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Big-tech Strategic Partnerships in Artificial Intelligence

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Abstract

Big-tech firms such as Alphabet (Google), Amazon, Apple, Meta (Facebook), Microsoft, NVIDIA, and Tesla are leading the development and commercialization of artificial intelligence (AI) by leveraging their strategic partnerships to access data, talent, and technical resources. These partnerships enable AI innovation and market expansion among big-tech firms, accelerating their dominance. This paper shares the results of a systematic literature review (SLR) of 74 papers to examine the motivations, operational practices, and challenges of big-tech AI partnerships. The findings highlight three key insights: first, AI partnerships are primarily formed to acquire strategic resources, reduce costs, and enhance reputation; second, big-tech firms rely on existing networks and complementary strengths, raising concerns about governance frameworks and power imbalances; and, third, smaller firms face tensions related to dependency, data control, and ethical considerations, requiring careful negotiation and governance mechanisms. Highlighting the understanding of these partnerships using the AI tech-stack frameworks of big-tech firms, and analysing polarities such as dominance versus dependency, this paper advances theoretical perspectives on strategic partnerships in AI ecosystems. It also highlights practical implications for partner managers navigating the changing power dynamics in AI strategic partnerships. The paper concludes with research gaps, including the need for research on decision-making tools for practitioners. We hope these insights support practitioners and academics to better understand the evolving role of big-tech strategic partnerships in shaping their unique AI ecosystems.

Keywords: artificial intelligence, big tech, strategic partnerships, AI ecosystems, governance, data, dependency, dominance, power imbalance, ethics

1. Introduction

1.1 The Dominance of Big-tech Firms

Big-tech firms are leading the development and commercialization of artificial intelligence (AI) through their cloud infrastructure, partnerships, patents, and investments in AI startups (Eleodor, 2019; Ferrari, 2024; Van Der Vlist et al., 2024). These firms are integrating AI into their technology stack and creating a broader AI ecosystem (Jacobides et al., 2021; Van Der Vlist et al., 2024). The seven tech giants - Alphabet, Amazon, Apple, Meta, Microsoft, NVIDIA, and Tesla - each began with modest resources and have achieved remarkable success, driving the world's economic growth (Ferrari, 2024). They are major investors in cutting-edge technology, and their dominance is reflected in their market capitalization.

There is a growing consensus among scholars that the dominance of big-tech firms in AI requires further research, especially strategic partnerships and acquisition practices, which substantially impact market dynamics and innovation (Jacobides et al., 2021; Rikap, 2023). AI development is collaborative and relies on a network of actors, including big tech, startups, consortia, governments, researchers, and users. This AI ecosystem produces various strategic partnerships. Different types of AI player (giants, creators, operators, traders, and takers) form partnerships based on their technology/business capabilities and needs (Jacobides et al., 2021).

Despite the extensive focus on these powerful platform firms, research into big-tech strategic partnerships in AI is limited in several key areas. Research focuses on AI ecosystems as a meta concept, ignoring the impact of the unique imprints (e.g. histories, existing products, and future roadmaps) of these seven organizations on their partnership strategies. With a good understanding of these firms' imprints, partners can better align with them. Furthermore, scholars have yet to account for the unique nature of the entire AI tech stack (technologies used

together to operate platforms) for each of these firms. We should therefore explain how each big-tech firm configures its technology stack to support unique strategic goals that create opportunities for partners. Understanding these unique tech stacks for AI would provide insights into how big-tech firms leverage partnerships to maintain dominance, shape their own and other AI ecosystems, and even set industry standards. Additionally, with this rapidly evolving AI space, we have a limited understanding of the challenges and tensions of industry partner managers (within big-tech firms and large, small, or regional organizations wanting to partner with big-tech firms) as they form, operate, and govern strategic partnerships in AI. Therefore, this research is motivated by the need to address knowledge gaps in strategic partnerships within the unique big-tech AI ecosystems of Alphabet, Amazon, Apple, Meta, Microsoft, NVIDIA, and Tesla. Addressing these gaps is important for industry and academia. Practitioners will use these insights to better form and manage partnerships, while this research can enhance theoretical perspectives on AI ecosystems and advance the discourse around dominance, dependency, and co-evolution within these ecosystems.

We use a qualitative approach to investigate the motivations and operational processes behind these partnerships, reviewing the academic knowledge in this area through an SLR (Xiao & Watson, 2019) and presenting our findings in this paper. We select and analyse 74 articles on the intersection between big tech, AI, and strategic partnerships. Specifically, this literature review asks (1) why they are formed, (2) how they operate, and (3) what challenges they face. This paper has three parts: methodology description, thematic findings in the form of results/discussion, and limitations/gaps. The rest of the paper is as follows: Section 2 describes the methodology in detail; Section 3 has the thematic findings in the form of results and a discussion; and Section 4 reviews limitations and gaps. This structure reviews the current landscape and highlights where additional contributions are needed.

2. Method

We used a systematic literature review (SLR) to identify, evaluate, and synthesize our research (Xiao & Watson, 2019). This involved formulating the research problem, searching and screening the literature, assessing the quality of studies, extracting data, and synthesizing the findings. I, as the primary researcher, conducted the SLR to create a baseline for the research so that I can track any changes as the field grows. Xiao and Watson emphasize the importance of conducting an SLR, which helps to create the foundations for advancing academic knowledge. They make the point that, to push the frontier of knowledge, a researcher needs to know where the frontier is.

2.1 Formulating the Problem

As Xiao and Watson suggest, identifying research questions is an iterative process. I began the process by familiarizing the team with the works of six ecosystem experts (Michael Cusumano, Ron Adner, Michael Jacobides, Marshall Van Alstyne, Shaz Ansari, and Annabelle Gawer) in academia. I also interviewed eight practitioners (anonymized as per their request) and asked them the following questions. First, can you define strategic partnerships for AI? Second, which theories are best suited to studying them, and why? Third, what are the challenges, opportunities, and best practices for these collaborations? Their responses encouraged the research team to move beyond simplistic definitions and embrace the complexity inherent in these collaborative arrangements. We therefore refined our research questions to explore the existing literature:

- RQ1: Why are big-tech strategic partnerships in AI formed?
- RQ2: How do big-tech strategic partnerships in AI operate?
- RQ3: What challenges do partner managers face?

2.2 Developing the Review Protocol

We then developed a plan for the literature review, including discussing the research questions, the criteria for selecting papers, methods for searching, checking quality, and gathering data, and how the data would be combined and reported (Xiao & Watson, 2019). This process included keeping a timeline to ensure the literature review remained on schedule.

2.3 Channels for Literature Search

We started with Google Scholar as the database for our research, but we quickly identified Web of Science (WoS) and Scopus for our initial literature review. After several iterations of keyword searches on both databases, we chose WoS, known for its rigorous selection criteria for indexing journals and for having a manageable data set for analysis, because research in this area is growing rapidly.

2.4 Keywords: Search String

We began by defining a search query to obtain information about the intersection between strategic partnerships and collaboration within the tech industry, focusing on big-tech firms and their involvement in AI. Using keywords, Boolean operators, and proximity operators within the business or management categories in WoS refines the literature search. This approach combines terms related to partnerships, big-tech firms, and AI technologies, ensuring the retrieved articles are relevant. This enhances the precision, relevance, and efficiency of the search, especially in fields like business and management, where the literature is vast and diverse. This search string focuses on the intersection between seven prominent global big-tech firms and AI, particularly within the context of partnerships. It focuses on the research questions discussed above to understand how big tech leverages AI technologies through strategic partnerships.

As the primary researcher, I did several variations of the keyword search string by getting feedback from the University library sciences team, and from two practitioner experts running strategic partnerships in AI. I used the Microsoft Word (wordnet lexical database) synonyms dictionary to find alternative words for big tech, partnerships, and artificial intelligence. The emphasis on terms such as “mergers and acquisitions”, “startups”, and “alliances” is intended to capture the diverse ways that these partnerships can manifest. Additionally, the purpose of including concepts like “multimodal prompting” and “natural language processing” is to gather any academic work that may be using AI capabilities as a generic description rather than focusing on specific capabilities.

2.5 Refining Results

By targeting the business and management categories within WoS, the search string retrieved literature that examines AI-driven partnerships from a managerial perspective. The advantage of using business and management categories was that we could capture numerous methodologies and theories that cut across multiple disciplines, keeping the data set manageable. I also narrowed it down to top-quality journals to ensure we understood the conversations supported by top indexes like the Social Sciences Citation Index (SSCI) and Emerging Sources Citation Index (ESCI). This kept the focus on high-quality, influential, and relevant sources to strengthen the rigour of our research. Given the specialized and niche nature of this research area, we did not limit the literature review by date range, which helps to avoid bias towards recent research and allows relevant older studies to be included.

2.6 Criteria for Inclusion/Exclusion

Table 1 sets the boundaries for this systematic review by defining the criteria for inclusion and exclusion. We focused on our research questions to help us define the intersection between big tech, partnerships, and AI. And we did not narrow these criteria down based on methodology, geographical area, or research design, as we will use this literature review to scope our ongoing research.

Table 1. Inclusion and exclusion criteria used for literature review

Description	Inclusion criteria	Exclusion criteria
Time frame	No upper or bottom limit	Not applicable
Search terms	Boolean to include terms synonymous with big tech, partnerships, and AI. Search within the results for article or early access (document types) and business or management (WoS) categories.	Not applicable
Database	Web of Science	Not applicable
Quality criteria	Top indexes - SSCI and ESCI	Not in top indexes - SSCI and ESCI

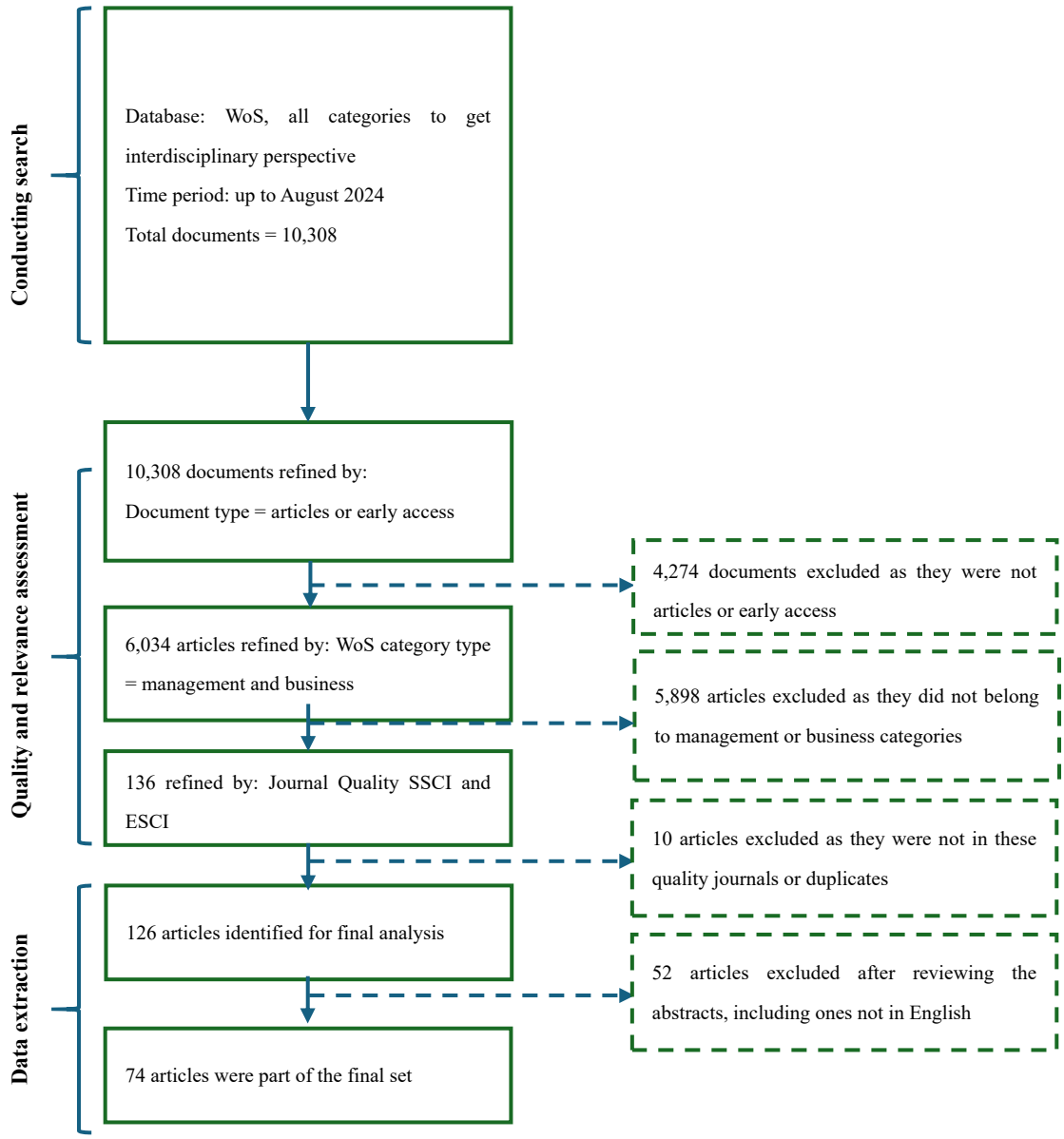
Source. Own work.

2.7 Screening Procedure

The final selection of papers is in English because we cannot review studies in other languages. For the 126 papers in the data set, we followed the screening procedure described by Xiao and Watson. I started by reviewing the abstracts to obtain a research summary. If the abstracts were unclear, we checked the conclusions for more details. When in doubt, we included the study to ensure nothing important was missed. Table 2 presents a review flow diagram (Xia et al., 2024) summarizing the article-screening process and including the number of articles

found and the selection steps.

Table 2. Flow Diagram for SLR



2.8 Thematic Analysis

As the primary researcher, I read through the final set of selected papers and then analysed them using a manual thematic analysis approach. Then, I read all the papers to immerse myself in the data, after which I generated initial codes by writing key ideas and recurring phrases on sticky notes. These notes were then physically arranged to identify patterns and clusters, forming a preliminary coding framework. This process was iterative: I continually refined codes and themes as I read through all the papers again. Although the analysis was conducted by me, preliminary findings were discussed with others to ensure the themes were representative. This approach, while manual, was consistent with established methods (Braun & Clarke, 2006) for thematic analysis.

3. Results

We now present the key findings from the SLR, which describe how strategic partnerships drive big tech's dominance in AI. Also, these findings align with our three research questions focused on big-tech strategic partnerships in AI: Why are they formed? How do they operate? What challenges do partner managers face? In

brief, first, big-tech strategic partnerships in AI are formed to secure valuable resources, such as data, talent, computational power, and big-tech firms' reputation in the market. Second, these partnerships often leverage existing networks to capitalize on trusted, established relationships. And, third, small-tech firms (and their partner managers) face challenges navigating power dynamics as big-tech firms grow in dominance, increasing competition to capture AI market share. Each key finding is presented in detail below.

3.1 Finding 1

AI partnerships are formed to access resources and manage reputations. There are many reasons why big-tech companies form and value AI strategic partnerships. In this literature review we identified five key sub-themes: acquiring data, securing talent, pooling resources to reduce costs, gaining access to new markets, and managing reputations. We present the findings relating to each of these sub-themes next.

These partnerships advance their existing company, product, and competitive strategies, such as acquiring data sources and skilled talent (Ferrigno et al., 2023; Parker et al., 2021). AI needs data, and big tech continues to gain access to new data reservoirs (Jacobides et al., 2021) and form partnerships that access new and diverse data sources, which are essential for training and refining AI algorithms (Parker et al., 2021). Partnering with firms in industry-specific use cases like healthcare, manufacturing, or finance allows big tech to tap into industry-specific data to develop tailored AI solutions and expand market reach into these new areas (Gleiss et al., 2021). This access to untapped industry data is invaluable for maintaining competitive advantage (Ferrari, 2024).

Moreover, Ferrari states that while sharing valuable data is important in these partnerships, it is necessary to address the associated risks of security breaches, data misuse, and privacy violations. Therefore, big-tech firms collaborate to safeguard their data assets and build data governance frameworks to comply with the relevant regulations (Ferrari, 2024).

Another common theme is the significant talent gap in AI, where the pool of skilled professionals is relatively limited (Eleodor, 2019). Big tech uses partnerships to access external talent to address the talent gap among firms. For example, collaborations with universities and research institutions provide a pipeline for recruiting graduates and researchers (Fraser & Mancl, 2016). Meanwhile partnerships with other firms, including potential competitors, allow the exchange of knowledge and best practices (Dyer & Hatch, 2006).

Jacobides et al. suggest that firms benefit from AI collaboration because they are pooling resources and, most importantly, accessing new markets. They believe big tech forms strategic partnerships in AI because of the capital-intensive nature of AI development and the necessary resources. Strategic partnerships increase innovation speed, as firms can combine different insights and run experiments (technical and business) with targeted feedback loops (Parker et al., 2021). These collaborations expand new markets and customer segments (Jacobides et al., 2021).

Finally, the strategic partnerships allow big-tech firms to address concerns that may impact their brand image and reputation (D'Cruz et al., 2022). Ethical, security, and privacy issues, and algorithmic bias, are among the top concerns mentioned in the literature (Ferrari, 2024; Sharakhina et al., 2023). Big-tech firms recognize the need to proactively address these concerns to build trust with regulators and consumers. Partnerships with government agencies, industry consortia, and advocacy groups help, enabling big tech to create industry standards, ethical guidelines, and transparency metrics (Dolata & Schwabe, 2023; Wang & Qiu, 2024). By engaging in these collaborations, big-tech firms safeguard their long-term interests and improve public acceptance of AI technologies (Jacobides, 2024; Jacobides et al., 2021, 2024). Big-tech firms also build strategic partnerships in AI to manage the challenges associated with AI technologies (Ferrari, 2024). They allow big-tech firms to set industry standards and influence regulatory frameworks (Parker et al., 2021). As competition from small and large players grows, big-tech firms can use strategic partnerships for long-term collaboration to maintain market advantage, allowing for continuous adaptation, knowledge sharing, and co-evolution to innovate (Jacobides et al., 2021).

Figure 1 summarizes the findings from this section. It shows, from a big-tech perspective, the relationship between company strategy and objectives, partnerships, and company benefits.

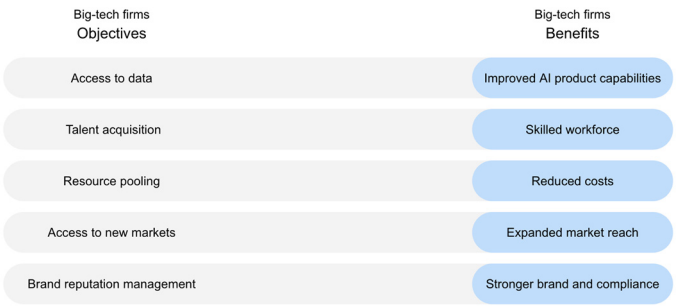


Figure 1. Diagram showing why big-tech firms form AI partnerships

Source: Own work.

Having explored why strategic partnerships are needed and valued, the next key finding explains how big-tech firms are layering on their existing relationships to further their strategic goals in AI development and deployment.

3.2 Finding 2

Big-tech AI partnerships operate by leveraging existing networks. Big-tech firms tend to take advantage of their existing networks and prioritize strategic partnerships with companies that are part of their ecosystems, as these relationships are built on trust and successful collaboration (Jacobides et al., 2021, 2024).

We identified three sub-themes from the literature. They describe the existing practices of big-tech firms with their trust-based partners: leveraging their complementary strengths and gap-filling offers, the need for new governance and agreement models, and shifting power balances, which come with dependency risks.

First, Jacobides et al. suggest that big tech focuses on complementary strengths, looking for partnerships that can fill technical and business gaps in their products, expertise, data, or market knowledge. But there is little discussion of how big tech forms partnerships outside its existing networks, and how those agreements are negotiated.

Second, while scholars agree there is a need for clear agreements on data ownership, usage rights, security protocols, and intellectual property protection, governance frameworks for these partnerships are still evolving (Ferrari, 2024; Ferrigno et al., 2023; Parker et al., 2021; Rikap, 2022). These frameworks are necessary because of the sensitive nature of the data shared in AI collaborations and the rise in intellectual property rights' issues (Ferrari, 2024; Ferrigno et al., 2023). However, best practices for governing and managing strategic AI partnerships are still emerging and hold potential for future research.

Third, the concern about power imbalances between big and small tech is actively debated in the literature. No firm wants to risk depending on a dominant partner (D'Cruz et al., 2022; Ferrari, 2024; Jacobides et al., 2021, 2024) and getting locked into their technology. Based on the value of exploring the power imbalances between big and small tech, the next finding explores the tensions in-depth.

Figure 2 shows the need for AI governance within big-tech firms collaborating with partners and customers.

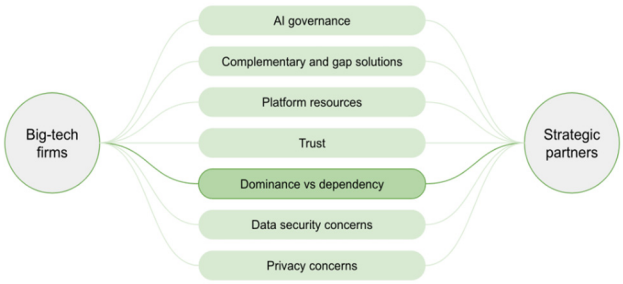


Figure 2. Big-tech firms extend existing networks and need to build AI governance models

Source: Own work.

3.3 Finding 3

Smaller firms (and partner managers) face challenges navigating tensions with big tech. Smaller firms often seek partnerships with big tech to gain market access, resources, and visibility. However, these partnerships come with challenges that require smaller firms to carefully navigate power dynamics and strategic tensions. Next, we present six sub-themes that emerged through this research into the challenges that small firms (and partner managers) face when working with big-tech firms.

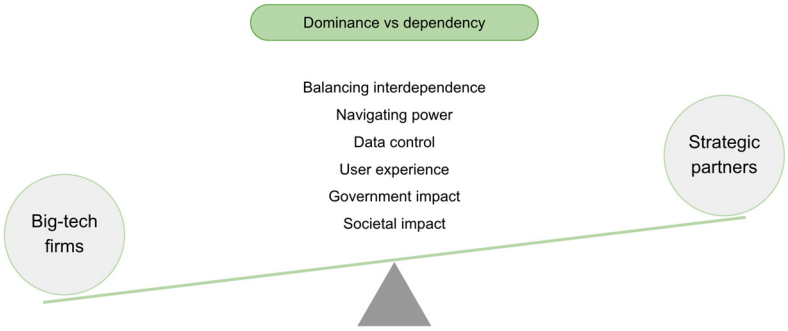


Figure 3. Challenges faced by smaller partners (and partner managers) with big-tech firms

Source: Own work.

3.3.1 Balancing Interdependence

Strategic partnerships in AI ecosystems thrive when they achieve balanced interdependence (Jacobides et al., 2024). However, smaller firms struggle with tensions such as hype versus reality, short versus long term, and value creation versus extraction, which arise because of the influence of big tech. First, the hype around AI can lead to overpromising and unmet customer expectations, potentially destabilizing partnerships (Jacobides et al., 2021, 2024). Second, the tension between short-term gains and long-term sustainability raises concerns about whether the current AI race prioritizes profits over ethics and broad, sustainable goals (Ferrari, 2024; McCarthy et al., 2023). Third, while big tech's resources and market dominance (Jacobides et al., 2021) are attractive to smaller firms, these advantages can create an imbalance, with smaller partners often pressured into less favourable terms to access the AI market (Arend, 2023). Based on these insights, and considering my experience as a practitioner, these tensions call for smaller firms to exercise more caution in AI partnerships. While working with big-tech firms as partners, smaller firms must consider the power imbalance, which could make them dependent on the technology and go-to-market methods of big-tech AI platforms.

3.3.2 Navigating Power

As discussed above, the relationships between big-tech firms and their smaller partners are also challenging because, while big tech offers partners access to valuable resources like data, funding, and global reach, it also creates dependency. The literature highlights the concept of "platform control", where big tech dominates essential infrastructure, making partners reliant on their systems (Cini, 2023; Jacobides et al., 2021; Yang et al., 2024). Research reveals worrying practices, such as big tech stifling innovation from smaller players and limiting their consumer choice (Parker et al., 2021; Rabassa et al., 2022; Yang et al., 2024), and tactics like price tying and product degradation to control the market (Kim & Luca, 2018). Since the big-tech platforms can collect vast amounts of market-demand signal data, if the demand for complementary technologies increases, big-tech strategies may change from partner to competitor (Kim & Luca, 2018). In this scenario they might build similar complementary functionality or even acquire complementary firms or competitors to maintain control (Parker et al., 2021). This can lead to smaller partners losing their competitive edge or being acquired by larger firms. Furthermore, the debate between open and closed innovation is also relevant, with open innovation offering collaborative benefits (Wamba-Taguimdje et al., 2020; Yang et al., 2024) but risking intellectual property being left unprotected (Hasan et al., 2021). Building on these key challenges - platform control, stifling innovation, and business practices - data emerges as a key leverage in AI partnership power dynamics. Next, we discuss the impact of data control in AI partnerships.

3.3.3 Data Control

Data - not just algorithms - is at the core of AI development and reflects power structures (Khokhar et al., 2016; Wang & Qiu, 2024) in AI partnerships. Smaller partners may feel pressured to share more data than they are comfortable with when partnering with larger firms, risking dependency (Rikap, 2022) and losing control over their innovations. Data sharing (Ferrari, 2024) is a strategic decision because dominant big-tech firms will use their extensive data to dictate terms (D'Cruz et al., 2022). Firms need to recognize the value of data to negotiate fair terms and maintain bargaining power (Biswas et al., 2023). The literature is relatively silent on how partner managers making decisions for their AI partnerships should act in these situations. For example, if decision-makers neglect the data trade-offs, do they risk increased dependence and losing market advantage? It is also not clear what kind of agreements and communications are needed during negotiations. Based on the insights from the literature review, we can only conclude that awareness of these tensions - such as intellectual property versus knowledge sharing, and internal versus external data - can help partner managers to make informed decisions. While data control creates dependency challenges for smaller firms, these dynamics also impact the end-user experience, where ethical considerations, privacy, and user autonomy become key tensions in AI partnerships.

3.3.4 User Experience

Designing user-friendly, ethical AI experiences is challenging, especially when aligning multiple companies' agendas, design philosophies, and data privacy practices (Eleodor, 2019; Ferrari, 2024; Orhan et al., 2022). These ethical challenges emerge when big- and small-tech firms collaborate. The "dopamine loop", where AI platforms exploit users' desire for novelty and validation, can lead to addictive behaviours and dependency on the platform for social interaction, including a sense of self-worth (Rabassa et al., 2022; Ramadan, 2021). Over-reliance on algorithms may erode critical thinking (Jurno, 2019; Salminen et al., 2023) and decision-making skills (Kitchens et al., 2020; Orhan et al., 2022; Riemer & Peter, 2021). This calls for a balance between AI as a helpful tool and a crutch. Scholars agree it is necessary to provide tools for self-management, such as digital wellbeing, personal data access, and privacy control (McCarthy et al., 2023; Rabassa et al., 2022). For me, this insight raises the question of who is responsible for upholding ethical guidelines and prioritizing user wellbeing, especially when multiple parties are involved in partnerships.

Small firms might have ethical concerns but may find it difficult to prioritize as they align with big-tech firms, as their ability to uphold these ethical guidelines is often influenced by the incentives that drive AI development. Developers' incentives, like profit and career growth, can shape AI development, causing systems to prioritize these goals over fairness, transparency, and social wellbeing, while creating dependence on the ethical decisions of AI creators (Qiao et al., 2020; Wamba-Taguimdje et al., 2020). To address these incentive-driven challenges, government intervention can help to balance power within AI partnerships. Next, we discuss what scholars are saying about governments' ability to protect smaller firms from exploitation.

3.3.5 Government Impact

Governments impact AI partnerships by enabling AI development and regulating AI initiatives, affecting both big- and small-tech firms. For example, some nation states act as facilitators by investing in research that is dependent on big tech to build AI (Ferrari, 2024; Jacobides et al., 2021). Scholars such as Jacobides et al. and Ferrari also state that the same nation states act as regulators to form policies protecting smaller firms against the risks of AI and challenging the dominance of big tech. Scholars suggest that governments should help smaller firms that partner with big tech to reduce market risk by intervening with dominant big-tech players when necessary (D'Cruz et al., 2022; Parker et al., 2021; Rabassa et al., 2022). As AI technologies evolve, governments must continue to strike a balance as they serve their dual role of promoting and regulating AI (Ferrari, 2024). Beyond regulatory and economic roles, governments, big tech, and small partners, there are profound societal implications, influencing how these technologies and partnership arrangements shape user behaviour and community dynamics. In the next part we discuss the scholarly perspective on the societal implications.

3.3.6 Societal Impact

AI technologies and their partnerships can create power shifts with long-term societal implications for the individuals or communities who depend on them (Jacobides et al., 2021; Jacobides & Lianos, 2021). The discussion about the impact of AI on society, focusing on the power dynamics between big-tech platforms and their users, is also important from the perspective of AI partnerships. While AI technologies offer convenience (Hasan et al., 2021; Ramadan, 2021) and personalization (Nguyen et al., 2024) in daily activities (like listening to music or streaming content), they also raise concerns about user dependence and transparency. AI big-tech

platforms often prioritize their own interests (Jacobides et al., 2021; Rabassa et al., 2022; Ramadan, 2021) by designing user behaviour in ways that benefit them, for example using data collected from users to predict and influence decisions. Conversations around the "black box" nature of AI, where even developers may not fully understand how decisions are made, challenge transparency and accountability (Orhan et al., 2022). This issue becomes particularly important when workers rely on opaque algorithms for job opportunities and pay, leading to potential exploitation (D'Cruz et al., 2022; Orhan et al., 2022).

Speaking as the primary researcher, with experience as a practitioner, the implications of these research insights are that partner managers from firms partnering with big tech need to build informed partnerships by asking critical questions and seeking greater transparency and accountability from the AI platform providers on behalf of their customers and users. To conclude, we summarize three key themed insights discussed in this literature review. First, big-tech firms pursue AI partnerships to acquire resources like data and talent, enter new markets, reduce costs, and build a positive reputation. These collaborations help them maintain a competitive edge but also require strong governance to manage data security and privacy risks. Second, big-tech firms tend to partner within their trusted networks and existing partners first, creating dependency risks and the need for governance around data and intellectual property. Third, smaller firms face strategic tensions when partnering with big tech, including balancing revenue with sustainability and managing data control. These power imbalances can impact smaller firms' autonomy and bargaining power in AI partnerships. Having discussed the three key thematic findings, we will briefly review our insights.

4. Discussion and Conclusion

Big-tech firms play a central, yet often controversial, role in shaping the development and trajectory of AI technologies, and their strategic partnerships are key to their firms' and product strategies (Ferrari, 2024). Big tech leads with infrastructure development, data access, and research initiatives, shaping the market with the help of other players in the broader AI ecosystem (Jacobides et al., 2021). While big tech has advanced AI technologies through partnerships, scholars acknowledge there is a need for scrutiny and potential regulatory interventions to address concerns about market concentration, ethics, and fair distribution of benefits arising from these new technologies (D'Cruz et al., 2022; Eleodor, 2019; Ferrari, 2024; Jacobides et al., 2021; Rabassa et al., 2022, p. 2). In this section, after exploring the definitions, we discuss two perspectives: first, the notion of an AI stack that frames partnerships through a technical lens; and, second, the polarities theory perspective, which allows us to understand the tensions and challenges in partnerships, which can deepen insights into why certain partnerships succeed or struggle.

4.1 Definitions

A clear, widely accepted academic definition of big-tech AI strategic partnerships was not found in this literature review. We propose to adopt the perspective of industry leader Satya Nadella, who views AI partnerships as collaborations supporting AI development and use (Nadella, 2018). Thus, the definition of a strategic partnership in AI is a collaboration with joint goals related to AI development, deployment, or application. The benefits include technological advancement, as partnerships facilitate access to cutting-edge AI technologies, expertise, and infrastructure. Although research into this area appears limited, from my industry experience these partnerships may be joint ventures where firms come together to form a new entity focused on a specific AI project or market, or licensing agreements where one company grants another the right to use its AI technology or intellectual property. They may also be mergers and acquisitions, where one company acquires another to gain control of its AI capabilities or market share. Insights from Nadella's 2018 book, *Hit Refresh*, provide a layered conceptual phase model to understand big-tech AI strategic partnerships. The synthesis below aligns his conceptual model with the work of other scholars, and the diagram below is my contribution.

- *Bespoke phase:* Bespoke cooperative agreements between organizations, such as strategic alliances, aimed at mutual benefits and competitive advantage (Ryan-Charleton et al., 2022). At this stage data remains siloed.
- *Platform democratization phase:* The second phase is the democratization of platforms (Cusumano et al., 2021), which involves broadening access to AI technologies and enabling broader participation in their development and use by giving developers and users the tools to engage with the platform. In this phase AI partnerships will act like existing platforms but will have AI technology as a new actor.
- *Agent ecosystem phase:* Agent ecosystems take inspiration from natural ecosystems and multi-agent systems to model complex business environments and interactions (Stalker et al., 2007).

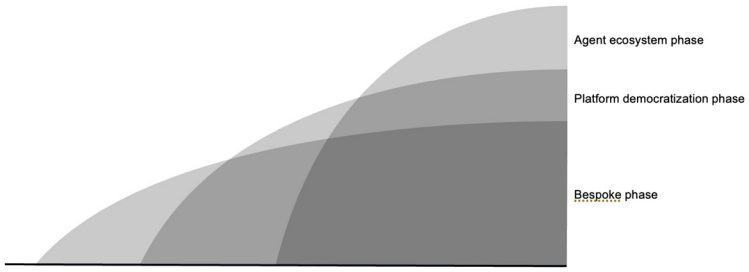


Figure 4. Progression of types of big-tech AI strategic partnership

Source: Own work.

Key to understanding the various phases and the resulting strategic partnerships is the notion of the technology stack, which we discuss next.

4.2 AI Stack

There is an ongoing discussion about AI ecosystems (Jacobides et al., 2021; Rikap, 2023; Van Der Vlist et al., 2024). A key insight from this literature review is that big-tech firms compete to control the entire AI tech stack to expand their dominance, an aspect not addressed in the literature. In addition, the evolving AI tech stacks of Apple, Microsoft, Alphabet, Amazon, NVIDIA, Meta, and Tesla offer important insights into how these firms will form and manage strategic partnerships. Therefore, we created a representative view of the AI tech stack (see Figure 5), which will form the basis for analysing each company's individual stack in our future research.

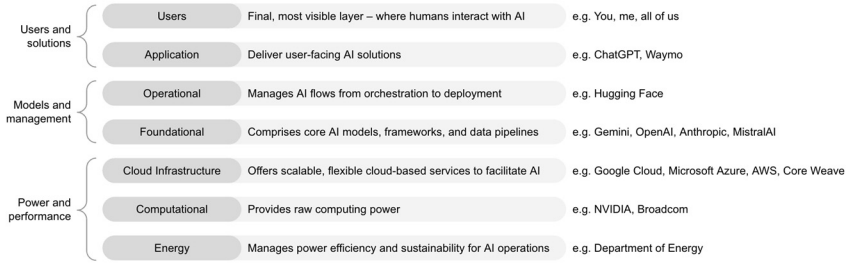


Figure 5. Current AI tech stack that big tech wants to control - inspired by visual from dealroom.co and crowdsourced on LinkedIn

Source: Own work

Beyond the definitions of strategic partnerships and the AI stack view, an important perspective for examining AI partnerships is through the lens of polarity management theory. Next, we discuss this perspective in detail.

4.3 Polarities Theory Perspective

Polarity management theory (Maurer, 2002) offers a lens to better understand big-tech strategic partnerships in AI. Identifying which polarities appear to be at work helps partner managers to evaluate the contrasting forces that may destabilize their partnership. This section also acknowledges the contrasting theories on power imbalances explored through these tensions or polarities. Understanding that these tensions exist when forming and running AI strategic partnerships can help partner managers to better manage their stakeholder conversations, especially when they find themselves positioned to take a side in one of these polar perspectives. From the literature review, we identified 18 polarities that contribute to tensions in decision-making. However, underpinning all of these appears to be the dominance versus dependency polarity, which we discuss next.

One of the key tensions anchoring the other polarities identified in the literature is dominance versus dependency. Partner managers are very aware of how the balance of power within a few large tech firms allows dominant players to shape partnerships. This often places smaller partners - startups, academic institutions, even nation states - in a position of dependence, with limited power (Jacobides et al., 2021). As noted earlier, the resulting

uneven playing field can hinder smaller firms' access to resources and stifle innovation (Parker et al., 2021). As partner managers establish strategic relationships, they must navigate the risks associated with potentially relinquishing market power or proprietary knowledge to a dominant platform (Ansari & Krop, 2012).

The "kill-zone" effect described by some scholars illustrates how big-tech acquisitions can deter investment in smaller firms within the same market, complicating strategic decisions for partner managers (Koski et al., 2023). Understanding these dynamics is essential for partner managers as they negotiate terms and structure partnerships to avoid depending on big-tech firms.

The dominance of big tech in areas such as cloud infrastructure, data, and R&D is well documented (Eleodor, 2019). These firms - Amazon, Google, and Microsoft, in particular - are "hyper scalers", controlling vast cloud networks essential for AI development and deployment (Jacobides et al., 2021). This gives them significant leverage in ecosystem negotiations and presents unique challenges for partner managers aiming to secure equitable terms. Furthermore, the ability of partner managers to address data-related concerns is increasingly important. Big-tech firms' data-driven business models allow them to amass vast data sets that provide a competitive edge in training AI algorithms. While some companies have tried to share data sets and promote responsible AI practices (D'Cruz et al., 2022; Jacobides et al., 2021), the ethical and governance implications of data concentration remain significant challenges that partner managers must consider during negotiations (Ferrari, 2024).

In AI research and development, the substantial investments and recruitment strategies of big-tech firms shape the direction of the field. They not only attract top talent from academia but also set trends by establishing research labs and publishing extensively (Jacobides et al., 2021). Partner managers recognize the implications of this concentration of expertise, which influences the types of partnership that can be formed and the terms of collaborations.

To navigate this landscape successfully, partner managers should consider big-tech firms' varied collaboration strategies, such as acquisitions, coopetition relationships, and open-source initiatives (Rikap, 2022). For example, Microsoft's acquisition of GitHub was a tactic designed to control key platforms and integrate open-source tools into its ecosystem (Jacobides et al., 2021). By engaging in strategic partnerships that address common technology challenges or gain access to new markets, big-tech firms consolidate their influence, requiring partner managers to be vigilant in structuring agreements that protect their interests. Figure 6 summarizes the various polarities identified in this literature review, including the recent debate about open versus closed ecosystems.

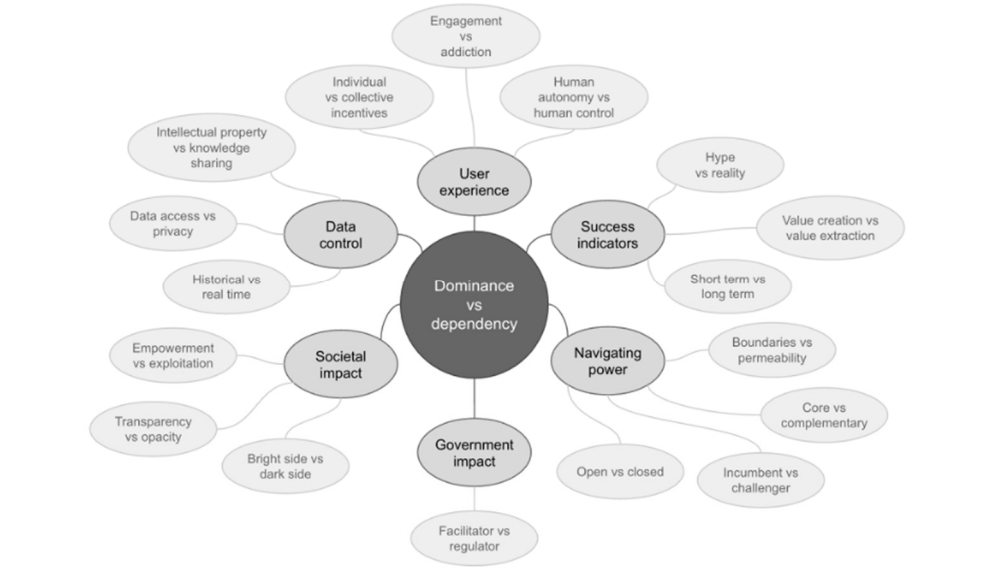


Figure 6. Polarities in Big-tech AI strategic partnerships

Source: Own work.

Next, we review the gaps and limitations of this literature review.

4.4 Gaps and Limitations

This literature review provides valuable insights into big-tech AI strategic partnerships, but gaps remain. While scholars like Jacobides et al. discuss the AI ecosystem and its players at system level, we argue for more in-depth case studies exploring partnership dynamics in each of the big-tech firm-specific AI ecosystems. Research also needs to track how small versus large partners adapt over time. For example, scholars do not address how the priorities and AI tech stacks or roadmaps of big-tech firms influence the formation of their partnership strategies, and their engagement models with large or small partners.

We also acknowledge that big-tech firms have built their empires selling software and hardware, and they are uniquely positioned to capitalize on AI technologies. Their strong financial positions allow them to pursue AI opportunities through their existing company offerings - strategy, products, and partnerships (Eleodor, 2019; Ferrari, 2024; Jacobides et al., 2021; Rikap, 2023). Moreover, these companies have a unique culture, rooted in their initial core business model - Microsoft's "technology-led", Amazon's "retail-first", Google's "search-led", Meta's "social-network-first", NVIDIA's "hardware-led", and so on. These cultural differences have influenced their respective AI innovation strategies, ranging from Microsoft's "frenemies" to Meta's "application-centred" approach (Rikap, 2023). But scholars do not consider the impact on partnerships of the big-tech firms' "imprints", such as founders' backgrounds, histories, and their unique characteristics in the market. This begs the question of how these "imprints" shape partnership strategies in their key regions of operation. This information is important because it allows partner managers to work better both within and with these big-tech firms. Finally, the gap between scholars and practitioners is also apparent, as scholars do not provide decision-making tools for practitioners to manage the emerging tensions. The power dynamics have shifted the expected interdependence in a partnership because big tech's dominance in AI necessitates decision-making support for practitioners.

Similarly, while scholars recognize the dependence of small tech on big-tech firms, future research could examine the unique challenges faced by smaller firms' AI partnerships, focusing on innovation capabilities and risk management within specific AI ecosystems of individual big-tech partners. Also, the review focuses on Western contexts, overlooking perspectives from other regions that may provide different insights into AI partnerships and regulatory practices. As AI technologies evolve, research will need to stay current and address new co-evolutionary challenges, such as multi-agent systems and integrating AI with other emerging technologies.

Specifically, there are several methodological and theoretical limitations to this literature review. For example, I did not cover all of the possible studies on big-tech partnerships in AI, especially those published in non-English languages, in less accessible journals, and specific to databases other than WoS, such as Scopus. Therefore, the diversity of this review is reduced, limited to the perspectives of a few prominent scholars. Also, my analysis does not include industry grey literature or interviews with partner managers, limiting the depth of insights. The fast pace of AI development may reduce the relevance of insights over time. In the same vein, new technological innovations or regulatory policy changes impact ongoing research, as it is challenging to keep it current. We need to develop new theoretical frameworks that look for the distinct characteristics of AI ecosystems, as most scholars are applying existing theories to understand the AI phenomenon. A rich body of research is emerging from fields beyond business and management, like economics, ethics, law, or sociology. Future research may need to include these categories. Since I took the perspective of big tech, it may be biased towards them. Future research could cover the perspectives of small tech or independent developers or advertisers.

4.5 Partner Managerial Implications

This study highlighted three key managerial consequences for partners. First, it provides a new way for partner managers to consider the decision to partner with big tech through the dominance versus dependence polarities' lens, as they will continue to rapidly evolve their AI offerings to gain competitive advantage in a dynamic market.

Second, these polarities allow partner managers to understand and navigate partnership tensions, helping partner managers to avoid falling prey to AI hype. They must conduct due diligence to assess AI technologies' capabilities and limitations, and set realistic expectations for partnership outcomes. They should be mindful of the power imbalance when partnering with big-tech firms and negotiate terms carefully to protect their interests, intellectual property, and market position. And, with rapid changes in AI technologies and therefore the partnership focus, they need to be even more open in their communications and establish mechanisms for conflict resolution.

Third, partner managers should understand concerns about transparency, bias, and data privacy to build trust with internal and external stakeholders and offer perspectives to reduce partnership risks. They also need to

advocate long-term sustainability by exploring the broader societal impact of AI partnerships. Finally, partner managers must stay on top of regulations and policy changes and adjust their partnership strategies accordingly.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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