. S. (2022). Where knowledge management and information management meet: Research directions. *International Journal of Information Management*, 63, Article 102458.

- Elidjen, Hidayat, D., & Abdurachman, E. (2022). The roles of gamification, knowledge creation, and entrepreneurial orientation towards firm performance. *International Journal of Innovation Studies*, 6(4), 229–237.
- Eng, S., & Woodside, A. G. (2012). Configural analysis of the drinking man: Fuzzy-set qualitative comparative analyses. *Addictive Behaviors*, 37(4), 541–543.

- Falahat, M., Lee, Y. Y., Soto-Acosta, P., & Ramayah, T. (2021). Entrepreneurial, market, learning and networking orientations as determinants of business capability and international performance: The contingent role of government support. *International Entrepreneurship and Management Journal*, 17, 1759–1780.
- Falk, R. F., & Miller, N. B. (1992). A primer for soft modeling. University of Akron Press. Ferreira, J., & Fernandes, C. (2017). Resources and capabilities' effects on firm
- performance: What are they? *Journal of Knowledge Management*, 21(5), 1202–1217. Ferreira, J. J., Azevedo, G. S., & Fernandez, R. (2011). Contribution of resource-based view and entrepreneurial orientation on small firm growth. *Cuadernos Délelőtt Gestión*, 11(1), 95–116.
- Ferreira, J. J., Ratten, V., & Dana, L. P. (2017). Knowledge spillover-based strategic entrepreneurship. International Entrepreneurship and Management Journal, 13(1), 161–167.
- Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. Academy of Management Journal, 54(2), 393–420.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Forstenlechner, I., Lettice, F., & Bourne, M. (2009). Knowledge pays for evidence from a law firm. Journal of Knowledge Management, 13(1), 56–68.

Fuentes-Fuentes, M., Bojica, A. M., & Ruiz-Arroyo, M. (2015). Entrepreneurial orientation and knowledge acquisition: effects on performance in the specific context of women-owned firms. *International Entrepreneurship and Management Journal*, 11, 695–717.

- Fuentes Fuentes, M. d M., Ruiz Arroyo, M., Bojica, A. M., & Fernández Pérez, V. (2010). Prior knowledge and social networks in the exploitation of entrepreneurial opportunities. *International Entrepreneurship and Management Journal*, 6, 481–501.
- Fuller, C. M., Simmering, M. J., Atinc, G., Atinc, Y., & Babin, B. J. (2016). Common methods variance detection in business research. *Journal of Business Research*, 69(8), 3192–3198.
- Gallego Gómez, C., & Vaquero Frías, L. (2022). Artificial intelligence and sustainable tourism development: The value of partnerships. ESIC Market, 53(3), Article e281.
- Games, D., & Rendi, R. P. (2019). The effects of knowledge management and risk taking on SME financial performance in creative industries in an emerging market: The mediating effect of innovation outcomes. *Journal of Global Entrepreneurship Research*, 9(1), 1–14.
- Garcia-Vega, M. (2006). Does technological diversification promote innovation?: An empirical analysis for European firms. *Research Policy*, *35*(2), 230–246.
- Gazi, M. A. I., Mamun, A. A., Masud, A. A., Senathirajah, A. R. S., & Tazizur Rahman, T. (2024). The relationship between CRM, knowledge management, organization commitment, customer profitability and customer loyalty in telecommunication industry: The mediating role of customer satisfaction and the moderating role of brand image. Journal of Open Innovation: Technology, Market, and Complexity, 10, Article 100227.
- Gefen, D., Rigdon, E. E., & Straub, D. (2011). Editor's comments: An update and extension to SEM guidelines for administrative and social science research. *MIS Quarterly*, 35(2), 3–14.
- Ghasemi, B., Khalijian, S., Daim, T. U. D., & Mohammadipirlar, E. (2021). Knowledge management performance measurement based on World-Class Competitive Advantages to develop strategic-oriented projects: Case of Iranian oil industry. *Technology in Society*, 67, Article 101691.
- Giraud Voss, Z., Voss, G. B., & Moorman, C. (2005). An empirical examination of the complex relationships between entrepreneurial orientation and stakeholder support. *European Journal of Marketing*, 39(9/10), 1132–1150.

Gligor, D. M., & Holcomb, M. C. (2012). Antecedents and consequences of supply chain agility: Establishing the link to firm performance. *Journal of Business Logistics*, 33, 295–308.

- Głodowska, A., Maciejewski, M., & Wach, K. (2019). How entrepreneurial orientation stimulates different types of knowledge in the internationalisation process of firms from Poland? *Entrepreneurial Business and Economics Review*, 7(1), 61–73.
- Grillitsch, M., Schubert, T., & Srholec, M. (2019). Knowledge base combinations and firm growth. *Research Policy*, 48, 234–247.

Gubrium, J. F., Holstein, J. A., Marvasti, A. B., & McKinney, K. D. (Eds.). (2012). The SAGE handbook of interview research: The complexity of the craft. Sage Publications.

- Gupta, R., & Sebastian, V. J. (2017). Configuration APproach to Strategic & Entrepreneurial Orientation Construct & Small Firm Growth: Evidence from India. *Theoretical Economics Letters*, 7, 1261–1281.
- Gupta, V.K., & Moesel, D.M. (2007). The impact of entrepreneurial orientation on knowledge management in strategic alliances: Evidence from high-technology SMEs. In Annual USASBE Conference, Florida.
- Hair, J., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM) (3nd ed.). SAGE Publications.
- Hamzah, M. I., Crick, J. M., Crick, D., Ali, S. A. M., & Yunus, N. A. M. (2023). The nature of the relationship between an entrepreneurial marketing orientation and small business growth: evidence from Malaysia. *International Journal of Entrepreneurship* and Small Business, 50(3), 355–391.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135.
- Herman, L. E., Sulhaini, S., & Farida, N. (2020). Electronic customer relationship management and company performance: Exploring the product innovativeness development. *Journal of Relationship Marketing*, 20(1), 1–19.
- Hernández-Perlines, F., Ibarra Cisneros, M. A., Ribeiro-Soriano, D., & Mogorrón-Guerrero, H. (2020). Innovativeness as a determinant of entrepreneurial orientation: analysis of the hotel sector. *Economic Research-Ekonomska istraživanja*, 33(1), 2305–2321.

#### International Journal of Information Management 78 (2024) 102802

Hernández-Perlines, F., Covin, J. G., & Ribeiro-Soriano, D. E. (2021). Entrepreneurial orientation, concern for socioemotional wealth preservation, and family firm performance. *Journal of Business Research*, 126, 197–208.

Holsapple, C. W., & Singh, M. (2001). The knowledge chain model: Activities for competitiveness. *Expert Systems with Applications*, 20(1), 77–98.

Holste, J. S., & Fields, D. (2010). Trust and tacit knowledge sharing and use. Journal of Knowledge Management, 14(1), 128–140.

Horng, J.-S., Liu, C.-H., Chou, S.-F., & Hu, D.-C. (2023). Entrepreneurial orientation, organizational learning, and performance in hospitality and tourism Start-ups: The ESCAPE perspective. *International Journal of Hospitality & Tourism Administration*, 24 (3), 468–490.

Hossain, M. B., Nassar, S., Rahman, M. U., Dunay, A., & Illés, C. B. (2022). Exploring the mediating role of knowledge management practices to corporate sustainability. *Journal of Cleaner Production*, 374, Article 133869.

Hughes, M., Hughes, P., & Morgan, R. E. (2007). Exploitative learning and entrepreneurial orientation alignment in emerging young firms: Implications for market and response performance. *British Journal of Management*, 18, 359–375.

Hughes, M., & Morgan, R. E. (2007). Deconstructing the relationship between entrepreneurial orientation and business performance at the embryonic stage of firm growth. *Industrial Marketing Management*, 36(5), 651–661.

Hughes, M., Hughes, P., Hodgkinson, I. R., Chang, Y.-Y., & Chang, C.-Y. (2022). Knowledge-based theory, entrepreneurial orientation, stakeholder engagement, and firm performance. *Strategic Entrepreneurship Journal*, 16(3), 633–665.

Hussin, N. B., Othman, A. S., & Jamaludin, A. (2015). Determinants of strategic information management (sim): A case study in a malaysia bank. *Qualitative and Quantitative Methods in Libraries*, 4(3), 679–692.

Itami, H. (1987). Mobilizing invisible assets. Cambridge: Harvard University Press.

Jalali, A., Jaafar, M., & Thurasamy, R. (2013). Influence of entrepreneurial orientation on the financial performance: evidence from SMEs in Iran. *Middle East Journal of Management*, 1(2), 168–185.

Jääskeläinen, A., Sillanpää, V., Helander, N., Leskelä, R.-L., Haavisto, I., Laasonen, V., & Torkki, P. (2022). Designing a maturity model for analyzing information and knowledge management in the public sector. VINE Journal of Information and Knowledge Management Systems, 52(1), 120–140.

Jeong, Y. M., Ali, M., Zacca, R., & Park, K. (2019). The effect of entrepreneurship orientation on firm performance: A multiple mediation model. *Journal of East-West Business*, 25(2), 166–193.

Jiang, X., Jiang, F., Sheng, S., & Wang, G. (2021). A moderated mediation model linking entrepreneurial orientation to strategic alliance performance. *British Journal of Management*, 32, 1338–1358.

Jöreskog, K. G. (1978). Structural analysis of covariance and correlation matrices. Psychometrika, 43, 443–477.

Kang, T., Baek, C., & Lee, J.-D. (2019). Effects of knowledge accumulation strategies through experience and experimentation on firm growth. *Technological Forecasting & Social Change*, 144, 169–181.

- Karimi, A., Daryani, M. A., & Rahmani, S. (2021). The influence of entrepreneurial orientation on firm growth among Iranian agricultural SMEs: The mediation role of entrepreneurial leadership and market orientation. *Journal of Global Entrepreneurship Research*, 11, 519–531.
- Karami, M., & Tang, J. (2019). Entrepreneurial orientation and SME international performance: The mediating role of networking capability and experiential learning. *International Small Business Journal*, 37(2), 105–124.

Kathuria, A., Saldanha, T. J. V., Khuntia, J., & Rojas, M. A. (2016). How information management capability affects innovation capability and firm performance under turbulence: Evidence from India. *ICIS 2016 Proceedings*, 18.

Kebede, G. (2010). Knowledge management: An information science perspective. International Journal of Information Management, 30(5), 416–424.

Kettinger, W. J., & Marchand, D. A. (2011). Information management practices (IMP) from the senior manager's perspective: An investigation of the IMP construct and its measurement. *Information Systems Journal*, 21(5), 385–406.

Kettinger, W. J., Ryoo, S. Y., & Marchand, D. A. (2021). We're engaged! Following the path to a successful information management capability. *Journal of Strategic Information Systems*, 30, Article 101681.

Kianto, A., Saenz, J., & Aramburu, N. (2017). Knowledge-based human resource management practices, intellectual capital and innovation. *Journal of Business Research*, 81, 11–20.

Kiyabo, K., & Isaga, N. (2020). Entrepreneurial orientation, competitive advantage, and SMEs' performance: Application of firm growth and personal wealth measures. *Journal of Innovation and Entrepreneurship*, 9(12), 1–15.

Khan, M. A., Rathore, K., Zubair, S. S., Mukaram, A. T., & Selem, K. M. (2024). Encouraging SMEs performance through entrepreneurial intentions, competencies, and leadership: serial mediation model. *European Business Review*, 36(2), 271–289.

Khan, S. A. R., Yu, Z., Golpîra, H., Sharif, A., & Mardani, A. (2020). A state-of-the-art review and meta-analysis on sustainable supply chain management: future research directions. *Journal of Cleaner Production*, 278, Article 123357.

Kmieciak, R., & Michna, A. (2018). Knowledge management orientation, innovativeness, and competitive intensity: Evidence from Polish SMEs. *Knowledge Management Research & Practice*, 16(4), 559–572.

Knott, E., Rao, A. H., Summers, K., & Teeger, C. (2022). Interviews in the social sciences. *Nature Reviews Methods Primers*, 2, 73.

Kock, N. (2014). Stable p value calculation methods in PLS-SEM. ScriptWarp Systems. Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment

approach. International Journal of e-Collaboration, 11(4), 1–10. Koehler, F., Caetano Bastos, L., & Cid Bastos, R. (2019). Understand the dynamic theory

Of organizational knowledge creation: roots and future. International Journal for Innovation Education and Research, 7(9), 124–141. Kollmann, T., & Stöckmann, C. (2014). Filling the entrepreneurial orientation–performance gap: The mediating effects of exploratory and exploitative innovations. *Entrepreneurship Theory and Practice*, 38(5), 1001–1026.

Kraaijenbrink, J., Spender, J. C., & Groen, A. J. (2010). The resource-based view: A review and assessment of its critiques. *Journal of Management*, 36(1), 349–372.

Kraus, S., Palmer, C., Kailer, N., Kallinger, F. L., & Spitzer, J. (2019). Digital entrepreneurship: A research agenda on new business models for the twenty-first century. *International Journal of Entrepreneurial Behavior & Research*, 25(2), 353–375.

Kraus, S., Rigtering, J. P. C., Hughes, M., & Hosman, V. (2012). Entrepreneurial orientation and the business performance of SMEs: A quantitative study from the Netherlands. *Review of Managerial Science*, 6, 161–182.

Krcal, M., & Kubis, M. (2016). Differences between knowledge and information management practices: Empirical investigation. In: Proceedings of the 8th international joint conference on knowledge discovery, knowledge engineering and knowledge management. Vol 3 (KMIS) (pp. 190–198).

Kreiser, P. M. (2011). Entrepreneurial Orientation and Organizational Learning: The Impact of Network Range and Network Closure. *Entrepreneurship Theory and Practice*, 35(5), 1025–1050.

Kumar, P., & Mokha, A. K. (2022). Electronic customer relationship management (E-CRM) and customer loyalty: The mediating role of customer satisfaction in the banking industry. *International Journal of E-Business Research*, 18(1), 1–22.

Kuratko, D., F. (2009). Entrepreneurship, theory, process and practice. Nashville: South Western Publication.

Kusa, R. (2023). The mediating role of competitive and collaborative orientations in boosting entrepreneurial orientation's impact on firm performance. *Entrepreneurial Business and Economics Review*, 11(4), 25–42.

Kusa, R., Suder, M., & Duda, J. (2023). Impact of greening on performance in the hospitality industry: Moderating effect of flexibility and inter-organizational cooperation. *Technological Forecasting & Social Change*, 190, Article 122423.

Kusa, R., Duda, J., & Suder, M. (2021). Explaining SME performance with fsQCA: The role of entrepreneurial orientation, entrepreneur motivation, and opportunity perception. *Journal of Innovation & Knowledge*, 6(4), 234–245.

Kvale, S. (1996). The 1,000-page question. Qualitative Inquiry, 2(3), 275-284.

Latif, K. F., Afzal, O., Saqib, A., Sahibzada, U. F., & Alam, W. (2021). Direct and configurational paths of knowledge-oriented leadership, entrepreneurial orientation, and knowledge management processes to project success. *Journal of Intellectual Capital*, 22(1), 149–170.

Latif, K. F., Nazeer, A., Shahzad, F., Ullah, M., Imranullah, M., & Sahibzada, U. F. (2020). Impact of entrepreneurial leadership on project success: mediating role of knowledge management processes. *Leadership & Organization Development Journal*, 41(2), 237–256.

Lee, L. T., & Sukoco, B. M. (2007). The effects of entrepreneurial orientation and knowledge management capability on organizational effectiveness in Taiwan: The moderating role of social capital. *International Journal of Management*, 24(3), 549–672.

Lechner, C., & Dowling, M. (2003). Firm networks: external relationships as sources for the growth and competitiveness of entrepreneurial firms. *Entrepreneurship & Regional Development*, 15(1), 1–26.

Li, Y.-H., Huang, J.-W., & Tsai, M.-T. (2009). Entrepreneurial orientation and firm performance: The role of knowledge creation process. *Industrial Marketing Management*, 38(4), 440–449.

Lin, C., & Chang, C. C. (2015). The effect of technological diversification on organizational performance: An empirical study of S&P 500 manufacturing firms. *Technological Forecasting & Social Change*, 90, 575–586.

Liu, C.-H., & Lee, T. (2015). Promoting entrepreneurial orientation through the accumulation of social capital, and knowledge management. *International Journal of Hospitality Management*, 46, 138–150.

Luhn, A., Aslanyan, S., Leopoldseder, C., & Priess, P. (2017). An evaluation of knowledge management system's components and its financial and non-financial implications. *Entrepreneurship and Sustainability Issues*, 5(2), 315–329.

Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. Academy of Management Review, 21, 135–172.

McNamara, C. (1999). General guidelines for conducting interviews. Minnesota: Sage.

Madhoushi, M., Sadati, A., Delavari, H., Mehdivand, M., & Mihandost, R. (2011). Entrepreneurial orientation and innovation performance: The mediating role of knowledge management. Asian Journal of Business Management, 3(4), 310–316.

Mahdi, O. R., Nassar, I. A., & Almsafir, M. K. (2019). Knowledge management processes and sustainable competitive advantage: an empirical examination in private universities. *Journal of Business Research*, 94, 320–334.

Mahmood, R., & Hanafi, N. (2013). Entrepreneurial orientation and business performance of women-owned small and medium enterprises in Malaysia: Competitive advantage as a mediator. *International Journal of Business and Social Science*, 4(1), 82–90.

Makori, E. O., & Osebe, N. M. (2016). Koha enterprise resource planning system and its potential impact on information management organizations. *Library Hi Tech News*, 33(4), 17–23.

Malhotra, Y. (1998). Knowledge management for the new world of business. Journal for Quality and Participation, 21(4), 58–60.

Malhotra, Y. (2005). Integrating knowledge management technologies in organizational business processes: Getting real time enterprises to deliver real business performance. *Journal of Knowledge Management*, 9(1), 7–28.

Marchand, D. A., Kettinger, W. J., & Rollins, J. D. (2000). Information orientation: People, technology and the bottom line. Sloan Management Review, 41, 69–80.

Mao, H., Liu, S., Zhang, J., & Deng, Z. (2016). Information technology resource, knowledge management capability, and competitive advantage: The moderating role

#### R. Kusa et al.

#### International Journal of Information Management 78 (2024) 102802

of resource commitment. *International Journal of Information Management*, 36(6, Part A), 1062–1074.

Marshall, R. S., & Standifird, S. S. (2005). Organizational resource bundles and institutional change in the U.S. organic food and agricultural certification sector. *Organization & Environment*, 18(3), 265–286.

- Martínez de Miguel, P., García Martínez, A., & Montes-Botella, J.-L. (2022). Review of the measurement of Dynamic Capabilities: a proposal of indicators for the automotive industry. *ESIC Market*, 53(1), Article e283.
- Martins, I. (2016). Network usage, entrepreneurial orientation and their effectiveness on SMEs growth. The Journal of Entrepreneurship, 25(1), 18–41.
- Masango, S., & Marinova, S. (2014). Knowledge-based network ties in early rapidly internationalising small firms: a missing link? *International Entrepreneurship and Management Journal*, 10, 471–486.
- Masud, A. A., Alamgir Hossain, M., Kumer Roy, D., Shakhawat Hossain, M., Nurun Nabi, M., Ferdous, A., & Tebrak Hossain, M. (2021). Global pandemic situation, responses and measures in Bangladesh: New normal and sustainability perspective. *International Journal of Asian Social Science*, 11(7), 314–332.
- Mazaheri, E., Lagzian, M., & Hemmat, Z. (2020). Research directions in information systems field, current status and future trends: A literature analysis of AIS basket of top journals. Australasian Journal of Information Systems, 24.

Minniti, M., & Bygrave, W. (2001). A dynamic model of entrepreneurial learning. Entrepreneurship Theory and Practice, 25(3), 5–16.

Mithas, S., Ramasubbu, N., & Sambamurthy, V. (2011). How information management capability influences firm performance. *MIS Quarterly*, 35(1), 237–256.

Moreno, A., & Casillas, J. (2008). Entrepreneurial orientation and growth of SMEs: A causal model. *Entrepreneurship Theory and Practice*, 32(3), 507–528.

- Mostafiz, M. I., Hughes, M., Simeonova, B., & Sambasivan, M. (2023). Entrepreneurial orientation and knowledge management: Comparing configurations of native and immigrant entrepreneurial firms. *International Journal of Entrepreneurial Behavior & Research, 29*(5), 1099–1132.
- Naqshbandi, M. M., & Jasimuddin, S. M. (2018). Knowledge-oriented leadership and open innovation: Role of knowledge management capability in France-based multinationals. *International Business Review*, 27(3), 701–713.
- Nasution, M. D. T. P., Rafiki, A., Lubis, A., & Rossanty, Y. (2021). Entrepreneurial orientation, knowledge management, dynamic capabilities towards e-commerce adoption of SMEs in Indonesia. *Journal of Science and Technology Policy Management*, 12(2), 256–282.
- Nitzl, C., Roldan, J. L., & Cepeda, G. (2016). Mediation analysis in partial least squares path modeling: Helping researchers discuss more sophisticated models. *Industrial Management & data Systems*, 116(9), 1849–1864.
- Nonaka, I., & Takeuchi, H. (1995). The knowledge-creating company: How Japanese companies create the dynamics of innovation. Oxford University.
- Nonaka, I., & Toyama, R. (2015). The knowledge-creating theory revisited: Knowledge creation as a synthesizing process. In *The essentials of knowledge management* (pp. 95–110). London: Palgrave Macmillan,.
- O'Leary, D. E. (1998). Guest editor's introduction: Knowledge-management systemsconverting and connecting. *IEEE Intelligent Systems*, 13(03), 30–33.
- Omisakin, O. M., & Adegoke, N. (2022). Entrepreneurial orientation and New Zealand family business growth performance: Environmental effects. *Small Enterprise Research*, 29(2), 138–164.
- Opoku, M. O. (2015). Information management and organisational performance: A review of literature. *Mediterranean Journal of Social Sciences*, 6(6), S1.
- Quinn, R. E., & Cameron, K. (1983). Organizational life cycles and shifting criteria of effectiveness: Some preliminary evidence. *Management Science*, 29(1), 33–51.
   Palacios-Marques, D., Roig-Dobon, S., & Comeig, I. (2017). Background factors to
- Palacios-Marques, D., Roig-Dobon, S., & Comeig, I. (2017). Background factors to innovation performance: Results of an empirical study using fsQCA methodology. *Quality & Quantity*, 51, 1939–1953.
- Palvia, P., Leary, D., Mao, E., Midha, V., Pinjani, P., & Salam, A. F. (2004). Research methodologies in MIS: An update. *Communications of the Association for Information Systems*, 14, 24.

Pappas, I. O., & Woodside, A. G. (2021). Fuzzy-set Qualitative Comparative Analysis (fsQCA): Guidelines for research practice in information systems and marketing. *International Journal of Information Management*, 58, Article 102310.

Parent, M. (2020). Unbiasing information technology decisions. Organizational Dynamics, 49(1), Article 100699.

Paul, J., Alhassan, I., Binsaif, N., & Singh, P. (2023). Digital entrepreneurship research: A systematic review. Journal of Business Research, 156, Article 113507.

Penrose, E. (1959). The theory of growth of the firm. Oxford: Blackwell.

- Pereira, V., & Bamel, U. (2021). Extending the resource and knowledge based view: A critical analysis into its theoretical evolution and future research directions. *Journal* of Business Research, 132, 557–570.
- Petrov, V., Ćelić, D., Uzelac, Z., & Drašković, Z. (2020). Three pillars of knowledge management in SMEs: Evidence from Serbia. International Entrepreneurship and Management Journal, 16, 417–438.
- Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12(4), 531–544.

Prajogo, D., Toy, J., Bhattacharya, A., Oke, A., & Cheng, T. C. E. (2018). The relationships between information management, process management and operational performance: Internal and external contexts. *International Journal of Production Economics*, 199, 95–103.

- Priyono, A., Moin, A., & Putri, V. (2020). Identifying digital transformation paths in the business model of SMEs during the COVID-19 pandemic. *Journal of Open Innovation: Technology, Market, and Complexity,* 6(4), 104.
- Ragin, C. C. (2008). Redesigning social inquiry: Fuzzy sets and beyond. Chicago. University of Chicago Press.

Ragin, C. C., & Sean, D. (2016). Fuzzy-Set/qualitative comparative analysis 3.0. Irvine, California: Department of Sociology, University of California,.

- Ramayah, T. J. F. H., Cheah, J., Chuah, F., Ting, H., & Memon, M. A. (2018). Partial least squares structural equation modeling (PLS-SEM) using smartPLS 3.0. An updated guide and practical guide to statistical analysis. Pearson Malaysia Sdn Bhd,.
- Rauch, A., Wiklund, J., Lumpkin, G. T., & Frese, M. (2009). Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future. *Entrepreneurship Theory and Practice*, 33(3), 761–787.
- Reijonen, H., Hirvonen, S., Nagy, G., Laukkanen, T., & Gabrielsson, M. (2015). The impact of entrepreneurial orientation on B2B branding and business growth in emerging markets. *Industrial Marketing Management*, 51, 35–46.
- Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Research in Marketing*, 26, 332–344.

Ringle, C. M., Wende, S., & Becker, J.-M. (2022). SmartPLS 4. Oststeinbek: SmartPLS GmbH.

Rodrigues, R. G., & Raposo, M. (2011). Entrepreneurial orientation, human resources information management, and firm performance in SMEs. Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration, 28(2), 143–153.

Roldan, J. L., & Sanchez-Franco, M. J. (2012). Variance-based structural equation modeling: Guidelines for using partial least squares in information systems research. In M. Mora, O. Gelman, A. Steenkamp, & M. Raisinghani (Eds.), Research methodologies, innovations and philosophies in software systems engineering and information systems (pp. 193–221). Hershey: IGI Global.

- Rosenbusch, N., Rauch, A., & Bausch, A. (2013). The mediating role of entrepreneurial orientation in the task environment–performance relationship: A meta-analysis. *Journal of Management*, 39(3), 633–659.
- Rossi, M., Chouaibi, J., Graziano, D., & Festa, G. (2022). Corporate venture capitalists as entrepreneurial knowledge accelerators in global innovation ecosystems. *Journal of Business Research*, 142, 512–523.
- Ruiz-Palomino, P., Hernández-Perlines, F., Jiménez-Estévez, P., & Gutiérrez-Broncano, S. (2019). CEO servant leadership and firm innovativeness in hotels: A multiple mediation model of encouragement of participation and employees' voice. *International Journal of Contemporary Hospitality Management*, 31(4), 1647–1665.

Saha, P., Nath, A., & Sit, K.(J. (2022). Re-examining the roles of experience quality at festivals: A comparative analysis using SEM and fsQCA. International Journal of Contemporary Hospitality Management, 35(5), 1802–1823.

- Sahoo, S., Kumar, A., & Upadhyay, A. (2022). How do green knowledge management and green technology innovation impact corporate environmental performance? Understanding the role of green knowledge acquisition. *Business Strategy and the Environment*, 32(1), 551–569.
- Salameh, A. A., Hatamleh, A., Azim, M. S., & Kanaan, A. G. (2020). Customer oriented determinants of e-CRM success factors. Uncertainty Supply Chain Management, 713–720.
- Sarstedt, M., Hair Jr, J. F., Cheah, J. H., Becker, J. M., & Ringle, C. M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal*, 27(3), 197–211.
- Schepers, J., Voordeckers, W., Steijvers, T., & Laveren, E. (2014). The entrepreneurial orientation-performance relationship in private family firms: the moderating role of socioemotional wealth. *Small Business Economics*, 43, 39–55.
- Schneider, C. Q., & Wagemann, C. (2012). Set-theoretic methods for the social sciences: A guide to qualitative comparative analysis. Cambridge: Cambridge University Press,
- Sewdass, N. (2005). Interrelationship between document management, information management, and knowledge management. South African Journal of Information Management. 7(3).
- Shane, S. (2000). Prior knowledge and the discovery of entrepreneurial opportunities. Organization Science, 11(4), 448–469.

Shane, S. A., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. Academy of Management Review, 25, 217–226.

- Shahzad, F., Du, J., Khan, I., Shahbaz, M., Murad, M., & Khan, M. A. S. (2020). Untangling the influence of organizational compatibility on green supply chain management efforts to boost organizational performance through information technology capabilities. *Journal of Cleaner Production*, 266, Article 122029.
- Shehzad, M. U., Zhang, J., & Waseel, A. H. (2023). Do green entrepreneurial orientation and green knowledge management matter in the pursuit of ambidextrous green innovation: A moderated mediation model. *Journal of Cleaner Production*, 388, Article 135971.
- Shekhar, & Valeri, M. (2023). Trends in knowledge management research in small businesses. European Business Review, 35(5), 573–599.
- Soininen, J., Martikainen, M., Puumalainen, K., & Kyläheiko, K. (2012). Entrepreneurial orientation: Growth and profitability of Finnish small- and medium-sized enterprises. *International Journal of Production Economics*, 140(2), 614–621.
- Sok, P., Snell, L., Lee, W. J. (T.), & Sok, K. M. (2017). Linking entrepreneurial orientation and small service firm performance through marketing resources and marketing capability: A moderated mediation model. *Journal of Service Theory and Practice*, 27 (1), 231–249.
- Song, W., Ma, X., & Yu, H. (2019). Entrepreneurial orientation, interaction orientation, and innovation performance: A model of moderated mediation. SAGE Open, 9(4), 1–13.
- Song, G., Min, S., Lee, S., & Seo, Y. (2017). The effects of network reliance on opportunity recognition: A moderated mediation model of knowledge acquisition and entrepreneurial orientation. *Technological Forecasting and Social Change*, 117, 98–107.

#### R. Kusa et al.

#### International Journal of Information Management 78 (2024) 102802

Soni, G., Mangla, S. K., Singh, P., Dey, B. L., & Dora, M. (2021). Technological interventions in social business: Mapping current research and establishing future research agenda. *Technological Forecasting and Social Change*, 169, Article 120818.

Srivastava, A., Bartol, K. M., & Locke, E. A. (2006). Empowering leadership in management teams: Effects on knowledge sharing, efficacy, and performance. *Academy of Management Journal*, 49(6), 1239–1251.

Stevenson, H. H., & Jarillo, J. C. (1990). A paradigm of entrepreneurship: Entrepreneurial management. Strategic Management Journal, 11(4), 17–27.

Suder, M. (2023). Impact of entrepreneurial orientation on performance and moderating role of crisis perception: multi-method examination. *Journal of Organizational Change Management*, 36(8), 86–116.

Suder, M. (2024). Entrepreneurial (re)orientation in the face of crisis: Is it worth modifying entrepreneurial strategy? *Journal of Entrepreneurship, Management and Innovation*, 20(2), 9–35.

Suder, M., Duda, J., Kusa, R., & Mora-Cruz, A. (2022a). At the crossroad of digital and tourism entrepreneurship: mediating effect of digitalization in hospitality industry (Vol. ahead-of-print No. ahead-of-print) *European Journal of Innovation Management*. https://doi.org/10.1108/EJIM-08-2022-0422.

Suder, M., Kusa, R., Duda, J., & Dunska, M. (2022b). How small printing firms alleviate impact of pandemic crisis? Identifying configurations of successful strategies with fuzzy-set qualitative comparative analysis. *Entrepreneurial Business and Economics Review*, 10(2), 61–80.

Sułkowski, Ł. (2016). Metodologia zarządzania – od fundamentalizmu do pluralizmu (Methodology of management – from fundamentalism to pluralism). In W. Czakon (Ed.), Podstawy metodologii badań w naukach o zarządzaniu (Fundamentals of methodology in managerial science. Piaseczno: Wydawnictwo Neicozywiste.

Tajeddini, K., Gamage, T. C., Tajdini, J., Qalati, S. A., & Siddiqui, F. (2023). Achieving sustained competitive advantage in retail and consumer service firms: The role of entrepreneurial orientation and entrepreneurial bricolage. *Journal of Retailing and Consumer Services*, 75, Article 103495.

Tajeddini, K., & Mueller, S. (2019). Moderating effect of environmental dynamism on the relationship between a firm's entrepreneurial orientation and financial performance. *Entrepreneurship Research Journal*, 9(4), 20180283.

Tarigan, Z. J. H., Siagian, H., & Basana, S. R. (2020). The effect of internal information management on firm performance, through supplier partnership and sustainable SCM. International Journal of Innovation, Management and Technology, 10(6), 239–242.

Theeke, M., & Lee, H. (2017). Multimarket contact and rivalry over knowledge-based resources. Strategic Management Journal, 38, 2508–2531.

Torres de Oliveira, R., Gentile-Lüdecke, S., & Figueira, S. (2022). Barriers to innovation and innovation performance: the mediating role of external knowledge search in emerging economies. *Small Business Economics*, 58, 1953–1974.

Uno, S. S., Bernarto, I., & Hasbullah, Y. (2019). The effect of entrepreneurial values and entrepreneurial orientation on micro, small, and medium businesses' financial performance. *International Journal of Innovation, Creativity and Change*, 5(6), 669–681.

Urban, B., & Matela, L. (2022). The nexus between innovativeness and knowledge management: A focus on firm performance in the hospitality sector. *International Journal of Innovation Studies*, 6(1), 26–34. Veselinović, L., Kulenović, M., Turulja, L., & Činjarević, M. (2021). The interplay of entrepreneurial orientation, total quality management, and financial performance. *Total Quality Management & Business Excellence*, 32(15–16), 1732–1750.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. Journal of Strategic Information Systems, 28(2), 118–144.

 Wales, W. J., Covin, J. G., Schüler, J., & Baum, M. (2023). Entrepreneurial orientation as a theory of new value creation. *Journal of Technology Transfer*, 48(5), 1752–1772.
 Wang, C. L. (2008). Entrepreneurial orientation, learning orientation, and firm

performance. Entrepreneurship Theory and Practice, 32(4), 635–657. Wang, W., Zhang, D., Wang, H., Zhu, Q., & Morabbi Heravi, H. (2023). How do

businesses achieve sustainable success and gain a competitive advantage in the green era? *Kybernetes*, 52(9), 3241–3260.

Wernerfelt, B. (1984). Harmonised implementation of Application-Specific Messages (ASMs). Strategic Management Journal, 5(2), 1–12.

Wheelen, T. L., Hunger, J. D., Hoffman, A. N., & Bamford, C. E. (2018). Strategic management and business policy: Globalization, innovation and sustainability (15th ed.). Pearson Education.

Wiesböck, F., & Hess, T. (2019). Digital innovations: Embedding in organizations. *Electronic Markets*, 26(2), 75–86.

Wiklund, J., & Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium sized businesses. *Strategic Management Journal*, 24, 1307–1314.

Wilson, G. A., & Perepelkin, J. (2022). Failure learning orientation, entrepreneurial orientation, and financial performance among U.S. biotechnology firms. *Journal of Small Business Management*, 60(4), 786–804.

Wold, H. (1982). Soft modeling: The basic design and some extensions. North Holl. Press. Woodside, A. G. (2013). Moving beyond multiple regression analysis to algorithms: Calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. Journal of Business Research, 66(4), 463–472.

Wójcik-Karpacz, A., Karpacz, J., Pavlov, D., & Rudawska, J. (2019). Entrepreneurial orientation and performance in the context of market dynamism: Similarities and differences between Polish and Bulgarian companies. *Management Forum*, 6(4), 40–47.

Xia, Q., Xie, Y., Hu, S., & Song, J. (2024). Exploring how entrepreneurial orientation improve firm resilience in digital era: Findings from sequential mediation and FsQCA. European Journal of Innovation Management, 27(1), 96–122.

YahiaMarzouk, Y., & Jin, J. (2023). Linking environmental scanning and organizational learning with organizational resilience of Egyptian SMEs: The moderating role of environmental uncertainty. *International Journal of Organizational Analysis*, 31(6), 2753–2792.

Yeow, A., Soh, C., & Hansen, R. (2018). Aligning with new digital strategy: A dynamic capabilities approach. Journal of Strategic Information Systems, 27(1), 43–58.

Zahra, S. A., & Covin, J. G. (1995). Contextual influences on the corporate entrepreneurship – Performance relationship: a longitudinal analysis. *Journal of Business Venturing*, 10, 43–58.

Zhao, Y., Li, Y., Lee, S. H., & Bo Chen, L. (2011). Entrepreneurial orientation, organizational learning, and performance: Evidence from China. *Entrepreneurship Theory and Practice*, 35(2), 293–317.