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Examining the Competitive Landscape of Digital Platforms:

A Cross-Sector Analysis

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Resumo

O surgimento de plataformas digitais revolucionou a análise da concorrência, confrontando as teorias tradicionais de vantagem competitiva, como a "Market-Based View". Quando aplicadas à economia digital, estas teorias tendem a generalizar o impacto de fatores estratégicos nas plataformas digitais. Muitas vezes, é adotada uma abordagem uniforme para todas as plataformas digitais, ignorando as características e diferenças específicas das mesmas.

Perante estes desafios, este estudo propõe-se a examinar o cenário competitivo das plataformas digitais com foco específico em cada setor, procurando responder à seguinte questão de investigação "Como variados fatores influenciam a competitividade nas plataformas digitais?", que se desdobra em: "Quais fatores influenciam a competitividade das empresas?" e "Quais fatores influenciam especificamente a competitividade nos diferentes setores das plataformas digitais?".

Recorrendo a uma abordagem de métodos mistos, esta análise abrange setores como as redes sociais e as plataformas de Transporte Individual de Passageiros em Veículo Descaracterizado" para avaliar o impacto relativo dos fatores estratégicos identificados a partir de teorias consolidadas de vantagem competitiva. O estudo indica que a influência desses fatores não é uniforme em toda a economia das plataformas digitais, realçando o caráter específico de cada setor na análise da competitividade. Dos dez fatores estratégicos analisados, apenas os efeitos de rede demonstram um impacto consistente em todos os setores, dada a sua ligação à essência das plataformas. Assim, esta investigação sugere a necessidade de mais discussões que contemplem as particularidades de cada setor nas plataformas digitais no contexto da gestão estratégica.

Palavras-chave: Plataformas Digitais, Concorrência, Fatores Estratégicos, Perspetiva Baseada no Mercado

Abstract

The emergence of digital platforms has transformed the study of competitive dynamics, challenging traditional theories of competitive advantage, such as Market-Based View. When these theories are applied to the digital economy, there is a tendency to make generalizations about how strategic factors impact the digital platforms. Often, this approach views digital platforms in a "one-size-fits-all" perspective, overlooking the unique characteristics and differences that exist between different sectors within the digital economy.

Given these challenges, this study has proposed to analyse the competitive landscape of digital platforms through a sector-specific lens, aiming to answer the research question "How different factors affect competitiveness across digital platforms?", which divides itself into: "What factors impact firms competitiveness?" and "Which factors specifically affect competitiveness within different sectors of digital platforms?".

Utilizing a mixed-methods approach, this analysis extends through sectors such as social media and ride-sharing to measure the relative impact of strategic factors identified from established theories of competitive advantage. The study reveals that the influence of these factors is not uniform across the digital platform economy, highlighting the sector-specific nature of competitive dynamics. Only one of the ten strategic factors analysed – network effects - shows a consistent impact across all sectors, due to its connection to the nature of platforms. Consequently, this research calls for more discussions that consider sector-specific nuances within digital platforms in strategic management.

Keywords: Digital Platforms, Competitive Dynamics, Strategic Factors, Market-Based View.

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Abbreviations

AMT: Autoridade da Mobilidade e dos Transportes (Portuguese for “Mobility of Transport Authority”)
API: Application Programming Interface
ASAE: Autoridade de Segurança Alimentar e Económica (Portuguese for “Economic and Food Safety Authority”)
B2B: Business-to-Business
B2C: Business-to-Consumer
C2C: Consumer-to-Consumer
CEAL: Contribuição Especial sobre o Alojamento Local (Portuguese for "Additional Tax for Short-Term Rentals")
DL: Decreto-Lei (Portuguese for "Decree-Law")
DMA: Digital Markets Act
DSA: Digital Services Act
EFSA: European Food Safety Authority
ESG: Environmental, Social, and Governance
GFL: General Food Law
HHI: Herfindahl-Hirschman Index
IMT: Instituto da Mobilidade e dos Transportes (Portuguese for "Institute for Mobility and Transport")
KPIs: Key Performance Indicators
KSFs: Key Strategic Factors
MBV: Market-Based View
OER: Operating Expense Ratio
RBV: Resource-Based View
VAT: Value-Added Tax

Introduction

The emergence of digital technologies has reshaped the competitive landscapes across industries, changing the market structure and business practices of companies alike (Sambamurthy et al., 2003; Siebel, 2019; Yoo et al., 2010).

This shift has required a re-evaluation of the established theories of market competition and business strategy, pioneered by scholars such as Barney (2001), Porter (1991), Schumpeter (1939) and Wernerfelt (1984). Increasingly, this re-assessment recognises digital platforms as forming a distinct domain in themselves, characterized with new proposed competitive drivers, such as multihoming and network effects (Cennamo, 2016; Parker et al., 2016).

These new research perspectives, however, often overlook the inherent diversity within digital platforms. This tendency to categorize platforms uniformly overlooks the fact that digital platforms constitute a highly heterogeneous group of companies, each marked by unique characteristics and competitive dynamics, with several authors attempting to understand digital platforms through specific lenses (Boudreau & Lakhani, 2011), suggesting that a "one-size-fits-all" approach might not capture the nuanced nature of competition.

As such, there is a need for research into how the distinct features prevalent among various digital platform sectors shape competition (Asadullah et al., 2018). A research gap exists in understanding the key factors that drive competition within different sectors of digital platforms, as it requires an approach that acknowledges the distinct characteristics of each sector within the digital platform ecosystem.

This leads us to the main research question: “How different factors affect competitiveness across digital platforms?”, which opens up two interrelated questions: “What factors impact firms competitiveness?” and “Which factors specifically affect competitiveness within different sectors of digital platforms?” By segmenting this analysis, we aim to understand the complex ways competitiveness works in the digital world, as these “new sociotechnical artefacts” have altered the paradigm of business, needing further research in this area (de Reuver et al., 2018).

Following the identification of our research questions, the structure of this study is organized into three sections: literature review, methodology and analysis and discussion. Through the literature review, we aim to identify key factors influencing competitiveness as highlighted by previous studies, setting a foundation for further examination of how these factors apply to digital platforms. We aim to test these factors against different sectors of digital platforms and conclude with a discussion on the findings derived from our analysis.

1. Literature Review

1.1 Competitive Strategy Frameworks in the Digital Age

Understanding a firm's sources of competitive advantage is a central theme in the field of strategic management (Hoskisson, 1999). This field studies organizational performance, namely the variables (factors) for achieving competitive advantage and strategic choice (Wang, 2014). Porter (1985) has stated that competitive advantage is integral to a firm's superior performance.

Currently, in the field of strategic management, there are two dominant theories that explain competitive advantage: the Market-Based View (MBV) and the Resource-Based View (RBV). RBV has led to the emergence of related frameworks such as the knowledge-based view and the capability-based view of strategy (Wang, 2014), also known as theory of dynamic capabilities. Moreover, other frameworks, like Schumpeter's theory of economic development and the Network-Centric View, have also offered insights into the sources of competitive advantage (Wong & Andersen, 2013).

However, the rapid evolution of digitization has led to a reassessment of the conventional strategic theories. Although MBV, RBV, and dynamic capabilities offer frameworks for understanding competitive advantage, the digital transformation has highlighted limitations in these models (T. Koch & Windsperger, 2017).

The increased influence of digital platforms in business settings has provoked a surge of academic interest (Shree et al., 2021), attracting researchers from fields such as economics, information technology, and information systems aiming to analyse its effects on theoretical and more practical domains (Hein et al., 2020).

Prior to analysing the effects of these platforms in the competitiveness landscape, it is crucial to establish an understanding of what constitutes digital platforms. Digital platforms, as emphasized by several authors such Kenney & Zysman (2019) and Koch et al. (2022) can have multiple definitions.

The academic discourse on digital platforms can be divided into two main views (de Reuver et al., 2018; Hein et al., 2020). On the one hand, researchers, especially from the fields of information systems, adopt a more technical view, focusing on the elements and processes that lay the technological groundwork for a platform (Asadullah et al., 2018).

According to the technical perspective, a digital platform can be described as an "extensible codebase of a software-based system" that serves as a technical core, providing essential functionality. This core is augmented and supplemented by "peripheral third-party derivatives" and interoperable modular services, creating an integrated ecosystem through which various interfaces and components interact (Blaschke et al., 2019; Tiwana et al., 2010).

On the other hand, studies that chose a non-technical view, especially from the economics and business backgrounds, describe platforms with a market-based view, taking into account how the platforms operate its ecosystem (Hein et al., 2020). This perspective describes the platforms as either multi-sided, as defined by Rochet & Tirole (2006), or one-sided markets, as it is the case of social media (Derave et al., 2021).

Multiple-sided markets refer to environments that act as intermediaries between end-users (from B2B and B2C to C2C) on multiple sides facilitating a range of transactions, aiming to attract both sides by appropriately benefiting each, while aiming to be financially sustainable (Rochet & Tirole, 2003, 2006). These user groups are connected due to shared reliance and dependence on each other or formal contracting. (Tan et al., 2015). In a one-sided market platform, one cannot identify distinct groups of users with different preferences; instead, the

platform serves a homogenous set of users, and any network effects that occur are direct rather than indirect (D. S. Evans et al., 2014).

For the purpose of our analysis, we adopted the non-technical definition of digital platforms. Nevertheless, it is still crucial to distinguish how digital platforms differ from traditional platforms that operate in a non-digital environment.

Non-digital platforms, often described as pipeline businesses, operate within a linear value chain where value creation and transfer are done in a step-by-step manner, such as the case of newspapers that connect subscribers with advertisers (Parker et al., 2016; Van Alstyne et al., 2016). In this model, value flows in a straight line from the inputs of the producer into the output delivered to the consumer, often managed by gatekeepers like editors or managers (Parker et al., 2016). These platforms operate in a tangible physical space, with the need of physical infrastructure and assets, focusing on resource control and internal optimization (Van Alstyne et al., 2016).

Digital platforms transform a linear value chain into a complex matrix of relationships (non-linear system) between users and the platform itself, enabling the exchange and cocreation of value through interactions facilitated by the platform's resources (Parker et al., 2016). In essence, these digital platforms serve as a hub around which companies and users can innovate and gain value far more effectively than without the presence of the platform (Teece, 2018b).

1.2. The Characteristics of Digital Platforms

The digital economy includes different groups of autonomous agents, also known as complementors, such as external producers and consumers, in the process of cocreating value, contributing to the digital platform's overall value

proposition (Hein et al., 2020). Therefore, these platforms create value not by owning resources but by orchestrating them as externally oriented platforms. (Van Alstyne et al., 2016).

The aforementioned process, managed by the platform, aims to connect, and mediate various groups within a unified ecosystem that comprises both the platform and the complementors (de Reuver et al., 2018; Hein et al., 2018). The viability of digital ecosystems is influenced by both the complementarity and competition among its players (Cozzolino et al., 2021).

Complementarity is the basis of an ecosystem as it creates a mutually beneficial relationship between the platform owner and its autonomous agents (Ceccagnoli et al., 2012). There can be two types of complementarities – unique and supermodular (Jacobides et al., 2018). In unique complementarity, both the platform and its user groups need each other to work at their best (Hart & Moore, 1990), such as the restaurants and delivery apps. In supermodular complementarity, as one grows or improves, it increases the value or effectiveness of the other (Milgrom & Roberts, 1990), as it is the case of add-ins.

Yet, this complementarity comes at a cost, as these agents may also find themselves competing between themselves and with the platform for market share. This competition not only weakens their competitive standing compared to the platform which control the ecosystem but also affects their ability to capture value effectively (Cozzolino et al., 2021; Gawer & Cusumano, 2002).

To mitigate these complexities, platforms provide coordinating mechanisms, rules, intellectual property, and financial capital, creating a structure to the market or ecosystem they aim to build (Teece, 2018b). Platform governance, as it is defined, takes into account central considerations including the division of decision-making rights between platform owners and third-party developers, the types of control mechanisms employed, and the incentive structures in place (Evans & Schmalensee, 2005; Tiwana, 2013)

Platforms also use various monetization strategies to secure their economic interests while balancing those of other stakeholders (K. J. Boudreau & Hagiu, 2008). This often involves creating targeted incentives for specific groups, leveraging network effects (Parker et al., 2016).

Additionally, platforms recognize that external agents only choose to remain on the platform if it lowers the distribution, transaction, and search costs incurred when they interact with each other (Pagani, 2013). In particular, platforms serve the functions of reducing search costs for users, which are incurred before the interaction to find the best partners, and shared transaction costs, which are incurred during the interactions themselves (Hagiu, 2007). These reduced costs directly contribute to enhancing the platform's overall value proposition for its users, effectively increasing the likelihood of their retention (Duch-Brown, 2017).

For the platform itself, its cost structure makes it unique when compared with other business models (Jullien, 2005). In particular, the marginal cost for providing services, such as reproduction and delivery of the service, is often negligible or even zero (Choi et al., 1997). However, digital platforms do face significant fixed costs, primarily due to software development and the overall implementation of the platform (Köthenbürger, 2020).

Moreover, digital platforms offer various advantages, enabling a faster market shift towards this model (Edelman, 2014). Digital platforms can scale more efficiently by eliminating traditional gatekeepers, through programmability, and create shorter feedback loops, through data homogenization (Parker et al., 2016; Yoo et al., 2010).

They also unlock new sources of value creation and supply by harnessing contributions from the community, changing the nature of supply to include the idle resources of users, who without the assistance of a platform intermediary would be inaccessible to the users (Parker et al., 2016). This so-called "shared economy" where participants co-create value by shifting roles between

consumers and producers showcases the differences of the value creation when compared against traditional businesses that have high fixed costs (Ritter & Schanz, 2019).

1.3. The Digital Platforms as a Heterogeneous Group

Although the terminology mentioned in the previous chapter captures the basic definition and characteristics of digital platforms, it is insufficient for fully incorporating their complex landscape, given the vast array of types that exist today (Asadullah et al., 2018). As such, and to better understand digital platforms, different categorizations are going to be presented in the following table.

Categorization	Types of Categories	Definition
Market Sides	One-Sided Market Multiple-Sided Market	Market sides represent distinct groups of agents, who derive value from engaging with agents from the other groups (Armstrong & Wright, 2007).
Governance Mode	Opened Closed	Ability of using, developing, and commercializing the platforms, as well as the ability to dictate how everything within is used, developed, or commercialized (Boudreau, 2010).
Degree of Centralization	Centralized Decentralized	In a centralized platform, the software takes a leading role in facilitating interactions between participants, automating much of the process including matching, payment handling, and task completion. In a decentralized platform, the mediator's role is reduced to possibly just simple matchmaking (Sutherland & Jarrahi, 2018).
Offering Orientation	Product Oriented Use Oriented Result Oriented	Product-oriented models focus on selling tangible products, use-oriented models sell the use of a product while retaining ownership, and result-oriented models sell an outcome without specifying the product used (Ritter & Schanz, 2019).
Types of Agents Involved	B2B B2C Others…	Nature of the participants involved in the transaction (platform), as mentioned by Katić (2003)
Interaction Mode	Collaborative Competitive	Method in which external contributors participate in the platform (Boudreau & Lakhani, 2011)

Table 1: Categorization Framework of Digital Platforms

It's worth noting that the study of platform classification hasn't been as rigorous as other aspects of these markets, as these classifications have often been constructed based on the specific objectives of individual research projects (Sanchez-Cartas & León, 2021). Therefore, these categorizations can overlap over the categorizations of renowned authors such as the following ones:

- Cusumano et al. (2019) have proposed a typology of platforms that classifies them based on how they generate value: transaction platforms, which facilitate interactions and data transmission between users and providers; innovation platforms, serving as technological foundations for development of complementary products or services; and hybrid platforms (Gawer, 2022). This categorization is related to the degree of centralization and the platform's governance mode.
- Boudreau & Lakhani (2011), distinguish between platforms based on the level of control exerted over external innovators and customers. This categorization is also related to the degree of centralization and the platform's governance mode.

1.4. Competitive Strategy Frameworks in the Digital Age

1.4.1 Market-Based View

Starting with one of the major theories of competitive strategy, Market Based View proposes that the positioning of the firm in the markets is the principal determinants of a firm's performance (McGee, 2015). One of its most famous frameworks is Porter's Five Forces Model, which identifies that industry structure incorporates five competitive forces that collectively determine the intensity of competition and attractiveness in a given industry (Porter, 1991; Wang, 2014).

The Five Forces are the supplier and the buyer bargaining powers, the threat of new entrants, the threat of substitute products or services, and the rivalry among existing competitors (Porter, 1980). With increased competition, a greater number of substitutes, lower entry barriers and heightened bargaining power of customers and suppliers, the likelihood for a firm to be profitable decreases.

When choosing their core strategies, firms select a generic strategy that is well-aligned with the industry forces, by investing and positioning themselves to counteract competitive pressures from others that push down on economic returns (Porter, 2008). Porter (1985) also implies delivering more value compared to competitors through ensuring that the strategy relies on an effectively company's value chain. The company's value chain is a collection of all the firm's activities that contribute to the final value of the product or service offered.

For Porter (1980) there are three generic strategies that firms can adopt. Firms employing a cost leadership strategy aim to minimize costs in their value chain while maintaining quality. Differentiation strategy focuses on enhancing product features, brand recognition, and customer service, often justifying higher prices. A focus strategy tailors value chain activities to a specific niche market, meeting unique needs and preferences.

Therefore, maintaining the alignment of a company's chosen generic strategy with its value chain activities is crucial since the success of a generic strategy depends on how effectively the firm configures and coordinates its value chain activities to address industry forces, particularly in the digital economy where there is an added significance due to its specific industry structure (Porter, 1985, 1991, 2001).

For Porter (2001), the particular structure of the industry of the Internet means overall increased competition due to reduced entry barriers, as the need for physical assets and proprietary applications lessens, increased consumer bargaining power through reduced switching costs, and intensified rivalry

between competitors as the focus shifts to price competition and a wider geographic market.

However, several authors raise several criticisms of Porter's Five Forces model. The model is criticized for its lack of guidance on strategic implementation, without providing actionable steps for firms (Grundy, 2006) and ignoring the consequences of complements in a certain industry (Magretta, 2011). Another main criticism refers to the fact that the static nature of the model, offering a snapshot of an industry but lacking the adaptability needed, particularly in sustaining competitive advantage (Barney, 2001).

1.4.2 Resource-Based View

Alternative theories provide explanations to some of the flaws of the Market-Based View, such as the Resource-Based View (RBV), that tackles the importance of sustaining competitive advantage through leveraging internal resources and capabilities (Goyal, 2021). The RBV has become one of the most important topics in strategic management, through integrating organizational theory into strategic analysis (Furrer et al., 2008).

The RBV originated from the work of Penrose (Rugman & Verbeke, 2002), which highlighted the interactions between a firm's resources and its management's experience, acknowledging that the deployment of these resources is both the main promoter and the main barrier to a firm's growth (Penrose, 1959), rather than industry structure. RBV introduced the idea that firms should be perceived as aggregations of resources rather than just entities that produce goods or services and that organizational resources are central to driving strategic decisions regarding sustained competitive advantage (J. B. Barney, 2001; Wernerfelt, 1984).

RBV provides an explanation of why companies differ in competitive performance, attributing this primarily to the heterogeneity of their resources,

since it enables firms to access and control superior resources, which are not available to others, thus cementing a sustained competitive advantage (Helfat & Peteraf, 2003; Peteraf, 1993). It also takes into account attributes such as resource immobility that may create persistence in differences in resources allocation (Peteraf, 1993).

(Barney, 1991, 1995) proposes that a firm's resources need to be valuable, rare, inimitable, and organized within the firm in order to sustain a competitive advantage. As such, these resources must firstly be valuable – crucial in exploiting opportunities and neutralizing threats; rare – as ubiquity erodes competitive value; inimitable – protected by unique certain conditions; and organized – as an organized firm optimizes these resources to improve its market position, turning inherent capabilities into actual advantages. Such resources must not only aid in facing external challenges but also remain exclusive to the firm to prevent emulation by competitors. To secure a competitive advantage, firms must align their resource investment with strategic deployment, ensuring both actions are coherently executed to maximize performance (Sirmon & Hitt, 2009).

RBV incorporates the dynamic aspect of path dependency, acknowledging the influence of a firm's historical decisions and resources on its current strategic direction, thereby stressing that resources should be seen as evolving assets (Barney, 2001). Intangible assets, such as intellectual capital, branding, and organizational competencies, are particularly dynamic due to their path dependency and their social complexity (Ray et al., 2004). As such, for several authors a firm's competitive advantage is more likely to be reliant on intangible resources rather than tangible assets (Hitt et al., 2006; Wong & Andersen, 2013).

Furthermore, although altering a firm's resources is challenging, restructuring its procedures can enhance the deployment of resources and induce competitive advantage (Ray et al., 2004). Recent work has been extending Barney's RBV

theory namely regarding the necessity to consider managerial decision and the importance of managing resources controlled by a firm (Hitt et al., 2016).
However, the evolution of the RBV underscores that an organization's strengths extend beyond its resources. The capabilities of a firm, forged through its resources, are not only necessary in shaping its strategic identity but also serve as the drivers of sustained competitive advantage and profitability (Grant, 1991). Therefore, RBV should also incorporate its capabilities, highlighting its vital role in strategic outcomes (Henderson & Cockburn, 1994).

1.4.3 Dynamic Capabilities

The original definition of dynamic capabilities, described by Teece et al. (1997), define these capabilities as a firm's aptitude for reconfiguring competences to quickly adapt to market shifts, thereby achieving innovative forms of competitive advantage. This definition was further expanded by Eisenhardt & Martin (2000) to include the capability of changing the environment.

Chandler & Hikino (1990) propose that competition and growth involve dynamic capabilities, largely due to the impacts of innovation and the shifts in market dynamics. This phenomenon has been ongoing since the Industrial Revolution, with the development of the modern industrial firm. As such, for these authors, competitive advantage of firms stems from dynamic capabilities from within a company to adapt to changes in the market (Grant, 1996; Teece et al., 1997).

Several divisions of capabilities have been conceptualized in the field, including the distinction between "operational" and "dynamic" capabilities as proposed by (Helfat & Peteraf, 2003), explaining that operational capabilities are the ones which are critical for day-to-day functions, similar to "ordinary capabilities" in Teece's hierarchical framework, which categorizes capabilities into different levels. Higher up in Teece's theory, low level dynamic capabilities

or “microfoundations” involve specific routines for adapting and reconfiguring resources (Teece, 2007). Finally, high level dynamic capabilities include sensing market changes, seizing opportunities, and reconfiguring organizational strategy (Teece, 2018a).

As such, the essence of dynamic capabilities theory lies in the necessity for companies to develop adaptive processes and structures in order to facilitating the sensing, seizing, and adapting to a constantly changing competitive landscape (Felin & Powell, 2016). These characteristics are unique to each organization, deeply ingrained in its culture and history and are not readily replicable or purchasable (Teece, 2023).

Although the digital economy's growth has led to dynamic and destabilizing environments, provoking a focus on developing dynamic capabilities in organizations (Eisenhardt et al., 2010), these models consistently view digitization as a hyper-dynamic condition that requires organizations to provide responsive solutions (Koch & Windsperger, 2017).

1.4.4 The Era of the Internet

The role of information technologies in these models is often seen merely as enablers of organizational capabilities or as capabilities in themselves, rather than being integrated into the business strategy (Koch & Windsperger, 2017). As such, scholars have presented the need for new strategic frameworks that effectively harness digital technology's unique capabilities for competitive advantage, particularly in the rapidly evolving digital economy (Yoo et al., 2010).

A network-centric view emerges as a viable solution to the problem of integrating digital technologies into business strategy, since it focuses on relationships and interdependencies within a network of actors, rather than on individual attributes (Borgatti, 2003). It offers a perspective where firms' behaviours are understood through structural constraints in a network, since

business strategies must align with the broader network's dynamics and capabilities, vital for achieving competitive advantage in an increasingly digitalized world (Economides, 1996).

Indirect (or cross-sided) network effects are especially crucial to the value and growth mechanisms of digital two-sided platforms (Hinz et al., 2020). The value that a user derives from a platform comes from the derived utility for each participant, determined by the overall number of users on the other side of the platform (Armstrong, 2006; Katz & Shapiro, 1985; Vogelsang, 2010). As platforms recognize that different users are affected differently by network effects, they use different pricing models and subsidies to one group of users to encourage them to use the platform (Armstrong, 2006; Rochet & Tirole, 2003).

These platforms can expand their offerings and reach a wider audience, leading to lower average costs, thanks to economies of scale and scope (Koch et al., 2022; Müller, 2019). This is also achieved, according to some authors, through the platform's "openness", as granting some access or giving up partial control over it boosts the platform ecosystem, essential for enabling its use and commercialization (Boudreau, 2010; Schreieck et al., 2016).

The market structure of a digital ecosystem is also influenced by the phenomenon of multi-homing, a practice where autonomous agents (being it, platform complements or end-users) engage with multiple platforms concurrently. Sellers often multi-home to broaden their market and reducing risks associated with dependency on a single platform (Constantinides et al., 2018). Multi-homing can also result from horizontal differentiation from the customer side, as consumers find different attributes of competing platforms attractive, receiving the benefits of network externalities in an environment of non-interconnected platforms (Evans & Schmalensee, 2005; Rochet & Tirole, 2006).

Besides the previous mentioned strategics factors, authors such as Cusumano et al. (2019) and Parker et al. (2016) consider factors such as a lack of niche specialization and substantial entry barriers as relevant factors that influence digital platforms, discouraging new competitors from entering the market, further securing the status quo. These market disruptions may involve "unfair" trading practices, which include imposing unfair conditions, altering market access, favouring own services, inserting "parity" clauses, and lacking transparency (Duch-Brown, 2017).

The evolving paradigm of digital platforms suggest that research should adapt to and expand upon our current understandings of these complex ecosystems (Madanaguli et al., 2023). The literature review highlights the diversity and complexity of digital platforms, identifying different sources of competitive strategy but it doesn't provide insights regarding an understanding of how these frameworks of competitive advantage function within specific digital sectors.

The identified research gap underscores the need of an examination of the main sources of competitiveness regarding digital platforms through a sector-specific lens. Therefore, this research has shifted towards examining the factors that determine the competitive environment within different sectors of digital platforms, to seek unique competitive elements, taking into account its specific characteristics.

2. Methodology

2.1 Research Method

This thesis adopts a mixed-methods approach to investigate the factors influencing competitiveness across digital platforms. A mixed methods approach involves the gathering and analysis of qualitative and quantitative data within the same research, aiming to consolidate the evidence in order to produce deductions and conclusions (Tashakkori & Creswell, 2007).

Through the incorporation of induction (from qualitative methods) and deduction (from quantitative methods) (Edmonds & Kennedy, 2016), the mixed-methods research design has helped with the understanding of the dimensions of competitiveness that either method alone might miss.

Specifically, in this study, we have adopted a fixed mixed-methods approach, due to the varied types of data collection regarding sources of competitiveness across digital platforms, where some factors are inherently quantitative—such as economies of scale, which can be measured across companies financials—and others are qualitative, such as "governmental regulations", that are not objectively measured.

A fixed approach involves the predetermined integration of qualitative and quantitative methods within the study, ensuring a structured analysis of both quantifiable metrics and nuanced perspectives (Creswell & Clark, 2017). By treating both methods with the same importance, we maintain their independence throughout the analysis phase, with the main objective of obtaining "different but complementary data on the same topic" (Morse, 1991).

Within the most relevant mixed methods designs we have chosen to implement a convergent parallel design, which involves carrying out

quantitative and qualitative data collections simultaneously during the same phase of our study (Creswell & Clark, 2017). Following this, we intend to interpretate the findings, comparing the insights gathered from each method (Schoonenboom & Johnson, 2017). The specific stage of integration of both data types into a coherent framework will occur during the data analysis phase through the construction of a competitive analysis matrix.

2.2 Hypothesis Framework

The central question guiding this research is: "How different factors affect competitiveness across digital platforms?", since as mentioned before the goal is to apply a sector-lens through the competitiveness factors behind the digital ecosystem. By examining these influences, the research aims to construct an understanding of the elements that may contribute to the success or failure of digital platforms, while taking into account the distinct sectors of each platform.

The study further elaborates upon it through two sub-questions: (1) What factors impact firms competitiveness? (2) Which factors specifically affect competitiveness within different sectors of digital platforms? The first sub-question aims to identify the main competitive elements that are widely recognized in both strategic management and information systems literature. The second sub-question builds on this foundation by taking into account the variety of these competitive factors in distinct sectors of the digital platform market, such as social media and e-commerce. We intend to understand the impact of such drivers of competitiveness in each sector, providing an understanding of the competitive dynamics that characterise different segments of the digital platform landscape.

The decision to choose a sector-specific analysis comes from the objective to examine digital platforms within specific categorizations, inspired in studies by Armstrong & Wright (2007), Evans et al. (2014), and Asadullah et al. (2018). This analysis seeks to make a connection between certain digital platform categorizations and the factors that drive competitive advantage. As such, we have proposed the following hypothesis:

Hypothesis: Competitive dynamics vary significantly across different sectors within the digital platform economy.

This hypothesis showcases our anticipation that the competitive landscape within the digital platform economy is influenced by the distinct key strategic factors unique to each sector, advocating for an industry-focused analysis that considers different key strategic factors that define competitiveness within different sectors of the digital ecosystem.

2.3 Data Collection Method

In the process of data collection for this study, a decision was made to rely on secondary data sources, incorporating a wide array of materials, including research papers, companies websites and industry analysis. Specifically, this includes analysis of reports and financial statements of chosen companies, in order to gather quantitative data, as well as industry analyses and other third-party data, that provided the necessary information to the analysis, enabling a review of the digital platform ecosystem.

The use of secondary data offers advantages, such as cost-effectiveness and the ability to access a wide range of historical and current data across different contexts and geographies (Vartanian, 2010). This information is necessary for analysing trends over time and conducting comparative studies across various

digital platform markets. However, relying on secondary data also introduces certain disadvantages, including potential issues with data accuracy, relevance, and the possibility that the data collection methods employed originally may not align precisely with the specific aims of this thesis (Church, 2002). To ensure a high level of relevance and accuracy, data sources were selected based on a set of predefined criteria, such as recency and credibility of information, and are outlined in section 2.4.3, in Table 4.

2.4 Implementation Methodology

The research has been divided into five separate phases: (1) Selection of theories of competitive advantage; (2) Selection of industry sectors; (3) Selection of relevant variables; (4) Data Collection; (5) Discussion, in which parts four and five will be presented in a chapter of its own.

2.4.1 Selection of Theories of Competitive Advantage

The initial phase of this research involved the development of a theoretical framework (Table 2) to identify the key sources of competitive advantage from existing literature, which has been defined in the literature review and expanded upon. Key literature from sources such as JSTOR, ScienceDirect, and Google Scholar provided a broad base of knowledge.

Source of Competitiveness	Selected Key Strategic Factors	Adjacent Competitive Strategy Theories	Selected Key Literature
Industry structure and firm's market position	Customer and Supplier Bargaining Power Governmental Regulation Substitute Products Product Differentiation	Market-Based View Structure-Conduct-Performance Five Forces Framework	Porter (1980, 1991, 2001, 2008), Bain (1968), Scherer & Ross (1980)
Firm's internal resources and capabilities	VRIO Resources Dominant Brands Unique Institutionalised Competencies	Resource-Based View Knowledge-Based View Core Competencies	Penrose (1959), Barney (1991, 1995, 2001), Wernerfelt (1984),
Firm's adaptability to market change	Flexibility and agility Management of paradoxes and conflicting priorities	Dynamic Capabilities	Chandler & Hikino (1990), Grant (1996), Teece et al. (1997, 2007, 2018a, 2023)
Innovation Dynamics	First mover advantage Proprietary Technology Product Deployment	Transient Advantage Disruptive Innovation Schumpeter's Theory of Economic Development	Schumpeter (1939, 1943), Leontief (1953), Nelson & Winter (1982)
Integrated Networks	Network Effects Multihoming Switching costs Complementaries	Network Centric View Relational View Ecosystem Strategy	Katz and Shapiro, 1985, Borgatti (2003), Rochet and Tirole (2003) Economides (1996)
Operational Cost Efficiency	Economies of Scale Economies of Scope Operational Efficiency ESG Risk	Transaction Cost Economics Resource Orchestration	Coase (1937), Williamson (1975, 1983), Moro-Visconti, (2022)

Table 2: Competitive Strategy Framework: Sources of Competitiveness and Strategic Factors

In constructing the framework, adjacent competitive strategy theories were arranged into categories that represent distinct sources of competitiveness. Six sources of competitiveness have been identified:

1. "Industry Structure and Firm's Market Position",
2. "Firm's internal resources and capabilities",
3. "Firm's adaptability to market change",
4. "Innovation Dynamics",
5. "Integrated Networks" and
6. "Operational Cost Efficiency".

For each source of competitiveness, and taking into account, their adjacent strategic theories, we have highlighted some of the key strategic factors (KSFs) related to each theory. These KSFs can be defined as the elements within a firm

or related to its broader industry that play a key role in shaping competitive advantage. These factors are identified within the literature and are crucial across various industries, not only in the digital landscape. Consequently, with the framework in Table 2, the research addresses its first sub-question: “What factors impact firms competitiveness?”

However, the scope of this analysis introduces certain limitations regarding the extent at which some key strategic factors (KSFs) can be analysed, due to its perspective being at the industry-level. Specifically, our industry-centric approach excludes two critical sources of competitiveness: "Firm's internal resources and capabilities" and "Firm's adaptability to market dynamics." These dimensions, by their very nature, consist in attributes at the individual-level and do not provide generalizations across an industry or sector. As a consequence, the KSFs related to these sources—such as VRIO resources or the operational/dynamic capabilities—are beyond the reach of our sector-wide lens. Instead, our focus remains on the sources of competitiveness that can be applied and analysed across sectors.

2.4.2 Selection of Industry Sectors

The second step of our research involves selecting which sectors within the digital platform economy to analyse. This decision is primarily guided by the definition of digital platforms presented in the literature review, showcasing them as one/multi-sided markets, which excludes single-application software like SAP ERP from our scope. Instead, our focus is on platforms that facilitate direct interactions between user groups. The following are the chosen industries, in which our study will focus on: (1) Social media; (2) Dating services; (3) Ride-sharing; (4) Accommodation services; (5) Food delivery; (6) Online marketplaces. These sectors were chosen because they incorporate the characteristics of digital

platforms, serving as prime examples of one/multi-sided markets where firms operate.

The next step involved identifying the companies within these sectors to be evaluated for most of the key strategic factors, specifically those related to Innovation Dynamics and Operational Cost Efficiency. The criterion for selecting these companies is detailed in Appendix I, in which we prioritized the 9/10 largest digital platforms by the number of downloads from Google Play Store, further categorized based on data availability. Preference was given to public companies or those that are subsidiaries of a larger public company with a primary business focus in the relevant sector, such as it is the case of PedidosYa and Foodpanda in the food delivery sector, which are part of the Delivery Hero group (see Appendix I). In instances where a platform is part of a larger public company, the analysis was extended to the parent company due to limits on data availability of the respective subsidiary. The specific companies analysed, following this criterion, are listed in Table 3.

Industries	**Analysed Companies**
Social Media	Meta Platforms, Snap, Reddit, Pinterest
Dating Services	Match Group, Bumble, Spark Networks
Ride-Sharing	DiDi Chuxing, Lyft
Accommodation Services	Booking, Airbnb, Tripadvisor, Expedia
Food Delivery	Zomato, Delivery Hero, Deliveroo, Doordash
Online Marketplace	Wish, Amazon, Mercado Libre, eBay

Table 3: Selected Digital Platform Industries and Companies

2.4.3 Selection of Relevant Variables

In order to answer the second sub-question, we have selected specific variables that correspond to the chosen key strategic factor (KSF) linked to the four selected sources of competitiveness that are going to be analysed: “Industry Structure and Firm’s Market Position”, “Innovation Dynamics”, “Integrated Networks” and “Operational Cost Efficiency”. These variables have been chosen since they evaluate the relative impact of each KSF within particular sectors, aiming to quantify its influence where possible.

Variables for this analysis are either key performance indicators (KPIs) where quantifiable metrics are available or have been formed through a more qualitative form of assessment when numerical data is not accessible or relevant.

Where such KPIs can be determined, they have been chosen in order to provide a measurable assessment of the strategic factors, in a way that can offer conclusive evidence for the analysis in the subsequent steps. In instances where KPIs are not applicable, due to the absence of data or the qualitative nature of the strategic factor, the study has implemented qualitative analysis methods.

The table is structured into four columns: “Source of Competitiveness”, “Key Strategic Factors”, “Variables”, which details the metrics used to quantify the impact of these factors, and “Data Source”, which provides the sources in which the analysis was based. As mentioned before, the research incorporates both quantitative and qualitative measures in order to capture a more complete view using data available online. For instance, we include quantitative data such as “Number of Patents” and “Average Cost per User”. For elements like “Network Effects” and ”Supplier Bargaining Power”; where direct KPIs are less tangible, we applied a standard qualitative assessment method to consistently evaluate each industries performance in these areas.

Source of Competitiveness	Key Strategic Factors	Variable	Data Source
Industry structure and firm's market position	Customer Bargaining Power	Adapted HHI	*Data from Semrush and AndroidRank*
Industry structure and firm's market position	Supplier Bargaining Power	Qualitative method	*Industry reports, newspapers and similar*
Industry structure and firm's market position	Governmental Regulations	Qualitative method	*Official legislation and industry reports*
Innovation Dynamics	Proprietary Technology	Number of Patents	*Patent Public Search Basic and Crunchbase*
Innovation Dynamics	Product Deployment	App Update Frequency	*Uptodown and Statista*
Integrated Networks	Network Effects	Qualitative method	*According to the definition of Katz & Shapiro (1994)*
Integrated Networks	Complementaries	Qualitative method	*Official Developer Documentation, Github, Company API Portals*
Operational Cost Efficiency	Economies of Scale	Average Cost per User (in last four years)	*Official companies reports and data aggregators*
Operational Cost Efficiency	Operational Efficiency	Operating Expense Ratio	*Financials from Yahoo Finance*
Operational Cost Efficiency	ESG Risk	ESG Risk Rating	*Sustainalytics*

Table 4: Relevant Chosen KSFs and Variables Table

3. Analysis and Discussion

3.1. Data Collection

3.1.1 Industry Structure and Firm's Market Position

Within the source of competitiveness "Industry structure and firm's market position," we analysed three widely recognized strategic factors in the literature: Customer Bargaining Power, Supplier Bargaining Power and Regulatory Pressure.

Beginning with "Customer Bargaining Power", which can be defined as the capacity of customers to impact the profitability and overall health of companies (Pecotich et al., 1999), as well as their role in influencing strategic decisions through preferences and behaviours, we have employed an adapted version of the Herfindahl-Hirschman Index. The HHI measures the degree of ownership concentration among market actors within a specific market (Yang et al., 2000)

This modified Herfindahl-Hirschman Index (HHI*) is adapted in the sense it evaluates the concentration within digital markets based on download activity among the top ten companies of each sector. The HHI* serves to indirectly reveal insights into customer bargaining power, as in these selected platforms the main market target is individual consumers around the world rather than organizational buyers, traditional metrics such as the Buyer Concentration Ratio become less pertinent.

Regarding "Supplier Bargaining Power", we have adopted a more qualitative approach due to the limited availability of quantitative data regarding supplier concentration. This methodology, similar to the framework proposed by Purbasari et al. (2020), focus in identifying key suppliers across sectors and

evaluating their influence based on a set of defined criteria: Influence on Prices & Quality, Supply Availability, and Market Structure.

We categorized suppliers into two groups: "Support Suppliers" and "Unique Value-Adding Suppliers". Support Suppliers provide essential services that support the operations of all industries, which include the firm infrastructure and technology (Porter, 1985). On the other hand, Unique Value-Adding Suppliers are specific to their industries and have a significant influence on industry operations.

The power of Support Suppliers is similar across the digital platforms industries and is lessened by the broad purchasing capabilities of internet-based commerce, as suggested by Porter (2001). In contrast, Unique Value-Adding Suppliers, who are deeply involved in their industries, have a greater influence and its power have been evaluated by looking at their role in pricing strategies, quality control, and the availability of their services, considering the current market structure, which can be competitive or fragmented. The resulting table, based on data from industry-specific reports and journalistic sources, visually represents this analysis.

Industry	**Social Media**	**Online Marketplace**	**Food Delivery**	**Accommodation Services**	**Ride-Sharing**	**Dating Services**
Unique Value-Adding Suppliers	Content creators	Sellers, logistics companies	Restaurants, drivers	Property owners	Drivers	n.a.
Influence on Prices & Quality	Low	High	High	High	Moderate	n.a.
Supply Availability	High	High	Moderate	Moderate	High	n.a.

Conclusion	Supplier Power Analysis	Low	Moderate/Low	Moderate	Moderate	Low

Table 5: Supply Analysis Matrix

Similarly to the KSF "Supplier Bargaining Power", we also measured the influence of "Governmental Regulations" on digital platforms through a qualitative research methodology. Recognising the diversity in regulatory landscapes across different geographical regions, we focused specifically on Portugal and, more broadly, on the European Union, by outlining key legal standards, the role of political institutions specific to various industries, policies related to subsidies, and taxation regulations. This method allows us to categorize the effects that these regulatory frameworks may have on digital platforms. We present these findings in a scale, illustrated in the subsequent table.

Industry	Legal Norms	Industry-Specific Political Institutions	Subsidy Policy	Taxation Rules	Impact
Social Media	DSA, DMA	n.a.	non specific	VAT in ads	High
Online Marketplaces	Electronic Commerce Directive, DAS, DL Nº 24/2014, DL Nº 166/2013	ASAE	non specific	VAT	High
Food Delivery	GFL, DL nº10/2015	ASAE, EFSA	non specific	VAT	Moderate
Accommodation Services	DL n.º 128/2014, DAC7	ASAE, Turismo de Portugal	incentives in certain regions	VAT, Tourism Tax, CEAL	High
Ride-Sharing	Lei n.º 45/2018, DAC7	AMT, IMT	non specific	VAT	High

Dating Services	DSA	n.a.	non specific	VAT in subscriptions	Moderate

Table 6: Governmental Regulation within Portugal by Industry

The subsequent results of the three KSIs for each industry are presented in Section 3.2 – Table 7, where they will be discussed.

3.1.2 Innovation Dynamics

Schumpeter (1943) argues that the essence of competition in capitalism lies significantly in the innovation, including the development of new technologies, organizational methods, and product offerings. Recognizing this, we have opted to focus on two specific strategic factors – "Proprietary technology" and "Product deployment", for this source of competitiveness. Both of these factors are essential for firms aiming to achieve competitive advantage, since economic benefits from innovation are temporary, because they diminish when imitators replicate the success (Fagerberg, 2003). The outcome of the analysis on these factors is present in Appendix III, further aggregate by sector in section 3.2 at table 7.

Starting with "Proprietary Technology", we measured this factor by analysing the number of patents held in the United States of America as of 2024. Patents, as manifestations of proprietary technology, not only reflect in a certain way the company's efforts towards innovation in a public manner but also may have a positive impact on market share, especially when an entity leverages its early entry with such technologies (Coeurderoy & Durand, 2004). We calculated the average of patent holdings for the chosen companies in each industry using data obtained from Patent Public Search Basic, Insights by Greyb and Crunchbase.

Product deployment refers to introduction of products to the market by a company, encompassing both innovative and imitative products (Shinkle &

McCann, 2014). Within the context of digital platforms, actual tangible products do not exist, and consequently, our analysis upon product deployment relies on the frequency of updates to their respective apps, which serve as an indicator of innovation and responsiveness to market demands within these platforms, including the introduction of new features or security patches. To assess this, we collected data regarding the update frequency of applications analysed companys in each industry, sourced from Uptodown.

3.1.3 Integrated Networks

For the analysis of "Integrated Networks" as a source of competitiveness, our analysis centres upon two strategic factors: "Network effects" and "Complementarities".

In regard to "Network effects", we made use of the definition provided by Katz & Shapiro (1994), which determined that these externalities are observed in markets where the value of a product or service to a user increases as the number of users grows. We utilised a qualitative methodology by analysing how these effects manifest across different digital platforms and assess through this definition the impact of this factor into these sectors.

Regarding "complementarities", our approach was also qualitative, examining the openness and extent of the official APIs provided by major companies within each industry. These APIs are necessary as they allow third-party developers to create complementary products and services, which can significantly enhance the platform's value proposition. Data was sourced from official developer documentation for the leading companies. We inferred from this the degree of complementarity within each industry, deducing that industries with more open APIs are likely to have a larger ecosystem of complementary products and services, as APIs serve as a "glue" that enables

external developers to easily connect and build upon the platform (Hilbolling et al., 2020).

3.1.4 Operational Cost Efficiency

In analysing the dimension of "Operational Cost Efficiency," our research focuses on three strategic factors: “Economies of scale”, “Operational efficiency”, and “ESG risk”, whose results can be seen in Appendix II, with the aggregated results by sector seen at table 7, in section 3.2.

Beginning with “Economies of scale”, we utilized the operating expenses and specific unit metrics for prominent companies across various sectors over a three-year span. Operating expenses obtained from annual reports are connected with unit measures, which vary from monthly active users to sales volumes, rendering direct comparison between companies infeasible. To bypass this, elasticity values for the cost per unit in response to changes in units produced are calculated individually for each entity. These values offer insights into the proportional change in the cost per unit given a change in the unit, without needing a homogeneous unit measure across companies.

The calculated elasticity values for each company provide the basis for a qualitative inference regarding the existence of economies of scale, as the observed proportional changes in the cost per unit in response to output variations are indicative of how scaling affects cost efficiency within each entity. The results categorize companies and their respective industries into three classifications: those where patterns indicative of economies of scale are verified, those where such patterns are not evident, and those where the outcome is inconclusive. Using these categories, an attempt was made to assess whether economies of scale were present across the sector.

For operational efficiency, we calculated the average Operating Expense Ratio (OER). This ratio was chosen as it reflects the proportion of a company's revenue

that is consumed by operating expenses, offering insights into the firm's management efficiency. A lower OER is typically indicative of higher efficiency and a more competitive cost structure, as it suggests that the company is able to generate revenue while containing costs.

As such, for this KSF we have calculated the OER margin of the last four year for the companies outlined in Table 3 and averaged the result. With this we obtained the results present in Table 7.

The ESG Risk Rating is the third strategic factor examined, a specific ESG metric, representing the company's exposure to long-term risks arising from environmental, social, and governance (ESG) factors, which are gaining prominence in the field, as seen in Moro-Visconti (2022). These ratings, sourced from Sustainalytics, were averaged for the major companies in each industry. High ESG risk can signal potential for operational disruptions, reputational damage, and increased regulatory scrutiny, all of which can impact a firm's competitive advantage.

3.2. Analysis of Results

With the previous collection of data, we have developed a matrix that measures the influence of KSFs on competitiveness in various sectors of the digital economy, outlined in Table 4. It categorizes the levels of impact into a scale-wide categories to indicate the degree of influence each factor has, which allows for the comparison between different sectors, enabling a more comprehensive examination of competitive dynamics.

Key Strategic Factor	Social Media	Online Marketplace	Food Delivery	Accommodation Services	Ride-Sharing	Dating Services
ESG Risk	High	Mid	Low	Low	Mid	Low
Operational Efficiency	Low	High	Mid	Low	Mid	Low
Economies of Scale	Inconclusive	Inconclusive	Inconclusive	Inconclusive	Inconclusive	Visible
Complementaries	High	High	Mid	High	Mid	Low
Network Effects	High	High	High	High	High	High
Product Deployment	High	High	Low	Mid	Mid	Low
Proprietary Technology	High	High	Low	Low	Low	Low
Governmental Regulations	High	High	Mid	High	High	Mid
Supplier Bargaining Power	Low	Mid	Mid to High	Mid to High	Low	Low
Customer Bargaining Power	Low	Mid	Mid	Low	Mid	Low

Table 7: Competitive Analysis Matrix

With the results from Table 7 we were able to gather insights into the competitive landscape across the chosen digital platform industries, revealing that strategic factors have different impacts within digital platforms, and do not have the same visible impact across all digital platforms.

- **Customer Bargaining Power**

A high level of market concentration, as indicated by the adapted HHI, suggests the presence of a few dominant players, potentially decreasing the influence of customers. With the results presented in Appendix V, we identified that this phenomenon is particularly pronounced in sectors such as social media and accommodation, where there is a notable concentration of market share among leading platforms, including YouTube and Instagram in social media, and Booking.com and Airbnb in accommodation. However, in the ridesharing and food delivery sectors, the power appears to oscillate to a more moderate spectrum, as there are more options in the mark.

- **Supplier Bargaining Power**

Supplier bargaining power exhibits a varied spectrum across digital platforms where the influences of Unique Value-Adding Suppliers is especially noticeable in the Online Marketplaces, Food Delivery, and Accommodation Services sectors, where supplier power is increased by factors such as regional limitations on supply availability and unique operational models, since all of them depend heavily on a network of service providers, such as restaurants and hotels, granting them more influence over the platforms. Social media platforms demonstrate lower bargaining power for suppliers, where content creators, though essential, have less influence over platform policies.

- **Governmental Regulations**

For the regulatory landscape we have identified Accommodation Services and Ride-Sharing as being particularly affected by the influence of government regulations, as both of industries have distinct legal frameworks governing them

both in Portugal and across many European nations. Furthermore, the introduction of the Digital Services Act represents an important point, marking a period of increased regulatory scrutiny for digital platforms especially on social media networks and online marketplace platforms.

- **Proprietary Technology and Product Deployment**

Through the analysis showcased in Appendix III with the results outlined in Table 7, it has become evident that proprietary technology and product deployment are not uniformly significant across all digital platform industries. Social media and online marketplaces emerge as sectors where these factors are highly pronounced, reflecting a landscape where rapid innovation is not just beneficial but critical to retaining competitive edge and user engagement. In sectors where proprietary technology is ranked high, the frequency of product deployment also tends to be high, reinforcing the role of constant innovation in maintaining market leadership. In contrast, the significance of proprietary technology is less pronounced in the accommodation and food delivery services, suggesting that these sectors may rely more on other factors such as supplier exclusivity deals or price discounts than on technology alone.

Likewise, a high rate of product deployment may reflect the fast-paced nature of industries such as social media and online marketplaces. On the other hand, innovation dynamics has a lower impact in dating services, a sector that may not require a high level of innovation when compared to other sectors.

- **Network Effects**

Each of the selected industries exhibits network effects, as one-sided or multi-sided markets, where the size and engagement level of the agents that use the platform significantly contribute to a platform's value, establishing network effects as a key driver of success for established players.

Social media and dating apps, for example, are generally considered one-sided markets with direct network effects, whereby the value of the network grows

with each additional user, though an argument could be made for classifying dating services as two-sided markets, given their facilitation of interactions between distinct user groups.

Online marketplaces, accommodation, and ride-sharing platforms exhibit strong indirect network effects characteristic of two-sided markets. In these cases, the platforms serve distinct user groups – buyers and sellers, guests and hosts, riders and drivers – each group's participation enhances the value for the other. Food delivery platforms present as a three-sided market, involving consumers, delivery personnel, and restaurants, each adding value to the experience of the others.

- **Complementaries**

Regarding complementarities, the findings reveal varying degrees of complementarity across the industries. High levels of complementarity in social media and online marketplaces indicate a wider ecosystem where third-party services and applications can thrive. Accommodation services and food delivery have a more selective approach to complementarities, as these industries offer APIs that provide a balanced mix of openness and control, allowing for a curated set of third-party services (specifically restaurants and property owners) that align with their business models. Dating services demonstrate low complementarity, which suggest a choice to maintain a closed ecosystem.

- **Economies of Scale**

Due to the firm-specific nature of the metrics, many of the industries concluded with indeterminate results regarding the presence of economies of scale on a sectoral level, with the notable exception of dating services. However, this data remains important, as although it is not focus of this thesis, the analysis from a firm-level perspective provides valuable insights. It still suggests, as other KSFs, that strategic factors might not uniformly apply across all digital platforms. Even within the same sector, specific characteristics of individual companies

result in varied impacts, underlining the need for specific strategic approaches rather than "one-size-fits-all" solutions in the digital economy.

- **Operational Efficiency**

The results outlined in Table 7, and based upon the data showed in Appendix II, reveal high operational efficiency in online marketplaces, despite the lack of visible economies of scale, which suggests that platforms can carve out competitive advantages through superior operational practices, independent of the size of their user base. Operational efficiency is particularly pronounced in online marketplaces and ride-sharing services, which may be a significant competitive advantage.

- **ESG Risk**

Finally, with the results that came from Appendix II, we note that ESG risks are higher in social media, which may reflect the intense scrutiny these companies face regarding data privacy, content moderation, and governance practices. On the other hand, food delivery services and dating services exhibit lower ESG risks, possibly due to their operational models which may present fewer ESG concerns.

Through this analysis we identified the impact of selected KPIs into digital platforms, as seen in Table 7, and we came upon the conclusion that the influence of these strategic factors varies across different sectors. This variance suggests that the digital platform ecosystem is at least more sector-specific, challenging the perspective taken by scholars that considered a "one-size-fits-all" approach to understanding competitive dynamics in the digital landscape.

Therefore, the following conclusion aims to summarize the main findings in order to address the research questions proposed at the introduction of this research, with the objective of providing a clearer direction for future research in strategy management.

Conclusion

The present thesis aimed to understand the competitiveness landscape of digital platforms across various sectors, emphasizing the need to understand the impact of strategic factors on their competitiveness. By examining key strategic factors from renowned theories of competitive advantage, this study intended to reveal their distinct impacts across selected sectors, addressing a gap in current research.

In examining the competitive dynamics within the digital landscape, a gap was observed in how digital platform sectors are viewed in strategic management. Traditional theories of competitive advantage, established before the rise of the digital age, have often considered distinct sectors/industries in order to understand the specific competitive advantage of businesses. However, when scholars, such as Porter (2001) and Cusumano et al. (2019), adapted these frameworks to the digital economy, these attempts have often led to broad generalisations of the impact of strategic factors within the digital framework, viewing digital platforms as a single identity, without considering the characteristics of sectors within platforms.

Given the distinctive features of digital platforms, where several categorizations can be made, this study proposes an approach that considers the specific competitive dynamics inherent to each sector. Our hypothesis argues that competitive dynamics could vary significantly across different sectors within the digital platform economy. This challenges the perspective which, although recognizing the influence of certain factors on digital platforms, often underestimates the varying levels of influence exerted by specific factors within different sectors of digital platforms. As such, we aim to refine the understanding

of digital platforms by emphasizing the importance of sector-specific analysis, thus addressing the existing gap in current strategic management practices.

This study involved investigating the impact of selected strategic factors from key theories of competitive advantage on the chosen industries in order to determine whether the hypothesis we asserted hold truth to the central research question and its sub-questions or the strategic factors, in fact, affect digital platforms uniformly, regardless of their sectorial distinctions.

A methodological framework was established to better answer our research questions. It began with identifying which factors are mentioned in the existing literature as impacting firms competitiveness, through a literature review of relevant work in the field, with the objective to answer the first sub-question. In this process, we identified six sources of competitiveness, each related to theories of competitive advantage and associated with some unique strategic factors, although some overlapped among these resources.

To answer the second sub-question, where we took into account, the impact within different sectors of digital platforms, we developed a cross-sector analysis, testing how impactful these factors are across different platforms. It was found that some factors had a stronger influence in certain sectors, while network effects consistently impacted all the sectors studied. These results allowed to draw conclusions on how different factors affect competitiveness across digital platforms and the hypothesis presented.

The findings suggest that KSFs impact differently digital platforms, indicating that there existing theories of competitive advantage cannot be universally applied to all digital platforms. For a company to secure and maintain a competitive advantage, it may need to pursuit several key factors from different sources of competitiveness. The study also recognises network effects as possibly the most consistently influential strategic factor, among the ones studied, across

digital platforms, as it closely aligns with our definition of a digital platform as a one or multiple-sided market.

This research concludes that no studied theory is inherently flawed or without impact within this new landscape, and, instead, a combination of various theories may be essential to understanding the competitive dynamics within these sectors. This is evidenced by the varying impacts of different strategic factors within the same industry, often overlooked by scholars focusing solely on a specific source of competitiveness.

Reflecting on this research's limitations, we acknowledge that the sample size is relatively small, due to the limited availability of public data on companies. The sector-specific focus of this research, while providing insights on sources of competitiveness that focused on a sector-oriented approach, also implies that other sources of competitiveness unique to individual platforms were not addressed, as it was the case with economies of scale. These includes "Firm's internal resources and capabilities", closely linked with the Resource-Based View and "Firm's adaptability to market change", related to theory of dynamic capabilities. These limitations emphasise the need for ongoing research in this area.

Future research should aim to expand the sample size of companies in order to improve the ability to generalize the study's findings, as well as include a broader group of strategic factors, especially those unique to individual firms. Such research is essential for keeping pace with the changing competitive landscape to identify new opportunities for strategic management.

Statement

During the preparation of this work, the author used CHATGPT in order to enhance the quality of the writing. After using this tool, the author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

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Appendix

Appendix I: Criteria for Inclusion of Companies in Analysis

Play Store Rank (*androidrank.com*)	**Industry**	**Platform**	**Type of Platform**	**Included in the Analysis**	**Public Company**
1	Accommodation Services	Booking.com: Hotels & Travel	Subsidiary. Owner is in the field.	Yes	Booking
2	Accommodation Services	Airbnb	Public Company	Yes	Airbnb
3	Accommodation Services	Tripadvisor: Plan & Book Trips	Public Company	Yes	Tripadvisor
4	Accommodation Services	Traveloka: Hotels & Flights	Private Company	No	Not Applicable
5	Accommodation Services	Agoda: Cheap Flights & Hotels	Subsidiary. Owner is in the field.	Yes	Booking
6	Accommodation Services	OYO: Hotel Booking App	Private Company	No	Not Applicable
7	Accommodation Services	Goibibo: Hotel, Flight & Train	Subsidiary. Owner is in the field.	No, due to lack of data	Not Applicable
8	Accommodation Services	trivago: Compare hotel prices	Subsidiary. Owner is in the field.	Yes	Expedia
9	Accommodation Services	Expedia: Hotels, Flights & Car	Subsidiary. Owner is in the field.	Yes	Expedia
1	Dating Services	Tinder Dating app. Meet People	Subsidiary. Owner is in the field.	Yes	Match
2	Dating Services	Badoo: Dating. Chat. Meet.	Subsidiary. Owner is in the field.	Yes	Bumble
3	Dating Services	Dating and Chat - SweetMeet	Private Company	No	Not Applicable
4	Dating Services	Boo: Dating. Friends. Chat.	Private Company	No	Not Applicable
5	Dating Services	Mamba Dating App: Make friends	Private Company	No	Not Applicable

6	Dating Services	Zoosk - Social Dating App	Subsidiary. Owner is in the field.	Yes	Spark Networks
7	Dating Services	OkCupid Dating: Meet Singles	Subsidiary. Owner is in the field.	Yes	Match
8	Dating Services	BLOOM, Meet Singles. Find Love	Private Company	No	Not Applicable
9	Dating Services	Bumble: Dating App & Friends	Subsidiary. Owner is in the field.	Yes	Bumble
10	Dating Services	Dating App & Flirt Chat Meet	Private Company	No	Not Applicable
1	Food Delivery	iFood comida e mercado em casa	Private Company	No	Not Applicable
2	Food Delivery	Zomato: Food Delivery & Dining	Public Company	Yes	Zomato
3	Food Delivery	Swiggy Food & Grocery Delivery	Private Company	No	Not Applicable
4	Food Delivery	Uber Eats: Food Delivery	Subsidiary. Owner is conglomerate.	No	Not Applicable
5	Food Delivery	foodpanda: food & groceries	Subsidiary. Owner is in the field.	Yes	Delivery Hero
6	Food Delivery	DoorDash - Food Delivery	Public Company	Yes	Doordash
7	Food Delivery	Rappi: Food Delivery, Grocery	Private Company	No	Not Applicable
8	Food Delivery	PedidosYa - Delivery Online	Subsidiary. Owner is in the field.	Yes	Delivery Hero
9	Food Delivery	Blinkit: Grocery in minutes	Private Company	No	Not Applicable
10	Food Delivery	Deliveroo: Food Delivery UK	Public Company	Yes	Deliveroo
1	Ride Sharing	Uber - Request a ride	Subsidiary. Owner is conglomerate.	No	Not Applicable
2	Ride Sharing	Grab - Taxi & Food Delivery	Subsidiary. Owner is conglomerate.	No	Not Applicable
3	Ride Sharing	Yandex Go — taxi and delivery	Subsidiary. Owner is conglomerate.	No	Not Applicable
4	Ride Sharing	Gojek - Food & Transportation	Subsidiary. Owner is conglomerate.	No	Not Applicable

5	Ride Sharing	Bolt: Request a Ride	Private Company	No	Not Applicable
6	Ride Sharing	99 - Private Driver and Taxi	Subsidiary. Owner is in the field.	Yes	Didi
7	Ride Sharing	Ola, Safe and affordable rides	Private Company	No	Not Applicable
8	Ride Sharing	Rapido: Bike-Taxi, Auto & Cabs	Private Company	No	Not Applicable
9	Ride Sharing	DiDi Rider: Affordable rides	Subsidiary. Owner is in the field.	Yes	Didi
10	Ride Sharing	Careem – rides, food & more	Subsidiary. Owner is conglomerate.	No	Not Applicable
11	Ride Sharing	Lyft	Public Company	Yes	Lyft
1	Online Marketplaces	Flipkart Online Shopping App	Subsidiary. Owner is conglomerate.	No	Not Applicable
2	Online Marketplaces	AliExpress	Subsidiary. Owner is conglomerate.	No	Not Applicable
3	Online Marketplaces	Wish: Shop and Save	Public Company	Yes	Wish
4	Online Marketplaces	Lazada - Online Shopping App!	Private Company	No	Not Applicable
5	Online Marketplaces	Amazon Shopping	Public Company	Yes	Amazon
6	Online Marketplaces	Mercado Libre: Compras online	Public Company	Yes	Mercado Libre
7	Online Marketplaces	Shopsy Shopping App - Flipkart	Private Company	No	Not Applicable
8	Online Marketplaces	Tokopedia	Subsidiary. Owner is conglomerate.	No	Not Applicable
9	Online Marketplaces	eBay: Online Shopping Deals	Public Company	Yes	Ebay
10	Online Marketplaces	Shopee: 2.2 1ª Liquida do Ano	Subsidiary. Owner is conglomerate.	No	Not Applicable
1	Social Media	YouTube	Subsidiary. Owner is conglomerate.	No	Not Applicable
2	Social Media	Instagram	Subsidiary. Owner is in the field.	Yes	Meta

3	Social Media	Facebook	Subsidiary. Owner is in the field.	Yes	Meta
4	Social Media	TikTok	Private Company	No	Not Applicable
5	Social Media	Snapchat	Public Company	Yes	Snap
6	Social Media	X	Private Company	No	Not Applicable
7	Social Media	Pinterest	Public Company	Yes	Pinterest
8	Social Media	Tumblr—Fandom, Art, Chaos	Subsidiary. Owner is conglomerate.	No	Not Applicable
9	Social Media	Reddit	Public Company	Yes	Reddit

Table 8: Criteria for Inclusion of Companies in Analysis

Appendix II: Operating Cost Efficiency Data by Company

Industry	Public Company	ESG Risk Rating	Operating Expense Ratio
Accommodation Services	Booking	19,2	75,07
Accommodation Services	Airbnb	24,3	79,25
Accommodation Services	Tripadvisor	26,4	95,26
Accommodation Services	Expedia	23,1	40,41
Dating Services	Match	18,8	42,42
Dating Services	Bumble	23,3	78,69
Dating Services	Spark Networks	no information	30,96
Food Delivery	Zomato	18,3	112,81
Food Delivery	Delivery Hero	23,4	38,83
Food Delivery	Doordash	22	59,18
Food Delivery	Deliveroo	23,4	43,47
Ride Sharing	Didi	25,7	26,25
Ride Sharing	Lyft	21,9	76,89
Online Marketplaces	Wish	26,2	84,81
Online Marketplaces	Amazon	30	9,38
Online Marketplaces	Mercado Libre	22,6	37,88
Online Marketplaces	Ebay	17,5	49,49
Social Media	Meta	33,7	46,06
Social Media	Snap	21,6	84,18
Social Media	Pinterest	23,8	77,27
Social Media	Reddit	no information	107,26

Table 9: Operating Cost Efficiency Data by Company

Appendix III: Innovation Dynamics Data by Company

		{a}	{b}
Industry	**Public Company**	**Android App Update Frequency - 2021**	**Number of Patents - 2023**
Accommodation Services	Booking	42	204
Accommodation Services	Airbnb	no information	165
Accommodation Services	Tripadvisor	24	No information
Accommodation Services	Expedia	43	173
Dating Services	Match	17 *(i)*	50
Dating Services	Bumble	no information	23
Dating Services	Spark Networks	no information	No information
Food Delivery	Zomato	47	No information
Food Delivery	Delivery Hero	25 *(ii)*	114
Food Delivery	Doordash	24	104
Food Delivery	Deliveroo	25	100
Ride Sharing	Didi	36	121
Ride Sharing	Lyft	39	410
Online Marketplaces	Wish	24	50
Online Marketplaces	Amazon	63	21730
Online Marketplaces	Mercado Libre	43	No information
Online Marketplaces	Ebay	no information	4915
Social Media	Meta	*77 (iii)*	16189
Social Media	Snap	no information	2432
Social Media	Pinterest	69	112
Social Media	Reddit	49	200
Dating Services	PlentyOfFish	21	
Dating Services	Grindr	21	
Ride Sharing	Bolt	34	

{a} - Due to lack of information in certain platforms, and in order to have at least three platforms per industry, we added other relevant platforms if needed.

i - Tinder; ii - foodpanda; iii - Instagram

{b} - Due to lack of information in certain platforms from PPUBS, we retrieved data from other sources such as Crunchbase and Insights by Greyb

Table 10: Innovation Dynamics Data by Company

Appendix IV: Aggregated Data from Appendix II and III

Industry	ESG Risk Rating	Operating Expense Ratio	App Update Frequency	Averaged Number of Patents
Accommodation Services	23,25	72,49	36,33	181
Dating Services	21,05	50,69	21,00	37
Food Delivery	21,78	63,57	32,00	106
Ride Sharing	23,80	51,57	36,33	266
Online Marketplaces	24,08	45,39	43,33	898
Social Media	26,37	78,69	59,00	733

Table 11: Aggregated Data of Innovation Dynamics and Operational Cost Efficiency by Industry

Appendix V: HHI* by Industry

Industry	HHI*
Social Media	2599,40
Online Marketplaces	1533,01
Ride Sharing	1855,95
Accommodation Services	2629,78
Food Delivery	1287,29
Dating Services	1994,89

Table 12: Adapted Herfindahl–Hirschman Index by Industry

Appendix VI: Economies of Scale by Firm

Industry	Public Company	Operating Expense 2023	Operating Expense 2022	Operating Expense 2021	Unit 2023	Unit 2022	Unit 2021	Type of Unit	Cost Per Unit 2023	Cost per Unit 2022	Cost per Unit 2021	Unit Change 22-23	Unit Change 21-22	Cost Per Unit Change 22-23	Cost Per Unit Change 21-22	Elasticity 22-23	Elasticity 21-22	Economy of Scale
Accommodation Services	Booking	15 530 000	11 988 000	8 462 000	1049	800	540	3	14 805	14 985	15 670	31%	48%	-1%	-4%	-4%	-9%	Verified
	Airbnb	6 696 000	5 009 000	4 294 000	465	394	301	3	14 390	12 713	14 266	18%	31%	13%	-11%	73%	-35%	Inconclusive
	Tripadvisor	1 491 000	1 275 000	959 000	149	142	113	1	10 000	8 973	8 517	5%	26%	11%	5%	232%	20%	Not verified
	Expedia	3 692 000	3 393 000	3 315 000	104	95	72	3	35 500	35 716	45 787	9%	31%	-1%	-22%	-6%	-70%	Verified
Dating Services	Match	1 445 863	1 347 618	1 263 731	11	11	10	2	135 127	123 635	131 639	-2%	14%	9%	-6%	-507%	-45%	Verified
	Bumble	690 622	756 857	690 020	58	50	42	1	11 907	15 137	16 429	16%	19%	-21%	-8%	-133%	-41%	Verified
Food Delivery	Zomato	70 843 000	55 400 000	23 408 000	647	535	238	4	109 495	103 551	98 353	21%	125%	6%	5%	27%	4%	Not verified
	Doordash	4 623 000	4 027 000	3 002 000	2161	1736	1390	4	2 139	2 320	2 160	24%	25%	-8%	7%	-32%	30%	Inconclusive
	Deliveroo	770 100	888 800	785 200	290	299	284	4	2 656	2 973	2 765	-3%	5%	-11%	8%	354%	142%	Not verified
Ride Sharing	Didi	35 186 000	42 816 000	62 616 578	471	437	452	1	74 705	97 977	138 532	8%	-3%	-24%	-29%	-305%	882%	Inconclusive
	Lyft	2 335 239	3 118 315	2 641 223	20	20	19	1	114 473	153 612	141 242	0%	9%	-25%	9%	-5172%	102%	Inconclusive
Online Marketplaces	Wish	387 000	564 000	1 475 000	14	26	101	1	27 643	21 692	14 604	-46%	-74%	27%	49%	-59%	-65%	Verified
	Amazon	56 953 000	55 392 000	41 436 000	230	213	200	2	247 622	260 056	207 180	8%	7%	-5%	26%	-60%	393%	Inconclusive
	Mercado Libre	5 383 000	4 129 000	2 564 000	218	148	140	1	24 693	27 899	18 314	47%	6%	-11%	52%	-24%	916%	Inconclusive
	Ebay	5 338 000	4 765 000	4 847 000	132	134	147	1	40 439	35 560	32 973	-1%	-9%	14%	8%	-919%	-89%	Verified
Social Media	Meta	62 192 000	62 416 000	48 527 000	4415	4243	4122	1	14 087	14 710	11 773	4%	3%	-4%	25%	-105%	850%	Inconclusive
	Snap	3 890 377	4 181 811	3 068 871	400	350	305	1	9 726	11 948	10 062	14%	15%	-19%	19%	-130%	127%	Inconclusive
	Pinterest	2 491 989	2 225 654	1 722 520	465	445	431	1	5 359	5 001	3 997	4%	3%	7%	25%	159%	774%	Not verified

We didn't managed to gather information about specific measurable units in Spark Networks, Reddit and Delivery Hero by year, and remove it from our analysis.
The values of units between companies cannot be compared as these are distinct variables, as they correspond to users (1), subscribers (2), bookings (3) or deliveries (4).

Table 13: Economies of Scale by Firm