Shaping Participation: How Digital Platform Design Influences User Participation

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This paper provides an integrative perspective on the factors influencing platform participation, a key driver of platform success. Based on a structured literature review of 99 scholarly articles from leading journals, this study synthesizes insights from the strategic, technical, and economic perspectives on digital platform design and governance from a participant viewpoint. It develops a participant-centric model that outlines the major determinants of platform adoption and homing decisions, considering both monetary and non-monetary costs, opportunity costs, and perceived benefits. The model also captures the dynamics of network effects and their implications for platform value creation, emphasizing the importance of strategic resource orchestration and adaptation over time. By unifying diverse concepts and frameworks, the paper addresses the complexity of platform ecosystems and provides actionable insights for platform providers seeking to enhance participant engagement and long-term platform viability. It contributes to the academic discourse by offering a comprehensive reference for future research and practical guidance for effective platform design and management.

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1 Introduction

Digital platforms have garnered sustained academic interest due to their economic significance and their tendency to outcompete traditional pipeline businesses (Reuver et al., 2018). Various platform types have been studied with regard to technical and managerial design options (Evans & Schmalensee, 2005; McIntyre & Srinivasan, 2017), with particular focus on network effects, the primary differentiator from pipeline models, due to their distinctive dynamics (McIntyre & Srinivasan, 2017; Rietveld & Schilling, 2021). Initially seen as a self-reinforcing mechanism that could help early entrants dominate markets, network effects are now understood as strategic assets that must be actively managed to remain effective (Eisenmann et al., 2006; Knee, 2018; Srinivasan, 2023). Accordingly, the focus has shifted from pure scaling to resource orchestration for sustained advantage (Hagiu & Wright, 2024). Despite diverse literature streams offering guidance on how design choices shape network effects and platform success, an integrative view remains underdeveloped (Reuver et al., 2018; Rietveld & Schilling, 2021). Seminal works like McIntyre & Srinivasan (2017), Rietveld & Schilling (2021), and Hagiu & Wright (2024) attempt to unify related concepts, but typically adopt a provider-centric lens.

This paper contributes by offering a participant-centric, integrative model of platform participation, one of the key drivers of platform success, based on a structured literature review. The model maps how platform design choices and exogenous contextual factors influence adoption decisions and interact over time. In line with Keen & Williams (2013), who emphasize that user preferences shape market outcomes (Cennamo & Santalo, 2013; Panico & Cennamo, 2022), this paper reframes platform success from the participant's perspective. The resulting model integrates strategic, technical, and economic views (McIntyre & Srinivasan, 2017), identifying key determinants of homing decisions and their underlying drivers. Due to its neutral formulation, the model applies across platform types and contexts, offering a unified framework for scholars and actionable guidance for practitioners seeking to influence participant behavior through design interventions.

2 Theoretical Background

Digital platforms are virtual intermediaries that provide value to its participants by facilitating (intergroup and potentially intragroup) interactions and by providing valuable services (i.e. boundary resources) (Mantena & Saha, 2012). Overall, they aggregate internally and/or externally provided resources for its participants to

foster value creation and facilitate interaction (Hagiu, 2014; Leong et al., 2019; Srinivasan, 2023). Platforms typically exist in complex ecosystems, not solely having horizontal ties with players in the same or adjacent markets, but also having horizontal ties with firms operating in other layers (Chung et al., 2024; Cohen & Zhang, 2022). These ties or relationships may differ even within a platform, depending on the dependences with other entities on each level.

A key distinction from pipeline businesses is the presence of multiple participant groups whose interactions create intra-group and inter-group externalities, making platform governance and design features essential (Chen, Yi, et al., 2022; Constantinides et al., 2018; Srinivasan, 2023; van Alstyne et al., 2016). Platforms guide the interactions of their participants through the features available, as well as through rules and regulations that determine the openness of a platform along several dimensions (Broekhuizen et al., 2021; Kazan et al., 2018; Ondrus et al., 2015; Rietveld & Schilling, 2021; van Alstyne et al., 2016). While more lenient rules allow for flexible use of the platform and more complementary innovation, they also carry risks, such as platform forking or disintermediating the platform, increased complexity, or the loss of control over aspects such as quality (Broekhuizen et al., 2021; Kazan et al., 2018; Leong et al., 2019; McIntyre & Srinivasan, 2017; Rietveld & Schilling, 2021; Zhu & Iansiti, 2019).

Accordingly, digital platforms differ from pipeline businesses through their dynamic value proposition, shaped by inherent resources and the influence of participant characteristics and contributions on one another (Knee, 2018; Leong et al., 2019; Mantena & Saha, 2012; Srinivasan, 2023). This stems from network effects, positive or negative externalities among users, which depend on platform design, user preferences, homing decisions, and exogenous factors like market environment and competition (Carroni et al., 2024; Eisenmann et al., 2006; Farronato et al., 2024; Hagiu & Wright, 2024; Hinz et al., 2020; Mantena & Saha, 2012; Srinivasan, 2023; Weyl, 2010; K. Zhang & Sarvary, 2015).

A participant's adoption decision is thus driven by the platform's perceived value minus the cost of joining and using it. To optimize adoption, platforms often subsidize the more price-sensitive group or the group generating stronger externalities (Bar-Gill, 2019; Eisenmann et al., 2011; H. Li et al., 2021; H. Li & Zhu, 2021; McIntyre & Srinivasan, 2017; Parker et al., 2016).

Once a critical mass is achieved, network effects are considered to become self-reinforcing. However, reaching that threshold is time-sensitive and hinges on early adopters, creating a 'chicken and egg' dilemma that can limit a platform's market potential and lead to failure (Evans, 2009; Evans & Schmalensee, 2010; Hagiu & Rothman, 2016; McIntyre & Srinivasan, 2017; Ondrus et al., 2015; Parker et al., 2016). Consequently, diverse launch strategies have been developed to address this challenge (Caillaud & Jullien, 2003; Chen et al., 2019; Edelman, 2015; Evans, 2009; Knee, 2018; Schirrmacher et al., 2017).

Beyond traditional network effects, data network effects have gained relevance with advances in AI and machine learning. These arise when platforms leverage growing data volumes to improve algorithms, refine services, and better understand user needs (Bergemann & Bonatti, 2024; Gregory et al., 2021; Varga et al., 2023). The ability to generate user insights enables personalized offerings, such as recommender systems or buyer analytics, and creates competitive barriers through accumulated data advantages (Bergemann & Bonatti, 2024; Gregory et al., 2021; Malgonde et al., 2022; Zhu & Iansiti, 2019).

3 Literature Review

3.1 Methods

To understand the drivers of platform success, a structured literature review was conducted following the guidelines of Webster & Watson (2002), Fink (2019), and the PRISMA-S extension for transparent and reproducible search strategies (Page et al., 2021; Rethlefsen et al., 2021). The systematic review was conducted in September 2024 using EBSCOhost (covering Business Source Ultimate, APA PsycInfo, and Communication & Mass Media Complete) and Web of Science. The review focused on identifying studies published in English-language journals listed in the FT50 or the AIS Senior Scholars' Basket of Journals, both of which represent high-quality, peer-reviewed outlets.

Search terms were developed by identifying common terminology in the field of digital platforms and refined iteratively to improve recall. The final search string was:

TI(("platform"OR "two-sided*" OR "multi-sided*" OR "digital ecosystem*" OR "marketplace*") AND ("network" OR "winner" OR "competing platforms" OR "multi*hom*")) OR AB(("platform*"OR "two-sided*" OR "multi-sided*" OR "digital ecosystem*" OR "marketplace*") AND ("network" OR "winner" OR "competing platforms" OR "multi*hom*"))*

No additional filters (e.g., date range) were used. The search strategy was peer-reviewed by a second researcher using the PRESS framework (McGowan et al., 2016). All references were exported to Citavi for citation management. Deduplication was performed using platforms' built-in tools and then manually by scanning title and author fields. This process resulted in 352 unique results.

Screening was conducted manually and independently by one researcher, starting with titles and abstracts, followed by full-text review where needed. Studies were included if they investigated digital platforms with a focus on factors influencing participation or design-related decisions. Overall, screening resulted in 69 relevant articles. Additionally, forward and backward citation tracking was applied to the included papers with a maximum of two iterations to identify further relevant literature, leading to a total of 99 relevant papers. A PRISMA 2020 flowchart (Figure 2, Appendix) summarizes the search and screening process (Page et al., 2021).

Relevant articles were thematically coded and synthesized using a manual, iterative process. Recurring themes and commonly used terms were grouped into a broader cost-benefit framework, offering a multidimensional view of factors contributing to platform success. Based on these findings, a conceptual model was systematically developed to illustrate the relationships influencing platform adoption and retention, which were identified as core drivers of platform success (van Alstyne et al., 2016; Varga et al., 2023). Using an inductive approach, key components and their interrelations were identified, clustered by similarity, and integrated into a value function simulating rational, value-based decision-making. The resulting model synthesizes diverse insights into a coherent framework, providing both conceptual clarity and a foundation for future empirical validation.

3.2 Findings

The literature yielded several insights regarding the competitive dynamics of platforms and the factors that contribute to a platform's success. Although there are numerous metrics for success, it was opted for a more nuanced approach. The dimensions and the factors influencing them that shape participants' homing and adaptation decisions were delineated. By identifying these dimensions, platform providers can gain insight into their participants' needs and adapt their strategies and design choices accordingly to achieve their goals and hence achieve success. The key points were clustered into different groups and will be outlined in the following sections, guided by Figure 1. It is important to acknowledge that the model's applicability is constrained by certain limitations. These include the assumption of some degree of rationality, despite the incorporation of bounded rationality and motivational factors (Hossain & Morgan, 2013; Sun & Gregor, 2023). This is in line with the insights from Simon (1966) and Petty et al. (1981). Hence, the model accounts for the absence of full information and the influence of motivational factors. However, it does not account for participants, fully relying on emotional or irrational decisions.

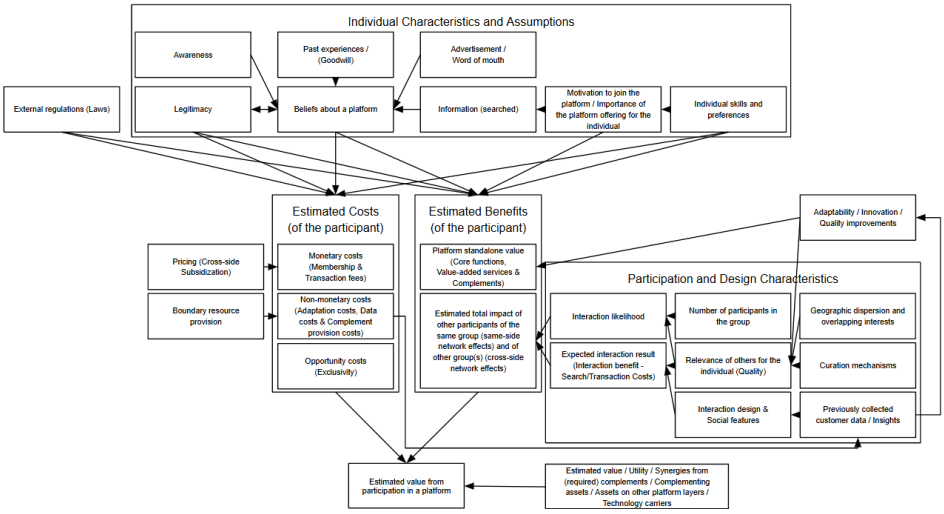

Figure 1: Influential Factors for a Participant's Platform Participation Decision
Source: Own

3.1.1 Fundamental Premise

The fundamental premise is organized as follows: Each potential participant of the different parties possesses distinctive characteristics, varying degrees of knowledge, capabilities, and preferences (Birge et al., 2021; Eisenmann et al., 2006; Farronato et al., 2024; Hagiu & Wright, 2024; Panico & Cennamo, 2022; Sun & Gregor, 2023; Veiga et al., 2017; K. Zhang & Sarvary, 2015). Therefore, the monetary and non-monetary costs and benefits associated with the platform may vary between the different parties and participants (Birge et al., 2021; Farronato et al., 2024). After estimating the value of the different options with the limited information available to them, rational potential participants will typically choose to participate in the platform that offers the highest expected total value for them, provided that the estimated overall value is positive (Edelman, 2015; Hagiu & Spulber, 2013; Hossain & Morgan, 2013; Keen & Williams, 2013; Mantena & Saha, 2012; McIntyre & Srinivasan, 2017). As participants are not limited to participation in a single platform, they subsequently evaluate the other options and estimate the additional value that would be gained from joining them (Bakos & Katsamakas, 2008; Barua & Mukherjee, 2021; Cennamo & Santalo, 2013; Hagiu & Wright, 2024; Tian et al., 2022). It is important to consider that the valuations are influenced by the previous choices made (Bakos & Halaburda, 2020). For instance, previous learning costs may be reflected to some extent in the valuations of other platforms (H. Li & Zhu, 2021; Polidoro & Yang, 2024). Conversely, solely new forms of interactions with previously engaged participants or various kinds of interaction with new participants translate into value (Bakos & Halaburda, 2020). However, the same kinds of interactions with the same participants that also multi-home do not provide any additional value (Bakos & Halaburda, 2020; Barua & Mukherjee, 2021). Therefore, in the case of overlapping participant groups, the value of each subsequent choice may be diminished to a certain extent in comparison to the initial valuation. This is contingent upon the presence of non-monetary costs that outweigh the benefits associated with the choice in question. Furthermore, positive interactions may help build goodwill towards a platform, increasing the likelihood of future participation (Calmon et al., 2021; Yang et al., 2022). In general, participants may utilize multiple platforms concurrently if they continue to derive value or utility from them (Bakos & Halaburda, 2020; Bakos & Katsamakas, 2008; Barua & Mukherjee, 2021). However, it is essential to consider that these decisions are subject to revision at specific intervals, and that preferences and, consequently, valuations may evolve

over time, especially as the platform and its ecosystem and industry mature (Broekhuizen et al., 2021; McIntyre & Srinivasan, 2017; Panico & Cennamo, 2022; Varga et al., 2023). This underscores the vital importance of platforms to reinvent themselves or to facilitate complementary innovation in order to maintain relevance (Cusumano & Gawer, 2002; Panico & Cennamo, 2022; van Alstyne et al., 2016; Varga et al., 2023; Zhu & Iansiti, 2019).

So, given this context, what drives the adaptation decision in detail? As indicated before, the decision process depends on the individual (Keen & Williams, 2013). First of all, if a participant is aware of the platform, past experiences, advertisements, and word-of-mouth shape a participant's beliefs about, and potentially the goodwill toward, a platform (Calmon et al., 2021; Edelman, 2015; Hagiu & Spulber, 2013; Keen & Williams, 2013; Koh & Fichman, 2014; Qiu & Rao, 2024; Sun & Gregor, 2023). In general, advertising and word-of-mouth increase a participant's awareness of a platform, which is influenced by the relevance of the platform's services to the participant and the participant's motivation to use the platform (Bar-Gill, 2019; Petty et al., 1981; van Alstyne et al., 2016; Varga et al., 2023; Yang et al., 2022; K. Zhang & Sarvary, 2015). Depending on a participant's motivation, the beliefs about a platform may be challenged by additional information gathered about a platform and its environment. This includes examining data about platform features, associated costs, legislation affecting the platform (Hagiu & Rothman, 2016; Ng & Pan, 2024), alternatives (Keen & Williams, 2013), the coherence of services offered (Taeuscher & Rothe, 2021), facilitated interactions, participating parties, beliefs about the platform's future development (Brouthers et al., 2016; Edelman, 2015; Zhu & Iansiti, 2012), risks involved with the platform usage (Gong et al., 2022; Hagiu & Rothman, 2016; Ng & Pan, 2024), etc. On this basis, the legitimacy or focality of a platform is assessed (Cennamo & Santalo, 2013; Ng & Pan, 2024; Sun & Gregor, 2023), as well as the potential costs and benefits associated with it, which ultimately influence a platform's valuation (Gong et al., 2022; Gregory et al., 2021; Hagiu & Rothman, 2016; Halaburda & Yehezkel, 2019; Khanagha et al., 2022).

3.1.2 Costs

A platform's valuation is heavily influenced by the costs of participation, which can be grouped into monetary, non-monetary, and opportunity costs (Carroni et al., 2024; Rietveld & Schilling, 2021; Srinivasan, 2023). These costs represent any barrier

to joining or staying on a platform, and while perceived subjectively, they generally correlate with actual costs (H. Li & Zhu, 2021).

Monetary costs include membership and transaction fees, which may be fixed or dynamic and vary across and within user groups (Birge et al., 2021; Du et al., 2014; Mantena & Saha, 2012; Rietveld & Schilling, 2021; Tavalaei et al., 2024; C. Zhang et al., 2022). They can regulate participation and influence platform quality (Anderson Jr. et al., 2023; Bakos & Katsamakas, 2008; Bernstein et al., 2021; Huang et al., 2022; Kazan et al., 2018; Tavalaei et al., 2024). Under the assumption of single-homing, cross-side subsidization, depending on the strength of network effects and the price sensitivity and demand elasticity of the parties, was often mentioned as a strategy to stimulate participation on one side and thus attract the other side to the platform (Barua & Mukherjee, 2021; H. Li et al., 2021; Srinivasan, 2023; Tavalaei et al., 2024; Weyl, 2010). Under the assumption of multi-homing, however, it is doubtful whether this strategy remains a viable option (Bakos & Halaburda, 2020; Cennamo & Santalo, 2013).

Non-monetary costs include switching and adaptation costs, such as learning or information costs associated with joining a platform, which act as barriers to entry but may also lock in users (Barua & Mukherjee, 2021; Cennamo & Santalo, 2013; Eisenmann et al., 2011; Gong et al., 2022; Hagiu & Rothman, 2016; Hagiu & Wright, 2024; Leong et al., 2019; Srinivasan, 2023). Data-related costs ("pricing by privacy") are a recurring form of non-monetary costs, as platforms may use personal data for service customization or monetization (Bergemann & Bonatti, 2024; Gregory et al., 2021; Varga et al., 2023). Changes in platform design (versioning) or functionality can increase adaptation costs, making backward compatibility a critical design consideration (Edelman, 2015; Panico & Cennamo, 2022; Xu et al., 2010).

Complement provision costs similarly affect adoption and homing choices. These include connectivity (ease of offering existing complements via interfaces) and the ability to create new complementary offerings using platform resources (Anderson Jr. et al., 2023; Hagiu & Wright, 2024; Polidoro & Yang, 2024; Rietveld & Schilling, 2021; Srinivasan, 2023; Tan et al., 2020). High connectivity thereby supports multi-homing, potentially reducing platform differentiation (Barua & Mukherjee, 2021; Kazan et al., 2018; Landsman & Stremersch, 2011; H. Li & Zhu, 2021; Mantena & Saha, 2012; Tian et al., 2022). While multi-homing is not inherently negative,

especially when a single platform cannot fully support complementors, platforms often aim to incentivize single-homing to strengthen network effects (Bar-Gill, 2019; Bernstein et al., 2021; K. Zhang & Sarvary, 2015). Thus, strategic investments in boundary resources must balance reducing participation frictions with maintaining platform distinctiveness (Anderson Jr. et al., 2023; Kazan et al., 2018; Tan et al., 2020).

Enabling complementary value creation differs from basic complement provisioning, as investments in boundary resources can increase the variety of new complements, attracting more users and enabling scaling over time (Chen, Tong, et al., 2022; Chen, Yi, et al., 2022; Leong et al., 2019; Tan et al., 2020). While such one-time investments can help establish a strong user base (Srinivasan, 2023), their impact may diminish if complementors multi-home using resources provided by the platform (Anderson Jr. et al., 2023). Granting greater autonomy to complementors can reduce provision costs but risks platform forking and added complexity (Broekhuizen et al., 2021; Hagiu & Wright, 2015; Karhu et al., 2018). Therefore, platform providers must carefully calibrate investments in boundary resources and design, considering factors such as market position, competition, participant characteristics, and the behavioral effects of platform changes (Bar-Gill, 2019; Barua & Mukherjee, 2021; Eisenmann et al., 2006; Karhu et al., 2018; Sun & Gregor, 2023; Tan et al., 2020).

Opportunity costs, the benefits forgone or penalties avoided by choosing one option over another, also influence platform decisions (Carroni et al., 2024; Tian et al., 2022; Zhu & Iansiti, 2019).

In instances where platforms are predicated on specific complements, hardware, or technology carriers (e.g., mobile phones and cars are indispensable for drivers to operate on Uber), it is imperative to assess the overall value, utility, and potential synergies when making a decision about participating (Chung et al., 2024; Cohen & Zhang, 2022; Leong et al., 2019). Considering the relative costs associated with each potential course of action, the decision regarding platform participation may be made in conjunction with, or as a precursor to, the acquisition of the complementary product. The valuation of the complementary product may have implications for the homing behavior of participants (Chung et al., 2024; Cohen & Zhang, 2022; Leong et al., 2019).

3.1.3 Benefits

Platform benefits can be broadly divided into standalone value perceived independently by users and the value derived from others' participation (Hagiu & Rothman, 2016; Rietveld & Schilling, 2021). Standalone value includes platform functions, content, and resources that initially attract participants and provide a sustainable competitive edge, as they are not reliant on complementors (Anderson et al., 2014; Mantena & Saha, 2012; Zhu & Iansiti, 2012). Matchmaking algorithms, although reliant on user participation, are also part of standalone value due to their design-based independence (Meyer et al., 2024; Zhu & lansiti, 2019). Participant data can further tailor and improve offerings, driving data-network effects, a self-reinforcing loop that boosts long-term platform value (Bergemann & Bonatti, 2024; Gregory et al., 2021; Varga et al., 2023).

Standalone value can be divided into core functions, such as matchmaking and transaction facilitation, and value-added services (Anderson et al., 2014; Anderson Jr. et al., 2023; Bhargava & Choudhary, 2004; Hagiu, 2014; Hagiu & Spulber, 2013). Core functions, shaped by platform architecture, are critical for initial adoption but may lead to adverse effects if over-optimized (Bakos & Katsamakas, 2008; Eisenmann et al., 2011; Meyer et al., 2024; Wu et al., 2018).

Value-added services, in contrast, are additional services (or boundary resources), including tools for customization or analytics options that enhance user and complementor experiences (Anderson Jr. et al., 2023; Du et al., 2014; Veiga et al., 2017; Wang et al., 2024), but their benefits can vary across participant groups and may impact overall welfare (Bergemann & Bonatti, 2024; Bhargava & Choudhary, 2004; Wang et al., 2024). These services may be offered freely or monetized, depending on strategic goals (Anderson Jr. et al., 2023; Bhargava & Choudhary, 2004; Du et al., 2014; Tan et al., 2020; Wang et al., 2024).

Platforms may also offer proprietary complements or content to drive adoption and achieve a critical mass (Hagiu & Spulber, 2013; Hagiu & Wright, 2015; Qiu & Rao, 2024; Tian et al., 2022, 2022; K. Zhang & Sarvary, 2015). Such offerings can also help to differentiate the platform and facilitate market envelopment, though they may disrupt existing complementors depending on the context (Bar-Gill, 2019; Hagiu & Wright, 2015, 2024; Haviv et al., 2020; Qiu & Rao, 2024; Raj, 2024; van

Alstyne et al., 2016). As platforms expand, service portfolios must be strategically managed, with attention to complementarity, user base overlap, and cost implications (Bar-Gill, 2019; Cusumano & Gawer, 2002; Eisenmann et al., 2011; Khanagha et al., 2022; Schreieck et al., 2024; Sun & Gregor, 2023).

Platform externalities significantly influence platform valuation (Gong et al., 2022; Varga et al., 2023). Depending on the availability of desirable participant traits, cross-side substitution, shaped by externalities, demand elasticity, and price sensitivity, can help regulate participation (Bakos & Halaburda, 2020; Bakos & Katsamakas, 2008; Cennamo & Santalo, 2013). Similarly, differential intragroup pricing may promote quality control or leverage spillover effects within participant groups (Bhargava et al., 2022; Haviv et al., 2020; Huang et al., 2022; Raj, 2024).

The desired characteristics of participants (also often referred to as quality), varying by platform type, individual interests, offering, and type of interaction, signal the likelihood of satisfactory interactions (Birge et al., 2021; Knee, 2018). This likelihood depends on the availability and relevance of others, interaction frequency, and associated costs (Anderson Jr. et al., 2023; Birge et al., 2021; Halaburda et al., 2018; Keen & Williams, 2013; Taeuscher & Rothe, 2021; Wu et al., 2018). Participant quality, often shaped by geography, shared interests, or other traits (Brouthers et al., 2016; Chen et al., 2019; Ghemawat, 2005; Varga et al., 2023; Veiga et al., 2017; K. Zhang & Sarvary, 2015; Zhu & lansiti, 2019), is critical but not always observable upfront, making interactions risky (Hagiu & Wright, 2024). To mitigate this, platforms use curation, and promote participant signaling, filtering, or other risk mitigation mechanisms to improve interaction outcomes (Belleflamme & Peitz, 2018; Edelman, 2015; Hagiu & Rothman, 2016; Kozinets et al., 2021; H. Li & Zhu, 2021; Pu et al., 2022; Sun & Gregor, 2023; Tunc et al., 2021; Z. Zhou et al., 2024).

Matchmaking algorithms, including recommender systems, discovery services, and filtering tools, enhance interaction quality by simplifying and improving match accuracy, especially when data volume is high (Banerjee et al., 2016; Belleflamme & Peitz, 2018; Gregory et al., 2021; Hagiu & Wright, 2024; Meyer et al., 2024; B. Zhou & Zou, 2023; Zhu & lansiti, 2019). In their absence, high search costs can reduce platform value (L. Li et al., 2020; Malgonde et al., 2022; Wu et al., 2018). The effectiveness of such systems depends on understanding users' value drivers (Hagiu & Wright, 2024; Zhu & lansiti, 2019), with paid prioritization potentially distorting

platform welfare (Banerjee et al., 2016; Bergemann & Bonatti, 2024; Guo & Easley, 2016; Malgonde et al., 2022; B. Zhou & Zou, 2023). Platforms must balance transparency, trust, applicability, and usability when designing curation and recommendation mechanisms (Hagiu & Rothman, 2016; Halaburda et al., 2018; Kozinets et al., 2021; H. Li & Zhu, 2021; Pu et al., 2022; Tunc et al., 2021).

Lastly, it needs to be considered that the relevance of interactions depends on the platform usage intentions of a participant; and, therefore, the different types of interactions are weighed unevenly when considering their impact on a platform's valuation (Birge et al., 2021; Farronato et al., 2024; Meyer et al., 2024; Panico & Cennamo, 2022; Rietveld & Schilling, 2021; Taeuscher & Rothe, 2021; Veiga et al., 2017; K. Zhang & Sarvary, 2015).

Intergroup interactions are typically most valuable, aligning with core use cases and revenue streams (Chen, Yi, et al., 2022). In these kinds of interactions, the match quality, depending on the level of satisfaction with a match, is therefore especially relevant (Birge et al., 2021; Hagiu & Rothman, 2016; Huang et al., 2022; Varga et al., 2023; Veiga et al., 2017). In contrast, intragroup interactions are more optional and may in some cases foster competition, risking participant fragmentation or market imbalance (Hagiu & Wright, 2024; Koh & Fichman, 2014; Malgonde et al., 2022; Meyer et al., 2024; Qiu & Rao, 2024; Tucker & Zhang, 2010). Thus, platforms should carefully manage both inter- and intragroup dynamics to optimize participation and value creation, which is dependent on the relative stance of the participants (Anderson Jr. et al., 2023; Chu & Manchanda, 2016; Hagiu & Wright, 2024; Kazan et al., 2018; Leong et al., 2019; Meyer et al., 2024).

Accordingly, a platform's valuation evolves with each new participant due to the cumulative effect of network externalities (Chen, Yi, et al., 2022; Knee, 2018; Srinivasan, 2023). Therefore, even in the absence of modifications to the platform's design, the value proposition of the platform is dynamic (Mantena & Saha, 2012; Rietveld & Schilling, 2021). It is crucial to ascertain whether the initially positive network effects persist in a self-reinforcing manner and to identify strategies for achieving and maintaining this dynamic, given that various factors, including participants' characteristics and interests, influence these effects (Knee, 2018; Leong et al., 2019; Panico & Cennamo, 2022; Rietveld & Schilling, 2021; Zhu & Iansiti, 2019). Also, different kinds of network effects, like same-side, different kinds of

cross-side, and data network effects may vary in their impact at different levels of participation and platform maturity (Anderson Jr. et al., 2023; Hinz et al., 2020; McIntyre & Srinivasan, 2017; Panico & Cennamo, 2022; Srinivasan, 2023; Varga et al., 2023; Zhu & lansiti, 2019). Overall, the strategic and adaptive management of the diverse array of network effects is crucial for the success of a platform (Cennamo & Santalo, 2013; Rietveld & Schilling, 2021; Srinivasan, 2023).

In conclusion, the value of a platform can be assessed differently at any given time, contingent on the information available to the participants regarding the platform, their own characteristics, and their motivation to use it (Anderson Jr. et al., 2023; Keen & Williams, 2013; Z. Zhou et al., 2024; Zhu & lansiti, 2019). Additionally, there are numerous cost factors or potential benefits that are not solely influenced by platform features and design; rather, they are also affected by the participation of other individuals (Gong et al., 2022). These factors may or may not be taken into account by a participant when making such a valuation estimate (Mantena & Saha, 2012; K. Zhang & Sarvary, 2015). Platform providers exert an influence on a platform's valuation, as they may modify their design decisions over time, which in turn affects potential participant costs and benefits (Anderson Jr. et al., 2023; Keen & Williams, 2013; Varga et al., 2023). Furthermore, this valuation may also undergo changes, as any other factors, such as participant clusters or individual interests or characteristics, like the perception of risk, undergo changes over time (Ng & Pan, 2024; Zhu & lansiti, 2019).

A final consideration of a platform provider, not directly associated with a participant's valuation of a platform, is the order and manner of market entry and/or platform envelopment (Hagiu & Rothman, 2016; Haiyang Feng et al., 2020; Srinivasan, 2023). The manner and timing of a platform's market entry have implications for its positioning and long-term success. The decision of whether to be a first or second mover in a market is influenced by the dynamics of the market and the strength of network effects (Feng et al., 2020; Haiyang Feng et al., 2020; McIntyre & Srinivasan, 2017; Srinivasan, 2023; Zhu & Iansiti, 2012). Network effects can either create an entry barrier for second movers, locking participants in, or provide second movers with the opportunity to target specific segments (Feng et al., 2020; Hagiu & Rothman, 2016; Leong et al., 2019; McIntyre & Srinivasan, 2017). Consequently, there are various market entry strategies, which typically revolve

around creating a high level of relevance in a specific market niche or targeting a specific participant group (Ondrus et al., 2015).

4 Conclusion

Digital platforms are complex constructs that must constantly adapt to heterogeneous and evolving participant needs across and within user groups (Birge et al., 2021; Farronato et al., 2024; Meyer et al., 2024; Reuver et al., 2018; Rietveld & Schilling, 2021; Weyl, 2010). However, much of the existing literature either narrowly addresses technical or managerial design features in isolated contexts or offers generalized findings with limited consideration of interdependencies. In addition, the few studies that have attempted to identify the interdependencies of design options and their potential impact on platform success have mostly been written from the perspective of platform providers, disregarding influencing factors from the perspective of participants (Hagiu & Wright, 2024; McIntyre & Srinivasan, 2017; Reuver et al., 2018; Rietveld & Schilling, 2021). This paper addresses these gaps by modeling the platform participation process from a participant-centric perspective and linking managerial design actions to platform adoption dynamics. Through a structured literature review and theoretical integration, it identifies key design elements, contextual factors, and governance choices that shape user participation, an indicator for platform success (Keen & Williams, 2013; Panico & Cennamo, 2022).

The model captures a broad range of adoption drivers, including individual-level factors such as prior experiences, word-of-mouth, and user motivation. It also accounts for barriers to participation, including monetary, non-monetary, and opportunity costs. In contrast, platform benefits are categorized into core functionalities, value-added services, third-party contributions, and network effects, offering a nuanced understanding of perceived value. By incorporating bounded rationality, imperfect information, and temporally iterative decision-making, the model addresses limitations of static or overly rational economic frameworks such as the Technology Acceptance Model (Davis, 1989; Kamal et al., 2020). Moreover, it is specifically tailored to the platform adoption process and integrates a wide array of both soft and hard factors influencing decision-making. As a result, it enables the simulation of a more holistic and realistic platform participation decision.

The aggregation of findings from papers in different contexts furthermore enables generalization across empirical studies and reveals causal interdependencies that are often overlooked (Rietveld & Schilling, 2021). As participant valuations are shown to vary significantly, the model challenges winner-takes-all assumptions and highlights the possibility of multiple coexisting dominant platforms in certain markets (Cennamo & Santalo, 2013; Srinivasan, 2023). By tracing how participant perceptions evolve over time and influence platform engagement, this paper provides platform providers with actionable guidance on adaptive governance, value provision, and strategic positioning (Z. Zhou et al., 2024).

5 Limitations and Future Research

While this paper offers a holistic view of platform participation and design interdependencies, several limitations must be acknowledged, both in relation to the study's scope and its methodological approach.

First, the literature review was limited to English-language publications appearing in journals listed on the FT50 and the AIS Senior Scholars' List. Although this ensured scholarly quality, it potentially excluded relevant insights from other high-quality journals, practitioner publications, or non-English sources. Extending the journal and language scope could generate additional perspectives or challenge some of the conclusions drawn here.

Second, the thematic synthesis involved an interpretive coding process based on conceptual and theoretical patterns across studies. Despite efforts to ensure analytical rigor, the absence of multiple coders or an intercoder reliability assessment introduces a degree of subjectivity. Similarly, the paper did not include a formal quality assessment of the reviewed studies, which could influence the weight or reliability of the synthesized findings.

Third, the conceptual model developed in this paper is grounded in a literature-based synthesis rather than empirical validation. While the model identifies key drivers of platform participation and their interdependencies, its explanatory and predictive validity has not yet been tested in real-world settings. Future research could strengthen these insights by applying the model in specific platform contexts and evaluating its outcomes.

Fourth, although this paper generalizes findings across multiple studies, some of the relationships identified would benefit from empirical testing and contextual grounding. For example, further work is needed to quantify the qualitative findings outlined here, particularly regarding the impact of design options, the influence of individual preferences and motivations, and the trade-offs between different governance choices.

Fifth, while the paper explores various forms of network effects, there remains a lack of research on their interdependencies, their relative significance at different stages of platform development, and the contextual variables that shape them (McIntyre & Srinivasan, 2017; Panico & Cennamo, 2022; Srinivasan, 2023; Varga et al., 2023). The model assumes that such effects vary by stage and user group, but empirical clarification is still lacking.

Finally, although the paper discusses the potential of emerging technologies such as AI, recommender systems, and machine learning to mitigate negative externalities (e.g., search costs, complexity), these claims remain conceptual. Further empirical investigation is needed to determine how such technologies can influence user experience and participation, and whether they offset the increasing complexity associated with platform growth (Gregory et al., 2021; Malgonde et al., 2022).

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Appendix

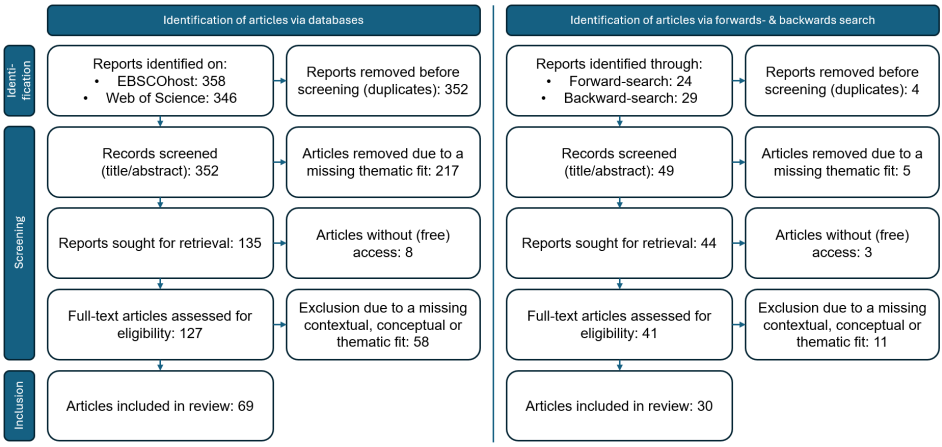

Figure 2: PRISMA 2020 flow diagram summarizing the article selection process