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Jacek Lipiec

Digital Transformation in Family Businesses

Abstract

Digitalisation has become a top priority of the European Commission, aimed at enhancing digital skills, securing digital infrastructure, and advancing the digitalisation of businesses and public services. The European Commission envisages that small and medium-sized enterprises will achieve at least a basic level of proficiency in using digital technologies. Existing research shows that digitalisation is not considered a priority by family businesses, as they tend to defer investments in this area. This article discusses the challenges associated with the conceptual framework, as the meaning of the term *digitalisation* and its derivatives is not straightforward. Polish equivalents have also been proposed, based on English terminology, making reference to the sphere of the enterprise and giving examples.

The main aim of this article is to discuss and systematise the conceptual framework, and to analyse the degree of digitalisation in Polish family businesses. The special nature and degree of digitalisation in family businesses were discussed using the systematic literature review method. To date, few articles addressing this topic have been published, which should encourage researchers to delve deeper. Polish family businesses have declared that greater digitalisation efforts will be made over the next year, which could provide an impetus for conducting research and tracking progress in this area.

Keywords: digitalization, digitization, digital transformation, family business, systematic literature review

Introduction

Nowadays, vast amounts of data are generated which can be used for various purposes, such as scientific, business, medical, and others. Public authorities often make some of this data available to the public. The immense volume of data is evident from the words of Eric Schmidt, Google's former executive chairman, who stated that between the dawn of civilization and 2003, five exabytes of data were created; currently, that amount is generated every two days (Smolan & Erwitt, 2012). The availability of vast data resources and the development of IT technologies based on them, particularly artificial intelligence, big data, and blockchain, have had a significant impact on every aspect of life, including the economy – triggering a revolution in industry known as 4.0.

Over the past decade, digital technologies have helped transform business practices (Nambisan et al., 2019). There are numerous examples of enterprises that have successfully undertaken this transformation (Teece, 2018). If they aim not only to survive but to thrive, family businesses should also adapt their operations to the new market conditions (Garzella et al., 2021).

Digitalisation has become a significant challenge for businesses, as highlighted by the pandemic, during which they were compelled to shift to working remotely. Various institutions and organisations play a role in shaping and supporting digitalisation; for the European Commission's activities, this has become a priority and should lead to the achievement of the goals set out in *2030 Digital Compass: the European way for the Digital Decade* (European Commission, 2021). According to the *European Declaration on Digital Rights and Principles for the Digital Decade* (European Commission, 2022), this transformation affects every aspect of life, offering considerable potential for improving its quality, economic growth, and sustainable development. The implementation of advanced digital technologies in businesses contributes to the success of the entire economy, which is crucial in an unstable economic environment, a factor in disruption of supply chains.

Jacek Lipiec, SGH Warsaw School of Economics, Poland, https://orcid.org/0000-0003-4986-6166

Polish companies rank low in digitalisation charts. Moreover, there is limited interest on the part of researchers in this issue, as demonstrated by an analysis of bibliographic and online resources. A significant portion of companies are family-owned, and in many respects these companies are seen as more efficient and focussed on long-term operations; however, digitalisation is not considered a priority for them.

Currently, there is no doubt that the development of digitalisation impacts the economy, but it is difficult to clearly determine the scope and outcomes (Degryse, 2016). In examining this trend, context is crucial, as the effects depend on the intensity and absorptive capacity of the economic sector or the country's policy in general (Bouncken et al., 2018). Furthermore, the likelihood of failure when businesses implement new digital technologies can be very high at the current stage of development, and can even range between 66% and 84% (Libert et al., 2016). Given the profound technological changes taking place, a new way of thinking about business and employee skills is required (Schallmo et al., 2017).

Evidently, the impact of new technologies extends to Polish businesses as well, including family-run ones. Given the substantial role of family-run businesses in the Polish (and global) economy, it seems reasonable to investigate whether they adapt more effectively to the new reality than their non-family counterparts. Rankings now emerging, or existing rankings, take digitalisation criteria into account, which may help answer the above question. For example, the European Investment Bank (EIB) incorporates this criterion into the European Investment Bank Investment Survey (EIBIS) (EIB, n.d.). Unfortunately, Poland ranks near the bottom among the most digital enterprises, while the top spots belong to companies from Denmark, the Netherlands, the Czech Republic and Finland. Therefore, it is worthwhile to address this topic, pointing out the barriers and potential ways to improve the existing situation. Also, European companies lag behind their American counterparts, despite the EU's efforts aimed at supporting digitalisation. The largest disparities (21%) occur in the construction sector (EIB, 2020), while the smallest are in the infrastructure sector (11%).

The topic of digitalisation, and particularly the use of digital communication tools and remote working, became essential for maintaining business continuity during the pandemic. Companies finally stopped seeing remote work as a utopia (Lipiec, 1998) and started looking for ways to implement it and maintain their business operations while travel restrictions and lockdown were in effect. The pandemic led to a general realisation that we are living in times of great volatility, uncertainty, complexity, and ambiguity (VUCA). This compelled companies to seek the best way to operate in such an environment, which came to be known as *business excellence in a volatile, uncertain, complex, and ambiguous environment* (BEVUCA) (Saleh & Watson, 2017). As a result, enterprises are engaging in various activities, focusing primarily on adapting digital tools.

At present, it is difficult to say definitively whether implementing digital transformation in businesses helps to create a stable, certain, simple, and unambiguous economic environment. However, the steps being taken by various institutions and organisations are indeed moving in that direction. As mentioned, numerous initiatives are being launched by the European Commission. For the most part, family businesses have not yet embraced the challenge of digitalisation (Xie et al., 2022), although they are becoming increasingly aware of its impact on their operations (Correani et al., 2020; ZPP, 2023).

The author was prompted to address the subject of digital transformation in family businesses for three reasons. Firstly, there are ambiguities in the terms used to translate fundamental English terms related to digitalisation. Secondly, light needs to be shed on the actions being taken by the European Commission in this area. Thirdly, it is necessary to analyse the level of digitalisation in businesses, with particular focus on family-owned enterprises.

The aim of this article is to systematise the conceptual framework and illustrate how digitalisation processes should be understood in the context of entrepreneurship, as well as to analyse the extent of digitalisation in family businesses.

The author attempted to answer the following research questions:

1. How should the concept of digitalisation and its derivatives be understood in the context of entrepreneurship?
2. To what extent and in what ways are family businesses undergoing digital transformation?

To address the first question, dictionary sources were used, whereas for the second one, a systematic literature review method was employed.

Theoretical Perspective

Method

Systematic literature review methodology, originally used in medical sciences (Bała et al., 2015; Davis et al., 2014) and later used in economic sciences (Stępień, 2023), including management science (Cabała et al., 2023; Snyder et al., 2016; Więcek-Janka et al., 2024; Witell et al., 2016), was employed. This is a method that enables transparent and structured selection and assessment of available literature resources. It consists of four stages: (1) identification, (2) searching, (3) evaluation and (4) synthesis of the most significant scientific evidence obtained in the first three stages (Fink 2019; Mazur & Orłowska, 2018; Thorpe et al., 2005; Tranfield et al., 2003). These stages, along with the corresponding procedure, are presented in the PRISMA diagram (Liberati et al., 2009).

Publications were identified based on queries using equivalent Polish and English terms (Mengist et al., 2020) related to the concepts of 'digitization' and 'family firm'.

- 'family firms' AND 'digitization' ($n = 3$)

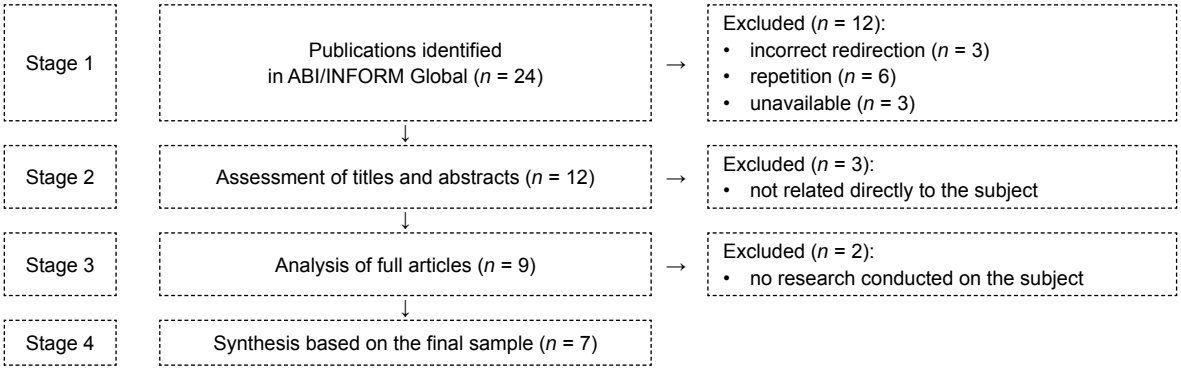
- 'family firms' AND 'digitalization' (n = 13)
- 'family firms' AND 'digital transformation' (n = 9)
- 'przedsiębiorstwa rodzinne' AND 'ucyfrowienie' (n = 0)
- 'przedsiębiorstwa rodzinne' AND 'cyfryzacja' (n = 0)
- 'przedsiębiorstwa rodzinne' AND 'transformacja cyfrowa' (n = 0)
- 'firmy rodzinne' AND 'ucyfrowienie' (n = 0)
- 'firmy rodzinne' AND 'cyfryzacja' (n = 0)
- 'firmy rodzinne' AND 'transformacja cyfrowa' (n = 0)

Subsequently, duplicates, erroneous redirects, and unavailable articles were eliminated (Figure 1). In the second stage, the titles and abstracts were reviewed and articles not directly relevant to the topic were excluded. In the third stage, a full-text analysis was conducted, rejecting those articles in which no research was performed.

In the final stage, full articles were analysed, the applied methods and research sample were highlighted, and the main conclusions from the research were presented (table 1).

There are few scholarly articles that address the topic of digitalisation in family businesses. Such

Figure 1
The Procedure Employed for the Systematic Literature Review



Source: own work based on the *PRISMA statement for reporting systematic reviews and meta-analyzes of studies that evaluate health care interventions: Explanation and elaboration*, A. Liberati, D. G. Altman, J. Tetzlaff, C. Mulrow, P. C. Gøtzsche, J. P. A. Ioannidis, M. Clarke, P. J. Devereaux, J. Kleijnen, & D. Moher, 2009, *Annals of Internal Medicine*, *151*(4), W–65 (https://doi.org/10.7326/0003-4819-151-4-200908180-00136).

Table 1
Conclusions from Previous Research

Research	Method	Sample	Conclusion
Pöschl & Freiling (2020)	• multiple case study • interviews	Small and medium-sized enterprises in the DACH region (340)	Current and incoming owner-managers focus on enhancing the level of digitalisation during succession processes. Digitalisation is undervalued and postponed for the long term.
Škare & Soriano (2021)	• dynamic panel models	Data from 28 EU Member States as well as Japan and the US	Agility in family businesses is heavily dependent on the national or industry level of digitalisation and investment in intangible assets.
Ano & Bent (2022)	• case study • epistemological phenomenology • partially structured interviews	French family firms (5)	Five key determinants for digital transformation: 1) change management associated with long-term sustainability 2) emotional attachment to the company 3) legacy impact 4) involvement of family members 5) owners' focus on employees.
Barile et al. (2022)	• case study	Italian start-up (1)	Implementation of digital solutions in various functional areas of the company.
Bouncken & Schmitt (2022)	• inductive method • partially structured interviews	Managers (19) from family businesses in Germany, Liechtenstein, and Switzerland (a total of eight companies)	Limited focus on digital transformation and a lack of competencies among management board members in this area.

Table 1 – continue

Research	Method	Sample	Conclusion
Pi-Hui Chung & Cheng-Yu Lee (2024)	• descriptive statistics • correlation matrix	Family-run publicly-traded companies from Taiwan	Family-run companies do not attach importance to digital transformation.
Bürgel & Hiebl (2024)	• conflict theory • in-depth interviews	German family firms (85) and 13 interviews	The selected strategies can help to increase the level of digitalisation, but their effectiveness depends on the distribution of ownership shares across the different generations.

Source: author's own work.

research has primarily been conducted in German-speaking countries, with a few instances in France, Taiwan, and Italy – the latter involving a case study of a single selected company. The conclusions indicate that family-run businesses do not consider digitalisation a priority, and tend to defer it. The competencies of management board members in this area are also quite limited.

Scope of Definition

Terms related to digitalisation are understood and translated in various ways from the English sources. For this reason, the conceptual scope was refined first, and the topic is further expanded upon in the subsequent sections of the work.

The three core English terms encountered in the subject area are digitisation, digitalisation, and digital transformation. They are translated in various ways, and therefore it is essential to clarify them. In Polish dictionaries, dictionaries of foreign words and technical English-Polish dictionaries, the terms digitisation and digitalisation are often used interchangeably, which may cause conceptual confusion. For the purposes of this article, the following Polish equivalents are adopted: *ucyfrowienie*, *cyfryzacja* (*digitalizacja*/*dygitalizacja*), and *transformacja cyfrowa*. The first term, *ucyfrowienie* (digitise), may be translated as *to convert (something, such as data or an image) into digital form* (Merriam-Webster, n.d.). In the context of a business, to *digitise* thus means creating a digital reflection of documentation that exists in paper form, but it does not contribute to creating added value. The term *digitalizacja* (less commonly *dygitalizacja*), on the other hand, refers to *the process of rendering written and printed data into digital form as stored on magnetic or other types of media* (Dubisz, 2008, p. 278). These terms are commonly translated as synonyms, which is why the term *cyfryzacja* has been adopted as an extension of the concept *ucyfrowienie*. Table 2 provides a more detailed conceptual distinction, taking into account various parameters and illustrating examples in relation to enterprises.

Digital transformation should be understood as "a change in how a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more value for the firm" (Verhoef et al., 2021, p. 889). Digitalisation can impact existing business processes or contribute to the development of new ones, such as the introduction of a new online customer service channel. While this may be challenging, it increases businesses' chances of achieving market success and should therefore be considered within business strategies. Digital transformation can lead not only to reshaping the business model of a company, but also the entire industry. When a company achieves success due to digital transformation, it becomes a model for others to follow.

The analysis indicates that family businesses are becoming increasingly aware of the potential of digitalisation, but they are yet to take appropriate action, and defer such measures. This thesis can also be verified using the Google Trends tool. The verification was carried out on a global scale and for Poland, using the three discussed terms in English for the worldwide research (Figure 2) and their Polish counterparts for the Polish research (Figure 3).

Globally, there is significant and increasing interest in digital transformation, while there is less interest in the remaining terms. However, in recent years in Poland, there has been scant interest in concepts such as *cyfryzacja*, *digitalizacja* and *transformacja cyfrowa* (Figure 3). In the case of *ucyfrowienie*, a message indicating insufficient data was displayed, and therefore the term has not been included in Figure 3.

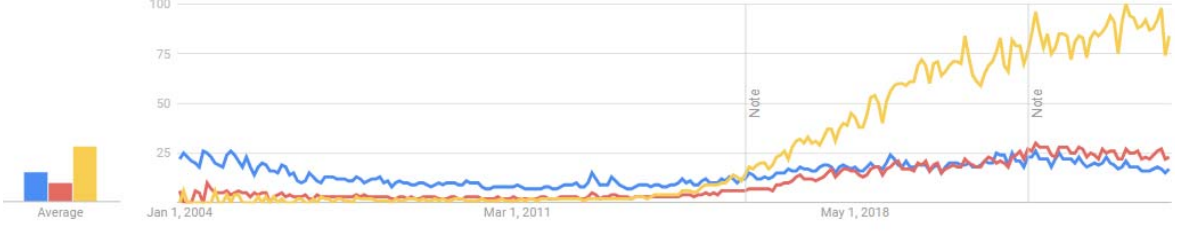
The Polish part of the research reveals that interest in the discussed phenomenon is quite low, except for two periods. The increase in interest in 2004 might be attributed to the planned implementation of the Act on Computerisation of the Activities of Entities Performing Public Tasks (Journal of Laws of the Republic of Poland, 2005). The act established the State Computerisation Plan and introduced, among other things, IT standards, electronic exchange of information within public registers, and electronic communication. Therefore, in accordance with the terminology adopted in the publication, it contributed to the digitalisation of public administration activities. The second period of heightened interest in these terms likely resulted from the establishment of the Ministry of Administration and Digitalisation in 2011 (Journal of Laws of the Republic of Poland, 2011) following the transformation of the former Ministry of the Interior and Administration and the Ministry of Infrastructure. After this event, interest in the terms was and remains somewhat negligible.

Table 2
The Differences between the Concepts of ucyfrowienie, cyfryzacja and transformacja cyfrowa

Parameter	Description
DIGITISATION (UCYFROWIENIE)	
Goal	Cost savings: More efficient utilisation of resources within current operations
Digital resources	Digital assets
Organisational structure	Standard hierarchy
Metrics	Standard key performance indicators (KPIs): Cost-to-Serve, Return on Investment (ROI), Return on Assets (ROA)
Digital growth strategies	Market penetration (product-based), market development, product development
Examples	Automated procedures and tasks; conversion of information from analogue to digital form
DIGITALISATION (CYFRYZACJA)	
Goal	Cost savings and increased revenues: More efficient production through the redesign of business processes; enhanced customer experience
Digital resources	(as above) + digital agility, digital networking capability
Organisational structure	Separate, agile units
Metrics	Traditional and digital key performance indicators (KPIs): User experience, unique clients/users, active clients/users
Digital growth strategies	(as above) + platform-based market penetration, co-creation platform
Examples	Use of robots in production; adding digital components to the product or service offerings; introducing digital distribution and communication channels.
DIGITAL TRANSFORMATION (TRANSFORMACJA CYFROWA)	
Goal	New cost-revenue model: Reconfiguration of assets to develop new business models
Digital resources	(as above) + the ability to analyse big data sets
Organisational structure	Separate units with flexible organisational forms, internalization of IT and analytical functional areas
Metrics	Digital key performance indicators (KPIs): Digital share, magnitude and momentum, co-creator sentiment
Digital growth strategies	(as above) + platform diversification
Examples	The introduction of new business models such as product-as-a-service, digital platforms, and pure data-driven business models

Source: author's own work based on *Digital transformation: a multidisciplinary reflection and research agenda*, P. C. Verhoef, T. Broekhuizen, Y. Bart, A. Bhattacharya, J. Qi Dong, N. Fabian, & M. Haenlein, 2021, *Journal of Business Research*, 122, pp. 889–901 (https://doi.org/10.1016/j.jbusres.2019.09.022).

Figure 2
Global Term Searches: Digitization, Digitalization, Digital Transformation



Source: Google Trends.

Figure 3
Searches in Poland for the Terms: cyfryzacja, digitalizacja and transformacja cyfrowa

Source: Google Trends.

A Family Firm in the Face of Digital Transformation

EU Context

Implementing any changes within an organisation poses a significant challenge (Deline, 2018), especially business transformation. Typically, the process is slow (Wright et al., 2004), and most attempts end in failure (Barrett & Stephens, 2016). The European Commission has made digitalisation a priority, aiming to facilitate this process and enhance the competitiveness of businesses. EU undertakings are much less competitive than their American counterparts, thus making this task even more crucial. Polish businesses do not rank among the EU's leaders in digitalisation, and there is also little interest in this matter, thus measures to raise overall awareness are imperative.

The European Commission considers digitalisation a priority and has set ambitious targets for businesses to achieve by 2030 (European Commission, 2021)[1]:

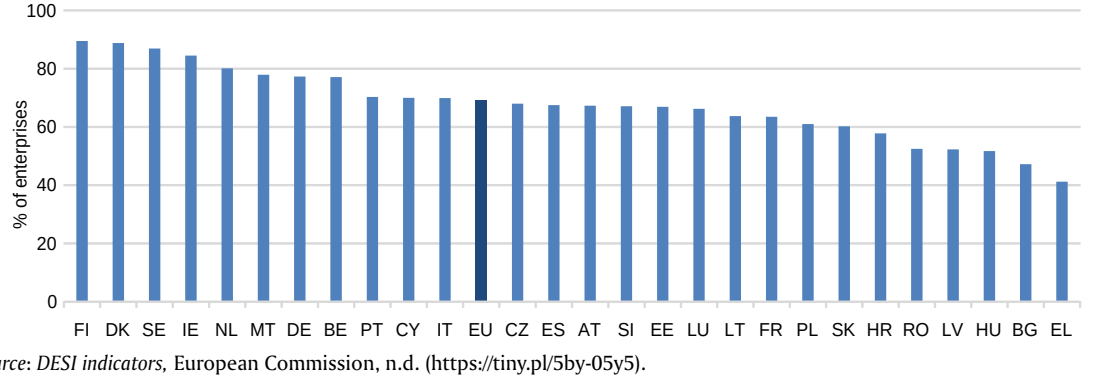
a) 75% of European enterprises have taken up:
   - Cloud computing services (2020 baseline: 26%)
   - Big data (2020 baseline: 14%)
   - Artificial Intelligence (AI) (2020 baseline 25%)
b) More than 90% of European SMEs reach at least a basic level of digital intensity (2019 baseline: 60.6%)
c) Europe will grow the pipeline of its innovative scale ups and improve their access to finance, leading to doubling the number of unicorns (2021 baseline: 122).

The Commission is preparing reports on the achievement of these targets, reviewing the progress made by Member States and presenting the Digital Economy and Society Index (DESI), which will be submitted to the European Parliament and the Council. According to the latest report, the greatest progress has been made in the use of cloud computing services (45% of European companies use these services), whereas the least progress has been recorded for the implementation of artificial intelligence (11%) (European Commission, 2023). By comparison, 15% of American companies and 16% of Chinese companies use artificial intelligence. A relatively high number of unicorns are being created in EU countries. The report shows that at the beginning of 2023, 249 unicorns were established in the EU, which was as much as half of the projected total, and it is highly likely that this growth rate will enable the target to be achieved by 2030.

Significant progress has been reported in the use of digital technologies within the SME sector (an average of 77%), yet there are considerable disparities between the Member States (Figure 4).

Polish SMEs are in the bottom quartile of this classification, with no distinction made between family and

Figure 4
SMEs with a Basic Level of Digital Intensity Excluding the Financial Sector, Based on 2022 Data



Source: *DESI indicators,* European Commission, n.d. (https://tiny.pl/5by-05y5).

[1] The EU's target for 2030 in relation to the baseline level.

non-family businesses (a definition for this distinction has not yet been adopted in the European Union). However, many countries recognise the distinct nature and role that family firms play in the economy (Opinion of the European Economic and Social Committee…, 2016). Therefore, it is reasonable to analyse them in terms of digitisation.

The Family Business Perspective on Digital Transformation

The contribution of family businesses to the global economy is significant (Chua et al., 2004), as they help generate jobs and national wealth (Mallon et al., 2018; Randerson et al., 2015). They differ from non-family businesses in many contexts, including in terms of innovation and digitalisation (De Massis et al., 2013; Werner et al., 2018). The key distinction between family and other enterprises stems from the overlap of two systems: family and business (Tagiuri & Davis, 1996).

A family can have a positive or negative effect on the process of succession, ownership, and the management of a company. Researchers have begun to use various theories and concepts to understand the nature and dynamics of this effect. The most commonly applied theories for this purpose include the agency theory (Chrisman et al., 2004; Surdej & Wach, 2010), stewardship (Davis et al., 1997; Le Breton-Miller & Miller, 2009), the resource-based view (Habbershon & Williams, 1999; Pfeffer & Salancik, 1978), and socioemotional wealth (Gomez-Mejia et al., 2007). Based on the above-mentioned theories, it can be assumed that digitalisation will find fertile ground in a family business and be swiftly implemented if the principal and the agent are one and the same – the owner, or if the principal's and agent's interests align. In that case, the company will allocate appropriate resources and will strive to achieve the highest possible efficiency. However, this is merely a theoretical and idealised model depicting a family business facing digitalisation, which may not necessarily hold true in practice, as suggested by the earlier literature review.

The current literature, which is the outcome of research in this field, contains scarce information on the impact of digital technologies on the functioning of family businesses. Most often it is assumed that the older generation is less inclined to use new technologies compared to the younger generation (Calabr et al., 2019; Lambrechts et al., 2017). In some papers, it is argued that family businesses are able to adapt their operations to the needs of digitalisation (Eller et al., 2020; Leppäaho & Ritala, 2022), and that a high level of employee engagement contributes to effective implementation (Bruque & Moyano, 2007). Contrary conclusions can also be found. For example, it has been shown that a family can have a negative impact on the development of the Internet of Things within a company (Ceipek et al., 2021). However, there is still a lack of sufficient research to fully explain this (Daskalopoulos & Machek, 2023). This subject is scarcely explored in Poland, thus it is worth focusing on it by presenting insights from research conducted by non-academic institutions, such as the European Investment Bank, the Union of Entrepreneurs and Employers, and Mastercard.

The European Investment Bank evaluated the readiness of companies for the new digital era. The study considered the criterion of being a family-run business, but in a very narrow scope – limited to the management practices employed. A study conducted across 28 countries, including Poland, suggests that digitally-oriented companies generally show a higher level of strategy monitoring and place greater emphasis on rewarding individual performance, yet they are less frequently overseen by the CEO or a family member. The opposite is true in Poland, which may imply that it is in fact family enterprises that are more focused on digitalisation. The EIB ranks Polish companies towards the bottom of the list among the countries with a moderate level of digitalisation, with one exception – they are placed above the EU average in terms of drone technology application. Moreover, over half of Polish digital firms have increased their workforce in the last three years, but salaries have risen only marginally and remain well below the EU average. There are slight differences in salaries between digital and non-digital companies, favouring the former. Enterprises point to several investment barriers, such as a lack of qualified staff, business regulations, labour laws, and taxes (EIB, 2020).

The context of business digitalisation is addressed in Mastercard research (Mastercard Europe, 2023). The latest survey was conducted among ten thousand employees from companies, primarily micro and small-sized, both family-owned and others, across fifteen countries, including Poland. It is worth starting by emphasising that family is perceived as an integral factor in the success of a business in the vast majority of cases. Half of those surveyed, who do not own or work for a family business, would consider the possibility in the future. The study highlights the advantages of family businesses, such as closer relationships between family members and with customers, and a higher degree of adaptability compared to non-family companies.

In fact, 37% of all family businesses declare readiness for operating in the digital economy, and it is similar for Poland (38%). In many sectors, these firms demonstrate a lower level of use of digital tools compared to non-family ones: family firms have a much greater preference for traditional forms of payment – by cash (45% vs 25%; 34% in Poland) or by debit/credit card (25% vs 14%; 36% in Poland). However, there are notable positive changes – there is an increase in the use of digital payments, as well as messaging applications and software for invoicing and financial management.

The digital transformation presents a greater challenge for family businesses compared to other enterprises (20% vs 12%; 17% for Polish businesses) (Mastercard, 2023). The pandemic forced them to turn to digitalisation to continue their operations. This is confirmed by the Mastercard research, which shows that more than half of family businesses use IT

tools related to project management. However, there are still many obstacles to digitalisation – primarily concerns related to security, privacy policies, and internet connectivity. Security concerns are predominantly raised by the younger generation (aged 25–44) in family firms.

The Union of Entrepreneurs and Employers conducted a survey on digitisation in the SME sector in Poland (ZPP, 2023), which shows that one in three small businesses does not use digital tools at all – this percentage is even higher among micro-enterprises (39%). Digitally-focused enterprises primarily use social media platforms and online payments (38%) – a figure similar to the Mastercard survey discussed above. The use of cloud computing services or artificial intelligence by these entities remains well below the European average. The greatest obstacle to implementing digital tools is the high cost of such operations, with legal and regulatory factors and employee skills playing a less significant role.

Insights from available research and analyses paint a picture of family businesses encountering the challenges of digital transformation. In terms of digitalisation, companies – particularly small and medium-sized enterprises – are lagging behind Europe's leaders and still favour a traditional approach to conducting business. However, they demonstrate openness to digitalisation comparable to that of non-family companies.

The process of digitalisation gained momentum during the COVID-19 pandemic. It is worth noting that the barriers hindering digitalisation are not linked to being a family business but rather result from business conditions and the regulatory environment. Conversely, for the SME sector, the biggest hurdle is the cost of implementing new technology.

Summary

Digitalisation is one of the European Commission's priorities. The moderate progress in this area indicates that it will be challenging to achieve the Commission's targets without further intensified actions and investments, despite those already undertaken, such as: The Data Act (Regulation…, 2023) and the Data Governance Act (Regulation…, 2022).

There are few studies and analyses addressing issues related to the digitalisation of family businesses. The operational characteristics of family businesses are different to those of non-family enterprises, which is why the digitalisation context should interest researchers in the field. Researchers, in turn, need to determine whether a separate support policy is needed for such entities.

A systematic literature review shows that the topic of digitalisation in family businesses is addressed in only a few articles. Unfortunately, they reveal that digitalisation is not considered a priority within these companies, and decisions are often deferred. There is also a lack of competence among the family members in charge to undertake such a transformation.

The Mastercard survey is one of the few (non-scientific) reports that highlights family businesses in the context of digitalisation. It reveals that one in five Polish family businesses is unable to identify which digital tools would most effectively support their business operations. A certain group of respondents (40%) believe that possessing the skills to use digital tools would enable them to implement a more effective digital transformation, but one in five is unable to select the appropriate ones.

Despite the challenges associated with digitalisation, positive trends are noticeable, as both family-run and other businesses are making progress in the implementation of digital tools. However, as demonstrated by the Mastercard study, in Bulgaria, Spain, Portugal, and Serbia non-family businesses are best prepared to face these challenges.

Polish family businesses declare the following digitalisation-related actions envisaged over the next year: (1) greater use of social media (35%), starting to accept digital payment (32%), starting to accept electronic payment (21%), launching online sales (19%), and participating in the online market (17%). These actions are generally aimed at supporting business operations.

Opting for digitisation brings other benefits to companies. It turns out that those that have digitalised their operations have increased their workforce over the past three years, whereas others either decreased or maintained the same level of staff. Moreover, such companies are better managed, invest more in research and development, and are more productive.

Daskalopoulos and Machek (2023) assert that digital transformation has contributed to the emergence of hybrid family businesses, that is those which, on the one hand, are aware of the new era and inclined to embrace transformation, yet on the other hand remain respectful of traditions and somewhat conservative. In their work, they highlight that it is difficult to definitively assess these entities due to insufficient research and the heterogeneity of this population of companies. Such research is also lacking in Poland.

However, there is substantial potential for further digitalisation of enterprises. To achieve this, technical actions (such as enhancing online security), financial initiatives (financial support primarily for small and medium-sized enterprises), and regulatory measures are necessary. It is also useful to improve employees' digital competencies. In addition, researchers should address this subject more frequently. The present article may serve as a contribution to the research and analysis in the field of digitalisation of family businesses.

References

Ano, B., & Bent, R. (2022). Human determinants influencing the digital transformation strategy of multigenerational family businesses: a multiple-case study of five French growth-oriented family firms. *Journal of Family Business Management*, *12*(4), 876–891. https://doi.org/10.1108/JFBM-12-2020-0117

Bała, M., Leśniak, W., & Jaeschke, R. (2015). Proces przygotowywania przeglądów systematycznych, z uwzględnieniem przeglądów Cochrane. *Polish Archives of Internal Medicine*, *125*, 16–25. https://doi.org/10.20452/pamw.3230

Barile, D., Secundo, G., & Del Vecchio, P. (2022). Food 4.0 for competing during the COVID-19 pandemic: experimenting digitalization in family firms. *European Journal of Innovation Management*, *27*(4), 1381–1402. https://doi.org/10.1108/EJIM-07-2022-0373

Barrett, A. K., & Stephens, K. K. (2016). The pivotal role of change appropriation in the implementation of health care technology. *Management Communication Quarterly, 31*(2), 163–193. https://doi.org/10.1177/0893318916682872

Bouncken, R. B., Ratzmann, M., Pesch, R., & Laudien, S. M. (2018). Alliances of service firms and manufacturers: relations and configurations of entrepreneurial orientation and hybrid innovation. *Journal of Business Research, 89*, 190–197. https://doi.org/10.1016/j.jbusres.2018.01.039

Bouncken, R., & Schmitt, F. (2022). SME Family firms and strategic digital transformation: inverting dualisms related to overconfidence and centralization. *Journal of Small Business Strategy*, *32*(3), 1–17. https://jsbs.scholasticahq.com/article/35278-sme-family-firms-and-strategic-digital-transformation-inverting-dualisms-related-to-overconfidence-and-centralization

Bruque, S., & Moyano, J. (2007). Organisational determinants of information technology adoption and implementation in SMEs: The case of family and cooperative firms. *Technovation, 27*(5), 241–253. https://doi.org/10.1016/j.technovation.2006.12.003

Bürgel, T. R., & Hiebl, M. R. W. (2024). Conflict management strategies and the digitalization of family firms: The moderating role of generational ownership dispersion. *IEEE Transactions on Engineering Management*, *71*, 9555–9574. https://doi.org/10.1109/TEM.2023.3293855

Cabała, P., Marciniak, M., Marchewka, M., & Woźniak, K. (2023). Evolution of trends in innovation studies. *Scientific Papers of Silesian University of Technology – Organization and Management Series, 185*, 67–104. http://dx.doi.org/10.29119/1641-3466.2023.185.5

Calabrò, A., Vecchiarini, M., Gast, J., Campopiano, G., De Massis, A., & Kraus, S. (2019). Innovation in family firms: A systematic literature review and guidance for future research. *International Journal of Management Reviews, 21*(3), 317–355.

Ceipek, R., Hautz, J., De Massis, A., Matzler, K., & Ardito, L. (2021). Digital transformation through exploratory and exploitative internet of things innovations: The impact of family management and technological diversification. *Journal of Product Innovation Management, 38*(1), 142–165. https://doi.org/10.1111/jpim.12551

Chrisman, J. J., Chua, J. H., & Litz, R. A. (2004). Comparing the agency costs of family and non-family firms: Conceptual issues and exploratory evidence. *Entrepreneurship Theory and Practice, 28*(4), 335–354. https://doi.org/10.1111/j.1540-6520.2004.00049.x

Chua, J. H., Chrisman, J. J., & Chang, E. P. C. (2004). Are family firms born or made? An exploratory investigation. *Family Business Review, 17*(1), 37–54. https://doi.org/10.1111/j.1741-6248.2004.00002.x

Chung, P.-H., & Lee, C.-Y. (2024). The attitude of family firms toward digital transformation: From the organizational learning perspective. *Advances in Management and Applied Economics, 14*(4), 19–32. https://doi.org/10.47260/amae/1442

Correani, A., De Massis, A., Frattini, F., Petruzzelli, A. M., & Natalicchio, A. (2020). Implementing a digital strategy: learning from the experience of three digital transformation projects. *California Management Review, 62*(4), 37–56. https://doi.org/10.1177/0008125620934864

Daskalopoulos, E., & Machek, O. (2023). Digital transformation in family businesses: A systematic literature review and research agenda. *Proceedings of the 19th European Conference on Management Leadership and Governance, 19*(1), 89–95. https://doi.org/10.34190/ecmlg.19.1.1740

Davis, J., Mengersen, K., Bennett, S., & Mazerolle, L. (2014). Viewing systematic reviews and meta-analysis in social research through different lenses. *SpringerPlus*, *3*, 511. https://doi.org/10.1186/2193-1801-3-511

Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Toward a stewardship theory of management. *Academy of Management Review, 22*(1), 20–47. https://doi.org/10.2307/259223

Degryse, C. (2016). *Digitalisation of the economy and its impact on labour markets*. Working paper 2016.02. ETUI. https://www.etui.org/sites/default/files/ver%202%20web%20version%20Working%20Paper%202016%2002-EN%20digitalisation.pdf

Deline, M. B. (2018). Framing resistance: identifying frames that guide resistance interpretations at work. *Management Communication Quarterly, 33*(1), 39–67.

De Massis, A., Frattini, F., & Lichtenthaler, U. (2013). Research on technological innovation in family firms: Present debates and future directions. *Family Business Review, 26*(1), 10–31. https://doi.org/10.1177/0894486512466258

Dubisz, S. (Ed.). (2008). *Uniwersalny słownik języka polskiego PWN*. Wydawnictwo Naukowe PWN.

EIB. (n.d.). *EIB Investment Survey*. Retrieved September 17, 2024, from https://www.eib.org/en/publications-research/economics/surveys-data/eibis/index?sortColumn=startDate&sortDir=desc&pageNumber=0&itemPerPage=10&pageable=true&la=EN&deLa=EN&tags=5bf8095afa70f13f9d3b51b3&orTags=true&orSubjects=true&orCountries=true

EIB. (2020). *Who is prepared for the new digital age? Evidence from the EIB Investment Survey*. European Investment Bank. https://data.europa.eu/doi/10.2867/03951

Eller, R., Alford, P., Kallmuenzer, A., & Peters, M. (2020). Antecedents, consequences, and challenges of small and medium-sized enterprise digitalization. *Journal of Business Research, 112*, 119–127. https://doi.org/10.1016/j.jbusres.2020.03.004

European Commission. (n.d.). *DESI indicators*. Retrieved September 17, 2024, from https://tiny.pl/5by-05y5

European Commission. (2021). *2030 Digital Compass: the European way for the Digital Decade.* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0118

European Commission. (2022). *European Declaration on Digital Rights and Principles for the Digital Decade.* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0028 52022DC0028

European Commission. (2023). *2030 Digital Decade. Report on the state of the Digital Decade 2023: annex*. https://data.europa.eu/doi/10.2759/810356

Fink, A. (2019). *Conducting research literature reviews: From the internet to paper*. Sage Publications.

Garzella, S., Fiorentino, R., Caputo, A., & Lardo, A. (2021). Business model innovation in SMEs: the role of boundaries in the digital era. *Technology Analysis and*

Strategic Management, 33(1), 31–43. https://doi.org/10.1080/09537325.2020.1787374

Gomez-Mejia, L. R., Haynes, K. T., Nunez-Nickel, M., Jacobson, K. J. L., & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative Science Quarterly, 52*(1), 106–137. https://doi.org/10.2189/asqu.52.1.106

Habbershon, T. G., & Williams, M. L. (1999). A resource-based framework for assessing the strategic advantages of family firms. *Family Business Review, 12*(1), 1–25. https://doi.org/10.1111/j.1741-6248.1999.00001.x

Journal of Laws of the Republic of Poland. (2005). Act on Computerisation of the Activities of Entities Performing Public Tasks (Journal of Laws of the Republic of Poland no. 64, item 565. [Ustawa z dnia 17 lutego 2005 r. o informatyzacji działalności podmiotów realizujących zadania publiczne (Dz. U. z 2005 r. nr 64, poz. 565)]. https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20050640565

Journal of Laws of the Republic of Poland. (2011). Regulation of the Council of Ministers of 21 November 2011 on the establishment of the Ministry of Administration and Digitization (Journal of Laws of the Republic of Poland 2011, no. 250, item 1501). [Rozporządzenie Rady Ministrów z dnia 21 listopada 2011 r. w sprawie utworzenia Ministerstwa Administracji i Cyfryzacji (Dz. U. z 2011 r. nr 250, poz. 1501)]. https://sip.lex.pl/akty-prawne/dzu-dziennik-ustaw/utworzenie-ministerstwa-administracji-i-cyfryzacji-17746700

Lambrechts, F., Voordeckers, W., Roijakkers, N., & Vanhaverbeke, W. (2017). Exploring open innovation in entrepreneurial private family firms in low-and medium-technology industries. *Organizational Dynamics, 46*(4), 244–261. https://doi.org/10.1016/j.orgdyn.2017.05.001

Le Breton-Miller, I., & Miller, D. (2009). Agency vs. stewardship in public family firms: A social embeddedness reconciliation. *Entrepreneurship Theory and Practice, 33*(6), 1169–1191. https://doi.org/10.1111/j.1540-6520.2009.00339.x

Leppäaho, T., & Ritala, P. (2022). Surviving the coronavirus pandemic and beyond: unlocking family firms' innovation potential across crises. *Journal of Family Business Strategy, 13*(1), 100440. https://doi.org/10.1016/j.jfbs.2021.100440

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. *Annals of Internal Medicine*, *151*(4), e1-e34. https://doi.org/10.7326/0003-4819-151-4-200908180-00136

Libert, B., Beck, M., & Wind, Y. (2016, July 14). 7 questions to ask before your next digital transformation. *Harvard Business Review*. https://hbr.org/2016/07/7-questions-to-ask-before-your-next-digital-transformation

Lipiec, J. (1998). Telepraca – utopia czy rzeczywistość? *Ekonomika i Organizacja Przedsiębiorstwa*, *8*, 23–25.

Mallon, M. R., Lanivich, S. E., & Klinger, R. L. (2018). Resource configurations for new family venture growth. *International Journal of Entrepreneurial Behavior and Research, 24*(2), 521–537. https://doi.org/10.1108/IJEBR-06-2017-0184

Mastercard. (2023). *SME Survey – Poland Results* [Unpublished internal report].

Mastercard Europe. (2023). *SME Survey Results* [Unpublished internal report].

Mazur, Z., & Orłowska, A. (2018). Jak zaplanować i przeprowadzić systematyczny przegląd literatury. *Polskie Forum Psychologiczne*, *23*(2), 235–251. https://doi.org/10.14656/PFP20180202

Mengist, W., Soromessa, T., & Legese, G. (2020). Method for conducting systematic literature review and meta-analysis for environmental science research, *MethodsX*, *7*, 100777. https://doi.org/10.1016/j.mex.2019.100777

Merriam-Webster. (n.d.). Digitize. *Merriam-Webster Dictionary*. Retrieved September 17, 2024, from https://www.merriam-webster.com/dictionary/digitize

Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: progress, challenges and key themes. *Research Policy, 48*(8), 103773. https://doi.org/10.1016/j.respol.2019.03.018

Opinion of the European Economic and Social Committee on 'Family businesses in Europe as a source of renewed growth and better jobs'(own-initiative opinion) (2016/C 013/03). (2016). https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52015IE0722

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. Harper and Row.

Pöschl, A., & Freiling, J. (2020). The impact of family-external business succession on digitalization: exploring management buy-ins. *International Journal of Information Systems and Project Management*, *8*(2), 24–46. https://doi.org/10.12821/ijispm080202

Randerson, K., Bettinelli, C., Fayolle, A., & Anderson, A. (2015). Family entrepreneurship as a field of research: exploring its contours and contents. *Journal of Family Business Strategy, 6*(3), 143–154. https://doi.org/10.1016/j.jfbs.2015.08.002

Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act). (2022). https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=CELEX%3A32022R0868

Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act). (2023). https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=CELEX%3A32023R2854

Saleh, A., & Watson, R. (2017). Business excellence in a volatile, uncertain, complex and ambiguous environment (BEVUCA). *The TQM Journal, 29*(5), 705–724. https://doi.org/10.1108/TQM-12-2016-0109

Schallmo, D., Williams, C. A., & Boardman, L. (2017). Digital transformation of business models- best practice, enablers, and roadmap. *International Journal of Innovation Management, 21*(8), 1–17. https://doi.org/10.1142/S136391961740014X

Smolan, R., & Erwitt, J. (2012). *The human face of big data*. Against All Odds Production.

Snyder, H., Witell, L., Gustafsson, A., Fombelle, P., & Kristensson, P. (2016). Identifying categories of service innovation: A review and synthesis of the literature. *Journal of Business Research*, *69*(7), 2401–2408. https://doi.org/10.1016/j.jbusres.2016.01.009

Stępień, B. (Ed.). (2023). *Systematyczny przegląd literatury w naukach ekonomicznych. Metodyka, przykłady*. Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu. https://doi.org/10.18559/978-83-8211-174-3

Surdej, A., & Wach, K. (2010). *Przedsiębiorstwa rodzinne wobec wyzwań sukcesji*. Difin.

Škare, M., & Soriano, D. R. (2021). A dynamic panel study on digitalization and firm's agility: What drives agility in advanced economies 2009–2018. *Technological Forecasting and Social Change*, *163*, 120418. https://doi.org/10.1016/j.techfore.2020.120418

Tagiuri, R., & Davis, J. (1996). Bivalent attributes of the family firm. *Family Business Review, 9*(2), 199–208. https://doi.org/10.1111/j.1741-6248.1996.00199.x

Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning, 51*(1), 40–49. https://doi.org/10.1016/j.lrp.2017.06.007

Thorpe, R., Holt, R., Macpherson, A., & Pittaway, L. (2005). Using knowledge within small and medium-sized firms: a systematic review of the evidence. *International Journal of Management Reviews*, *7*(4), 257–281. https://doi.org/10.1111/j.1468-2370.2005.00116.x

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management, 14*(3), 207–222. https://doi.org/10.1111/1467-8551.00375

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2021). Digital transformation: a multidisciplinary reflection and research agenda. *Journal of Business Research, 122*, 889–901. https://doi.org/10.1016/j.jbusres.2019.09.022

Werner, A., Schröder, C., & Chlosta, S. (2018). Driving factors of innovation in family and nonfamily SMEs. *Small Business Economics, 50*(1), 201–218. https://doi.org/10.1007/s11187-017-9884-4

Więcek-Janka, E., Chochołowska, N., Zarówna, W., & Gralińska, P. (2024). Scientometric analysis of Industry 4.0, Engineer 4.0 and Manager 4.0 in Family Businesses. *Management and Production Engineering Review*, *15*(1), 126–139. https://doi.org/10.24425/mper.2024.149995

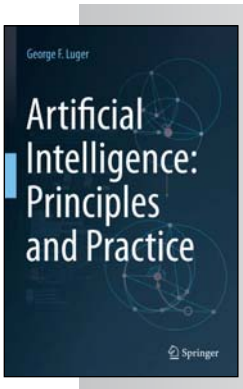
Witell, L., Snyder, H., Gustafsson, A., Fombelle, P., & Kristensson, P. (2016). Defining service innovation: A review and synthesis. *Journal of Business Research*, *69*(8), 2863–2872. https://doi.org/10.1016/j.jbusres.2015.12.055

Wright, G., Van Der Heijden, K., Bradfield, R., Burt, G., & Cairns, G. (2004). The psychology of why organizations can be slow to adapt and change. *Journal of General Management, 29*(4), 21–36. https://doi.org/10.1177/030630700402900402

Xie, X., Zhang, H., & Blanco, C. (2022). How organizational readiness for digital innovation shapes digital business model innovation in family businesses. *International Journal of Entrepreneurial Behavior and Research, 29*(1), 49–79. https://doi.org/10.1108/IJEBR-03-2022-0243

ZPP. (2023). *Cyfryzacja sektora MŚP w Polsce*. Związek Przedsiębiorców i Pracodawców. https://zpp.net.pl/wp-content/uploads/2023/11/02.11.2023-Raport-Cyfryzacja-sektora-MSP-w-Polsce.pdf

Jacek Lipiec is a professor at the SGH Warsaw School of Economics. He specialises in the issues of family entrepreneurship, particularly in the context of family governance, environmental protection, and digitalisation.



We recommend

George F. Luger, *Artificial Intelligence: Principles and Practice*

This book provides a complete introduction to Artificial Intelligence, covering foundational computational technologies, mathematical principles, philosophical considerations, and engineering disciplines essential for understanding AI. Artificial Intelligence: Principles and Practice emphasizes the interdisciplinary nature of AI, integrating insights from psychology, mathematics, neuroscience, and more. The book addresses limitations, ethical issues, and the future promise of AI, emphasizing the importance of ethical considerations in integrating AI into modern society. With a modular design, it offers flexibility for instructors and students to focus on specific components of AI, while also providing a holistic view of the field. Taking a comprehensive but concise perspective on the major elements of the field; from historical background to design practices, ethical issues and more, Artificial Intelligence: Principles and Practice provides the foundations needed for undergraduate or graduate-level courses. The important design paradigms and approaches to AI are explained in a clear, easy-to-understand manner so that readers will be able to master the algorithms, processes, and methods described. The principal intellectual and ethical foundations for creating artificially intelligent artifacts are presented in Parts I and VIII. Part I offers the philosophical, mathematical, and engineering basis for our current AI practice. Part VIII presents ethical concerns for the development and use of AI. Part VIII also discusses fundamental limiting factors in the development of AI technology as well as hints at AI's promising future. We recommended that PART I be used to introduce the AI discipline and that Part VIII be discussed after the AI practice materials. Parts II through VII present the three main paradigms of current AI practice: the symbol-based, the neural network or connectionist, and the probabilistic. Generous use of examples throughout helps illustrate the concepts, and separate end-of-chapter exercises are included. Teaching resources include a solutions manual for the exercises, PowerPoint presentation, and implementations for the algorithms in the book.

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