

AI-powered growth hacking: benefits, challenges and pathways

AI-powered
growth
hacking

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Abstract

Purpose – This paper aims to (1) unveil how artificial intelligence (AI) can be implemented in growth-hacking strategies; and (2) identify the challenges and enabling factors associated with AI's implementation in these strategies.

Design/methodology/approach – The empirical study is based on two distinct groups of analysis units. Firstly, it involves 11 companies (identified as F1 to F11 in Table 1) that employ growth-hacking principles and use AI to support their decision-making and operations. Secondly, interviews were conducted with four businesses and entrepreneurs providing consultancy services in growth and digital strategies. This approach allowed us to gain a broader view of the phenomenon. Data analysis was performed using the Gioia methodology.

Findings – The study firstly uncovers the principal benefits and applications of AI in growth hacking, such as enhanced data analysis and user behaviour insights, sales augmentation, traffic and revenue forecasting, campaign development and optimization, and customer service enhancement through chatbots. Secondly, it reveals the challenges and catalysts in AI-driven growth hacking, highlighting the crucial roles of experimentation, creativity and data collection.

Originality/value – This research represents the inaugural scientific investigation into AI's role in growth-hacking strategies. It uncovers both the challenges and facilitators of AI implementation in this domain. Practically, it offers detailed insights into the operationalization of AI across various phases and aspects of growth hacking, including product-market fit, user acquisition, virality and retention.

Keywords Growth hacking, Artificial intelligence, Decision-making, Automation

Paper type Research paper

1. Introduction

In recent years, companies have radically changed their approaches to innovation to adapt to the rapidly evolving and dynamic markets. Approaches such as open innovation, design thinking, agile and lean startups have provided companies with leaner and more flexible tools to innovate efficiently (Chesbrough and Tucci, 2020; Ghezzi and Cavallo, 2020). In this context, growth hacking has attracted particular interest among practitioners, startups, founders and consultants in recent years (Bargoni *et al.*, 2023).

Nevertheless, growth hacking has only recently aroused interest among academics. In fact, it is only in the last three to four years that scholars have begun to investigate this



approach from a scientific point of view (Troisi *et al.*, 2020; Cavallo *et al.*, 2023). According to Ellis and Brown (2017), growth hacking is “a process of rapid product and marketing channel experimentation to find the most efficient way to grow a business”. It involves utilizing innovative and unconventional marketing techniques, often driven by data and experimentation, to achieve exponential growth in a short period.

One of the pillars of growth hacking is automation (Troisi *et al.*, 2020), which is facilitated by artificial intelligence (AI) (Huang and Rust, 2021, 2022). AI refers to machine learning algorithms that analyse large amounts of data to make predictions or perform tasks without being explicitly programmed (Loureiro *et al.*, 2021; Secinaro *et al.*, 2021; Del Giudice *et al.*, 2023a). For example, AI systems gather data on users’ behaviour, such as the products viewed, the items purchased, the time spent on specific pages and more. Based on those data, an AI-driven recommendation engine uses machine learning algorithms to suggest products to users (Bresciani *et al.*, 2021). It considers not only individual users’ behaviour but also the behaviour of similar users. Indeed, through AI tools, it is possible to automate processes and activities, increasing the efficiency and effectiveness of decision-making. As such, AI might bring many benefits to growth hacking. Surprisingly, despite its growing relevance, the intersection of AI and growth hacking remains a largely unexplored area in scientific research. This notable research gap is significant, particularly considering the potential impact that AI could have on growth-hacking strategies. Therefore, there is a pressing need for empirical evidence to guide companies and managers, especially those yet to adopt growth-hacking methodologies, on how to leverage AI effectively. Understanding the internal factors and resources necessary for harnessing this powerful technology is crucial for its successful integration. In line with this, this paper aims to (1) reveal how AI can be implemented in growth-hacking strategies; and (2) identify the challenges and enabling factors associated with AI’s implementation in these strategies.

In a similar vein, the study aims to answer the following questions:

- RQ1. How can AI be implemented in specific phases and activities of growth-hacking strategies or within various application domains of growth hacking?
- RQ2. What are the challenges and enabling factors in the implementation of AI in growth-hacking strategies?

Due to a paucity of studies on this topic, we decided to rely on an inductive qualitative research design, focusing on multiple-case studies involving micro, small and larger enterprises, consulting agencies and professional growth-hacking consultants. The data collection primarily consisted of observations and semi-structured interviews. The empirical study encompassed 21 in-depth interviews with CEOs, managers and consultants responsible for leading growth programmes in their respective companies or for their clients. The data were analysed following the Gioia methodology.

The findings involve two main areas. First, the paper identifies the main effective benefits and scope of usage of AI, such as analysing data and studying user behaviour, increasing sales, forecasting traffic, sales and revenue, structuring and developing effective campaigns, customer service and chatbots. Second, the paper unveils the challenges and enabling factors for AI-driven growth-hacking strategies, such as the importance of experimentation, the significance of creativity and the key role of data gathering.

The paper offers the following contributions. First, from a theoretical point of view, the paper contributes to the literature on growth hacking by shedding light on the role of AI in growth-hacking strategies. In this sense, the paper also highlights the challenges and enabling factors of its implementation. Second, from a practical point of view, the paper provides precise insights into how AI can be implemented by companies in specific phases and areas of growth hacking, such as product–market fit, hack/users’ acquisition, virality and retention.

2. Literature review

AI has emerged as a transformative technology in the business landscape, revolutionizing various aspects of organizations' operations (Del Giudice *et al.*, 2023b; Jarrahi *et al.*, 2023) and supporting business model innovation (Kanbach *et al.*, 2023). In other words, implementing AI tools allows firms to reshape and innovate their business model (Burström *et al.*, 2021). Recently, business models have been studied from a dynamic perspective. In this regard, business model dynamics can take four different forms (Sanasi, 2023): business model validation, business model innovation, business model scaling and business model pivoting. Hence, contemporary companies are now building new digital dynamic capabilities thanks to the implementation of AI and related tools, along with the gathering and usage of big data (Santoro *et al.*, 2018), to increase the opportunities for sensing, seizing and transforming (Mikalef *et al.*, 2021). Specifically, dynamic capabilities have been suggested to allow firms to sense and seize emerging business opportunities and reconfigure the way in which they do business to adapt to shifting market conditions (Teece, 2007). Hence, numerous studies have explored the applications of AI in different business domains, highlighting its potential to drive renewal, change, innovation, efficiency and competitive advantage (Enhölm *et al.*, 2022; Odugbesan *et al.*, 2023) but also the dark side of AI (Arias-Pérez and Vélez-Jaramillo, 2022).

One prominent area in which AI has made significant inroads is customer relationship management (Ledro *et al.*, 2022). AI-powered chatbots and virtual assistants have revolutionized customer service by providing real-time support and personalized recommendations, leading to improved customer satisfaction and retention (Xu *et al.*, 2018). Additionally, AI-driven sentiment analysis enables businesses to gain valuable insights from social media interactions, helping them to understand customer preferences and sentiments (Mudambi and Schuff, 2018). Another critical domain in which AI has shown immense promise is marketing and advertising. AI algorithms can analyse vast amounts of data from various sources, such as social media, web browsing behaviour and purchase history, to target customers with highly personalized and relevant content (Duan *et al.*, 2019a). This level of personalization not only enhances customer engagement but also improves the efficiency of marketing campaigns, leading to higher conversion rates and an increased return on investment. Furthermore, AI has become a game changer in supply chain management. Advanced AI algorithms can optimize inventory levels, predict demand and identify potential disruptions, enabling businesses to streamline their supply chain operations and reduce their costs (Srinivasan *et al.*, 2019). Additionally, AI-powered predictive maintenance systems can help organizations address equipment failures proactively and minimize downtime, leading to improved productivity and operational efficiency (Zhang *et al.*, 2018).

Moreover, AI has demonstrated its prowess in business strategy formulation and decision-making (Duan *et al.*, 2019b; Shrestha *et al.*, 2019). AI-powered analytics can process vast amounts of data, industry trends and market insights to provide businesses with valuable intelligence for strategic planning (Thomke, 2019). AI-driven simulations and scenario analysis help organizations evaluate various strategic options and assess potential outcomes, leading to more informed and data-driven decisions.

Despite the numerous benefits and opportunities offered by AI, its widespread adoption in the business world also presents challenges. Issues related to data privacy, security and ethical considerations have garnered significant attention (Hagendorff, 2020). AI systems require varied and rich sources of big data (Mehmood *et al.*, 2024). Additionally, the complexity of AI implementation and the need for specialized skills may act as barriers for some organizations (Van den Broeck *et al.*, 2018). Hence, successful AI integration requires a thoughtful approach, strategic planning and commitment to addressing these challenges effectively.

In conclusion, the literature on the use of AI in the business context has underscored its transformative potential across various domains. From customer relationship management to supply chain optimization and strategic decision-making, AI-driven solutions have shown remarkable effectiveness in achieving two kinds of objectives: on one side, improving efficiency and supporting decision-making processes; and, on the other side, enhancing innovation activities, developing new ideas, implementing new customer relationship patterns and so on. However, there seems to be a paucity of studies on AI-driven growth-hacking strategies, although all growth hackers use AI tools for their daily strategies and experiments.

Growth hacking, initially emerging in the startup world, has gained significant traction as a strategic approach to achieving rapid and scalable growth for businesses (Holiday, 2014). Coined by Sean Ellis in 2010, the term growth hacking was primarily focused on finding scalable and repeatable growth models for startups to acquire a large user base quickly (Ellis, 2010). It involved utilizing innovative and unconventional marketing techniques, often driven by data and experimentation, to achieve exponential growth in a short period (Picken, 2017).

Early studies on growth hacking predominantly explored its application in the startup ecosystem. Researchers highlighted the importance of adopting a growth-centric mindset and employing creative, low-cost and high-impact strategies to acquire and retain customers rapidly (Babin and Cardona, 2016). Such strategies often included viral marketing, referral programmes and A/B testing to optimize conversion rates. Other studies explored the theme of business growth, focusing on the factors that promote rapid and agile growth, terming it Blitzscaling (Kuratko *et al.*, 2020).

Over time, the concept of growth hacking has evolved beyond startups and is now recognized as a valuable methodology applicable to businesses of all sizes and industries (Bargoni *et al.*, 2024a). Recent studies have emphasized its broader scope, wherein growth hacking is seen as a data-driven and iterative approach to improving various business processes and activities (Nikou and Bouwman, 2021). It involves conducting continuous experiments, analysing data and making informed decisions to drive growth in different aspects of the organization, such as marketing, product development and customer experience (Sanasi *et al.*, 2023). In this context, the implementation of growth hacking has also shifted from a purely marketing-driven approach to a more holistic organizational strategy. More recent studies have stressed the significance of cross-functional collaboration, in which marketing, product development and engineering teams work together to identify growth opportunities and design data-informed experiments (Villalonga, 2019). This integrated approach enables businesses to optimize their entire customer journey and enhance their overall performance. Furthermore, the rise of digital technologies and the availability of vast amounts of data have paved the way for growth hacking to become increasingly data-centric (Sanasi, 2023). AI and machine learning algorithms are now leveraged to analyse customer behaviour, segment audiences and personalize experiences, all of which contribute to driving growth (Bhattacharya *et al.*, 2022). Other studies have found evidence of the interest in AI applied to marketing automation, segmentation and customization (Fileri *et al.*, 2021).

Data-driven decision-making has become a core aspect of growth hacking, allowing businesses to iterate and optimize strategies based on real-time insights. Recent studies have delved into the specific strategies and decision-making processes employed by firms practising growth hacking. Troisi *et al.* (2020) conducted an in-depth analysis of three firms and revealed insights into data-driven decision-making, shedding light on the integration of AI tools into growth-hacking strategies. Bohnsack and Liesner (2019) developed a taxonomy for growth hacking and provided practical applications for firms to implement growth-hacking techniques effectively. Additionally, Cavallo *et al.* (2023) explored the relationship among business model scaling, growth hacking and digital entrepreneurship, offering valuable insights into the adoption of growth-hacking practices in scaling ventures.

Moreover, [Bargoni et al. \(2023\)](#) proposed a conceptual framework linking growth hacking and international dynamic marketing capabilities, providing research propositions to guide further investigations into the internationalization potential of growth hacking. [Bargoni et al. \(2024b\)](#) described how growth-hacking strategies can be implemented effectively across four levels of analysis: market, organization, project and product. The authors highlighted the importance of adopting growth-hacking practices to minimize the likelihood of innovation failure in each of these domains.

In conclusion, growth hacking, originally rooted in the startup world, has evolved into a comprehensive methodology applicable to businesses across industries. While its early focus was on finding scalable business models, today, growth hacking is perceived as a data-driven approach to improving processes and activities through continuous experimentation. As businesses strive for growth and competitiveness in the digital age, embracing growth-hacking principles can provide a competitive advantage and foster sustainable growth. From the perspective of business model dynamics ([Sanasi, 2023](#)), growth hacking is no longer viewed merely as a method for scaling a business. Instead, it is recognized as an experimental approach aimed at validating, innovating and pivoting a business model through rigorous hypothesis testing.

For all these reasons, it is logical to postulate that AI can facilitate many of the activities of growth, testing and analysis of experiments. Despite this, as far as we know, the literature has not yet provided empirical evidence on how new AI tools can support specific activities related to the growth methodology.

3. Methodology

This research employs an inductive qualitative research design, focusing on multiple-case studies ([Eisenhardt and Graebner, 2007](#)). Considering the novelty of the phenomenon and the limited existing literature, qualitative research with an inductive design will prove to be valuable in discovering novel insights and providing empirical descriptions of the phenomena under investigation ([Eisenhardt, 1989](#); [Gioia et al., 2013](#)). The choice of an inductive qualitative study stems from the scarcity of research focused on the specific objective of exploring how AI tools can be implemented to foster growth-hacking strategies. Currently, only a few studies have addressed growth hacking, and, to the best of our knowledge, none have delved into the role of AI in fostering growth-hacking implementation.

Case studies offer a deep dive into each case, allowing researchers to gather additional data as necessary ([Eisenhardt, 1989](#)). To overcome the limitations of single-case studies, we chose the multiple-case study approach, aiming to enhance the generalizability of our results and the comparability of our findings ([Eisenhardt, 1989](#)). Accordingly, our research provides a comprehensive and varied analysis, which enhances its overall value and credibility.

The empirical study is based on two distinct groups of analysis units. Firstly, it involves 11 companies (identified as F1 to F11 in [Table 1](#)) that employ growth-hacking principles and use AI to support their decision-making and operations. In selecting the companies, we applied the following criteria: (1) we ensured that the companies were active in using the growth methodology; and (2) we made sure that AI had been used consistently for at least one year in various growth activities, from automation to lead generation, data analysis, conducting tests and so on. These companies operate in diverse sectors, including fitness and wellness, gaming, tax services, EdTech, travel and tourism, e-publishing services, accommodation and co-working.

Secondly, interviews were conducted with businesses and entrepreneurs providing consultancy services in growth and digital strategies. A total of four entities (labelled C1 to C4 in [Table 1](#)) were analysed. Overall, 21 semi-structured interviews were conducted. The decision to analyse both companies and consultants stems from the understanding that these

MD	Case	Business sector/type	Value proposition	Company size	Firm age	No. of interviews
	F1	Fitness and wellness	Digital platform for wellness and work-out services	Micro	6	1
	F2	Gaming	Digital platform based on gaming technology innovation	Small	2	1
	F3	Tax services	Digital platform for simplifying the management of financial services and tax payments	Small	7	1
	F4	EdTech	Digital platform based on data and AI to simplify educational learning	Small	3	1
	F5	Travel and tourism	Digital platform for organizing and sharing tourism experiences for the younger generation	Small	4	4
	F6	E-publishing services	Digital platform for researching, promoting and developing sports knowledge and practice	Small	7	1
	F7	Travel and tourism	Digital platform for sharing passion for travel and events	Medium	6	1
	F8	Entertainment	Digital platform for local event management and planning	Micro	1	1
	F9	Accommodation and co-working	Digital platform for living space creation that fosters new beginnings with a welcoming home	Small	3	2
	F10	Fitness and wellness	Digital platform as a search engine for sports activities	Small	6	1
	F11	FinTech	Digital platform for investing in cryptos	Small	6	1
	C1	Strategy, consulting and business growth	Strategic business consulting and implementation of digital projects for businesses engaged in achieving sustainable success	Small	8	3
	C2	Strategy, consulting and business growth	Strategic business consulting and implementation of data-driven and customer-centric growth strategies	Micro	6	1
	C3	Digital marketing and business growth	Growth expert who helps companies grow their businesses and mindset with experiments	Micro	4	1
Table 1.	C4	Digital marketing and business growth	Consultant managing and optimizing SEO and SEA for customers and agencies	Individual	–	1
	Source(s): Own elaboration					

Characteristics of the sample and respondents

two perspectives employ growth strategies and, more broadly, digital strategies in different ways. This approach allowed us to gain a broader view of the phenomenon.

The units of analysis were selected as case studies to provide a comprehensive and varied analysis, thereby enhancing the research's overall value and credibility. By incorporating perspectives from firms, consultants and startupers, this study offers a more detailed understanding of the subject matter, benefiting both practitioners and researchers. Additionally, this approach enabled an exploration of the usage of AI tools for growth-hacking strategies in various contexts.

We gathered information from various sources, engaging in multiple rounds of semi-structured interviews with selected informants. Additionally, we tapped into primary

sources, such as informal conversations, to enrich our data collection. Simultaneously, we gathered extensive information from various secondary sources, including public domain materials and documents provided by the informants themselves. These documents included public interviews, presentations made by the informants, internal presentations, news articles and online videos. The purpose of this data collection was to cross-reference and verify the information obtained, ensuring a more comprehensive understanding of the business development and growth plans of the selected cases, which helped to reduce observers' potential biases (Eisenhardt, 1989; Gioia *et al.*, 2013).

The data collection and interviews were conducted from October 2022 to January 2024. The one-to-one semi-structured interviews involved open-ended questions and were conducted by multiple researchers, lasting between 30 and 90 min each. Sample questions included: (1) Do you use AI tools in growth-hacking activities or more generally in experimentation and/or growth processes? (2) What tools do you use? (3) For what purpose? (4) What are the biggest challenges in implementing the AI tools that you use?

Following a process of gradual abstraction, raw data were manually categorized, linked to themes and aggregated (Pratt, 2009) to identify recurring patterns concerning specific areas relating to how AI can be implemented in growth-hacking strategies. More specifically, all the interviews were recorded and transcribed in full, as were the secondary sources. Whenever we felt that data were missing or incomplete, we asked the informants for further details. The next step was to analyse the data meticulously, rereading the transcripts to start making connections between concepts and selecting representative quotes (Strauss and Corbin, 1990). While collecting and organizing the data, we aggregated them into case descriptions to give structure to the large volume of data collected (Eisenhardt, 1989). We analysed the data through an interpretive approach, using tables and graphs, following Gioia *et al.*'s (2013) guidelines for qualitative data analysis, to condense the body of data and structure our interpretive scheme.

The interviews concluded when data saturation was reached, indicated by consistent information on the areas of AI usage for growth-hacking implementation across all the interviews. Table 1 presents the sample characteristics and the interviewees included in the study.

4. Findings

4.1 *AI's effective benefits and scope of usage*

4.1.1 Data analysis and user behaviour study. AI can be employed to analyse vast amounts of data from various sources, including social media, websites, email marketing and user behaviour analysis. This data analysis helps to identify patterns, trends and valuable insights to guide growth-hacking strategies. For example, an e-commerce company involved in this study utilizes AI to analyse customer behaviour on its website. By collecting data on user interactions, product views and purchase history, the AI system identifies patterns that indicate high-intent users. The company then tailors personalized offers and recommendations to these users, resulting in increased conversion rates and customer satisfaction.

AI outperforms human capabilities in processing large datasets swiftly and efficiently. For instance, the analysis of customer behaviour on a website should underpin all strategic decisions. This understanding enables companies to comprehend their customers better and identify opportunities for marketing process enhancements. By integrating AI tools with other platforms, like social media and email marketing software, customers' data can be analysed to discern which content resonates best with them, leading to improved marketing decisions.

As expressed by a marketing consultant, "AI allows for more precise and automated analysis of online consumer behaviour, supporting market segmentation. These analyses

lead to better-defined communication campaigns, re-targeting, dynamic pricing and more". AI applications can identify and analyse user behaviours throughout the customer journey, aiding decision-making in campaigns and conversion tactics. Moreover, AI can recommend personalized content based on user preferences and past interactions with similar content. It can even suggest content based on the activities of the user's close friends on social media.

As suggested by a growth hacker, "We use various AI tools to analyse user behaviour within our segments. These tools automate data analysis and provide insights that the human mind would struggle to grasp". Ultimately, AI systems identify and construct an effective buyer persona, adapting it over time to changing market conditions. These precise analyses can subsequently optimize campaigns and increase sales (next finding).

4.1.2 Increasing sales. AI plays a fundamental role in helping businesses boost sales effectively while reducing human resource costs. Leveraging AI-based tools allows companies to scale their sales and marketing activities efficiently. Furthermore, AI streamlines processes, saving time and preventing costly human errors. AI provides valuable insights into customer behaviour and preferences, empowering growth hackers to offer personalized experiences that enhance conversions and revenue. For example, an online retailer participating in this research implements AI-powered chatbots to engage with website visitors and answer product-related queries. He stated, "Automating certain processes through AI has allowed us to increase the conversion rate, which in turn increases revenue". By offering personalized product recommendations based on user preferences and browsing history, chatbots significantly increase cross-selling and upselling opportunities, ultimately leading to higher sales revenue.

A marketing manager provided concrete examples, stating, "We use AI tools for upselling and cross-selling. This allows us to increase sales, raise the average cart value, and optimize profitability". By offering AI-driven suggestions for additional products and services, companies can cater to customer desires more effectively, enhancing the product-market fit. Another interviewee emphasized the key role of AI in automating some simple but significant processes for managing the sales funnel. "With AI, we have structured an email marketing automation process. When a user searches for us and shows interest in our products, we try to acquire their email contact and automatically launch a campaign that can offer them the product they are looking for. This increases the conversion rate and helps to mitigate the user's fears".

4.1.3 Forecasting traffic, sales and revenue. Collecting and analysing customer data allows companies to anticipate changes in customer behaviour, creating algorithms to predict churn rates and accurately estimate the customer lifetime value. Therefore, AI helps to predict traffic, sales and revenue. The crucial first step in implementing AI in a company is to define precisely which data to use. An essential aspect highlighted by a consultant is the following: "In the growth process, data collection is vital. Without data, there is no growth. However, it is crucial to understand which data to collect, from which sources, how to clean and aggregate them, etc." Afterwards, data scientists can build models using machine learning techniques like neural networks (NNs) or deep learning (DL). These algorithms take past patterns into account to make predictions about future events based on historical data series. An online marketplace applies AI-based predictive analytics to forecast website traffic and sales during peak seasons, such as Black Friday. By analysing historical data, market trends and external factors, the AI system provides accurate predictions, enabling the marketplace to optimize its inventory, server capacity and marketing efforts.

As explained by a head of growth, "Let's say we want to predict the number of visitors to our website during this year's Black Friday using a neural network algorithm. To achieve this, we train the algorithm using Black Friday sales data from previous years and data from other days in November. We also consider other relevant factors, such as weather conditions and upcoming significant holidays like Christmas Eve, which could influence buying

behaviour. By inputting all this information into our model, we can make more accurate predictions for the upcoming Black Friday and prepare accordingly”.

4.1.4 Structuring and developing effective campaigns. AI can be utilized in several ways to create successful content. One popular approach is to use machine learning to analyse the performance of existing social media posts and to identify the most successful ones. These posts can then serve as inspiration for future posts or even form the basis of an entire campaign.

Another method involves using DL algorithms to extract key information from user engagement data (likes, comments and shares) on social media platforms, such as Facebook, Instagram and Twitter. This helps to identify the types of posts that resonate best with a specific audience, enabling the creation of more effective content for those platforms.

AI is also highly effective in developing email marketing campaigns. For instance, defining an effective subject line, producing compelling email content and analysing the best time of day to send emails can all be enhanced with AI. Additionally, AI can efficiently analyse customer feedback received through email surveys, providing insights such as qualitative analysis of responses, sentiment analysis, automated response messaging and personalized questionnaires for specific groups of recipients.

Moreover, AI is valuable in A/B testing, a critical element of digital marketing and, more specifically, email marketing. Testing can be repetitive and inefficient, with potentially endless attempts. AI comes to the rescue by enabling the testing of numerous options, the conducting of multiple tests simultaneously, quick personalized testing and the application of sophisticated targeting.

As explained by a consultant, “we utilize AI tools to analyse the performance of past ad campaigns. The AI system identifies the most successful ad creatives, audience segments and posting times. Based on these insights, we craft new campaigns that align with customer preferences and generate higher engagement rates”.

4.1.5 Enhancing customer service with chatbots. AI is excellent for customer service as it allows companies to understand customer needs and provide personalized responses. AI can even assist in generating appropriate language for responses. The more data available on customer behaviour, the better companies can address issues with their products or services, making customers feel that they are receiving precisely what they need.

Moreover, AI assists in discovering new ways to support customers. It can pre-qualify potential clients, direct them to the right representative, enhance user experiences with chatbots and understand user needs to deliver personalized messages. Chatbots, powered by AI, offer round-the-clock support, efficiently resolving customer queries and issues. This enables companies to excel in customer service, thanks to natural language processing (NLP). An online service provider implements AI-powered chatbots to handle customer inquiries and support requests. The chatbots use NLP to understand customer intent and provide accurate and timely responses. The availability of round-the-clock customer support through chatbots results in improved customer satisfaction and reduced response times.

As highlighted by a marketing manager, “We realized that many users were asking the same questions to the chatbot. This allowed us to identify a pain point within the customer journey. Consequently, we improved the user experience on our website, resolving the issue. This improvement led to an increase in revenue”.

Table 2 presents examples and quotes from the interviewees regarding the application of AI in specific stages of growth hacking. As a reference framework, we considered the four stages suggested by Holiday (2014): product–market fit, hack, virality and retention. *Product–market fit (PFM)* involves ensuring that a product or service meets the needs and demands of a target market; *hack* focuses on innovative, often unconventional marketing strategies to grow the business rapidly; *virality* aims to create content or marketing strategies that are highly shareable, aiming to spread the product or service quickly through word of

Findings, examples and quotes	GH phase
By collecting data on user interactions, product views and purchase history, the AI system identifies patterns that indicate high-intent users	Product–market fit
The company then tailors personalized offers and recommendations to these users, resulting in increased conversion rates and customer satisfaction	Hack/user acquisition and retention
AI allows for more precise and automated analysis of online consumer behaviour, supporting market segmentation	Product–market fit
By offering AI-driven suggestions for additional products and services, companies can cater to customer desires more effectively, enhancing the product–market fit	Product–market fit
These analyses lead to better-defined communication campaigns, re-targeting, dynamic pricing and more	Hack/user acquisition
AI applications can identify and analyse user behaviours throughout the customer journey, aiding decision-making in campaigns and conversion tactics	Hack/user acquisition
AI provides valuable insights into customer behaviour and preferences, empowering growth hackers to offer personalized experiences that enhance conversions and revenue	Hack/user acquisition
One popular approach is to use machine learning to analyse the performance of existing social media posts and to identify the most successful ones. These posts can then serve as inspiration for future posts or even form the basis of an entire campaign	Hack/user acquisition
AI is also highly effective in developing email marketing campaigns. For instance, defining an effective subject line, producing compelling email content and analysing the best time of day to send emails can all be enhanced with AI	Hack/user acquisition
This helps to identify the types of posts that resonate best with a specific audience, enabling the creation of more effective content for those platforms	Hack/user acquisition
We utilize AI tools to analyse the performance of past ad campaigns. The AI system identifies the most successful ad creatives, audience segments and posting times. Based on these insights, we craft new campaigns that align with customer preferences and generate higher engagement rates	Hack/user acquisition
Moreover, AI can recommend personalized content based on user preferences and past interactions with similar content. It can even suggest content based on the activities of the user’s close friends on social media	Viral
By offering personalized product recommendations based on users’ preferences and browsing history, chatbots significantly increase cross-selling and upselling opportunities, ultimately leading to higher sales revenue	Retention/boosting sales
Additionally, AI can efficiently analyse customer feedback received through email surveys, providing insights such as qualitative analysis of responses, sentiment analysis, automated response messaging and personalized questionnaires for specific groups of recipients	Retention/boosting sales
By analysing historical data, market trends and external factors, the AI system provides accurate predictions, enabling the marketplace to optimize its inventory, server capacity and marketing efforts	Retention/boosting sales
We use AI tools for upselling and cross-selling. This allows us to increase sales, raise the average cart value and optimize profitability	Retention/boosting sales
We realized that many users were asking the same questions to the chatbot. This allowed us to identify a pain point within the customer journey.	Product–market fit
Consequently, we improved the user experience on our website, resolving the issue. This improvement led to an increase in revenue	Retention/boosting sales
Source(s): Own elaboration	

Table 2.
AI’s effective benefits
and scope of usage

mouth or social sharing; finally, *retention* is about keeping customers engaged and making them repeat buyers, which are vital for long-term success. These stages provide a comprehensive view of the growth-hacking process, from the initial product development to acquiring and retaining customers.

4.2 Challenges and enabling factors

4.2.1 The importance of experimentation. One key aspect that emerged from the interviews is that AI does not provide exact and definitive answers. Merely using AI tools is not enough; conducting experiments is crucial to understand what works and what does not in growth-hacking activities. AI can offer support and suggestions, but the process of experimentation through trial and error remains essential, as the growth approach suggests. Moreover, the interviews emphasize the significance of human interpretation and guidance in utilizing technologies and conducting experiments as AI cannot fully replace the role of human experts in making strategic decisions.

For instance, a marketing manager revealed that his team leverages AI-powered tools to optimize its email marketing campaigns. The AI tool analyses customer behaviour and suggests personalized content recommendations. However, the team acknowledged that the AI's recommendations should be tested and fine-tuned through human-led A/B testing. By conducting A/B tests with different subject lines, call-to-action buttons and content variations, the team members can understand which combinations yield higher open rates, click-through rates and conversions. As he concluded, "The human expertise in interpreting the test results and refining the AI-driven suggestions helps improve the overall effectiveness of the email marketing strategy".

Another participant emphasized the importance of conducting tests supported by AI and big data. Specifically, through some tests, this company's employees realized that it had scaled sufficiently and that it was time to focus on loyalty and retention. In the second step, AI was useful for testing some hypotheses regarding retention strategies. At the end of the process, it was decided to implement gamification to engage as many users as possible on a daily basis.

4.2.2 The significance of creativity. While AI and its tools are valuable, the results of the interviews highlight that creativity plays a fundamental role in generating innovative ideas and conducting successful experiments in growth hacking. The utilization of AI technologies should not replace creative thinking but rather should complement it to achieve better results. One of the interviewees described a social media marketing campaign for a fashion brand that uses AI-generated content suggestions to increase engagement. While the AI tool can provide data-driven insights into the best times to post, content themes and optimal image selection, the creative team is responsible for crafting captivating stories, visuals and unique brand experiences. By creatively combining AI-generated insights with innovative content ideas, the brand can create more impactful social media campaigns that resonate with its target audience and drive higher customer engagement. An interviewee explained this concept as follows: "We follow a classic growth-hacking process composed of analysis, ideation, prioritization, execution phases. AI greatly assists in the analysis, prioritization and execution phases. However, the ideation phase requires great creativity and problem-solving. These are still rare skills and difficult to learn".

4.2.3 The central role of data in growth hacking. Without a doubt, the interviewees emphasized the crucial role of data in leveraging AI tools effectively and efficiently for growth hacking. To achieve meaningful outcomes, a variety and abundance of data are required to train the AI algorithms accurately and make informed decisions. An e-commerce company participating in this research employs AI-powered chatbots to provide personalized customer support. To achieve this, the chatbot needs access to extensive customer data, including past interactions, purchase history and preferences. As one manager said: "By analysing these data, the chatbot can offer tailored product recommendations, address customer inquiries more effectively and even anticipate customer needs based on previous behaviour. The availability of comprehensive data enhances the chatbot's ability to provide a seamless and personalized customer experience, fostering customer loyalty and satisfaction".

As stressed earlier, AI helps to predict traffic, sales and revenue. The crucial first step in implementing AI in a company is defining precisely which data to use. An essential aspect highlighted by a consultant was, “In the growth process, data collection is vital. Without data, there is no growth. However, it is crucial to understand which data to collect, from which sources, how to clean and aggregate them, etc.”

In conclusion, the interviews’ findings highlight the importance of human involvement in experimentation, the significance of creativity in synergy with AI and the indispensable role of data in maximizing the potential of AI for growth-hacking strategies. By embracing these insights, businesses can harness AI’s power to drive innovation, improve customer engagement and achieve sustainable growth in the competitive digital landscape. [Figure 1](#) shows the data structure obtained through the Gioia methodology.

5. Implications and conclusions

5.1 Findings and critical discussion

This paper has tried to shed light on how AI can be implemented in growth-hacking strategies and unveil the challenges and enabling factors related to the implementation of AI in growth-hacking strategies. Data gathered through semi-structured interviews revealed AI’s main effective benefits and scope of usage.

First, AI can be implemented for data analysis and user behaviour study. For example, an e-commerce company involved in this study utilizes AI to analyse customer behaviour on its website and on social media. By collecting data on user interactions, product views and purchase history, the AI system identifies patterns that indicate high-intent users. The

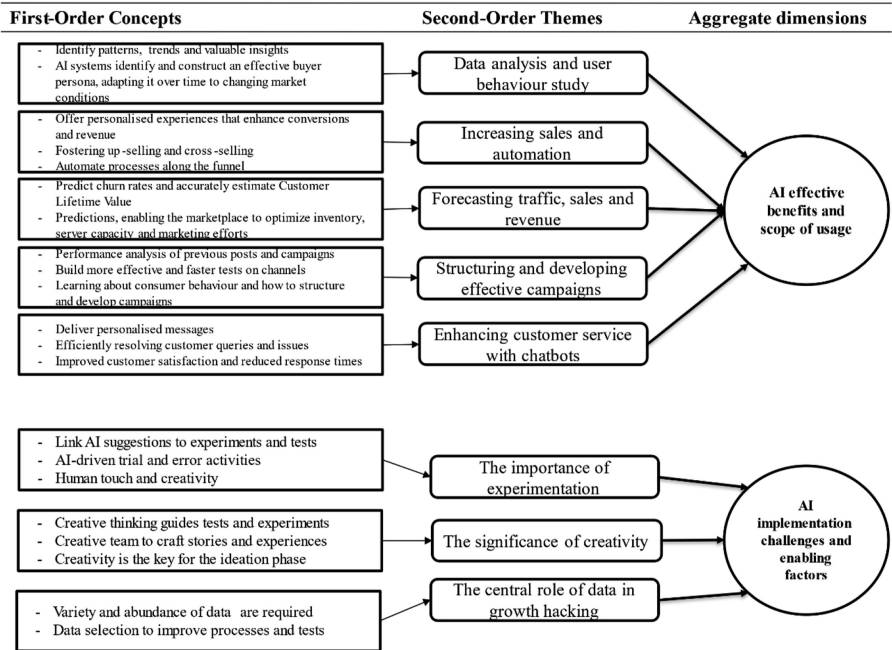


Figure 1. Data structure

Source(s): Own elaboration

company then tailors personalized offers and recommendations to these users, resulting in increased conversion rates and customer satisfaction (Macca *et al.*, 2024). From a dynamic capabilities perspective (Teece, 2007), companies can build sensing skills through data analytics. This data analysis helps in seizing and transforming current products, services and processes while developing new ones. This is in line with the literature suggesting that AI-driven data analysis helps businesses gain a deeper understanding of customer preferences and behaviour, leading to improved customer targeting and more effective marketing campaigns (Ramanathan *et al.*, 2017).

Second, the study shows that AI can be highly effective in increasing sales, both to existing and new clients, boosting scaling. One of the companies involved in this study implements AI-powered chatbots to engage with website visitors and answer product-related queries. By offering personalized product recommendations based on user preferences and browsing history, the chatbots significantly increase cross-selling and upselling opportunities, ultimately leading to higher sales revenue, average spending and other metrics. This is in line with the study by Van Doorn *et al.* (2017), which emphasized the effectiveness of AI-driven recommendation systems in driving sales and customer loyalty.

Third, AI tools are vital for effective campaign structuring and development. A social media marketing agency utilizes AI tools to analyse the performance of past ad campaigns. The AI system identifies the most successful ad creatives, audience segments and posting times. Based on these insights, the agency crafts new campaigns that align with customer preferences and generate higher engagement rates. This implementation of technology facilitates continuous in-depth learning, both in terms of understanding consumer behaviour and in the way in which campaigns are developed and analysed.

Fourth, customer service and chatbots are increasingly automated thanks to AI. Several companies involved in this study implement AI-powered chatbots to handle customer inquiries and support requests. The chatbots use NLP to understand customer intent and provide accurate and timely responses. The availability of round-the-clock customer support through chatbots results in improved customer satisfaction and reduced response times (Chung *et al.*, 2020). As suggested by the literature, technologies like chatbots and service-providing humanoid robots will be incorporated into numerous service experiences, thus enhancing the ability to engage customers on a social level. According to our findings, AI can be used to automate some of the angles of the company–customer relationship and thus to offer an overall better experience along different phases of the funnel.

Finally, AI can be used to forecast traffic, sales and revenues. By analysing historical data, market trends and external factors, the AI system provides accurate predictions, enabling the marketplace to optimize inventory, server capacity and marketing efforts. Better forecasting of sales, trends and scenarios facilitates the decision-making process, allowing for better allocation of resources and minimizing risk.

The paper also unveiled the challenges and enabling factors for AI-driven growth-hacking strategies, such as the importance of experimentation, the significance of creativity and the key role of data gathering. One key aspect that emerged from the interviews is that AI alone is not enough to improve performance; conducting experiments is crucial to understand what works and what does not in growth-hacking activities. AI can offer support and suggestions, but the process of experimentation through trial and error remains essential (Bargoni *et al.*, 2024a), and it is guided by human input and creativity. This is consistent with the second finding, which concerns the key role of creativity. In this regard, the implementation of AI technologies should not replace creative thinking but rather should complement it to achieve better results. For example, the founder of a platform (F11) emphasized the importance of AI in understanding that, once a level of scaling has been reached, it is better to focus on user retention. However, AI alone is not enough to test different loyalty and retention mechanisms.

Creativity is the necessary key to developing ideas to test. Specifically, some employees have suggested implementing a gamification system that could bring a high percentage of users to the platform every day.

From a practical perspective, while the AI tool can provide data-driven insights into the best times to post, content themes and optimal image selection, the creative team is responsible for captivating crafting stories, visuals and unique brand experiences. Finally, AI needs data. To achieve meaningful outcomes, a variety and abundance of data are required to train the AI algorithms accurately and make informed decisions (Rialti *et al.*, 2019; Bresciani *et al.*, 2021).

5.2 Implications for theory

This paper makes the following theoretical implications. First, the paper contributes to the literature on growth hacking by shedding light on the key role of AI in growth-hacking strategies and approaches. In particular, the findings add to the literature by providing specific scope for the use of AI tools in specific phases of growth hacking identified in the literature (product–market fit, hack, virality and retention) (Holiday, 2014). In this sense, the literature has agreed that growth hacking is based on creative marketing, coding and automation, and data analytics and testing (Troisi *et al.*, 2020). Building on the business model dynamics view (Sanasi, 2023) and dynamic capabilities view (Teece, 2007), we add to this stream of literature by showing that AI is vital to support key growth-hacking activities in different phases, such as PMF, hack, virality and retention; these phases unlock the firm's ability to sensing, seizing and transforming the business model of the firm (Mikalef *et al.*, 2021). In this sense, building on the work of Sanasi (2023), we show that growth hacking is no longer used merely as a method for scaling a business. Instead, it is an experimental approach aimed at validating, innovating and pivoting a business model through rigorous hypothesis testing. In our cases, growth hacking has been implemented to develop and launch new product features, improve the user experience and enhance the customer relationship.

Second, the paper empirically demonstrates that growth hacking can also be used by small- and medium-sized companies that traditionally have fewer resources than larger companies (Jabeen *et al.*, 2023). Our results, albeit qualitative, show that small and medium enterprises (SMEs) are very active in using experiments, data analytics and automation and that this methodology is greatly facilitated by AI tools. Traditionally, growth hacking has been linked to the efforts of large-scale enterprises or startups to achieve significant growth and record economic valuations. However, this paper demonstrates that such methodologies can be employed effectively by smaller businesses with more modest growth objectives. It further establishes that AI is not only a tool for larger entities but also accessible and beneficial for smaller-scale businesses. This expands the scope of AI's application and demonstrates its practicality across various business sizes.

Third, the paper sheds light on the challenges and enablers of AI implementation. From a resource-based view (Lockett *et al.*, 2009) and dynamic capability perspective (Teece, 2007), the paper indicates that, although technology is a very important factor, the human factor remains the key to AI-driven growth-hacking processes. Experiments and creativity are linked to the human factor, which needs to experience failure phases to learn and find the right strategies for growth and improvement. This insight carries significant implications for human resource management. Effective leadership is required to cultivate a strong inclination toward risk-taking alongside establishing a culture steeped in data gathering and analysis. This approach is crucial for guiding entrepreneurial experiments and fostering an environment of continuous improvement.

5.3 Implications for practice

Finally, from a practical point of view, the article suggests precise insights into how AI can be implemented by companies in specific phases and areas of growth hacking, such as product-market fit, hack/user acquisition, virality and retention. Therefore, our research suggests the following takeaways to managers and growth hackers.

Firstly, to use AI tools, it is necessary to collect data in abundance and variety through different channels. This requires investment, albeit sometimes limited, in databases and knowledge management systems. Companies can leverage various tools to collect data for AI and analytics, including CRM platforms (e.g. Salesforce, HubSpot), web and mobile analytics tools (e.g. Google Analytics), data management platforms (e.g. Adobe Audience Manager) and machine learning platforms (e.g. AWS Machine Learning). These tools enable the gathering of customer interactions, online behaviour and unstructured data, providing a comprehensive data foundation for predictive analytics and personalized experiences. They can be also used to gather data for experiments and hypothesis testing.

Secondly, creativity remains the key to exploiting growth hacking and data analytics (Jarrahi, 2018). Therefore, especially in the hiring phase, companies should also focus on creative human resources, not only employees who are technologically skilled. To be more precise, the growth-hacking team should have complementary skills, including competencies in IT and data analytics, as well as creativity, problem-solving and communication. As previously discussed, AI provides insights for decision-making. The company must be capable of making decisions to test with a data-driven process. Creativity, as shown by our data, plays a key role in defining decisions to test (e.g. the gamification system for F11).

5.4 Limitations and future lines of research

This paper is subject to the following limitations. First, the empirical research focuses on various sectors and companies, making it impossible to generalize the results, although they offer practical insights that are applicable across all contexts. Second, the qualitative nature of the paper does not allow for definitive conclusions about the impact of AI on performance and growth. Therefore, future studies could use quantitative methods to test specific hypotheses and relationships. From this perspective, ours is an inductive approach aimed at highlighting and suggesting best practices. Third, the participating companies are at different growth levels. Some are in the embryonic phase, while others are scale-ups. Our empirical research did not consider the companies' maturity stage. Since AI and growth activities might differ based on the companies' maturity state, future studies could be conducted on specific categories (startups, scale-ups or incumbents).

References

- Arias-Pérez, J. and Vélez-Jaramillo, J. (2022), "Understanding knowledge hiding under technological turbulence caused by artificial intelligence and robotics", *Journal of Knowledge Management*, Vol. 26 No. 6, pp. 1476-1491, doi: [10.1108/jkm-01-2021-0058](https://doi.org/10.1108/jkm-01-2021-0058).
- Babin, R. and Cardona, A. (2016), "Growth hacking: a new paradigm for social entrepreneurship", *Proceedings of the 12th International Conference on Intellectual Capital, Knowledge Management & Organizational Learning (ICICKM)*, pp. 19-26.
- Bargoni, A., Jabeen, F., Santoro, G. and Ferraris, A. (2023), "Growth hacking and international dynamic marketing capabilities: a conceptual framework and research propositions", *International Marketing Review*, Vol. 41 No. 1, pp. 74-106, doi: [10.1108/imr-07-2022-0156](https://doi.org/10.1108/imr-07-2022-0156).
- Bargoni, A., Santoro, G., Petruzzelli, A.M. and Ferraris, A. (2024a), "Growth hacking: a critical review to clarify its meaning and guide its practical application", *Technological Forecasting and Social Change*, Vol. 200, 123111, doi: [10.1016/j.techfore.2023.123111](https://doi.org/10.1016/j.techfore.2023.123111).

-
- Bargoni, A., Smrčka, L., Santoro, G. and Ferraris, A. (2024b), "Highway to hell or paradise city? Exploring the role of growth hacking in learning from innovation failure", *Technovation*, Vol. 131, 102945, doi: [10.1016/j.technovation.2023.102945](https://doi.org/10.1016/j.technovation.2023.102945).
- Bhattacharya, S., Medeiros, I. and Gaston, R. (2022), "The role of artificial intelligence in growth hacking strategies", *Journal of Business Research*, Vol. 141, pp. 183-193.
- Bohnsack, R. and Liesner, M.M. (2019), "What the hack? A growth hacking taxonomy and practical applications for firms", *Business Horizons*, Vol. 62 No. 6, pp. 799-818, doi: [10.1016/j.bushor.2019.09.001](https://doi.org/10.1016/j.bushor.2019.09.001).
- Bresciani, S., Ferraris, A., Romano, M. and Santoro, G. (2021), *Digital Transformation Management for Agile Organizations: A Compass to Sail the Digital World*, Emerald Publishing, Bingley.
- Burström, T., Parida, V., Lahti, T. and Wincent, J. (2021), "AI-enabled business-model innovation and transformation in industrial ecosystems: a framework, model and outline for further research", *Journal of Business Research*, Vol. 127, pp. 85-95, doi: [10.1016/j.jbusres.2021.01.016](https://doi.org/10.1016/j.jbusres.2021.01.016).
- Cavallo, A., Cosenz, F. and Noto, G. (2023), "Business model scaling and growth hacking in digital entrepreneurship", *Journal of Small Business Management*, pp. 1-28, doi: [10.1080/00472778.2023.2195463](https://doi.org/10.1080/00472778.2023.2195463).
- Chesbrough, H.W. and Tucci, C.L. (2020), "The interplay between open innovation and lean startup, or, why large companies are not large versions of startups", *Strategic Management Review*, Vol. 1 No. 2, pp. 277-303, doi: [10.1561/111.00000013](https://doi.org/10.1561/111.00000013).
- Chung, M., Ko, E., Joung, H. and Kim, S.J. (2020), "Chatbot e-service and customer satisfaction regarding luxury brands", *Journal of Business Research*, Vol. 117, pp. 587-595, doi: [10.1016/j.jbusres.2018.10.004](https://doi.org/10.1016/j.jbusres.2018.10.004).
- Del Giudice, M., Scuotto, V. and Papa, A. (2023a), *Knowledge Management and AI in Society 5.0*, Taylor & Francis, New York, NY.
- Del Giudice, M., Scuotto, V., Orlando, B. and Mustilli, M. (2023b), "Toward the human-centered approach. A revised model of individual acceptance of AI", *Human Resource Management Review*, Vol. 33 No. 1, 100856, doi: [10.1016/j.hrmmr.2021.100856](https://doi.org/10.1016/j.hrmmr.2021.100856).
- Duan, W., Gu, B. and Whinston, A.B. (2019a), "Do social media promotional tools boost customer engagement? Evidence from a randomized field experiment", *MIS Quarterly*, Vol. 43 No. 1, pp. 327-342.
- Duan, Y., Edwards, J.S. and Dwivedi, Y.K. (2019b), "Artificial intelligence for decision making in the era of Big Data – evolution, challenges and research agenda", *International Journal of Information Management*, Vol. 48, pp. 63-71, doi: [10.1016/j.ijinfomgt.2019.01.021](https://doi.org/10.1016/j.ijinfomgt.2019.01.021).
- Eisenhardt, K.M. (1989), "Building theories from case study research", *Academy of Management Review*, Vol. 14 No. 4, pp. 532-550, doi: [10.2307/258557](https://doi.org/10.2307/258557).
- Eisenhardt, K.M. and Graebner, M.E. (2007), "Theory building from cases: opportunities and challenges", *Academy of Management Journal*, Vol. 50 No. 1, pp. 25-32, doi: [10.5465/amj.2007.24160888](https://doi.org/10.5465/amj.2007.24160888).
- Ellis, S. (2010), "Find a growth hacker for your startup", available at: <https://www.startup-marketing.com/find-a-growth-hacker-for-your-startup/>
- Ellis, S. and Brown, M. (2017), *Hacking Growth: How Today's Fastest-Growing Companies Drive Breakout Success*, Crown, New York.
- Enholm, I.M., Papagiannidis, E., Mikalef, P. and Krogstie, J. (2022), "Artificial intelligence and business value: a literature review", *Information Systems Frontiers*, Vol. 24 No. 5, pp. 1709-1734, doi: [10.1007/s10796-021-10186-w](https://doi.org/10.1007/s10796-021-10186-w).
- Filieri, R., D'Amico, E., Destefanis, A., Paolucci, E. and Raguseo, E. (2021), "Artificial intelligence (AI) for tourism: an European-based study on successful AI tourism start-ups", *International Journal of Contemporary Hospitality Management*, Vol. 33 No. 11, pp. 4099-4125, doi: [10.1108/ijchm-02-2021-0220](https://doi.org/10.1108/ijchm-02-2021-0220).

-
- Ghezzi, A. and Cavallo, A. (2020), "Agile business model innovation in digital entrepreneurship: lean startup approaches", *Journal of Business Research*, Vol. 110, pp. 519-537, doi: [10.1016/j.jbusres.2018.06.013](https://doi.org/10.1016/j.jbusres.2018.06.013).
- Gioia, D.A., Corley, K.G. and Hamilton, A.L. (2013), "Seeking qualitative rigor in inductive research: notes on the Gioia methodology", *Organizational Research Methods*, Vol. 16 No. 1, pp. 15-31, doi: [10.1177/1094428112452151](https://doi.org/10.1177/1094428112452151).
- Hagendorff, T. (2020), "The ethics of AI ethics – an evaluation of guidelines", *Minds and Machines*, Vol. 30 No. 1, pp. 99-120, doi: [10.1007/s11023-020-09517-8](https://doi.org/10.1007/s11023-020-09517-8).
- Holiday, R. (2014), *Growth Hacker Marketing: A Primer on the Future of PR, Marketing, and Advertising*, Penguin, New York, NY.
- Huang, M.H. and Rust, R.T. (2021), "A strategic framework for artificial intelligence in marketing", *Journal of the Academy of Marketing Science*, Vol. 49 No. 1, pp. 30-50, doi: [10.1007/s11747-020-00749-9](https://doi.org/10.1007/s11747-020-00749-9).
- Huang, M.H. and Rust, R.T. (2022), "A framework for collaborative artificial intelligence in marketing", *Journal of Retailing*, Vol. 98 No. 2, pp. 209-223, doi: [10.1016/j.jretai.2021.03.001](https://doi.org/10.1016/j.jretai.2021.03.001).
- Jabeen, F., Belas, J., Santoro, G. and Alam, G.M. (2023), "The role of open innovation in fostering SMEs' business model innovation during the COVID-19 pandemic", *Journal of Knowledge Management*, Vol. 27 No. 6, pp. 1562-1582, doi: [10.1108/jkm-05-2022-0347](https://doi.org/10.1108/jkm-05-2022-0347).
- Jarrahi, M.H. (2018), "Artificial intelligence and the future of work: human-AI symbiosis in organizational decision making", *Business Horizons*, Vol. 61 No. 4, pp. 577-586, doi: [10.1016/j.bushor.2018.03.007](https://doi.org/10.1016/j.bushor.2018.03.007).
- Jarrahi, M.H., Askay, D., Eshraghi, A. and Smith, P. (2023), "Artificial intelligence and knowledge management: a partnership between human and AI", *Business Horizons*, Vol. 66 No. 1, pp. 87-99, doi: [10.1016/j.bushor.2022.03.002](https://doi.org/10.1016/j.bushor.2022.03.002).
- Kanbach, D.K., Heiduk, L., Blueher, G., Schreiter, M. and Lahmann, A. (2023), "The GenAI is out of the bottle: generative artificial intelligence from a business model innovation perspective", *Review of Managerial Science*, Vol. 18 No. 4, pp. 1-32, doi: [10.1007/s11846-023-00696-z](https://doi.org/10.1007/s11846-023-00696-z).
- Kuratko, D.F., Holt, H.L. and Neubert, E. (2020), "Blitzscaling: the good, the bad, and the ugly", *Business Horizons*, Vol. 63 No. 1, pp. 109-119, doi: [10.1016/j.bushor.2019.10.002](https://doi.org/10.1016/j.bushor.2019.10.002).
- Ledro, C., Nosella, A. and Vinelli, A. (2022), "Artificial intelligence in customer relationship management: literature review and future research directions", *Journal of Business and Industrial Marketing*, Vol. 37 No. 13, pp. 48-63, doi: [10.1108/jbim-07-2021-0332](https://doi.org/10.1108/jbim-07-2021-0332).
- Lockett, A., Thompson, S. and Morgenstern, U. (2009), "The development of the resource-based view of the firm: a critical appraisal", *International Journal of Management Reviews*, Vol. 11 No. 1, pp. 9-28, doi: [10.1111/j.1468-2370.2008.00252.x](https://doi.org/10.1111/j.1468-2370.2008.00252.x).
- Loureiro, S.M.C., Guerreiro, J. and Tussyadiah, I. (2021), "Artificial intelligence in business: state of the art and future research agenda", *Journal of Business Research*, Vol. 129, pp. 911-926, doi: [10.1016/j.jbusres.2020.11.001](https://doi.org/10.1016/j.jbusres.2020.11.001).
- Macca, L.S., Shehzad, N., Kovacova, M. and Santoro, G. (2024), "Unlocking e-commerce potential: micro and small enterprises strike back in the food and beverage industry", *European Journal of Innovation Management*. doi: [10.1108/ejim-01-2023-0023](https://doi.org/10.1108/ejim-01-2023-0023).
- Mehmood, K., Jabeen, F., Rashid, M., Alshibani, S.M., Lanteri, A. and Santoro, G. (2024), "Unraveling the transformation: the three-wave time-lagged study on big data analytics, green innovation and their impact on economic and environmental performance in manufacturing SMEs", *European Journal of Innovation Management*. doi: [10.1108/ejim-10-2023-0903](https://doi.org/10.1108/ejim-10-2023-0903).
- Mikalef, P., Conboy, K. and Krogstie, J. (2021), "Artificial intelligence as an enabler of B2B marketing: a dynamic capabilities micro-foundations approach", *Industrial Marketing Management*, Vol. 98, pp. 80-92, doi: [10.1016/j.indmarman.2021.08.003](https://doi.org/10.1016/j.indmarman.2021.08.003).
- Mudambi, S.M. and Schuff, D. (2018), "What makes a helpful online review? A study of customer reviews on Amazon.com", *MIS Quarterly*, Vol. 42 No. 1, pp. 185-200.

- Nikou, S. and Bouwman, H. (2021), "Digital growth hacking strategies: literature review and future research agenda", *Proceedings of the 27th Americas Conference on Information Systems (AMCIS)*, pp. 1-11.
- Odugbesan, J.A., Aghazadeh, S., Al Qaralleh, R.E. and Sogoke, O.S. (2023), "Green talent management and employees' innovative work behavior: the roles of artificial intelligence and transformational leadership", *Journal of Knowledge Management*, Vol. 27 No. 3, pp. 696-716, doi: [10.1108/jkm-08-2021-0601](https://doi.org/10.1108/jkm-08-2021-0601).
- Picken, J.C. (2017), "From startup to scalable enterprise: laying the foundation", *Business Horizons*, Vol. 60 No. 5, pp. 587-595, doi: [10.1016/j.bushor.2017.05.002](https://doi.org/10.1016/j.bushor.2017.05.002).
- Pratt, M.G. (2009), "From the editors: for the lack of a boilerplate: tips on writing up (and reviewing) qualitative research", *Academy of Management Journal*, Vol. 52 No. 5, pp. 856-862, doi: [10.5465/amj.2009.44632557](https://doi.org/10.5465/amj.2009.44632557).
- Ramanathan, U., Subramanian, N. and Parrott, G. (2017), "Role of social media in retail network operations and marketing to enhance customer satisfaction", *International Journal of Operations and Production Management*, Vol. 37 No. 1, pp. 105-123, doi: [10.1108/ijopm-03-2015-0153](https://doi.org/10.1108/ijopm-03-2015-0153).
- Rialti, R., Zollo, L., Ferraris, A. and Alon, I. (2019), "Big data analytics capabilities and performance: evidence from a moderated multi-mediation model", *Technological Forecasting and Social Change*, Vol. 149, 119781, doi: [10.1016/j.techfore.2019.119781](https://doi.org/10.1016/j.techfore.2019.119781).
- Sanasi, S. (2023), "Entrepreneurial experimentation in business model dynamics: current understanding and future opportunities", *International Entrepreneurship and Management Journal*, Vol. 19 No. 2, pp. 805-836, doi: [10.1007/s11365-023-00836-7](https://doi.org/10.1007/s11365-023-00836-7).
- Sanasi, S., Ghezzi, A. and Cavallo, A. (2023), "What happens after market validation? Experimentation for scaling in technology-based startups", *Technological Forecasting and Social Change*, Vol. 196, 122839, doi: [10.1016/j.techfore.2023.122839](https://doi.org/10.1016/j.techfore.2023.122839).
- Santoro, G., Fiano, F., Bertoldi, B. and Ciampi, F. (2018), "Big data for business management in the retail industry", *Management Decision*, Vol. 57 No. 8, pp. 1980-1992, doi: [10.1108/md-07-2018-0829](https://doi.org/10.1108/md-07-2018-0829).
- Secinaro, S., Dal Mas, F., Massaro, M. and Calandra, D. (2021), "Exploring agricultural entrepreneurship and new technologies: academic and practitioners' views", *British Food Journal*, Vol. 124 No. 7, pp. 2096-2113, doi: [10.1108/bfj-08-2021-0905](https://doi.org/10.1108/bfj-08-2021-0905).
- Shrestha, Y.R., Ben-Menahem, S.M. and Von Krogh, G. (2019), "Organizational decision-making structures in the age of artificial intelligence", *California Management Review*, Vol. 61 No. 4, pp. 66-83, doi: [10.1177/0008125619862257](https://doi.org/10.1177/0008125619862257).
- Srinivasan, R., Cakanyildirim, M. and Pachamanova, D. (2019), "Predictive analytics in support of sustainable operations: research overview, application landscape, and future directions", *Production and Operations Management*, Vol. 28 No. 7, pp. 1805-1827.
- Strauss, A. and Corbin, J. (1990), *Basics of Qualitative Research*, Sage Publications, Thousand Oaks, CA.
- Teece, D.J. (2007), "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28 No. 13, pp. 1319-1350, doi: [10.1002/smj.640](https://doi.org/10.1002/smj.640).
- Thomke, S.H. (2019), "Building a culture of experimentation", *Harvard Business Review*, Vol. 97 No. 2, pp. 40-48.
- Troisi, O., Maione, G., Grimaldi, M. and Loia, F. (2020), "Growth hacking: insights on data-driven decision-making from three firms", *Industrial Marketing Management*, Vol. 90, pp. 538-557, doi: [10.1016/j.indmarman.2019.08.005](https://doi.org/10.1016/j.indmarman.2019.08.005).
- Van den Broeck, T., Schrauwen, B., Van Dijck, D. and Dhoedt, B. (2018), "Human-AI interaction: a survey", *Foundations and Trends in Human-Computer Interaction*, Vol. 12 No. 3, pp. 253-356.
- Van Doorn, J., Mende, M., Noble, S.M., Hulland, J., Ostrom, A.L., Grewal, D. and Petersen, J.A. (2017), "Domo arigato Mr. Roboto: emergence of automated social presence in organizational frontlines

-
- and customers' service experiences", *Journal of Service Research*, Vol. 20 No. 1, pp. 43-58, doi: [10.1177/1094670516679272](https://doi.org/10.1177/1094670516679272).
- Villalonga, B. (2019), "Growth hacking as a new business strategy", *International Journal of Innovation, Management and Technology*, Vol. 10 No. 5, pp. 176-180.
- Xu, M., Chen, H. and Whinston, A.B. (2018), "Measuring and managing customer satisfaction in large-scale e-commerce systems", *Journal of Management Information Systems*, Vol. 35 No. 1, pp. 101-133.
- Zhang, J., Lee, Y. and Wang, X. (2018), "A deep learning approach to predictive maintenance of equipment", *IEEE Transactions on Industrial Informatics*, Vol. 14 No. 10, pp. 4682-4691.
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