

Leaders and Managers Key Characteristics and Open Innovation Adoption in SMEs: Systematic Review and Future Directions

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Abstract

Existing literature provides limited insights into the role of individual actors and the human side of Open Innovation (OI) adoption in SMEs. Additionally, there is a lack of studies that systematically consolidate and analyze the publications addressing this specific topic. This research aims to fill this gap by pursuing three main objectives: firstly, to review the influence of SME leaders and manager's characteristics on the adoption of OI; secondly, to identify the characteristics of leaders and managers of SMEs and their leadership styles when adopting OI; and lastly, to explain their role in promoting OI. A total of 43 peer-reviewed articles published in reputable scientific journals from 2003 to 2022 were examined. This study classifies manager's characteristics that contribute to the effective implementation of OI within SMEs into three categories: demographic characteristics, personal characteristics, and managerial characteristics. This review contributes to prior research by outlining a leader and manager profile that leads to the successful implementation of OI in SMEs. The article concludes with theoretical and practical contributions and suggestions for potential directions for future research.

Keywords: Open innovation, Characteristics, Traits, Leader, Manager, SMEs, Systematic literature review.

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1 Introduction

OI is one of the trendiest topics in the innovation management literature (Huizingh, 2011; Rangus and Cerne, 2019). It refers to an emerging model of innovation that utilizes external knowledge for internal innovation (inbound) and external paths to the market for internal innovation (outbound) (Chesbrough, 2006; Dahlander and Gann, 2010; Parida et al., 2012). Depending on the direction of knowledge flows, OI takes various modes (Chesbrough et al., 2006).

The adoption of the OI model was initially proposed and explored in the context of large firms (Chesbrough, 2003; Laursen and Salter, 2006). However, Small and Medium-sized Enterprises (SMEs) have received little attention. Hossain and Kauranen (2016) point out that research concerning OI within the context of SMEs is lacking, causing them to be excluded from the broader OI discussion (Bigliardi and Galati, 2018; Burnswicker and Vanhaverbeke, 2015). Despite this, several studies have shown that OI is also adopted by SMEs (Usman et al., 2018; Santoro et al., 2018; De Marco et al., 2020; Costa et al., 2023). SMEs rely more on OI (Tsai et al., 2022;

Messeni Petruzzelli et al., 2022) to overcome their challenges (Aleksic et al., 2021; Tsai et al., 2022; Costa et al., 2023), including the liability of smallness (van de Vrande et al., 2010; Marzi et al., 2023), resources constraints (Odriozola-Fernandez et al., 2019; Messeni Petruzzelli et al., 2022; Costa et al., 2023; Marzi et al., 2023), less structured internal capabilities (Hossain and Kauranen, 2016), less formalized practices (Albats et al., 2021; Marzi et al., 2023), difficulty in obtaining external funding, lack of market and technology knowledge (Vega Jurado et al., 2022), and frequent inability to cover all of their innovative activities (Brunswick and van de Vrande, 2014). Moreover, SMEs have the qualities required to benefit from OI, given their tendency towards taking risks, low bureaucracy (Bertello et al., 2022), increased responsiveness to market changes, and flexible and shorter decision-making processes (Torchia and Calabrò, 2019; Livieratos et al., 2022).

Previous studies have explored the determinants that promote SMEs' openness (Chabbouh and Boujelbene, 2020), with a particular emphasis on contextual factors (Dahlander and Gann, 2010) and environmental characteristics (Hung and Chou, 2013). However, studies that consider individuals and the 'human' aspect of OI remain rare (Ahn et al., 2017; Bogers et al., 2018; Aleksic et al., 2021). This scarcity of research limits our understanding of how human factors impact OI (Ahn, 2020; Marzi et al., 2023). This dimension holds a significant place in our understanding of the SME context. This is attributed to the substantial influence and prominence of individual leaders and managers in both the operation and strategic development of the firm (Saunders et al., 2012; Mammassis and Kostopoulos, 2019). They also serve as pivotal decision-makers (Hsu et al., 2013; Marzi et al., 2023) and represent the epicenter of innovation within an SME (Marcati et al., 2008). Consequently, an SME's strategic decisions, such as the adoption of OI, are profoundly shaped by the characteristics of its leaders and managers (Ahn et al., 2013).

According to Chan et al. (2017), the characteristics of an SME's leader and manager are essential for the success of OI. Their profile is crucial for influencing the business culture in favor of collaborative actions, both internally and externally allies (Diaz-Delgado et al., 2019). Moreover, the implementation of OI involves managerial challenges such as transforming business models, redesigning the internal innovation process, and changing organizational structure and culture (Tsai et al., 2022; Messeni Petruzzelli et al., 2022), which often generates organizational refusal and internal resistance to change (Marzi et al., 2023) that need strong leadership to be addressed (Rangus and Cerne, 2019). The SME leader and manager must deliberately weigh the tension between knowledge sharing and knowledge protection (Singh et al., 2021). Furthermore, OI is associated with a significant use of inter-organizational relationships (Messeni Petruzzelli et al., 2022). Therefore, a diverse inter-organizational network of leaders and managers and their openness are necessary for the successful adoption of OI in SMEs (Gomez and Rangus, 2018, 2019). Consequently, the OI process relies on the SME leader and manager (Gomez and Rangus, 2018; Aleksic et al., 2021) and many researchers argue that the role of SME leader and manager in OI adoption deserves more attention (Ahn et al., 2017; West and Bogers, 2017; Bogers et al., 2017, 2018; Gomez and Rangus, 2019; Santoro et al., 2020).

Given the significance of the SME leader and manager's involvement in OI and in response to the recent call by Ahn et al. (2017) for increased research on the 'human' dimension of OI, this study attempts to address this research gap by investigating the linkage between the characteristics of SME leader and manager and OI adoption. Thus, our research question is: What characteristics and traits define the SME leader and manager who successfully adopts OI? To answer this question, our research examines previous studies using a Systematic Literature Review (SLR) focused on SME leader and manager characteristics and leadership styles associated with

effective OI adoption. This approach aims to synthesize and expand the body of knowledge in this field of research.

The present study contributes to the existing literature in three main ways. First, given the growing need to adopt the OI paradigm in SMEs, this study extends the existing literature on OI adoption in SMEs. Second, despite their potential importance in SME contexts where the leader or manager serves as the pivotal decision-maker (Marzi et al., 2023), the OI literature has neglected the roles of these key individuals (Ahn, 2020). This study adds to the body of literature by providing an overview of the SME leader and manager's characteristics and leadership styles associated with successful OI adoption. Third, this SLR enables us to propose a leader and manager's profile that will support effective OI adoption in SMEs, enhancing our understanding of the human aspect and micro-foundations of OI (Aleksich et al., 2021).

The remainder of this article is structured as follows. The first section focuses on SLR methodology. The second section presents descriptive analysis findings. The third section is devoted to various SME leader and manager characteristics and traits covered in the selected articles. Finally, the fourth section discusses the findings, contributions, and limitations of the SLR.

2 Methodology

As is the case for several authors (Giannopoulou et al., 2011; Torchia and Calabrò, 2019), this review was developed in two successive phases: (1) collection of articles; and (2) content analysis.

Collection of articles: After defining the research question related to the relationship between SME leader and manager's characteristics and traits and OI adoption, nine keyword strings have been established (figure 1). Our primary objective is to consider all possible articles related to the topic. To achieve this, we performed our search on the Scopus and Web of Science (WoS) databases, previously used in OI research (Battistella et al., 2017; Obradovic et al., 2021; Carrasco-Carvajal et al., 2023). These databases are among the most recognized and widely used academic databases in research (de Jesus et al., 2018; Harzing and Alakangas, 2016). Both databases are a reliable source of relevant quality peer-reviewed articles (Jugend et al., 2020; Hossain et al., 2016). The articles included in this review were published between 2003, when Chesbrough officially introduced the concept of OI, and February 2022, the date of this study. Only peer-reviewed English articles were included in the review to guarantee the accuracy of selected articles (Saunila, 2020). As Hossain et al. (2016), articles such as interviews, industry reports, and book chapters were eliminated. Paper conferences were also eliminated as we didn't have the resources to distinguish reviewed and non-reviewed conferences (Giannopoulou et al., 2011).

After searching for articles, an initial database of 2692 articles was obtained. Selected articles were exported to EndNote software to identify and remove duplicates. As a result, 1101 duplicated articles were eliminated. The next step involved analyzing the title and the abstract. Thus, 1525 articles were excluded as they did not fit the aim of the study. The acceptance criteria for articles included two main requirements. Firstly, the article had to explicitly feature the term "OI", its dimensions, and "SMEs" within any of its fields, including the title, abstract, and keywords (Idrissi Fakhreddine and Castonguay, 2023; Hossain et al., 2016). Secondly, the abstract needed to provide clear indications that the article addresses the relationship between the characteristics and traits of SME leaders or managers and the adoption of OI or at least some aspect related to this issue. This resulted in a refined sample of 66 articles for an in-depth analysis in accordance with the objective of this study. Four of them were non-accessible in databases. After reviewing the

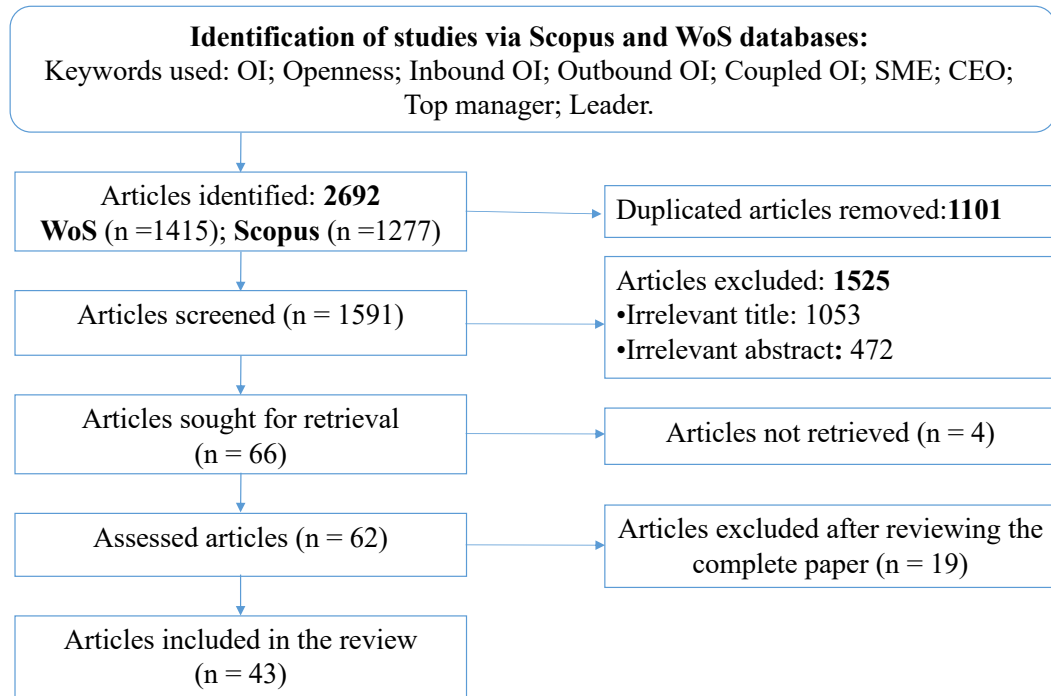


Figure 1. Systematic literature review steps
Source: Author's compilation

full content, 43 articles were selected (Figure 1).

Content analysis: The study aims to identify the characteristics, traits, and leadership styles of SME leaders and managers that promote OI adoption. To achieve this, we extract relevant details from each included article using a Microsoft Excel file designed to capture the crucial information. This includes identifying the characteristics and leadership styles of the leaders and managers investigated in each article, as well as examining the relationship between these factors and the adoption of OI. The categorization of the characteristics and traits that affect OI adoption is based on previous research, particularly the demographic (Hsu et al., 2013) and managerial (Barrett et al., 2021) characteristics. The authors suggest using the 'personal characteristics' category to describe traits that are inherently linked to a leader's personality, such as their attitudes towards OI, patience, balancing skills, assertiveness, and openness. The main findings are succinctly summarized, as detailed in the appendix.

3 Descriptive results

This review examines 43 included articles starting from 2003. Firstly, the investigation revealed that the relationship between SME leaders and managers' characteristics and OI wasn't addressed until 2010. Second, the findings show that the majority of articles (70%) were published between 2018 and 2020, demonstrating the growing interest in the subject (figure 2). In fact, the limited number of identified articles highlights the restricted scope of our understanding of this subject.

The review also examined the methodological approaches used in the selected articles. The analysis reveals that 74% (32 articles) applied a quantitative approach. Regression and Structural Equation Modeling (SEM) were the most commonly used statistical analyses. Specifically, 44% of the publications used SEM, while 50% used regression. In addition, 14% (6) of the articles

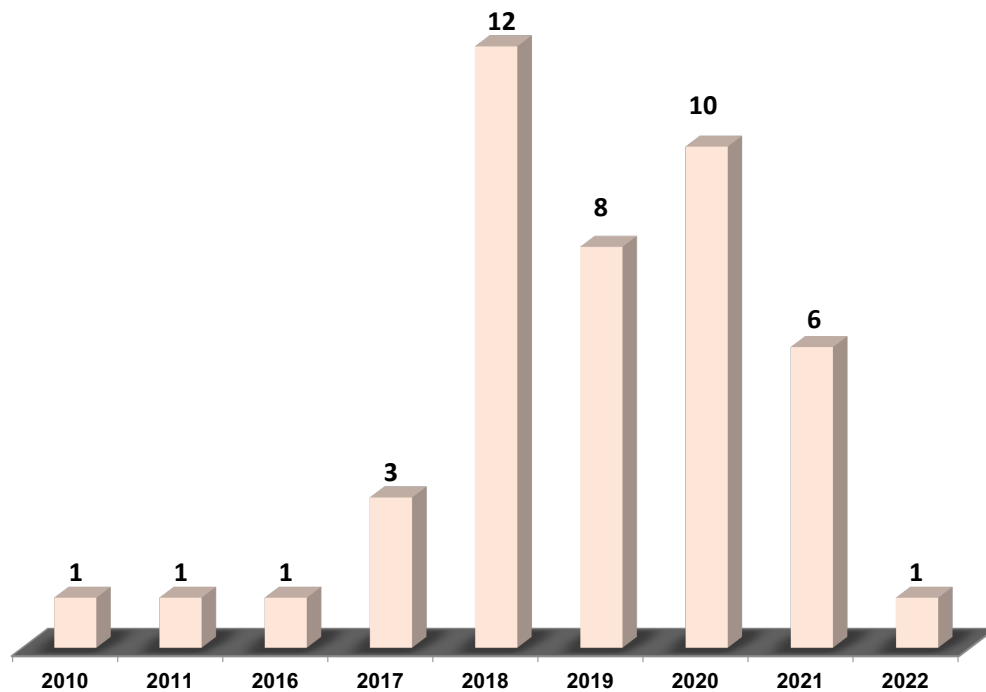


Figure 2. Number of publications over time
Source: Author's compilation

used a qualitative approach. The remaining 12% of the articles are theoretical, including only three literature reviews that contain evidence linking leaders and managers to OI adoption. This underscores the importance of conducting a SLR to expand and improve the theoretical understanding of the topic.

Figure 3 illustrates that studies conducted in the European context, including the United Kingdom, Italy, Spain, and Slovenia, dominate with 16 publications. Asia follows in second place with 13 articles, mainly conducted in India, South Korea, and Malaysia. Regarding the African continent, the number of articles is limited to four: one each from Tunisia and Kenya, and two from South Africa. Seven articles did not specify the study's geographical context.

African countries have begun to show more interest in developing leader and manager characteristics that promote the adoption of OI in SMEs. These findings underscore the need for additional research in developing countries, specifically in Africa, to further explore this topic within their unique context. Drawing comparisons and contrasts with developed countries will provide valuable insights.

Regarding the sectoral distribution of included articles, the analysis reveals that 26 articles did not specify the industry of the SME. Despite the widespread adoption of OI in high-tech industries (Aleksic et al., 2021), the characteristics of SME leaders and managers related to OI adoption are not limited to any particular sector. Therefore, it is requested to conduct more studies in different sectors to deepen our understanding of the topic.

The results also show that leader and manager characteristics that influence the adoption of OI are more extensively studied in the manufacturing and service sectors, as evidenced by 11 articles in the review.

Regarding the theories mobilized in the included articles, the findings indicate that Resource-Based View (RBV) was used in seven articles, Dynamic Capabilities (DC) in six articles, Upper

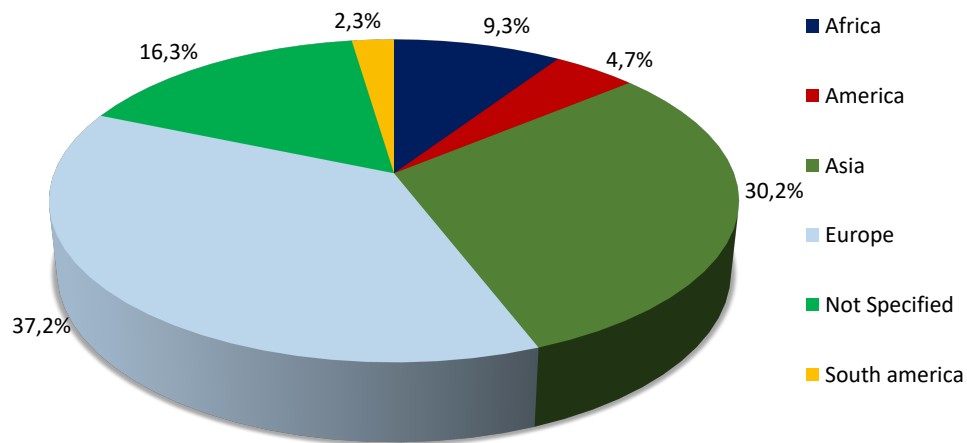


Figure 3. Continents' studies
Source: Author's compilation

Echelon Theory (UET) in five articles, and Knowledge-Based View (KBV) in four articles as the dominant theories that explain the relationship between leader and manager's characteristics and OI adoption in SMEs.

4 OI manager's traits

Our analysis allowed us to distinguish three categories of the manager's characteristics. The first relates to demographic characteristics (Hsu et al., 2013), including training, experience, and tenure. The second concerns managerial traits (Barrett et al., 2021), namely the manager's network, entrepreneurial orientation (EO), managerial skills, entrepreneurial alertness, and entrepreneurial strategic vision. The last category relates to personal characteristics, which include the manager's openness, assertiveness, patience, balancing skills, and OI-oriented attitude.

4.1 Demographic characteristics

4.1.1. Manager's training

Ahn et al. (2017) demonstrated in their study involving 306 Korean SMEs that CEO training in a technological discipline is positively correlated with technology-oriented OI adoption, especially in the form of research and development (R&D) collaboration. However, they did not find a significant correlation between CEO's academic degree and OI adoption. In a subsequent study, Ahn (2020) explored 401 Korean SMEs and found that CEO training indirectly promotes SME openness.

In contrast, Taheri et al. (2018), in their study involving 105 university spin-offs confirmed that the training of managers in various fields positively influences firm openness. They observed that the level of training has a curvilinear influence on openness, suggesting that a manager's higher training can lead to a "lock-in" situation due to increased self-confidence and autonomy.

4.1.2. Manager's experience

Barrett et al. (2021) confirmed in their qualitative research involving seven Irish SMEs that professional or industry experience provides managers with the necessary confidence and know-how to effectively engage in partnerships and proactively manage OI projects. Additionally, Mabula et

al. (2020) found that a manager's experience has a favorable and significant impact on the launch and enhancement of new products and services in the context of OI among African SMEs. In a qualitative case study of two Dutch start-ups investigating how they organized and managed OI activities with large firms, Usman and Vanhaverbeke (2017) argued that a manager's experience was crucial in determining the partnership's efficacy. In contrast, Ahn et al. (2017) found no significant effect of the CEO's years of employment on the adoption of OI. Similarly, in their study of 60 European start-ups, Di Pietro et al. (2018) stated that there was no noticeable distinction between new and experienced managers in their adoption of OI approaches.

On a different note, Taheri et al. (2018) reported a curvilinear impact of CEO experience domains and innovation experience levels on the openness of SMEs. This is attributed to "lock-in" situations that result from the growth of self-confidence and autonomy, acting as barriers to the development of openness.

4.1.3. Manager's tenure

In their study of 264 companies, Biscotti et al. (2018) found a positive relationship between CEO turnover and the adoption of OI. These findings confirm the tendency of new managers to embrace OI practices. As new managers have less attachment to an organization's status quo, they are more willing to consider new and profitable investment opportunities (Wu et al., 2005). This desire to explore external knowledge drives them to adopt the OI paradigm (Berchicci, 2013). In contrast, managers with long tenure tend to strongly adhere to their organizational paradigm. This attachment can result in a misalignment between the internal organization and its external environment (Pfeffer and Salancik, 2003), leading to a preference for closed innovation.

4.2 Managerial characteristics

4.2.1. Manager's network

According to Ahn (2020), CEOs' industrial networks do not contribute to openness in SMEs. Conversely, their academic networks have a positive influence on SME openness. The study conducted by Chabbouh and Boujelbene (2020) on 141 Tunisian SMEs revealed a significant correlation between social networks and the degree of openness in the innovation process. In their study involving 264 SMEs and large enterprises, Podmetina et al. (2018) confirmed the critical role of a manager's network capacity in OI. Similarly, De Oliveira et al. (2018), through a SLR, demonstrated the critical importance of a manager's network for achieving success in OI. Gomezel and Rangus (2019) investigated the relationship between network leaders and OI among 1080 SME leaders in the both US and Slovenia. Their study revealed a lack of a significant relationship between network leaders and OI in the US sample, whereas a noteworthy positive correlation was observed in the Slovenian sample.

4.2.2. Manager's entrepreneurial orientation

Barrett et al. (2021) assert, based on a qualitative study involving seven Irish SMEs in the high-tech sector, that a manager's EO is crucial for integrating external knowledge, thereby adding value to the OI projects in SMEs. Similarly, Freixanet et al. (2021) demonstrated in their study of 128 Spanish SMEs that EO stimulates OI activities, leading to greater innovation performance.

In the same vein, Jayawardhana (2020) found a positive impact of EO on SMEs' orientation toward OI in her study of 442 Sri Lankan SMEs operating in the service and manufacturing sectors. Additionally, Hassan and Iqbal (2020) found that EO is positively related to OI in their research involving 332 senior managers of Pakistani SMEs in the services and manufacturing sectors. Najjar and Dhaouadi (2020) reached a similar conclusion in their study of 178 CEOs of Tunisian SMEs

in the high-tech sector, confirming that CEO EO has a positive and significant impact on both inbound and outbound OI activities. Similarly, Podmetina et al. (2018) demonstrated in their survey of 264 managers of SMEs and large companies that EO is among the most important factors for OI adoption. The same conclusion is also supported by Ahn et al.'s (2017) study, which found that CEOs' EO is associated with all organization market-related OI activities as well as outbound OI activities.

4.2.3. Managerial skills

In their study of 141 Tunisian SMEs, Chabbouh and Boujelbene (2020) identified a statistically significant positive correlation between the managerial skills of the manager and the degree of openness within the innovation process. These abilities play a vital role in facilitating the OI process, specifically in terms of communication, teamwork, and problem-solving (Podmetina et al., 2018). In a study of 200 managers from both SMEs and large US companies, Wang et al. (2020) found a significant correlation between managerial skills in internal and external communication and successful OI outcomes. Similarly, Barrett et al. (2021) emphasized the critical role of managerial capabilities in integrating external knowledge that enhances the value of the OI SME's current and future projects.

4.2.4. Entrepreneurial vigilance

According to Chesbrough (2006), identifying opportunities should accelerate internal innovation and expand markets for external use of innovation, illustrating the behavior of OI. Gomezel and Rangus (2018) support this concept in their study of 188 Slovenian SMEs, revealing that entrepreneurial vigilance-encompassing activities such as analysis, exploring information, linking, evaluating, and judging potential market opportunities- is intricately related to the effective implementation of OI.

4.2.5. Entrepreneurial strategic vision

In their study of 264 managers from SMEs and large companies, Podmetina et al. (2018) identified strategic vision as a significant factor affecting the adoption of OI. Chabbouh and Boujelbene (2020) demonstrated in their study of 141 Tunisian SMEs that a manager's strategic vision enables the company to take more risks and actively pursue new opportunities, resulting in greater involvement in inbound OI.

4.3 Personal characteristics

4.3.1. Attitude toward OI

Ahn (2020) showed, through his study of 401 Korean SMEs, that CEOs' attitudes toward OI play a pivotal role in unbending the company's borders. Aligning with this perspective, Ahn et al. (2017) asserted that a positive CEO attitude is significant in almost all OI modes. Drawing from their study of 178 Tunisian SMEs, Najjar and Dhaouadi (2020) found that the CEO's attitude towards OI exerts a positive impact on inbound OI but exhibits no statistically significant effect on outbound OI.

4.3.2. The patience of the manager

In their study, Ahn et al. (2017) affirm a positive relationship between a manager's patience and inbound OI. The authors attribute this association to a manager's ability to discern challenges, with timeframes playing a critical role in inbound OI. Conversely, the same study reveals a negative relationship between a manager's patience and outbound OI. In this scenario, managers are compelled to swiftly adapt their innovation strategy to explore alternative paths to market.

4.3.3. The openness of the manager

Rangus and Cerne (2019) showed a positive correlation between OI adoption and a manager's openness in their study of 100 Slovenian SME leaders. Similarly, Podmetina et al. (2018) confirmed the significance of knowledge-sharing capacity as a crucial element in OI adoption through their study of 264 SMEs and large enterprise managers. Additionally, Singh et al. (2021) demonstrated in their study of 404 SMEs in the manufacturing sector in the United Arab Emirates that a manager's openness significantly influences both inbound and outbound OI. Furthermore, Aleksic et al. (2021) confirmed in their study of 148 Slovenian SMEs that openness is positively correlated with OI. In addition, the study conducted by Gomezel and Rangus (2019) supported the positive link between a manager's openness and OI. In their qualitative study of seven Italian SMEs, Bertello et al. (2022) found that OI depends on the manager's openness to others. However, Mu et al.'s (2019) study revealed a negative and significant relationship between a manager's openness and OI success.

4.3.4. Manager's assertiveness

In their study involving seven Italian SME managers, Bertello et al. (2022) identified two dimensions of a manager's assertiveness: directiveness and social assertiveness. Directiveness refers to the manager's ability to lead, direct, or influence others in complex interpersonal situations requiring action, initiative, decision-making, and responsibility (Pearsall and Ellis, 2006). Social assertiveness relates to the manager's ability to comfortably initiate, maintain, and conclude social interactions (Lorr and More, 1980).

Bertello et al. (2022) demonstrated that showing self-assertiveness through both directiveness and social assertiveness serves as a critical mechanism for managers to achieve successful OI engagement. Consequently, self-assertiveness is a crucial manager trait to: (1) positively dialogue and interact with external partners while negotiating and managing a mutually beneficial relationship, and (2) effectively communicate with employees to accept additional work, interact with new people, and receive new assignments, all of which contribute to the success of OI implementation.

4.3.5. Balancing skills

Balancing skills refers to the capacity to take a systemic view and recognize the interests of various involved parties (Ritala et al., 2009). This capacity is considered crucial for managing both intra- and inter-organizational interactions, facilitating the equilibrium of divergent forces, including cooperation and competition, trust and contracting, and formal and informal networks (Bouncken and Fredrich, 2016).

Bertello et al. (2022) demonstrated that the balancing skills of SME manager have a positive influence on OI adoption. These authors also underscored the significance of balancing conflicting interests to effectively engage in the practice of OI.

5 Leadership and OI

5.1 Transformational leadership

Transformational leadership cultivates an environment conducive to increased risk-taking and inspires employees to explore beyond organization boundaries, resulting in the promotion of inbound OI (Diesel and Scheepers, 2019). This leadership style emphasizes motivating employees (Burns, 1978), promoting autonomy (Bass, 1999), fostering creativity through trust-building (Bandura, 1997), instilling commitment (Bakker et al., 2006), facilitating learning, and encouraging novel

perspectives, effective collaborate, and shared goals-all of which positively related to OI (Burcharth et al., 2017).

Edelbroek et al. (2019) found the robust impact of transformational leadership on the OI process, investigating the relationship between transactional and transformational leadership and the quality of the OI process. Furthermore, Jia et al. (2018) affirmed that transformational leadership exhibits a positive correlation with both the breadth and depth of an organization's openness, based on their study of 163 Chinese enterprises.

5.2 Transactional leadership

Transactional leaders prioritize efficiency and adhering to time constraints while avoiding risks (Bass, 1985). This leadership style is most effective in stable and predictable environments, where past performance can guide activities, leading to greater success (Lowe et al., 1996). Reactive in nature, transactional leaders respond to observed employee behavior on the job (Judge and Piccolo, 2004). This reactive approach may run counter to the proactive nature required in OI processes (Hoch, 2013).

Edelbroek et al.'s (2019) study, involving 173 employees from many large enterprises and SMEs, demonstrated no significant correlation between transactional leadership and the OI process. Similarly, Jia et al.'s (2018) study affirmed a negative relationship between transactional leadership and the breadth and depth of organizational openness.

5.3 Paternalistic leadership

Managers adopting the paternalistic leadership style combine strict authority, discipline, and moral virtue in their management approach (Farh and Cheng, 2000). Additionally, paternalistic leaders provide a free environment that encourages employee participation in decision-making processes (Wang et al., 2011). Furthermore, this leadership style promotes adaptation processes and the sharing of ideas (Ahmed et al., 2018). Therefore, providing a pleasant and secure work environment that can assist employees in co-creating value (Saputri and Mulyaningsih, 2015) is a crucial element for OI success (Chesbrough, 2011).

These findings were further corroborated by Ahmed et al.'s (2018) study involving 422 Malaysian healthcare professionals, which found a positive relationship between paternalistic leadership style and OI. Similar findings were concluded by Jam et al. (2016) in their study of 344 managers in Malaysia, demonstrating a strong and positive link between paternalistic leadership and OI.

5.4 Democratic leadership

Democratic leaders' behavior is guided by democratic principles including equal participation, inclusion, self-determination, and deliberation (Dahl, 1991). These principles extend into the organizational field, shaping leadership through employee involvement, effective communication, sharing suggestions, continuous performance evaluation, friendliness, and a positive attitude (Bass, 1991). Such attributes collectively promote an environment conducive to idea exchange within and beyond the organizational boundaries (Kuczmarski and Kuczmarski, 1995).

Ahmed et al. (2018) demonstrated that democratic leadership has a positive impact on the OI by fostering employee participation in decision-making and promoting a sense of ownership among employees. Similarly, Jam et al. (2016) found a positive and significant relationship between democratic leadership style and OI.

5.5 Authentic leadership

Authentic leaders are characterized by transparency, morality, forward-thinking, developmental orientation, and exemplary role modeling (Ahmed et al., 2018). They derive their efficacy from a profound awareness of their values, beliefs, strengths, and weaknesses (Gardner et al., 2005). These exceptional qualities not only enable them to identify potential opportunities and challenges (Wieand et al., 2008), but also to exert a significant influence on the behavior of their subordinates, thereby cultivating trust and respect (Walumbwa et al., 2008). Authentic leaders promote knowledge sharing among employees to foster innovative ideas, which is crucial in implementing OI (Rego et al., 2012).

Ahmed et al. (2018) found a positive correlation between authentic leadership and OI in their study of 422 healthcare professionals in Malaysia. Furthermore, in a cross-national study involving 390 enterprises in the Netherlands and India, De Jong et al. (2018) underscored the critical role of authentic leadership as a key success factor for OI. Their research particularly emphasized the heightened impact of authentic leadership among Indian leaders compared to their Dutch counterparts. These results align with Jam et al.'s (2016) study of 344 Malaysian managers, which confirmed a positive relationship between authentic leadership style and OI.

5.6 Empowering leadership

Empowering leadership facilitates employee collaboration and promotes an organizational learning culture that fosters knowledge exploration and exploitation for OI (Jönsson et al., 2015). This leadership style inspires employees to generate novel ideas and explore them externally (Zhang and Bartol, 2010). Furthermore, it establishes an environment of trust that facilitates effective communication, enabling a thorough comprehension of the dynamic market and the constructive and collaborative assessment of external knowledge's opportunities and benefits (Bligh, 2017).

Empirical evidence from Naqshbandi and Tabche's (2018) study of 155 Indian managers shows a significant, positive relationship between empowering leadership and both inbound and outbound OI. This result is reinforced by Naqshbandi et al.'s (2019) research that also confirms a positive correlation between empowering leadership and both inbound and outbound OI.

6 Discussion and conclusion

OI is a strategy that facilitates sustainable competitive advantages (Vanhaverbeke and Cloudt, 2014; Diaz-Delgado et al., 2019), maintains innovation leadership (Salampasis et al., 2015), and contributes to creating and capturing value (Cunningham et al., 2021; Bhimani et al., 2023). Particularly for SMEs, this approach offers several advantages, including costs and risks reduction, enhanced operational flexibility, improved products marketing efficacy, and heightened innovation performance (Bigliardi and Galati, 2018).

While previous research on OI has primarily concentrated on examining its antecedents at the organizational level (Bertello et al., 2022), current literature highlights the significance of exploring the human side dimension and investigating the determinants of OI at the individual level (Bogers et al., 2017; West and Bogers, 2014). The adoption of OI within SMEs requires managers with specific characteristics that could facilitate this process and attain desired outcomes and success (Biscotti et al., 2018; Bertello et al., 2022). To explore these characteristics we conducted a SLR examining 43 publications extracted from Scopus and WoS databases. Our purpose is to address the research question, "What characteristics and traits define the SME leader and manager who succeeds in adopting OI?" Additionally, we aim to identify the leadership styles that promote the adoption of OI in SMEs. This SLR evaluates the entire literature dealing with SME leaders and

managers' characteristics that promote the adoption of OI. The objective is to provide an overview of the literature's evolution on this topic and identify profiles of SME leaders and managers that can favor OI implementation. The small size of our selected database (43 articles) highlights the fact that the knowledge about the role of individual actors in leading and managing OI is limited (Ahn et al., 2017; Salter et al., 2014).

This study clearly shows that certain characteristics of managers contribute to promoting OI in SMEs. Our analysis has identified three categories of manager characteristics that influence the adoption of OI in SMEs: demographic characteristics, managerial characteristics, and personal characteristics.

In terms of demographic characteristics, results show that a manager's education and experience have a positive impact on SME openness (Ahn et al., 2017; Ahn, 2020; Usman and Vanhaverbeke, 2017). According to Darmadi (2013), CEO education and experience are complementary, as the skills needed to make managerial decisions are not always formed only by formal educational qualifications. Furthermore, the manager's experience and education foster his or her "absorptive capacity" to recognize the potential value of external resources and to credibly engage with and leverage external complementary knowledge to support innovation activities (Barrett et al., 2021). Moreover, the manager's experience builds his confidence and his or her know-how which are crucial to proactively engaging in OI projects (Mabula et al., 2020; Barrett et al., 2021), and thus may be crucial in determining the success of such collaboration (Usman and Vanhaverbeke, 2017). However, other studies claim that a manager's educational level and experience have a curvilinear influence on the openness of the firm (Di Pietro et al., 2018; Taheri et al., 2018). The curvilinear relationship suggests that an extended education or experience may lead to path dependency (Ahn et al., 2017) or a "lock-in" situation based on increasing self-confidence and self-reliance that creates constraints on the development of openness (Dencker et al., 2009; Taheri et al., 2018). These controversial results indicate that further research is necessary to identify the ideal level of education and experience.

In terms of managers' personal characteristics, results show that managers' attitude toward OI is positively related to inbound and outbound OI (Ahn et al., 2017; Ahn, 2020; Najar and Dhaouadi, 2020). Concerning the manager's openness, the findings reveal that it stimulates both inbound and outbound activities of the SME (Podmetina et al., 2018; Gomez and Rangus, 2019; Rangus and Cerne, 2019; Singh et al., 2021; Aleksic et al., 2021).

Bertello et al. (2022) have shown that a manager's assertiveness contributes to the success of OI implementation. The same authors argue that a manager's balancing skills as the ability to equilibrate opposing forces (Bouncken and Fredrich, 2016), are relevant for a manager to successfully engage in OI. Assertiveness combined with balancing skills allows the manager to deal with intra- and interpersonal relationships, emotions, and feelings of individuals as the main elements of OI (Cunningham et al., 2021).

In terms of managerial characteristics, according to studies by Podmetina et al. (2018) and de Oliveira et al. (2018) the manager's networking skills are among the most crucial success factors for OI. Managers play a network-oriented role in facilitating OI (Bhimani et al., 2023). Thus, the degree of openness of the innovation process is strongly correlated with the capacity to integrate both social and academic networks (Chabbouh and Boujelbene, 2020; Ahn, 2020).

Another characteristic refers to the manager's EO. The literature reviewed confirmed that EO positively influences the orientation of SMEs toward OI (Jayawardhana, 2020; Hassan and Iqbal, 2020) making it one of the most critical factors for OI adoption (Freixanet et al., 2021; Podmetina et al., 2018; Ahn et al., 2017). Managers who demonstrate a strong willingness to

take risks, innovate, and be proactive are more inclined to overcome OI challenges (Usai et al., 2018) and integrate external knowledge into the innovation process (Barrett et al., 2021).

Managerial skills of the manager include communication, teamwork, and problem-solving (Podmetina et al., 2018). These abilities are crucial for the success of the OI process (Chabbouh and Boujelbene, 2020; Wang et al., 2020; Barrett et al., 2021).

Gomezel and Rangus (2018) demonstrate that a manager's entrepreneurial vigilance, which includes analyzing, exploring information, linking, evaluating, and judging future business opportunities, is related to the effective implementation of OI. According to Podmetina et al. (2018), a manager's strategic vision is one of the most crucial factors in adopting OI as it allows the firm to take more risks and engage more actively in OI (Chabbouh and Boujelbene, 2020).

Figure 4 summarizes the findings of our study and forms the general framework of our research. According to Salampasis et al. (2015), leaders and managers play a crucial role in driving OI. Successful adoption of OI requires SME managers to possess specific traits that enable the implementation of this model. The managers' experience complements their training, as it represents "learning by doing" (Barrett et al., 2021). This contributes to the development of absorptive capacity, which is a prerequisite for and an effective facilitator of successful OI (Carrasco-Carvajal et al., 2023; Bhimani et al., 2023). Additionally, absorptive capacity fosters innovative capacity (Bhadauria and Singh, 2023), which is a component of EO (Covin and Slevin, 1989). The latter allows managers to accept risks and improve their ability to seek resources externally (Jayawardhana, 2020), encouraging boundary-crossing behavior and expanding their potential network for OI engagement (Barrett et al., 2021).

The leader's assertiveness, fueled by training and experience (Barrett et al. 2021), enables him or her to better understand, negotiate, and interact positively with partners (Bertello et al., 2022), thereby enhancing his or her "reputational credibility" and cultivating trust-based relationships. These are important factors in fostering collaboration and knowledge sharing (Alaassar et al., 2020). In addition, the leader's openness to innovative ideas, learning, feedback, and new network relationships can promote OI (Gomezel and Rangus, 2019). Thus, combining assertiveness with a leader's openness can allow him to reconcile divergent partner interests (Bertello et al., 2022) and help him strengthen and expand his network, creating more opportunities for collaboration and partnerships.

Our study has also examined the influence of leadership styles on OI. These findings indicate that paternalistic, democratic, and authentic leadership styles are positively correlated with OI adoption (Jam et al., 2016; Ahmed et al., 2018; De Jong et al., 2018). Transformational leadership is positively related to OI breadth and depth (Jia et al., 2018; Edelbroek et al., 2019), whereas transactional leadership is negatively related to OI (Jia et al., 2018; Edelbroek et al., 2019). For empowering leadership, the studies by Naqshbandi and Tabche (2018) and Naqshbandi et al. (2019) show that there is a positive relationship between it and inbound and outbound OI activities.

6.1 Theoretical implications

The present research contributes to the literature on OI, especially in the SME context (Hossain and Kauranen, 2016; Torchia and Calabrò, 2019; Santoro et al., 2020; Tchouwo et al., 2021), exhibiting that SME manager's characteristics and leadership style are crucial in promoting OI adoption. Indeed, the research adds to that of Salter et al. (2015), Ahn et al. (2017), Bogers et al. (2018), Santoro et al. (2020), and Bertello et al. (2022), showing that the personal, demographic and managerial characteristics of SME leaders and managers (as illustrated in Figure 4) are crucial individual factors for successfully implementing OI model. Thus, contributes to a

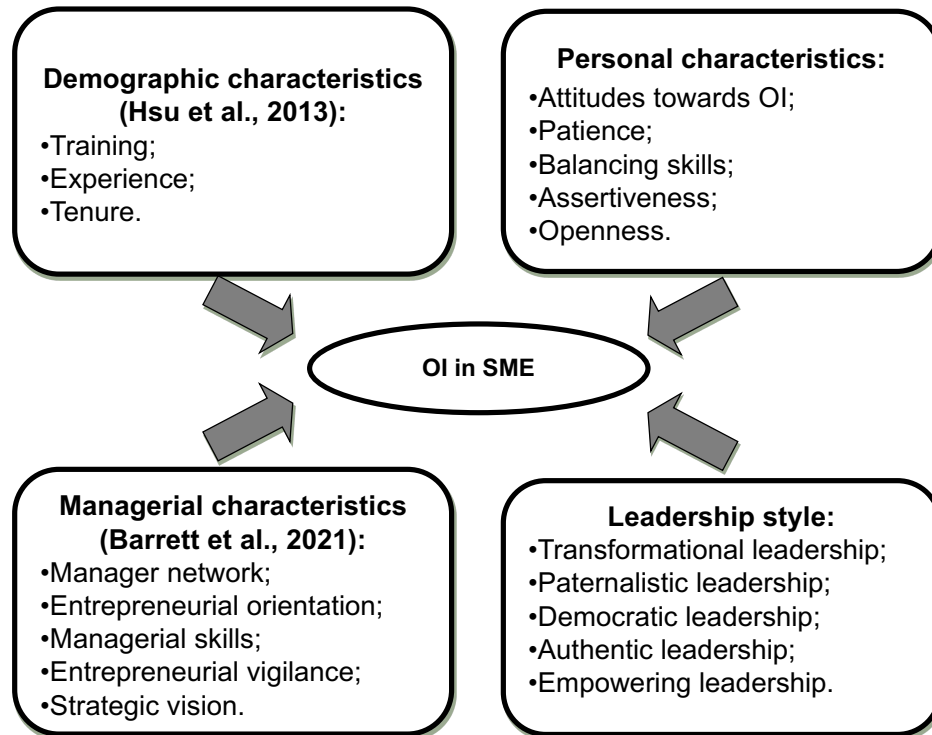


Figure 4. Study's general framework
Source: Author's elaboration

more comprehensive and precise understanding of the SME OI peculiarities (Vanhaverbeke et al., 2014; Barrett et al., 2021).

In response to the claim that the relationship between managers' characteristics and OI is rarely studied (Ahn et al., 2017; Ahn, 2020), this research provides a step toward understanding of SMEs' adoption of OI. To the best of our knowledge, this study is the first that combines the findings of research on manager's characteristics with studies on leadership styles across various contexts. Furthermore, this study completes the findings of other studies on the characteristics and determinants of OI in SMEs (e.g. Hafkesbrink and Schroll, 2014; Bacon et al., 2019; Tchouwo et al., 2021) by focusing on the micro-foundation level and drawing a profile of the SME manager who could adopt the OI model. The study further identifies the necessary characteristics and leadership styles of SME managers (Figure 4) that promote OI. In addition, this study contributes to the existing literature on leadership and OI in SMEs. Previous studies have attempted to investigate the relationship between leadership styles and OI (Ahmed et al., 2018; Jia et al., 2018; Naqshbandi and Tabche, 2018). However, these studies solely examine the influence of specific leadership styles on OI. Our research investigates the impact of all leadership styles, including transformational, paternalistic, democratic, authentic, and empowering leadership, on the adoption of OI in SMEs. These findings enhance our understanding of the human aspect and micro-foundations of OI (Aleksich et al., 2021).

6.2 Practical implications

The research is also relevant to both SME managers and policymakers. For SME managers, this study provides an overview of the key traits and characteristics of the SME manager's profile and leadership styles that drive OI implementation. As a result, managers are called upon to reinforce these characteristics and choose the leadership styles that effectively support the adoption of

this paradigm. In addition, SME leaders and managers seeking to implement an OI strategy can benefit from recognizing and understanding these traits and characteristics when selecting appropriate external partners for new OI projects. According to Bigliardi and Galati (2018), finding the right partner is the main barrier to OI adoption. Therefore, SME managers can refer to these characteristics and leadership styles to recognize whom to collaborate and cooperate with within the OI framework.

Given the critical role of OI in helping SMEs overcome their size-related limitations and resource constraints (Costa et al., 2023; Marzi et al., 2023) and achieve superior performance (Jayawardhana, 2020), it is crucial to identify the characteristics and traits of a leader that facilitate OI adoption. This will assist in recruiting CEOs by considering these traits and leadership styles as a checklist to determine the profile of a future CEO who can competently implement the OI model.

The article provides useful insights for policymakers to support OI implementation in SMEs. First, this research calls policymakers' attention to the need to recognize that SME managers can play an important driving role in promoting and diffusing OI (Ahn, 2020), as they are at the epicenter of innovation activities (Marcati et al., 2008). Second, the characteristics identified in this study as conducive to OI adoption can be used as selection criteria for SME managers who may benefit from public grants promoting innovation. This approach would ensure optimal usage of government grants by fostering collaboration and co-creation/co-capture of value. Third, policymakers can leverage the results of this study by including leadership styles that facilitate the implementation of OI in training programs specifically designed for SME managers to promote OI (Ahn, 2020).

6.3 Limitation and further research

Although this research has notable theoretical and practical contributions, it presents limitations. Firstly, the results of the study could be constrained due to the specific inclusion and exclusion criteria used, such as keywords, which may have limited the selection of all relevant studies dealing with the topic. As a suggestion, future studies should use a wider range of keywords to identify a greater number of articles addressing the topic. Secondly, only a limited number of articles, 43 in total, were included in the analysis. Other types of publications, such as books, conference papers, policy documents, and professional and expert reports could be examined in future studies to identify the largest body of research on the subject. Additionally, exploring these sources can provide a more comprehensive understanding of the topic. Thirdly, as the impact of CEO characteristics can vary with the OI mode (Ahn et al., 2013), the review does not differentiate between the characteristics that promote inbound OI mode over outbound and coupled modes, despite distinctions highlighted in the OI literature (Ahn et al., 2013). For instance, the inbound OI mode refers to the internal use of external knowledge (Chesbrough et al., 2006; Dahlander and Gann, 2010; Huizingh, 2011), which can cause internal resistance such as "Not Invented Here" syndrome (Ahn et al., 2017). Manager with a positive attitude toward OI becomes relevant in overcoming this syndrome (Najar and Dhaouadi, 2020). Conversely, the outbound OI mode involves greater risks that require a high EO, as the firm may reveal its proprietary information, which may jeopardize the confidentiality of the firm's technologies (Laursen and Salter, 2014). As a result, likely, the characteristics and leadership styles of SME leaders and managers who support inbound OI differ from those who support outbound OI. Subsequent studies should consider these factors when investigating the relationship between leader and manager characteristics and OI mode adoption in SMEs.

This study has identified also gaps in the literature, indicating that there is an unexplored aspect of the topic that future studies should take into consideration. Some characteristics need further investigation to study their impact on OI in different contexts, notably training, experience, manager's openness, and transactional leadership. The reviewed articles show that these characteristics are related to OI implementations in different ways. For example, Taheri et al. (2018) found a curvilinear relationship between training and OI. For experience, the study by Barrett et al. (2021) found a positive association with OI, while others found a negative relationship with OI (Ahn et al., 2017; Di Pietro et al., 2018). Therefore, future studies will further explore the relationship between these characteristics and OI adoption in SMEs.

Additionally, managers' characteristics examined in this study influence the interaction of SMEs with external partners. Thus, they influence more the OI orientation of SMEs. In contrast, leadership styles within the SME are addressed by examining their influence on employees, which facilitates the implementation of OI practices. We believe that the success of OI needs to take into consideration both adoption and implementation. Therefore, future research should focus on these two aspects and their complementarity.

Another gap that needs to be explored in the literature is the capacity of managers to coordinate between OI actors inside and outside the SME. To explore OI through partnerships and at the inter-organizational level, it is necessary to use specific coordination mechanisms that enable positive outcomes with partners (Baggio et al., 2018). Therefore, future studies could use Grandori and Soda's (1995) model, which presents the coordination mechanism of inter-organizational relationships, and explore it through the lens of OI.

Another research perspective might concern the geographical context of the studies (Carrasco-Carvajal and Garcia-Perez-De-Lema, 2021). As stated by Najjar and Dhaouadi (2020), limited attention has been paid to the impact of manager's characteristics on OI in developing economies. Hossain et al. (2016) and Usman et al. (2018) suggested studying OI in the context of developing countries. Future research should explore manager's traits and their influence on OI in such countries.

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8 Appendix

Table 1. The findings of the studies on manager traits and OI adoption.

Category	Manager's characteristics	Results	References
Demographic characteristics	Training	CEO education directly affects internal R&D and indirectly contributes to firm openness.	Ahn (2020)
		OI adoption in terms of R&D collaboration is positively correlated with CEO training in a technological discipline.	Ahn et al. (2017)
		CEO academic degree has no significant association with OI adoption.	
		CEO's education level has a curvilinear influence on openness.	Taheri et al.(2018)
		CEO's diverse education is found to have a positive influence on company openness.	
	Experience	The CEO's working years have no significant relationship with OI adoption.	Ahn et al. (2017)
		The founder's career experiences are important in integrating external knowledge and adding value to the SME's OI projects (current and future).	Barrett et al. (2021)
		No strong differences emerged between first-time and serial entrepreneurs in terms of OI adoption.	Di Pietro et al. (2018)
		Entrepreneurs with industry and management expertise seem less prone to exploit the crowd as an external source of knowledge.	
		There is a negative trend between founders' startup experience and OI, which becomes stronger as founders' experience increases.	
Innovation experience is part of the optimal model, indicating that higher levels of experience increase openness.	Taheri et al. (2018)		
Founder experience domains have a curvilinear influence on openness.			
The level of innovation experience has a curvilinear influence on openness.			

Category	Manager's characteristics	Results	References
Personal characteristics		The experience level of the founder is crucial for the success of the collaboration.	Usman and Vanhaverbeke (2017)
	Tenure	OI is significantly and positively affected by CEO turnover.	Biscotti et al. (2018)
	Attitudes towards OI	CEOs' attitudes toward OI play an important role in opening firm boundaries. Positive attitude of a key decision-maker is significant in almost all OI modes. CEO attitudes toward OI positively impact inbound OI and the innovation climate.	Ahn (2020) Ahn et al. (2017) Najar and Dhaouadi (2020)
		The direct effect of CEO attitude toward OI on outbound OI is not significant. The results of the indirect effect revealed the significance of full mediation of CEOs' attitude on outbound OI and the complementary mediation CEOs' attitude on inbound OI.	
	Manager patience	The patience of CEOs has a positive correlation with inbound OI, specifically in R&D collaboration. Conversely, it has a negative correlation with outbound OI.	Ahn et al. (2017)
	Manager balancing skills	Balanced skills, including the ability to manage divergent interests and formal as well as informal collaborations, are essential for effectively engaging in multiplex boundary work to achieve collaborative innovation.	Bertello et al. (2022)
	Manager assertiveness	Assertiveness through directiveness and social assertiveness is relevant to successfully engage in multiplex boundary work for collaborative innovation.	Bertello et al. (2022)
	Managers openness	Openness as measured by knowledge sharing boosts OI. The correlation between knowledge sharing and OI has a strong and significant impact on the high-tech industry. Openness to others through perspective-taking and empathy is essential for effectively engaging in multiplex boundary work to foster collaborative innovation.	Aleksic et al. (2021) Bertello et al. (2022)
		Entrepreneurial openness positively impacts absorptive capacity, which in turn leads to improved innovation performance. There is a significant negative correlation between an 'openness orientation' and success in open collaborative innovation.	Gomez and Rangus (2019) Mu et al. (2019)

Category	Manager's characteristics	Results	References
Managerial characteristics		The ability to share knowledge within the organization is among the most important for OI adoption.	Podmetina et al. (2018)
		Leaders building OI coalitions were marginally and significantly associated with both openness towards others and innovative behavior.	Rangus and Cerne (2019)
		The positive relationship between openness toward others and innovative behavior is enhanced at higher levels of leaders' involvement in building OI coalitions.	
		Knowledge sharing practices influence positively and significantly inbound OI.	Singh et al. (2021)
		The relationship between knowledge sharing practices and outbound OI was significant.	
		CEOs' prior industrial networks do not contribute to opening firm boundaries.	Ahn (2020)
		CEO's academic networks influence positively and significantly the degree of SMEs' openness.	
		Networking is among the most important for OI.	Podmetina et al. (2018)
		Social networks have a significant correlation with the degree of openness of the innovation process.	Chabbouh and Boujelbene (2020)
		The network and relationships are important OI success factor.	de Oliveira et al. (2018).
	For the American sample, there is no statistically significant correlation between maintaining pre-existing contacts and organizational innovation. Conversely, in the Slovenian sample, maintaining existing contacts is significantly related to promoting OI.	Gomez and Rangus (2019)	
	Entrepreneurial Orientation	CEOs' EO is linked to both market-oriented and organization-oriented OI as well as outbound OI.	Ahn et al. (2017)
		The founder's EO plays a crucial role in effectively integrating external knowledge and bringing added value to the SME's ongoing and future OI initiatives.	Barrett et al. (2021)
		International EO fosters OI activities, which are positively linked to improved innovation performance.	Freixanet et al. (2021)
		EO has a positive correlation with knowledge management capability, which in turn has a positive correlation with OI.	Hassan and Iqbal (2020)
		SMEs' EO positively affects their OI orientation.	Jayawardhana (2020)

Category	Manager's characteristics	Results	References
		CEO EO positively influences both inbound and outbound OI through innovative climate, demonstrating a complementary mediation.	Najar and Dhaouadi (2020)
		Entrepreneurial mindset and skills are the most important elements in the adoption of OI.	Podmetina et al. (2018)
	Risk-taking	Risk-taking has a positive relationship with inbound and outbound OI.	Carrasco-Carvajal and Garcia-Perez-De-Lema (2021)
		Risk-taking is positively and significantly related to both inbound and outbound OI activity of firms.	Madrid-Guijarro et al. (2021)
		The effect of risk-taking on outbound firm activity is clearly stronger than the effect on inbound activity.	
		Companies seem to be more open when they ensure risk taking approach.	Santoro et al. (2020)
	Managerial skills	Managerial skills are positively and significantly associated with the degree of openness of the innovation process.	Chabbouh and Boujelbene (2020)
		Communication, team-working and problem-solving skills are among the most important for OI.	Podmetina et al. (2018)
		Open internal communication is significantly related to OI success.	Wang et al. (2020)
		Open external communication was significantly related to OI success.	
		The founder's management capabilities are critical in integrating external knowledge and adding value to the SME's OI projects (current and future).	Barrett et al. (2021)
	Entrepreneurial vigilance	An individual-level OI mindset has a positive impact on all three entrepreneurial alertness dimensions: scanning and searching, association and connection, evaluation and judgment.	Gomezal and Rangus (2018)
	Strategic vision	The strategic vision is positively related to the degree of openness of the innovation process.	Chabbouh and Boujelbene (2020)
		The strategic thinking is among the most important abilities for OI adoption.	Podmetina et al. (2018)

Source: Authors' elaboration

Table 2. Leadership styles and OI.

Leadership styles	Results	References
Wise leadership	The adoption of wise leadership demonstrates a significant positive direct and indirect impact on energizing the OI within family-owned firms.	Abdulmuhsin and Tarhini (2020)
Paternalistic leadership	Paternalistic leadership style is positively related to open service innovation. Results revealed a significant positive relationship of paternalistic leadership style with OI.	Ahmed et al. (2018) Jam et al. (2016)
Democratic leadership	Democratic leadership plays a crucial role in promoting OI. A statistically significant positive correlation was found between a democratic leadership style and OI.	Ahmed et al. (2018) Jam et al. (2016)
Authentic leadership	Authentic leadership has a positive role in fostering OI/ The construct of authentic leadership was found to be related to OI. Results revealed a significant positive relationship between authentic leadership style and OI.	Ahmed et al. (2018) De Jong et al. (2018). Jam et al. (2016)
Complexity leadership	There is a significant positive linear relationship between complexity leadership and exploitative innovation. The relationship between complexity leadership and exploratory innovation is not significant.	Diesel and Scheepers (2019)
Transformational leadership	Transformational leadership has been shown to have a strong and significant relationship with the process of OI. Transformational leadership is positively related to openness breadth as well as to openness depth.	Edelbroek et al. (2019) Jia et al. (2018)
Transactional leadership	The relationship between transactional leadership and the OI process did not prove to be significant. Transactional leadership is negatively related both to openness breadth and openness depth.	Edelbroek et al. (2019) Jia et al. (2018)
Empowering leadership	Empowering leadership has a significant and positive relationship with inbound and outbound OI. Empowering leadership is positively related to inbound and outbound OI.	Naqshbandi and Tabche (2018) Naqshbandi et al. (2019)

Source: Authors' elaboration

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