The Future of Knowledge Management in Family firms: Factors and Barriers for AI Adoption

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Abstract: Family businesses represent the most widespread entrepreneurial form. Within knowledge management studies, a large amount of research has focused on family businesses, highlighting the particular needs they require. At the same time, several studies have highlighted the existence of barriers and enabling factors in the adoption of new technologies within family businesses. Currently, we are seeing the spread of artificial intelligence (AI) within business organizations. On these premises, this study has a dual objective. The first objective, from a theoretical point of view, wants to trace the link between AI and knowledge management. The second objective of this study aims to identify the main barriers to the application of AI in family businesses. This study is based on a systematic literature review using the phases of data collection, bibliometric analysis and content analysis. Two international scientific databases were used: Scopus and Web of Science (Clarivate). A search string was created by identifying keywords. Subsequently, only scientific documents published in double blind review journals, in English, were selected. The sample used in this study contained about 40 scientific documents. The results of this study offer initial reflections on the adoption of artificial intelligence in family businesses. Artificial intelligence represents a new way of managing knowledge within organizations. The peculiar characteristics of family businesses impose reflections on the methods of adoption and barriers that may emerge. This study contributes to the understanding of family businesses, under the theoretical perspective of knowledge management. Family businesses represent complex but widespread organizations. For this reason, academics, entrepreneurs and practitioners must understand the obstacles that could make the adoption of AI difficult.

Keywords: Family Firm, Barriers, Knowledge Management, AI, Absorptive Capacity.

1. Introduction

Family businesses represents the most common element in the entrepreneurial system. For this reason, family business assumes a relevant role in economic and social system. This relevance has attracted the attention of management and organization theory scholars. Consequently, an intensive and active academic debate has developed around family businesses. In recent decades, scholars have focused attention on the peculiar characteristics of family businesses (Salganicoff, 1990; Sharma, et al., 1997; Ventura, et al., 2020; Daspit, et al., 2021), often, through a comparison with non-family businesses (Conz and Magnani, 2020; Rovelli, et al., 2022; Baltazar, et al., 2023). Above all, a growing research area on knowledge management studies in family business has developed. This line of studies aimed to understand the dynamics and practices of knowledge management in family businesses (Chaudhary and Batra, 2018; Pütz and Werner, 2023).

The family business, under the theoretical lens of knowledge management theories, emerges the paradox of family businesses. In fact, family businesses are organizations recognized as slow to introduce innovation and new knowledge (Nieto, et al., 2015; Soluk and Kammerlander, 2021). Innovation and technological progress represent levers for maintaining or increasing competitive advantage. For this reason, family businesses must increase their capacity to absorb new technology and knowledge. Artificial Intelligence (AI)-based systems represent the latest and greatest challenge for family businesses. Artificial intelligence (AI) is a relatively recent phenomenon, which is spreading rapidly and across various sectors.

Although the first attempts to define artificial intelligence date back to the 1950s, even today, it appears difficult to offer a complete and exhaustive definition of artificial intelligence. AI represents a complex and multidimensional phenomenon. With the aim of analyzing AI, under a theoretical perspective typical of knowledge management studies, we can preliminarily define artificial intelligence (AI). AI, and the systems connected to it, can be defined as systems capable of absorbing, creating, managing and transferring the knowledge of an organization, within it, through different combination techniques. Knowledge management (KM), therefore, is supported through AI systems.

AI systems rely on external and internal knowledge sources. External sources are represented by the ability to store, collect and use quantities of data (big data); instead, internal sources are the absorption of professional knowledge to carry out a certain task and knowledge of the organization.

With these premises, the main objective of this study is to identify the Factors and barriers for AI Adoption that can influence the adoption of AI systems in family businesses.

2. Theoretical Framework

2.1 Family Firms in Knowledge Management Studies

In recent decades, knowledge has assumed the role of a strategic resource and source of competitive advantage (Mårtensson, 2000). For knowledge to become a strategic resource, the organization's processes must be based on the creation, storage, sharing and enhancement of knowledge. Knowledge Management (KM) becomes a crucial and transversal element in all organizational processes (Martinez-Conesa et al., 2017). KM can be traced back to all activities oriented towards the acquisition, storage, sharing and application of knowledge (Alavi and Leidner, 2001; Lee, 2012). Organizations, therefore, find themselves having to develop the ability to organize their internal processes by enhancing knowledge (Durst and Edvardsson, 2012; Del Giudice and Maggioni, 2014).

In the modern debate within knowledge management studies, a growing and solid line of studies has focused on family businesses (Ventura, et al., 2020; Arzubiaga, et al., 2022; Vesperi, et al., 2023).

Despite this, knowledge management appears particularly complex. First of all, knowledge is an intangible and complex element with results that cannot be measured in the short term and, above all, cannot be defined a priori. On the other hand, family businesses are particularly complex organizations with intrinsic characteristics, equipped with a system of values dominated by opposing strategic orientations (Reid, et al., 1999; Hernández-Linares, 2020). Different analytical perspectives and facets emerge in KM studies on family businesses (Letonja and Duh, 2016; Ge and Campopiano, 2022; Ratten, 2023). More specifically, previous research on KM has mainly focused on the difference between family and non-family businesses.

Studies analyzing the multiple facets of KM have mainly focused on non-family businesses (Obeso et al., 2020), while KM research on family businesses is still at an early stage. although it is broad and offers insights for both research and management practice, there is a lack of coherent and adequate conceptualizations of KM for the development of theoretical models and the design of empirical work in the always complex area of the family. businesses. The objective of this study is to offer the theoretical basis for understanding the adoption of artificial intelligence, identifying the main barriers and enabling factors, in family businesses, under the theoretical perspective of KM.

3. Methodology

The main purpose of this study is to offer a theoretical framework on the adoption of artificial intelligence in family businesses, under the theoretical perspective of knowledge management. The academic contributions on family businesses, also from the perspective of knowledge management studies, appear substantial and in a mature phase. On the contrary, the impact of artificial intelligence on the dynamics of family businesses appears poorly studied and fragmented.

With these premises and with the aim of offering a broad picture of existing scientific contributions, a qualitative methodology was adopted (Bell, et al., 2004), of an exploratory nature (Alcácer, et al., 2016), based on the literature review. The systematic literature review also allows future research to be linked to studies conducted in the past (Vesperi and Coppolino, 2023).

The collection and analysis of scientific documents followed the following steps:

I. Source of the data. The scientific documents analyzed in this study are all the scientific documents on family firms contained in the databases (a) SCOPUS and (b) Web of Knowledge (WoS). Scientific documents were extracted and retrieved in April 2024. Only peer-reviewed journals articles published in English were considered (not considered: books, chapters/book reviews, professional articles, conference proceedings, working papers, reports, unpublished works; see on this point Tranfield et al., 2003). We selected only scientific papers with the following keywords in article titles, abstracts and keywords: “knowledge”, “family firm*” OR “family business*”, “Artificial Intelligence*” OR “AI”, “barrier*”, “enabl*”.

Only scientific documents were considered in the areas "*Business, Management and Accounting*" and "*Social Science*". No time limitation criteria has been inserted.

Finally, 178 records were produced from the sources.

II. File format and database preparation. All bibliographic data have been saved in CSV (Comma Separated Values) format, sorted in alphabetical order by title. In addition, other entries not considered useful or duplicate entries have been removed from the file. (Karamali, et al., 2020).

III. Visualization of keywords. The database was exported and analyzed using the VOSviewer software (see van Eck and Waltman, 2007; 2010; 2014) with the aim of identifying the link between the keywords used by the authors of the scientific documents identified.

IV. Selection of scientific documents. The implementation of qualitative methodological processes could generate "non-transparent areas". According to Yin (2012), to solve this limit the authors must analytically describe all the steps taken for the selection of scientific documents. To overcome this limit, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyzes) guidelines have been adopted. The selected scientific papers will be analyzed to define the theoretical framework on the topics under study.

The PRISMA guidelines guarantee transparency in the systemic literature review process (Liberati, et al., 2009).

In the study, attention had to be paid to duplicates that were removed from the databases. The final database is made up of n. 41 relevant documents of which 10 open access. The remaining papers were read to ensure their alignment with the research objective according to the theoretical quality and methodology/robustness of the data.

4. Main Results and Discussion

From the analysis of the scientific documents identified, numerous contributions emerge which deal with understanding the enabling factors and barriers to the adoption of new technologies and knowledge. The literature on the topic, therefore, is rich in theoretical and empirical analysis perspectives. With the aim of offering the most complete academic debate, the graphic representation of the scientific panorama was created. The scientific panorama was created by highlighting the relationships between the keywords that scholars have used to analyze the phenomenon of enabling factors and barriers.

Figure 1 shows the representation of the scientific panorama based on the intensity of use of keywords.

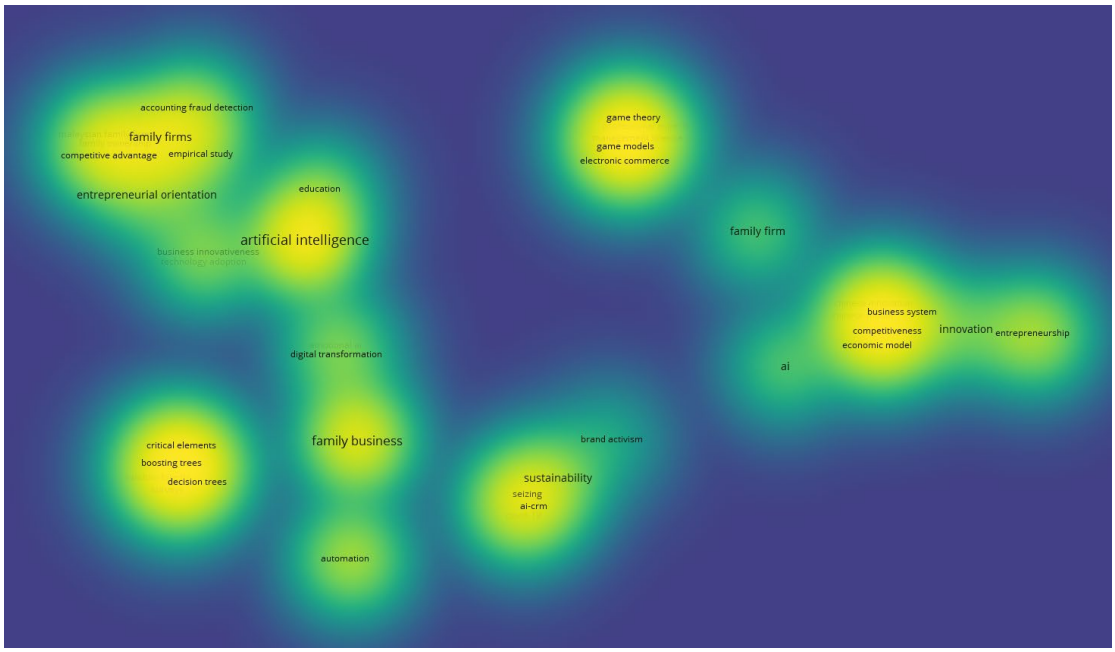

Figure 1: Scientific landscape

Source: Vosviewer software

Figure 1 shows the scientific landscape, highlighting the density (i.e. numerousness) of the words. The keywords that are at the center of larger circles define a greater number of uses than that keyword. The scientific landscape is characterized by the presence of various centers that focus the attention of scholars. In fact, we can identify the main centers around the keywords "family firms", "family business", "competitiveness", "sustainability" and "critical elements". Although the first two centers are representations of the same phenomenon but with different terminology, the other centers of the scientific landscape determine different analysis perspectives of the scholars.

First of all, it is possible to identify the historical evolution of the number of manuscripts published over time. The first paper published on the topic dates back to 2010. Since 2019, there has been an increase in published articles. In fact, over 50% of the selected papers were published from 2019 to 2023.

This allows us to draw the conclusion that the topic of the adoption of AI systems represents an emerging topic in the field of knowledge management studies, linked to family businesses.

A further consideration, under the temporal perspective, that emerges is linked to the focus on AI systems. In fact, the less recent selected articles adopt an analysis perspective focused mainly on the theoretical definition of artificial intelligence and the impacts of new technologies.

The most recent articles, on the other hand, focus on a hybrid perspective, that is, the selected papers begin to offer some empirical reflections.

A further element of preliminary analysis is linked to the countries from which the greatest number of contributions come.

The country from which the greatest number of contributions come is the United States with 13 contributions. Subsequently, the major countries that have contributed are Australia (with 10 contributions) and Germany (with 7 contributions). Finally, there are Italy and the United Kingdom (with the same number of contributions, that is 5) and Spain (with 1 contribution).

Finally, the last data is the number of papers published in open access. Of the 41 selected articles, 10 articles were published in open access. Open access articles represent easily consultable articles that can influence the scientific community and practitioners more quickly.

From reading the abstracts and selected articles, it emerges that introducing an AI system within a complex organization such as a family has a profound impact on internal processes.

Several authors have highlighted that the introduction of new technologies.

By focusing attention on enabling factors and barriers, numerous contributions emerge. Although it is possible to identify different taxonomies of enabling factors and barriers, the most recent and modern literature focuses on the presence or absence of some factors that could Favor or hinder the adoption of new technology, particularly in family businesses.

By analyzing the selected scientific documents, 9 factors capable of influencing (positively or negatively) the adoption of artificial intelligence (AI) in family businesses were identified.

Subsequently the factors were divided based on a micro or macro dimension. Table 1 reports the factors identified.

Table 1: Dimension Factors

Micro Dimension Factors	Macro dimension Factors
Know-how or new knowledge needed	Compagny Dimension
Perceived ease of AI System	IT system diffusion
Human Capital	HRM and Organizational Culture
Use of team work	Organizational Structure
	External economic and fiscal incentives

Source: our elaboration

Table 1 breaks down the factors based on their direct impact. Two dimensions have been identified: micro and macro dimensions. All the factors that are directly influenced by individuals have been grouped in the micro

dimension. Micro factors are internal factors and are unique to each organization. For this reason, it is included i) Know-how or new knowledge needed; ii) Perceived ease of AI System; iii) Human Capital and iv) diffusion of teamwork.

The first micro dimension is know-how or new knowledge needed. In fact, the selected papers highlight that it is necessary to understand the organizational needs that AI systems must respond to. In fact, it is necessary to create a map of the knowledge present within the organization and understand which knowledge needs the AI system must respond to. The second element is the way in which the AI system is perceived. Some articles have highlighted that there is often a wrong perception of the AI system and its functioning. Human capital is a further micro dimension factor. Finally, the diffusion of culture and the diffusion of teamwork becomes a crucial element.

Instead, all factors connected to a dimension of organizational structure or external to the organization have been identified as macro dimension factors. They are micro dimension factors: i) Company Dimension; ii) IT system diffusion; iii) HRM and Organizational Culture; iv) Organizational Structure and v) Economic and fiscal incentives.

5. Limits and Future Research Directions

This study can represent a first element of reflection in the debate on the adoption of artificial intelligence in family businesses. Understanding the enabling factors or barriers that can favor or hinder the introduction of AI systems in family businesses takes on an important economic and social value, especially considering the role that family businesses play in economic and social systems. Helping entrepreneurs and professionals of family businesses can promote the value of a local socioeconomic system. Family businesses are very complex socio-economic systems. In fact, the presence of two systems (family and business) often determines tensions in the adoption of new innovations. In fact, from the selected articles a consolidated line of studies emerged focused on the causes that determine the failure of the adoption of new technologies by companies. This line, which also characterizes the studies on the adoption of AI systems in family businesses. In fact, several studies have used this theoretical framework. This aspect therefore determines a starting point for scholars of family businesses and AI systems who want to understand the barriers and enabling factors of AI systems.

In assumption, this study, although analyzing a recent topic such as the adoption of AI systems in family businesses, benefits from a consolidated reference literature. In fact, to understand this very specific phenomenon, it is necessary to resort to the consolidated literature on the socio-economic characteristics of family businesses, with reference to internal innovation processes and the enabling factors and obstacles to the adoption of new technologies. At the same time, AI systems have been considered in this study as a tool for knowledge transfer within the family business. For this reason, it is also necessary to resort to the theoretical framework on knowledge transfer and KT tools. These considerations therefore determine a very high complexity for scholars who approach this study.

The study is not without limitations. The first is related to the methodology used. The analysis was based on a limited number of scientific papers, selected through a keyword search string. Further future studies should expand the number of keywords and scientific papers analyzed. Another limitation of this study is related to this aspect. Changing the keywords could reveal additional barriers and enablers that have not yet emerged.

Further research steps could highlight other factors that are not yet present. In fact, the study analyzed a limited number of scientific papers. In fact, the results of this study could be integrated, identifying a larger number of scientific papers. Finally, the study analyzed the relationship between family business and AI, with the sole purpose of identifying barriers and enablers. Many aspects require further investigation.

Future studies should focus on the empirical investigation of AI barriers and enablers in family businesses. Future studies could investigate barriers and enablers in a variety of contexts in terms of geographical location, sector, size, level of family involvement. A further step could be represented by using a methodology based on empirical observation. Future studies in this sense could validate the factors identified through interviews or case study analysis.

This study contributes to the academic debate on knowledge management studies, offering a first element of reflection on artificial intelligence and family businesses. In particular, the results of this study can help to understand how to promote the introduction of artificial intelligence systems in knowledge management in family businesses.

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