



## A NEW INDUSTRIAL REVOLUTION

### The Platformization of Our Markets, Businesses and Societies

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International Business  
Bachelor's Thesis  
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## **Declaration**

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**Objectives**

The main objectives of this work were to study and ascertain the significance of digital platforms as market mediators, and to investigate how platform environments impact the relevant stakeholder groups, these being businesses, consumers and regulators. A final, separately outlined objective was to identify and comment on any risks and/or controversies which may arise as a result of increased platform diffusion, adoption and generalisation. This process is described in the thesis as *platformization* for short. The study describes contemporary issues in international business, but on a broader level it is also set in the context of digitalization and its changing of the social landscape.

**Summary**

The study outlines digital platforms as a new, innovative hybrid-concept. Platforms exist simultaneously as digital infrastructure, business models and market spaces. These market spaces are heavily characterized by network effects and massive economies of scale. As business models, platforms impose a new economic paradigm which is delineated by winner-take-all potential, open-sourced value chains and the heavy emphasis of technology and data. For companies platforms entail increasing competition, which is disruptive to some and lucrative for others. For consumers platforms offer novel products and services, but also less quantifiable benefits such as social gain. A variety of concerns, such as data privacy and negative consumer outcomes from network effects manifest on the flipside. For public institutions platforms constitute uncharted territory with regards to regulation. Issues concerning governance revolve around fair competition and misuse of monopolistic power.

**Conclusions**

The changes brought forth by platformization, economic and social, are gargantuan new developments that cannot be wholly described as 'good' or 'bad'; instead, they function to alter the socio-economic reality of many, and in so doing function as a new 'norm' of sorts. For the time being, studies would suggest that the public values the benefits digital platforms grant access to over potential drawbacks. For businesses, however, the coming years entail turbulent times as platform dynamics continue to proliferate markets. The pressure to enact legislation to curb the power of the most dominant platform businesses rises amidst rallying fears of the misuse of platform power, rendering the future uncertain.

**Key words:** *digital disruption, digital platforms, platform economy, network effects, information communications technology*

**Language:** English

**Grade:**

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## Part I Introduction

The annual World Economic Forum in Davos, Switzerland had a strikingly grandiloquent official theme for its meeting in 2019: “*Globalization 4.0: Shaping a Global Architecture in the Age of the Fourth Industrial Revolution*” (Schenker, 2019). While *the Fourth Industrial Revolution* certainly sounds like an impactful phenomenon, it is likely that the origins and meaning of this title would largely escape the layman. What, then, is meant by this elusive revolution supposedly taking place all around us?

To elaborate, the 2019 discussions in Davos revolved around one binding issue: the impact of novel technology on business and society. Sub-topics and panels contemplated themes such as digital disruption, the dominance of tech industries, the future of work, e-commerce, data privacy and appropriate governance for digital environments. Interestingly, there is one topic that embodies all of these themes into one concept, which has also been frustratingly underrepresented in recent public discourse: digital platforms and their reshaping of the economic landscape.

### Significance of the Research

In this research document I seek to combine multiple perspectives on a topic which is rarely receiving of a cross-disciplinary approach. Digital platforms, emergent from advancements in information communications technology, are far too often only viewed merely as technological curiosities among the broader public. In academia we see this lack of perspective repeat itself; whether it be with the study of organizational science or a business case on how companies succeed in e-commerce markets, the foundational significance of digital platforms as market mediators remains unaddressed. This academic blind spot has led to a situation where businesspeople are usually ahead of the curve when compared to scholars and regulators. This observation is not exclusive to the World Economic Forum discussions, for in my own platform research I discovered corporate documents by companies such as McKinsey, KPMG, Accenture and Oxera to be of unrivalled value from time to time.

## Research Design

The broader research questions this thesis is built on are as follows:

**RQ1:** What are the distinguishing elements of a platform-based business model?

**RQ2:** How does the emergence of digital platform ecosystems impact the stakeholder dynamics of traditional markets?

**RQ3:** What risks or controversies can be identified with increased reliance on platforms?

The objectives I pursue with these research questions are:

1. To outline a conceptual framework of the platform ecosystem & comment on its significance
2. To conduct stakeholder analysis in assessing the changes brought forth by the platform model – perspectives studied include businesses, consumers & regulators
3. To explore how the shift towards platform-based economies drives social change

Part I of the thesis will here forth comprise a methodology section followed by a review of the theoretical background and literature of the topic. This review will introduce the relevant concepts and technologies and cover scholarly consensus on the origins and significance of digital platforms from a business perspective. In doing so Part I will focus on answering Research Question 1 and accomplishing the first objective.

Part II of the thesis is dedicated to stakeholder analysis of the implications digital platforms have on different market actors. This thesis considers three perspectives: that of businesses, consumers and regulators. Part II is split in this manner in order to determine what effects the established '**platformization**' of markets has on different interest groups and how these effects may differ among one another. The final Discussion section will summarize the findings and comment on the changes brought forth by platformization. The summary will seek to apply the Stakeholder Analysis observations to a broader socio-economic context where the benefits and benefactors, as well as risks, controversies and byproducts of platformization may be identified. In doing so Part II focuses on answering Research Questions 2 & 3 and likewise accommodates Objectives 2 & 3.

## Methodology

This thesis utilizes primarily qualitative means to study the research problem at hand. More specifically, the chosen methodological approach was to conduct secondary research, i.e. desk research. The objective here, then, was to review and combine previous findings in order to make new and meaningful observations. The primary sources for information gathering include academic journals, articles, books and institutional reports. Some corporate publications, such as commercial surveys, are also cited. These serve to bring a quantitative angle to the research as well as providing for more empiricism in general. For example, in Part II Section 1.2: *Forms of platform participation*, a survey of more than 1600 U.S. enterprises by Bughin, Catlin & Dietz (2019) of McKinsey & Co. provides valuable data regarding the prevalence of platform-adoption.

### Ethics and Reliability

When referring to secondary sources (e.g. to the aforementioned surveys), the findings of others are not merely regurgitated, but instead contextualized to support the analysis and conclusions made in the research proper. This approach serves as a guiding principle which extends to the whole thesis, as is pertinent to the ethics of desk research. Reliability control is admittedly less straightforward than with quantitative methods, but nonetheless an important consideration. The chosen sources have been carefully selected to cover a diverse set of perspectives on the subject matter. Individual takes on the topic may range between theoretical and empirical, informative and commercial, or critical and welcoming. No single source is relied upon in excess. Each source is also analytically scrutinized, compared, and contrasted; this is particularly the case for more contested ideas, or ones that repose in the fringes of academia. Any biases, such as commercial ones in the corporate material, or partisan arguments in favour of certain stakeholders, are identified and mitigated to the best of the author's ability.

### Reasoning

The reasons for choosing the methodological approach detailed above are manifold. Primarily, it was clear from the beginning that this project would encompass cross-disciplinary research on new, partially uncharted topics. Indeed, the work combines

knowledge and elements of conventional business studies, economics, information technology, organizational study and sociology. The idea here was to compound the work of pioneering platform researchers such as Michael Cusumano, Annabelle Gawer, Geoffrey Parker, Marshall van Alstyne and Sangeet Choudary with other, complementary viewpoints in order to build a bigger picture.

As mentioned earlier, platforms are often viewed from a markedly in-field vista (such as in tech), which is limiting for a topic that is so impactful in many contexts. As is already evident from the research questions, which include the study of platforms, their many stakeholders and the risks associated, it is unlikely that the objectives here could have been pursued adequately with quantitative methods at an undergraduate level. The approach chosen is therefore suitable and justified; few such pieces of work have been written up to date. These circumstances also served as the original spur for the author's initiative to choose this topic in the first place - and in so doing to hopefully illuminate a space which has thus far been somewhat of an academic blind spot.

## **Literature Review**

### **1. Digitalization as a Prelude to Platforms**

#### **1.1 Epilogue**

A defining megatrend in 21<sup>st</sup> century business discourse has been the impact of digitalization on markets. Digitalization is often conflated with the term *digitization*, which refers to the straightforward transformation of data from analogue to digital form (Bloomberg, 2018). Digitalization, however, captures a broader range of meanings as the process in which digital technologies prevail, alter business models and provide new value-producing opportunities (Gartner, n.d.).

The systemic changes brought forth by this phenomena are often described by scholars as *digital disruption* (Skog, Wimelius & Sandberg, 2018), since its consequences are said to erode contemporary approaches, boundaries and processes that may have served as the traditional foundation for value capture within the given market (Karimi



& Walter, 2015). Digital disruption as a concept, however, is often framed in a partisan context since it is addressed primarily from the perspective of legacy businesses which are the targets of said *disruption*. Skog, Wimelius & Sandberg (2018) combine several scholarly perspectives to offer the following, exhaustive definition of digital disruption:

*“The rapidly unfolding processes through which digital innovation comes to fundamentally alter historically sustainable logics for value creation and capture by unbundling and recombining linkages among resources or generating new ones.”*

Digital innovation, therefore, is at the very core of introducing this dynamic. Yoo, Henfridsson & Lyytinen (2010) purport that digital innovation can be examined as *product innovation*, which is often the subject of Information System Research (IS), or *process innovation*, which is more commonly studied in Information Technology (IT) spheres. Product innovation is defined as *carrying out of new combinations of digital and physical components to produce novel products* (Yoo, Henfridsson & Lyytinen, 2010). Meanwhile, process innovation breaks down business operations to processes and seeks to apply innovations to *key processes* (Davenport, 1992).

What, however, drives digital innovation? According to existing IS research, digital innovation in both products & processes is expedited by new technology (Yoo, Henfridsson & Lyytinen, 2010; Moore & Tambini, 2018). Some innovations [technologies] may span both product and process developments; **digital platforms**, for instance, can be identified as an industry disruptor on many fronts (Karimi & Walter, 2015).

## 1.2 ‘This time it’s different?’

Markets have always been responding to entrant technology, and certainly have not remained static over time. Before moving on the question of why digitalization is perceived as an entirely new paradigm must therefore be addressed. Barrett et. al (2015) argue that digital innovation has become the major driving force for [all] social and business innovation in the 21<sup>st</sup> century. Rapid technological advances during the past decade in areas such as mobile solutions, social media, digital platforms, cloud computing and the Internet of Things have allowed for radical, completely novel products and services to emerge (Hyvönen, 2018). Moreover, within just 1-2 decades these ‘novel’ products and services, as well as particularly their providers, have risen to

constitute the most valuable industries in the world (Moore & Tambini, 2018; Zysman & Kenney, 2015).

In order to understand this transformation, one must establish what makes digital technologies different from their predecessors. Yoo, Henfridsson & Lyytinen (2010) outline three distinctive characteristics of digital technologies. These are:

1. *reprogrammability*,
2. *the homogenization of data*, and
3. *the self-referential nature of digital technology*

*Reprogrammability* refers to a digital device's ability to execute a multitude of different functions, and that these functions can be reprogrammed (altered) at any time. The significance of this is that the features and value delivery mechanisms of digital offerings can be updated, developed and optimized after their initial launch (Nambisan et al, 2017).

*The homogenization of data* means that any content (for instance audio, video, transactions) "*can be stored, transmitted, processed, and displayed using the same digital devices and networks, thus separating the content from the medium*" (Hyvönen, 2018). The effect of this is that innovations are inexpensive and benefit vastly from swift scaling effects, as almost all devices can access any given content.

Perhaps the most significant characteristic of digital technologies-in terms of explaining the rapid onset and success of digitalization-is *the self-referential nature of digital technology*. This quality asserts that the spread of digital innovations accelerates the use of digital technologies [in business & industry], which in turn fosters more digital innovation. This leads to the creation of a positive virtuous cycle where digital technologies have lower entry barriers, decreased learning costs and accelerated diffusion rates (Yoo, Henfridsson & Lyytinen, 2010). In practise this leads to the "*increased creation and availability of digital devices, networks, services, and contents*" (Benkler, 2006 in Yoo, Henfridsson & Lyytinen, 2010). In layman's terms, therefore, the theoretical framework posits that digitalization only leads to more digitalization. A self-sustaining, exponential process is therefore initiated as the cycle is set in motion.

## 2. Digital Platforms

### 2.1 Platforms as a concept & business model

Digital platforms, as examined earlier, are a prime example of digital innovation (Skog, Wimelius & Sandberg, 2018). While digital platforms are manifest in a number of novel products and services, the idea of platforms is more of a concept than it is any specific, tangible piece of technology. Indeed, the variety of platforms almost defies their categorisation (Zysman & Kenney, 2015). A working definition of digital platforms can be suggested as:

*“a technology-enabled business model that creates value by facilitating exchanges between two or more interdependent groups”* (Morvan, Hintermann & Vazirani, 2016),

or alternatively:

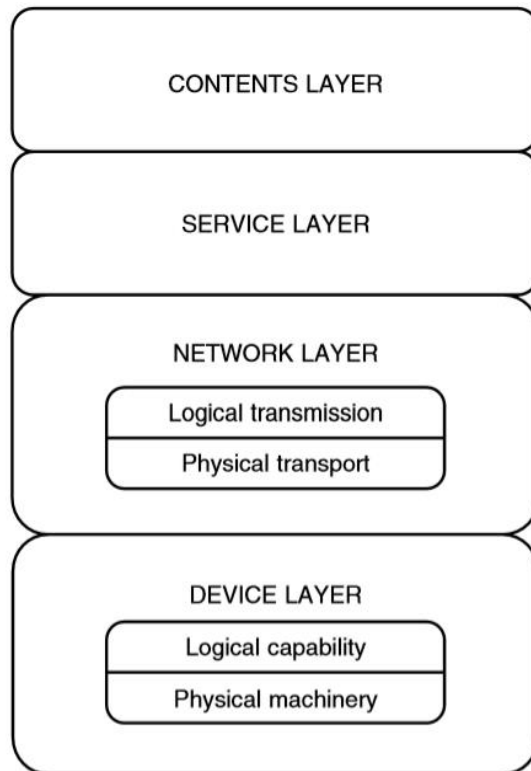
*“frameworks that permit collaborators – users, peers, providers -- to undertake a range of activities, often creating de facto standards, forming entire ecosystems for value creation and capture,”* (Zysman & Kenney, 2015).

A common denominator for both definitions is that platforms are understood as a means of facilitating transactions between two or more groups. Commonly these groups are end-users and producers (Morvan, Hintermann & Vazirani, 2016), but more specifically may include e.g. developers, advertisers, entrepreneurs & employees (Markus & Loebbecke, 2013).

Another crucial point is value creation; Hagiu (2013) underlines the concept of *network effects* as the source of platform value creation/capture. Network effects are said to occur when the intrinsic value of a given product or service increases as its user base grows (Reddy, 2018). Examples of value creation through network effects include e.g. a larger marketplace, or alternatively the increased creation of complementary goods & services [by 3<sup>rd</sup> parties] which add to the original platform/business.

## 2.2 Platform technology

### Exhibit 1: The Layered Architecture of Digital Technology (Yoo, Henfridsson & Lyytinen, 2010)



Farrell & Weiser (2003) identify four different layers of digital technology: the content layer, application layer, logical layer and the physical layer. Yoo, Henfridsson & Lyytinen (2010) have refined these ideas to extrapolate a hierarchical four-layer model for digital technology, which includes the content layer, service layer, network layer and device layer (Exhibit 1).

The device layer, which is further sub-divided into the logical and physical components, consists of all appliances capable of interacting with digital content (hardware) as well as e.g. their operating systems (logical capability). The network layer includes artefacts of physical connectivity (e.g. cables) as well as internet access standards. The service layer constitutes the sphere of different applications and services available through the network, and finally, the contents layer includes all the data these services and applications host. The *Layered Architecture of Digital Technology* model is useful in providing insight to the diversity of platforms; indeed, examples of platform-utilizing technologies can be identified in each layer of this framework.

1. Device layer (logical capability): operating systems
2. Network layer: the World Wide Web (Zysman & Kenney, 2016)
3. Service layer: software-as-a-service (SaaS), search engines

#### 4. Contents layer: data storage, infrastructure-as-a-service (IaaS)

Each of these digital technologies **facilitate 3<sup>rd</sup> party interaction** and **leverage network effects for value**, which therefore validates their categorization as platforms (Hagiu & Wright, 2015; Zysman & Kenney, 2016). In summary: the physical components of platforms are algorithms, hardware, software and service modules (Henderson & Clark, 1990 in Kim, 2015) but for the purposes of this thesis digital platforms will be understood more broadly as the *infrastructure and rules for a marketplace* (as per van Alstyne, Parker & Choudary, 2016), which then meet the established criteria.

### 2.3 Cloud Computing

Cloud computing refers to digital technology “...enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction,” (NIST, 2011). Examples of these computing resources include servers, networks, applications and services. A less technical definition of cloud computing has been summarized by Vaquero et al. (2008) as “a large pool of easily usable and accessible virtualized resources.”

The reason cloud computing is significant with regards to the scope of this thesis, however, is because it has largely facilitated the mass-adoption of the platform business model. The shift from computing as a hardware and capital investment-heavy software product to a “*location independent and highly scalable service that is acquired on demand*” (Bayrak, Conley & Wilkie, 2011) has enabled the rapid diffusion of novel digital services. Through cloud computing, firms are effectively able to ‘rent’ computing power from service providers on a pay-on-demand basis (Bayrak, Conley & Wilkie, 2011), and then use it for their own commercial purposes, primarily new product offerings. Some scholars have, therefore, described cloud computing as a new general purpose technology (Etro, 2012), which is a term used to describe a “*new method of producing and inventing that is important enough to have a protracted aggregate impact*,” (Jovanovic & Rousseau, 2005).

## 2.4 Cloud Computing Service Models & Platforms

Cloud computing technology is generally categorized to three types of service models (NIST, 2011). These are:

- 1) Software-as-a-service, SaaS
- 2) Platform-as-a-service, PaaS
- 3) Infrastructure-as-a-service, IaaS

Software-as-a-service (SaaS) refers to a creator offering customers the pay-on-demand use of their applications which run on a cloud infrastructure. This underlying infrastructure may be owned by software creator or provided for by a 3<sup>rd</sup> party. The PaaS and IaaS service models are more developed with regards to facilitating multi-sided platform activity. Platforms-as-a-service extend to users the opportunity to host their own digital creations and applications on the provider's cloud, to the extent which these are technically compatible. The users do not control the underlying cloud infrastructure, such as storage, networks or servers, but retain control and limited configuration ability of their own contributions (NIST, 2011). Finally, the sophisticated IaaS model provides the users with a pool of fundamental computing resources such as processing power, networks and storage (NIST, 2011), which then allow the users to execute and run their own software. The user still does not manage the underlying cloud infrastructure, but exercises increased independence through control of e.g. operating systems and storage (NIST, 2011).

With reference to the *Layered Architecture of Digital Technology* (Exhibit 1; Yoo, Henfridsson & Lyytinen, 2011), the following can be surmised of the extant cloud computing service models:

- Software-as-a-service pertains to technology belonging to the Service Layer
- Platform-as-a-service enables its consumers to develop, host and deploy Service Layer content on the service provider's Contents Layer infrastructure
- Infrastructure-as-a-service provides its consumers with the capability of *creating* novel Contents Layer innovations through outsourced computing resources, which can then be hosted on the service provider's cloud infrastructure

### 3. Platform Organization

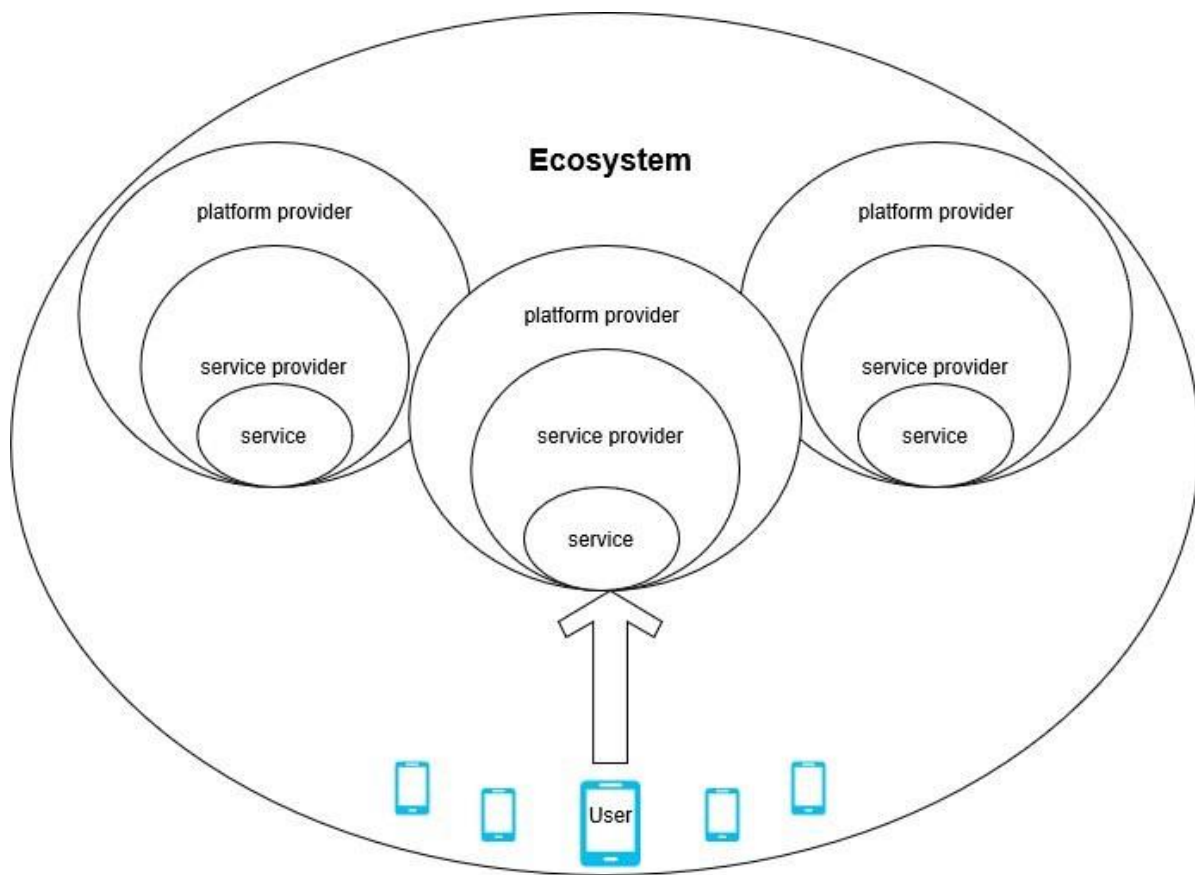
#### 3.1 The Platform Ecosystem

The rise in utilization of the platform business model and associated digital technologies have led to the emergence of a novel economic framework: the platform ecosystem. Merriam-Webster defines an ecosystem as:

*“something (such as a network of businesses) considered to resemble an ecological ecosystem especially because of its complex interdependent parts.”*

As platforms continue to expand, create, disrupt, and form a complex network of affiliates, scholars have likened this new environment to the development of an organic ecosystem. In this context, the essence of platforms has been explained as “...*the collection of solutions by the access channels or interfaces related to the problems of the entities belonging to an ecosystem,*” (Iansiti & Levien in Kim, 2015). While business ecosystems have been written about before (e.g. Schumpeter, 1942), scholarly consensus would distinguish that digital platforms are at the heart of this novel ecosystem, particularly in the ITC industry. Evans, Schlamensee & Hagiu (2006) describe the platform ecosystem as consisting of “*mutually dependent business communities and consumers who have a complementary and symbiotic relationship with the platform*”.

Exhibit 2: Conceptual framework of the platform ecosystem structure (Author)



As the centrepiece of the model, the role of an [innovation] platform is to allow “...*other participants within an ecosystem to build complementary goods, services, or technologies based on an integrated foundation of goods services, and technologies,*” (Gawer & Cusumano, 2013). Exhibit 2 illustrates this complementary nature of goods/services built by 3<sup>rd</sup> party actors (service providers) by using elliptical subsections for each layer or the structure. Ecosystem affiliate service providers provide services to customers, while platform providers administer the *integrated foundation* Gawer & Cusumano (2013) refer to, which is often hosted on a cloud infrastructure. Moreover, entire platforms may also complement one another. Such is the case e.g. for AirBnB and Amazon Webservices, which is why the platform providers are also shown as interdependent elements. Together all the pictured entities constitute a simple yet descriptive model of the ecosystem itself, the unitary nature of which is indicated by the final ellipses.



### 3.2 How does the Ecosystem work?

An ecosystem requires a high degree of synergy to function. For this it relies heavily on data and “...*the platforms or technologies that support interconnection, such as service-oriented architectures and cloud computing,*” (Markus & Loebbecke, 2013). Examining the organizing logic of an ecosystem, Miles et al. (2009) describe the concept of an Innovation form organization (I-form for short): a system which is characterized by constant innovation through inter-firm knowledge sharing and collaboration. The model also underpins the role of one organizational unit as the facilitator of this collaboration, a role which is fulfilled by providing the necessary infrastructure and developing strategic initiatives for the community to prosper. “*By not having responsibility for administration and growth, member firms of the I-form organization can focus on forming the temporary collaborative networks needed to generate product and market innovations,*” (Miles et al, 2009). Albeit this theory largely predates *modern* digital platforms, the parallels between the functions of an I-form organization and those of a platform ecosystem are striking. Referring to Figure 2 for comparisons:

1. The service category constitutes *products and market innovations*
2. The service provider is a collaborative member of the I-form organization
3. The platform provider is the *facilitator*, host to the digital infrastructure at the core of the system

Criticisms of applying the I-form model to a platform ecosystem without reservations have also been put forth; for instance, it has been argued that instead of being a strictly collaborative community, the platform provider within an ecosystem corresponds to a managerial role while platform affiliates are more comparable to employees (Yonatany, 2020). Yonatany further argues that “*knowledge of the highest significance flows in the form of directions given by the platform provider to its respective affiliates*” instead of knowledge flowing freely as theorized in the I-form model. Alternatively, Markus & Loebbecke (2013) have put forth the concept of *business communities*, which comprise an even larger unit structure. These are represented by the cross-section of actors spanning an entire industry and may often include several interacting platforms. Nevertheless, scholarly consensus seems to agree on central/leading role of the digital platform in these organizational units.

## 4. The Emergence of Platform-based Economies

### 4.1 Introduction













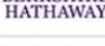



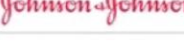

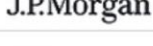

So, what effects have these new means of technological value capture had with regards to the global business environment? According to scholars and businesspeople alike, global markets are shifting towards increased platform utilization and reliance (Srnicek, 2017; Zysman & Kenney, 2016). In real terms this means that the share of economic activity being facilitated by & transacted within platforms is ever-growing. Although the exact size of this market is immensely difficult to ascertain due to scope variables and lack of exhaustive data, contemporary research has offered estimates such as 4.3\$ trillion (Evans & Gawer, 2016) or 7.2\$ trillion (KPMG research cited in Consultancy.org, 2018). To put these massive figures into perspective, the market cap of the entire Standard & Poor's 500 stock index, which tracks 500 of the largest U.S. businesses, was 28.1\$ trillion as of December 2019 (Yahoo Finance, 2020).

The previous section established the platform ecosystem as the framework in which digital platforms are manifest within the economy at large. But where, in real terms, are these ecosystems located, which industries do they span and who are the relevant stakeholders? The final section of this literature review will attempt to identify and describe the concept of a **platform economy**.

### 4.2 Platforms as a Phenomenon

*"A digital platform economy is emerging,"* (Zysman & Kenney, 2016). Academics, in contrast to engineers and businesspeople, have arguably struggled to keep up with the rapid pace of platform diffusion. Indeed, seven of the ten globally most valuable firms now utilize a platform business model (Schenker, 2019), yet profuse literature on the topic has only recently been forthcoming. Exhibit 3 reveals that Microsoft alone has managed to stay at the forefront of value creation, while the other gargantuan conglomerates of yesteryear have been all but ousted by new platform-leveraging enterprises.

Exhibit 3: Ten most valuable companies by market cap in 2018 versus 2008 (Schenker, 2019)

2018					2008				
RANK	COMPANY		FOUNDED	US\$bn	RANK	COMPANY	FOUNDED	US\$bn	
1.		*	1976	890	1.	 PetroChina	1999	728	
2.		*	1998	768	2.	 EXXON	1870	492	
3.		*	1975	680	3.		1892	358	
4.		*	1994	592	4.	 中国移动 China Mobile	1997	344	
5.		*	2004	545	5.	 ICBC	1984	336	
6.	 Tencent 腾讯	*	1998	526	6.	 GAZPROM	1989	332	
7.	 BERKSHIRE HATHAWAY		1955	496	7.		1975	313	
8.	 Alibaba.com	*	1999	488	8.		1907	266	
9.	 Johnson & Johnson		1886	380	9.	 SINOPEC	2000	257	
10.	 J.P.Morgan		1871	375	10.	 AT&T	1885	238	

\*employs platform business

The origin story of digital platforms lays in the ICT-driven services transformation which emerged alongside the internet (Zysman & Kenney, 2016). Today, however, few industries untouched by digitalization remain. Consequentially, digital platforms have also permeated all manner of different industries. Popular examples of business-to-consumer platforms include Uber (transportation) and AirBnB (accommodation), while IBM Watson (AI) and Salesforce (consultancy) are prominent business-to-business examples. When one factors in cloud computing, it can be asserted with confidence that the majority of businesses with any kind of digital presence today come into contact with platforms.

In a platform economy, the value added “*depends on the extensiveness and functioning of the network,*” (Dufva et al, 2017) as discussed earlier in relation to network effects. Scholars have thereby argued that companies should now embrace platform-leveraging strategies in order to not be left out of these vast value chains, or face extinction (Parker, Van Alstyne & Choudary, 2016). Despite these pressures to adapt, the future of the recently upstart platform-based economies is currently uncertain (Dufva et al, 2017). Zysman & Kenney (2016) share this view: they argue that while platforms are driving unprecedented change, “*the exact nature of that change will be*

*determined by the social, political, and business choices we make.*” As of yet, the future relationship between private, public and regulatory actors in the platform business remains unclear (Dufva et al, 2017).

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## **Part II**

### **Stakeholder Analysis**

As already briefed upon in the literature review section, the impact of digital platforms on business-as-usual is immense. Platform dynamics are proliferating all manner of traditional industries, often with disruptive consequences, unprecedented externalities, but also a plethora of new opportunities. The focus in Part II is to identify and evaluate specific phenomena and the ramifications platformizing environments pose to businesses, consumers and regulators. The final discussion will recap the key observations and present an overview of the new stakeholder dynamics in *platformized* environments.

## 1. Businesses & Platforms

### 1.1 Strategic framework

A fundamental assumption is that a majority of companies will eventually be exposed to digital platforms. This naturally gives firms cause to establish their own strategic alignment with regards to platform-driven change in some manner, even if the chosen policy is to disregard them for the time being. Vasquez Sampere (2016) emphasizes that platforms create new opportunities for companies by “...*circumventing traditional business rules*,” (Korhonen et. al, 2017). This is a rather assured perspective, as it is equally evident that firms whose core competencies are grounded in said *traditional business rules* would likely view these opportunities as threats instead. Regardless of differing views, companies seemingly have three baseline strategic options to consider with regards to platformization (Bughin, Catlin & Dietz, 2019). These can be identified as:

1. Developing one's own platform technology & business model
2. Entering an existing platform ecosystem as an affiliate
3. Ignoring digital platforms & discarding the platform business model as unsuitable

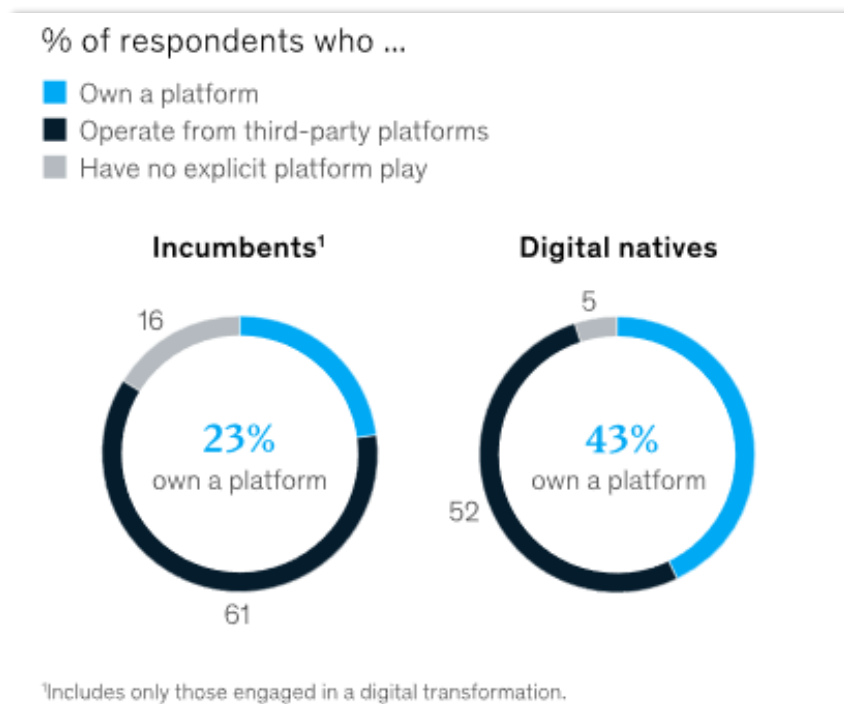
### McKinsey study on platform adoption in different industries

A recent study of 1600 businesses (Bughin, Catlin & Dietz, 2019; Exhibit 4) divided respondents into two categories: *digital natives* and *incumbents*. Here digital natives denote businesses that were founded on the basis of digital technology (primarily IT companies), while incumbents are legacy businesses which have entered digital markets at a later stage. The findings of the study offer insight on the scale and nature of platformization in different industries. As shown in Exhibit 4, businesses native to digital technology are far more likely to leverage platform strategies (Options 1 & 2 as outlined earlier) with only 5% opting out (Option 3) compared to the incumbents' 16%. Incumbent businesses are also only half as likely to own their platform when compared to digital natives. Nevertheless, the extent of platformization in legacy businesses is also major. The study notes that platforms are “*no longer the domain solely of digital*

*natives*” (Bughin, Catlin & Dietz, 2019) and highlights companies such as Nike, Daimler and Unilever as examples of traditional businesses who have ventured to create their own platform.

A final key discovery of the study notes that the prevalence of platforms within a given industry correlates strongly with its extent of digitalization. For example, only 55% of respondents in the healthcare & pharmaceuticals sector leveraged platform strategies whereas 95% of those in the consumer banking sector did so (Bughin, Catlin & Dietz, 2019).

Exhibit 4: Survey results for platform strategy: (Bughin, Catlin & Dietz for McKinsey, 2019)



## 1.2 Forms of platform participation – why the high number of affiliates?

On the aggregate level, studies would indicate that incorporating any kind of platform-leveraging strategy is preferable over choosing to opt out (Morvan, Hintermann & Vazirani, 2016; Bughin, Catlin & Dietz, 2019). However, engaging with platforms is certainly not a risk-free endeavour either. Struggling to optimize monetization, attempting to platformize a business that is inherently too low margin to succeed or failing to

establish trust are some of the common stumbling blocks businesses face in crafting their platform strategy (Eastwood, 2019).

Returning to the industry study by McKinsey (Bughin, Catlin & Dietz, 2019), it is no surprise that the most common platform strategy for incumbents and digital natives alike was cooperation with a 3<sup>rd</sup> party platform. Despite industry hype, the number of successful platforms is relatively low (Cusumano, Gawer & Yoffie, 2019). Of the commercially successful platforms that do exist, Cusumano, Gawer & Yoffie found the overwhelming majority to be transactional in nature. This means that the platform facilitates transactions between multiple market actors, but does not accommodate for others to build, expand or otherwise create new product offerings the platform architecture, which is characteristic to *innovation platforms*. “*Creating an innovation platform is...difficult. This entails platform entrepreneurs introducing a technology that other firms will adopt as core to their business and then build products and services around*” (Cusumano, Gawer & Yoffie, 2019). Operating systems are a good example of the monopolistic dynamic of innovation platforms: the world has only one dominant software platform for PCs – Windows – and two for smartphones – iOs and Android (Cusumano, Gawer & Yoffie, 2019). It also goes without saying that introducing this kind of technology is expensive – the cost structure of digital platforms generally includes high fixed costs, particularly in relation to research & development (Duch-Brown, 2017).

### 1.3 Evaluating becoming a platform affiliate

As concluded above, most global companies decide to participate on platforms as an affiliate, i.e. they manage a presence in the chosen ecosystem without a stake in the ownership of the platform. Many find a 3<sup>rd</sup>-party solution attractive because it offers quick access to the platform business’ userbase (Reinartz, Wiegand & Wichmann, 2017) with little to no immediately apparent trade-off. Another prompt benefit is that firms may capitalize on the economies of scale and network effects of the ecosystem with marginal-if any-responsibility of the high fixed costs associated with maintaining the platform infrastructure (Duch-Brown, 2017). These advantages may be particularly desirable for smaller businesses who otherwise struggle to gain visibility in the market (Reinartz, Wiegand & Wichmann, 2017). However, large businesses with their own independent platforms may also become affiliates. In these cases, the company

platform becomes interlinked with an even larger platform ecosystem, which typically unlocks access to an array of complimentary features (Bughin, Catlin & Dietz, 2019). Indeed, the McKinsey study by Bughin, Catlin & Dietz (2019) concluded that the firms who initially chose to deploy their own platforms were highly likely to collaborate with broad industry-wide platform ecosystems at a later stage.

Just as with any other platform strategy, opting for a 3<sup>rd</sup> party solution has its own complications and controversies. The pricing structure of many platform models is often characterized by the practise of price discrimination towards consumers, affiliates or both (Jeon, Kim & Menicucci, 2015). This leads to situations where different affiliates are charged different rates for their participation. Beyond claims of unfairness, this convention essentially means that the share of value capture available to affiliates depends on their bargaining power within the ecosystem (Duch-Brown, 2017). As an example of this dynamic, Amazon charges the professional sellers on its retail platform for margins from 8% up to 17%, depending on the product category being sold (Reinartz, Wiegand & Wichmann, 2017). Considering that due to network effects the platform owner is incentivized to accumulate as much affiliates as possible (Reinartz, Wiegand & Wichmann, 2017) a conflict of interest can be extrapolated. Arguably, a large pool of affiliates subject to intense competition for value share serves to reduce the bargaining power of individual actors (Duch-Brown, 2017).

#### 1.4 Competition in a platformizing environment

Van Alstyne, Parker & Choudary (2016) describe the competitive implications of platform diffusion as “*seismic*”, not only in traditional marketplaces but also between competing platform businesses. Porter’s foundational ideas of analysing competition through the Five Forces model become somewhat limited and hard to apply in a platform environment (van Alstyne, Parker & Choudary, 2016). It is no surprise, then, that legacy companies have proven themselves vulnerable in responding to the rapid emergence of platforms, which is why they are now looking to execute their own platform *plays* (as evident in Bughin, Catlin & Dietz, 2019). For historical perspective, in the 20<sup>th</sup> century it took American companies in traditional industries such as steel and heavy machinery decades to outcompete their dominant rivals in Great Britain and Germany (van Alstyne, Parker, Choudary, 2016). Today, it may take only a few years for a

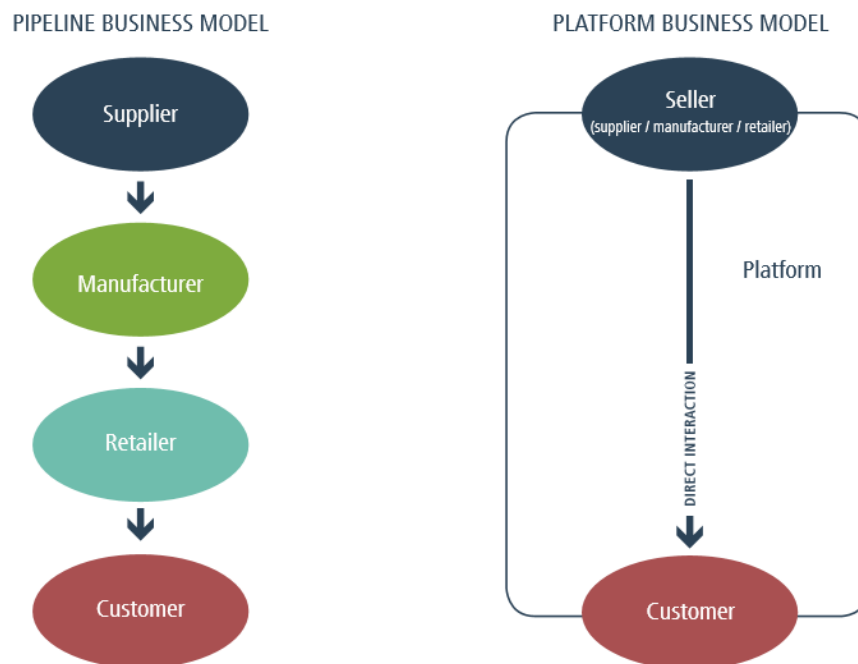


platform upstart such as Uber or Alibaba to seriously challenge the market-leading *incumbents*. Bhadrawaj et al. (2013) have outlined four different themes for businesses to consider when adapting their competitive strategy for the digital [platform] era; these are **scope**, **speed**, **scale** and **sources** of value creation & capture. In this section these factors will be discussed from a platform-centric perspective, and further developed to provide analysis on how platforms change the nature of competition.

The scope of business pertains to a company's ability to leverage digital resources, in this case the company platform, in order to expand into new markets (Hyvönen, 2018). An example of this would be Amazon's initiatives with Amazon Web Services, which was the underlying digital infrastructure used to support subsequent services such as Amazon Kindle and Prime Video (Hyvönen, 2018). Here Amazon utilized their AWS computing platform to enter new markets, namely those for e-book retail and streaming services (Hyvönen, 2018). Returning to the digital hierarchy architecture model by Yoo, Henfridsson & Lyytinen (2011; Part I Section 2.1), Amazon's strategy can be described as having first established itself on the service layer with the AWS offering, and then expanding vertically to other layers with novel offerings (Hyvönen, 2018) such as Kindle Readers (**device layer**) and Prime Video Originals (**content layer**).

Platforms enable companies to capture the element of speed to the benefit of their competitive advantage (Bhadrawaj et al, 2013). As explored earlier in Part I Section 1.2, digital innovations, such as the platform infrastructure, are comparatively faster to manage since their contents are separated from their medium (*homogenization of data*) **and** the product offerings can be updated after launch as a consequence of *re-programmability* (Yoo, Henfridsson & Lyytinen, 2011). This means that the platform itself can be maintained, updated, reengineered and developed in a timelier manner than physical pipeline infrastructures, which is understood by scholars as the traditional way of organizing business activity (van Alstyne, Parker & Choudary, 2016). Platforms also promote speed by providing for shorter transitional periods in finding new parties to interact with (OECD, 2019), given that the relevant partners are available on the same ecosystem. Somewhat similar to a subset of the platform ecosystem model (author), Exhibit 5 (Reinartz, Wiegand & Wichmann, 2019) demonstrates how these speed [efficiency] gains play out on a digital retail platform vs. a typical retail supply chain.

Exhibit 5: Interaction on a digital platform vs. traditional [pipeline] supply chain (Reinartz, Wiegand, Wichmann, 2017)



The next strategically significant way platforms force changes to the traditional competitive landscape is through new opportunities in business scaling. As explained earlier, digital innovations are rapid to scale, but what exactly drives these scaling effects in the context of digital platforms? In *'The Platform Business Model & Strategy'*, Kim (2015) argues that platforms facilitate open value chains whereas traditionally they have been tied to strictly internal processes. In other words, this means that platform companies may benefit from access to other market actors and their assets when creating and operating their value chains, i.e. the business activities that go into transforming input to output (Jurevicius, 2013). An illustrative example of this would be a retail platform commissioning computing resources from a cloud computing service provider. This allows for scalability on an otherwise unattainable magnitude. Indeed, open-sourced value chains answer the question as to why the world's largest accommodation provider (AirBnB) does not own a single hotel room, why the world's most popular taxi company (Uber) owns no cars (Reinartz, Wiegand & Wichmann, 2017), or how a leading retailer such as Alibaba survives without any inventory or warehouses (van Alstyne, Parker & Choudary, 2016).

### 1.5 How do companies monetize platforms?

Finally, platforms offer new sources of value capture as per Bhadrawaj et al. (2013). Where does this value reside and how is it captured? Returning to the foundation of how platforms work, it is evident that the network effects unlocked within a given ecosystem constitute the most significant value to platform participants (van Alstyne, Parker & Choudary, 2016), not necessarily the preceding new technologies themselves. The crucial question for companies operating a platform, then, is how to monetize the platform business model in such a way that charges users for the benefits that they extract from the network **but** is simultaneously conducive of its rapid and effortless expansion. Ironically, capitalizing on the positive feedback loop which breeds network effects is often counterproductive to the process itself in many ways: charging users for platform access may cause people to avoid the platform altogether; charging based on usage can limit peoples frequency and duration of engagement; finally, charging based on content launched would likely discourage creativity and innovation (van Alstyne, Parker & Choudary, 2016). Nonetheless, a profitable business model is as necessary from a business perspective as in any other industry. Van Alstyne, Parker & Choudary (2016) have therefore argued that “...*monetization is [...] one of the most difficult – and fascinating issues that any platform company must address.*”

Intuitively, it would seem that a strong catalyst for success is to postpone profit-driven monetization efforts until a *critical mass* (Morvan, Hintermann & Vazirani, 2016) of platform users has been accumulated. This logic is supported by a number of successful real world examples as well; for instance, the market leading digital payment platform PayPal “*practically ‘bought’ their own user base*” (Posthumus & Samsom, 2018) by subsidizing new users with 10\$ for signing up and offering another 10\$ for every referral. Although this expensive customer acquisition strategy is certainly not sustainable in the long term, it succeeded in achieving the critical mass of users for the PayPal platform. Today, new users do not register because of a 10\$ subsidy [which was discontinued] but because they gain access to the platform’s established network of millions of retailers and customers (Posthumus & Samsom, 2018). Almost as if a sequitur to the perspective by Parker, van Alstyne & Choudary (2016) outlined earlier, Posthumus and Samsom (2018) conclude that the ‘golden rule of platforms’ is “*users first, monetization second*”.

The appropriate monetization strategy for a platform business model depends essentially on the type of platform a company operates; as established earlier, platforms can be extremely diverse. Here we will return to the simple separation of *transactional platforms* and *innovation platforms* (Cusumano, Gawer & Yoffie, 2019). For innovation platforms (e.g. operating systems, SaaS models), which often reside entirely in digital space, the role of data as the centerpiece of monetization efforts is enhanced. In this context data is understood as any information, commercial or otherwise, which is contained in and extracted from a platform ecosystem. According to data-driven value chain researchers Marconi, Larocca & Visconti (2017), “*three current IT trends are enabling businesses to achieve the previously elusive goal of data monetization*”. These are big data, business analytics and cloud computing, all of which share a close connection to digital platform technology.

Companies who operate an innovation platform can capitalize on the data generated within their ecosystems in a number of different approaches. These include but are not limited to:

1. Leveraging data for internal operations (strictly proprietary approach)
2. Licensing proprietary data to select clients on a pay-on-demand basis
3. Trading data for mutual benefits
4. Leveraging proprietary data for advertising opportunities
5. Selling premium data products, e.g. data subscriptions
6. Sharing data freely among all stakeholders for maximum network effect experience

(Walker, 2015 in Marconi, Larocca & Visconti, 2017)

For transactional platforms, the focus of commercialization lies more in the exchange of goods and services, which follow traditional monetization guidelines. These product offerings can still be digital (e.g. Spotify, Salesforce), but accommodate physical product offerings (e.g. Uber, AirBnB) as well.

### 1.6 Winner-take-all dynamics

If the industrial revolution was centered around the factory assembly line, similarly the new age of digitalization can be embodied in the digital platform (Cusumano, Gawer &

Yoffie, 2019). Yet just as during and after the industrial revolution, heated social and economic debate has risen over whether these modern industrialists (the platform owners) wield an unhealthy degree of power and influence (Zysman & Kenney, 2016). Many scholars in different fields have debated the issue of whether platform economies are inherently oriented towards *winner-take-all* markets, and if so, why this is the case. A winner-take-all market is generally understood as a business environment where the best performers claim close to all of the benefits, leaving very little for other actors (Kenton, 2018). The controversy of winner-take-all markets revolves around their tendency to drive increased wealth dispersal; some get it all while others get nothing. Intuitively, it is not hard to see this dynamic play out in the contemporary platform economy, where a select few tech companies and their platforms demonstrably dominate global markets (see Exhibit 3; Schenker, 2019). This section will not seek to comment on whether or not platform economies are strictly winner-take-all markets, but rather explore why these characteristics are so endemic to the platform discussion.

### 1.7 Capturing the market

The notion of winner-take-all markets, albeit contested, appears very lucrative to businesses with platform ambitions. According to Cusumano, Gawer & Yoffie (2019), some businesses are willing to haemorrhage lots of money in the beginning because they are convinced that “*at the end of the road, there’s going to be a winner-take-all market*” waiting for them. As detailed earlier, the share of platforms that evolve into large commercial success stories is low (Cusumano, Gawer & Yoffie, 2019), yet when platforms do succeed, they make for tremendous returns. Often the winners may grow into seemingly invincible corporate goliaths that can do as they please. In this regard, empirical evidence would support the winner-take-all argument: it is all but too easy to distinguish several such *winners* (Moore & Tambini, 2018): Google, Apple, Facebook, Amazon and so on.

The theoretical argument as to why the platform model is conducive of winner-take-all phenomenon is, once again, tied to network effects (Kim, 2015). Considering the case of YouTube, for instance, it is evident that the video-sharing platform was the first of its kind to achieve the *critical mass* of users shortly after 2005. Initial users and content creators attracted more users, which then increased the attractiveness of the platform

sufficiently for network effects to take hold (Kim, 2015). Thereafter, the likelihood of a competing business repeating this success diminishes as the original network grows (Sun & Tse, 2007), particularly if the market conditions are such where consumers do not adopt more than one platform for accessing similar content.

### 1.8 Value within the Ecosystem

*“The reality is that the winners and losers in markets depend on who can participate and on what terms”* (Zysman & Kenney, 2016). This much is clear, but what of the power dynamic inside platform ecosystems – how is the value shared? From a data-centric perspective, extant information system research explains that even though all stakeholders within a digital network participate in value creation through data, the monetary reward for doing so is more evident to the companies managing it (Marconi, Larocca & Visconti, 2017). This can be applied to mean that although all platform ecosystem members create value, their participation in terms of proprietorship and monetization is limited. Unsurprisingly, several real-world examples support this conclusion; Facebook, for instance, does not own or create the content on its platform, but nonetheless reaps the majority benefits of its monetization.

## **2. Platforms and the Public**

### 2.1 Introduction

Just as platforms are changing the way companies conduct business, they are also altering the socio-economic standing of ordinary citizens; as consumers of platform-sourced goods and services, as the audience of platform marketing and monetization efforts, as members of vast information networks or even as employees and entrepreneurs of platform businesses. In the study of economics, the theoretical background posits that consumers are net benefactors of platforms since these are said to increase competition and reduce costs in the market (Lee, 2012). Indeed, scholars have conducted many studies where the results would support the existence of *consumer surplus*-net aggregate benefit-in platform-mediated markets (Oxera, 2015). However, economic theory tends to be lamentably one-dimensional in its analysis: market

performance gains in favour of the consumer may be all but offset by other factors such as labour disruption or privacy concerns. Furthermore, what awaits the consumer when platforms become too dominant or monopolistic? Bearing these questions in mind, this section is dedicated to a more comprehensive analysis of the different perspectives on platforms & the common consumer.

## 2.2 Consumer benefits

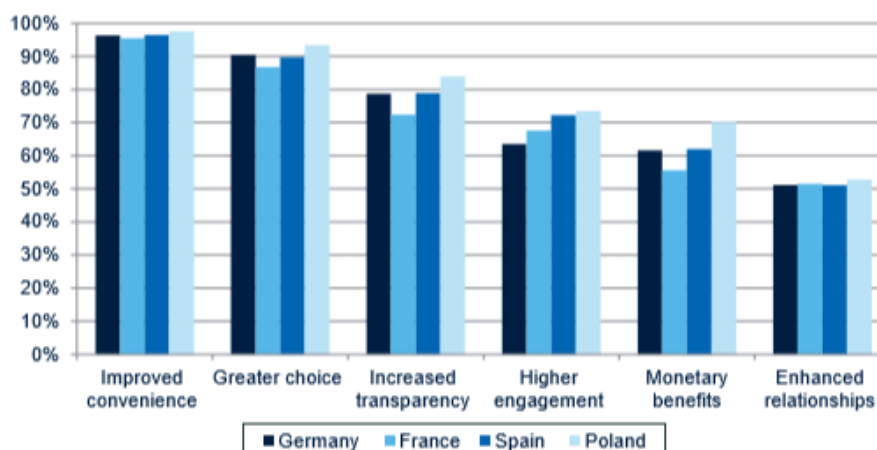
First and foremost, platforms have provided consumers with entirely novel channels through which to consume (Wang, Ai & Zhong, 2019) – and more broadly, to **transact**. How, though, are these new channels ‘superior’ or at least different from traditional ones? As detailed above, consumers may benefit from platform market penetration through the knock-on effects of increased competition, which tend to drive a lower price level (Lee, 2012; van Alstyne, Parke & Choudary, 2016). Furthermore, this increased competition usually provides for greater product variety, an aspect that is also greatly valued by consumers (Lee, 2012; Wang, Ai & Zhong, 2019). What is unique to the platform channel, however, is the ease and efficiency of interaction which serves to decrease costs. Examples of such reduced costs to the consumer include:

- 1) Search costs – the costs incurred in the process of finding the desired parties to interact with, and
- 2) Transaction costs – any costs associated with the exchange of goods and services (Moore & Tambini, 2018; OECD, 2019).

## Oxera Business Study on Platforms & Consumer Value

In 2015, Oxera Consulting conducted an insightful survey of over 6000 household respondents in 4 countries (Germany, France, Spain, Poland); the idea was to identify and measure consumer perceptions of the benefits they gain from the usage of online platforms. According to Oxera, the limitation of a lot of the contemporary research on the subject is that it only examines the mechanisms of whether and how much consumers benefit from platform use, but rarely delves into specifics regarding what factors the consumers themselves value the most.

Exhibit 6: Consumer perception of platform benefits (Oxera, 2015)



The findings would indicate an overwhelmingly positive response, since 97% of respondents identified at least one benefit they associate with platform use (Exhibit 6; Oxera, 2015). The most selected benefit categories were improved convenience, greater choice, increased transparency, higher engagement, monetary benefits and enhanced relationships, which were all *relatively* consistent across the studied nations. A key derivative observation is that a lot of these benefits (such as transparency, enhanced relationships) are rather intangible in nature, which further highlights a ‘blind spot’ of economic literature in this area.

### 2.3 Platform size & consumer utility

A crucial element of the theory on platforms and network effects would dictate that the value/benefits of platforms to consumers is directly correlated with the size of the platform. This is due to the inter-dependence of the demand for a platform and the demand for the associated goods, services and applications (Iansiti & Zhu, 2015). Consider, for instance, a software platform: “*Having more applications on... [the] platform leads to greater demand for that platform; at the same time, a larger installed base of consumers leads to a larger supply of applications,*” (Lee, 2015). The more participants, the larger the platform, and therefore the most value to customers it would seem (Brunier et. al, 2020). Aside from cost reduction and product variety, this conclusion is also supported by a utilitarian perspective, since the access to and availability of the associated goods and services increases in tandem with the platform user base (Hagiu,



2015). These specific network phenomena are often cited as ‘cross-side network effects’ or ‘indirect network effects’ by scholars (Hagiu, 2015).

#### 2.4 The Monopoly Dilemma: Winner-take-all from the Customer Perspective

A central tenet of traditional economics is that monopolistic markets are characterized by several inefficiencies and disadvantages over more competitive ones. To the consumer these include but are not limited to supply restrictions onto the market, higher pricing, reductions in consumer welfare and limitations in product and supplier choice (Economics Online, n.d.). Considering, then, the earlier section on *Platform Size and Consumer Utility*, an economic paradox becomes evident. In other words, if consumer value is maximized when a given platform is as large as possible, will it not eventually develop monopoly power, and consequentially hinder the former?

A monopoly outcome gains support from researchers who subscribe to an expectation-driven view of platform success (Iansiti & Zhu, 2015). In this school of thought and its associated modelling, consumers are taken to form rational expectations of a platform’s future success (in terms of market share) and to adjust their behaviour accordingly. Therefore, these scenarios often play out to create a *monopoly equilibrium*, where all consumers eventually accumulate on one platform (Iansiti & Zhu, 2015). A key observation of these models is that as would-be new platforms lack an established userbase, customers tend to side with the incumbent platform (Iansiti & Zhu, 2015). This cross-side network phenomenon makes it very difficult to dislodge existing monopolies (Moore & Tambini, 2018), and also implies an emphatic first mover advantage. According to some researchers, for consumers this means that “...*a platform that has a small lead on both sides of the market [...] could take over the entire market even if its quality is inferior to its rivals,*” (various in Iansiti & Zhu, 2015).

There is no clear-cut scholarly consensus on whether and when a monopoly outcome should be expected (Lee, 2015). Müller and Böhme (2014) have attempted to outline the market conditions in which a platform monopoly emerges, and those in which competing platforms may coexist; they posit that conditions where

- 1) platforms are homogenous
- 2) consumers wish to use only one platform for one function, and

### 3) the cross-side network effects are strong and positive

are conducive of a monopoly outcome. On the contrary, the likelihood of markets that do not exhibit these conditions to reach a monopoly equilibrium is “*ambiguous*” (Müller and Böhme, 2014). However, the authors make note that the absence of one or all of these factors alone does not rule out a platform monopoly either. Indeed, there are indicators that customer multi-homing (using many platforms for similar functions) is the strongest catalyst for platform competition (Moore & Tambini, 2018). In this regard, a stark conflict of interest between the platform owners and the platform users can be discerned. While most of the consumers on digital platforms practise and value multi-homing (Oxera, 2015), the platform suppliers are often taking measures to lock in their userbase in order to counter this practise in their favour (van Alstyne, Parker & Choudary, 2016).

## 3. Platforms and Society: A Regulatory Perspective

### 3.1 The need for a regulatory framework

This final stakeholder analysis section will discuss the relationship public institutions have with the process of platformization. It is evident that such a large change in markets will prompt a regulatory response (Cusumano, Gawer & Yoffie, 2019); the question is, what kind of policies will be enacted and how will they shuffle the platform power dynamic. Up until very recently, platform owners have undoubtedly been “ahead of the curve”, meaning that they have been largely able to make up their own rules as they go. This owes to the exponential development and diffusion of digital technologies wherein the rest of society has been unable to keep up. With a dilemma between the untold opportunities posed by platforms and the socio-economic reverberations of platformization becoming ever more apparent, regulators have gradually entered the industry frame with budding approaches Dufva et al. (2017).

Moore & Tambini (2018) examine the ascendancy and power of the world’s largest platform companies in their book “*Digital Dominance: The Power of Google, Amazon, Facebook and Apple.*” They extrapolate that while the calls for tough regulations on platforms are sometimes confounded with partisan arguments from incumbents

seeking protection against their platform competitors, the regulatory measures currently in authorities' disposal do seem outdated for a platform setting. Similarly, van Alstyne, Parker & Choudary (2016) produce an elaborate list of reasons why these markets should be regulated with a new approach they would dub 'Regulation 2.0'. These include the rules of platform access and participation, pricing concerns, data privacy and ethics, national control of information assets, tax policy, labour regulation and the potential for misuse of power by the *winner* platform companies. Few concrete measures or specific policies have yet to be unearthed, but in recent developments the U.S. Federal Trade Commission, Department of Justice and Congress have begun subjecting the largest platform companies (Google, Amazon, Facebook, Apple) to increased anti-trust scrutiny (Chen, 2019).

### 3.2 Case: The European Union & Digital Platforms

According to the European Commission (2019), "...platforms are strong drivers of innovation and play an important role in Europe's digital society and economy. [...] They increase consumer choice, improve efficiency and competitiveness of industry and can enhance civil participation in society." It is also evident from the European Commission's public communications that their regulatory interests have spiked in recent years. Their website [ec.europa.eu] lists several projects, legislative undertakings and investigations into topics also discussed in this thesis (digital platforms, the platform economy, cloud computing, data privacy), all of which have been launched in only recent years.

Despite presenting platforms in a primarily positive spotlight, the Commission does concede that: "*The growing importance of the online platform economy raises new policy and regulatory challenges. In particular... [its] ...potential cannot be fully exploited due to certain potentially harmful trading practices and a lack of effective redress*" (2018). The wording of *Commission Decision of 26.4.2018* also discretely implies that traditional tools such as Competition Law, Labour Law and Data Protection statutes (Strowel & Vergote, n.d.) have proven inadequate as regulatory tools for platform environments, primarily due to the rapid pace of technological development. Some of the *issues* the European authorities outline as emerging in a problematic context include "...algorithmic decision-making and ranking, data access and use,

*remuneration of material displayed online, business-to-business commercial relations in online advertising, alleged discriminatory practices of service providers vis-à-vis users and restrictions on users to offer different conditions on other distribution channels,”* (European Commission, 2018). Unsurprisingly, most of these topics have also been brought forth in the earlier stakeholder analysis sections. To counter their shortcomings the EC has established its own Observatory on the Online Platform Economy. Although tasked only to observe, liaise, investigate and advise for the time being, it is entirely possible if not likely that the recommendations of this institution will see themselves become legislation in the near future.

#### **4. Conclusions & Discussion**

Digital platforms and the concept of the platform economy are perhaps the most significant technological and economic advancements of the late decade. In ascertaining the impacts of digital platforms, two major themes become apparent throughout this thesis. The first of these deals with understanding the rapid breakthrough of digital platforms and their tremendous potential for new value creation and capture. Scholars and empirical evidence establish digital platforms as providing for grand opportunities with regards to novel products and services, efficiency, collaboration, technological innovation and market welfare – this much is clear.

The second theme contemplates the dynamics of how platform value is shared, and with what consequences. A concern shared by many regarding the current trajectory of the platform power structure is that this new value, as detailed earlier, will primarily be enjoyed and administered by tech giants such as Amazon and Apple. Likewise, it remains unclear whether society will be able to make good on the opportunities of platformization or will it squander them. The situation has multiple levels to it: for instance, a consumer who enjoys certain types of platform benefits may simultaneously suffer from platform-induced disruption at the workplace, or bear anxiety regarding how platform corporations manage and handle his/her data.

In light of the findings presented in this thesis, it is fair to say that societies around the globe are at a crossroads regarding the future of platforms. According to most experts the platform steam engine will not stop here, but that the global share of economic activity being mediated by platforms will only continue to increase as larger and larger

ecosystems form by the day. The economic playing field will likely be completely revolutionized, and the reader will live to see ever more innovative developments such as the mass-adoption of cloud computing solutions in daily life. As the process of platformization surges forward, it is highly likely that the societal issues and other externalities discussed in this thesis will also intensify. Unless consumers, businesses and the public sector find some common ground in the form of an agenda for managing platformization, they risk a *carte blanche* scenario wherein the largest platform companies can dictate the terms of the future marketplace. By the words of John Zysman and Martin Kenney (2016): “*We are in the midst of a reorganization of our economy in which the platform owners are seemingly developing power that **may** be even more formidable than was that of the factory owners in the early industrial revolution.*”

## 5. Reference List

Barrett, M., Davidson, E., Prabhu, J. and Vargo, S., 2015. Service Innovation in the Digital Age: Key Contributions and Future Directions. *MIS Quarterly*, [online] 39(1), pp.135-154. Available at: <<https://paulallen.ca/documents/2015/08/barrett-m-davidson-e-prabhu-j-and-sl-vargo-service-innovation-in-the-digital-age-key-contributions-and-future-directions-2015.pdf>>.

Bayrak, E., Conley, J. and Wilkie, S., 2011. The Economics of Cloud Computing. *Korean Economic Review*, [online] 27(2), pp.203-220. Available at: <[https://www.researchgate.net/publication/298491478\\_The\\_Economics\\_of\\_Cloud\\_Computing](https://www.researchgate.net/publication/298491478_The_Economics_of_Cloud_Computing)> [Accessed 4 Apr 2020].

Benkler, Y. 2006. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven, CT: Yale University Press. Cited in Yoo, Henfridsson & Lyytinen (2010).

Bharadwaj, A., Sawy, O. A. El, Pavlou, P. A. and Venkatraman, N. (2013) ‘Digital Business Strategy: Towards a Next Generation of Insight’, *MIS Quarterly*, 37(2), pp. 471–482.

Bloomberg, J., 2018. *Digitization, Digitalization, And Digital Transformation: Confuse Them At Your Peril*. [online] Forbes. Available at: <<https://www.forbes.com/sites/jasonbloomberg/2018/04/29/digitization-digitalization-and-digital-transformation-confuse-them-at-your-peril/#7cde20fe2f2c>> [Accessed 4 Apr 2020].

Brunier, F., Kelly, C., Malevitis, T. and Shah, A., 2020. *The Future of Platform Value*. [online] Accenture.com. Available at: <<https://www.accenture.com/us-en/insights/strategy/platform-value>> [Accessed 4 Apr 2020].

Bughin, J., Catlin, T. and Dietz, M., 2019. *The right digital-platform strategy*. [online] McKinsey & Co. Available at: <<https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/the-right-digital-platform-strategy>> [Accessed 4 Apr 2020]

Chen, A., 2019. *Regulating or breaking up Big Tech: an antitrust explainer*. [online] MIT Technology Review. Available at: <<https://www.technologyreview.com/2019/06/05/135080/big-tech-breakup-regulation-antitrust-apple-amazon-google-facebook-doj-ftc-policy/>> [Accessed 4 Apr 2020].

Consultancy.org. 2018. *Market Size Of Global Platform Economy Surpasses \$7 Trillion Mark*. [online] Available at: <<https://www.consultancy.org/news/104/market-size-of-global-platform-economy-surpasses-7-trillion-mark>> [Accessed 4 Apr 2020].

Cusumano, M., Gawer, A. and Yoffie, D., 2019. *How Digital Platforms Have Become Double-Edged Swords*. [interview transcript] Available at: <<https://sloanreview.mit.edu/article/how-digital-platforms-have-become-double-edged-swords/>>

Davenport, T., 1992. *Process Innovation: Reengineering Work Through Information Technology*. Boston: Harvard Business School Press, pp.5-7.

Duch-Brown, N., 2017. *The Competitive Landscape of Online Platforms*. [online] Seville, Spain: Joint Research Centre for the European Commission. Available at: <<https://ec.europa.eu/jrc/sites/jrcsh/files/jrc106299.pdf>> [Accessed 4 Apr 2020].

Dufva, M., Koivisto, R., Junno, S., Ilmola, L., 2017. *Anticipating Alternative Futures for the Platform Economy*. [online] Available at: <[https://www.researchgate.net/publication/320043058\\_Anticipating\\_Alternative\\_Futures\\_for\\_the\\_Platform\\_Economy](https://www.researchgate.net/publication/320043058_Anticipating_Alternative_Futures_for_the_Platform_Economy)> [Accessed 4 Apr 2020].

Eastwood, B., 2019. *Digital platforms: High valuations, but high risk of failure*. [online] MIT Sloan Management Review. Available at: <<https://mitsloan.mit.edu/ideas-made-to-matter/digital-platforms-high-valuations-high-risk-failure>> [Accessed 4 Apr 2020].

Economics Online (n.d.). Monopoly. [online] Available at: <[https://www.economicsonline.co.uk/Business\\_economics/Monopoly.html](https://www.economicsonline.co.uk/Business_economics/Monopoly.html)> [Accessed 4 Apr 2020].

Ecosystem. *Merriam-Webster.com Dictionary*, Merriam-Webster. Available at: <<https://www.merriam-webster.com/dictionary/ecosystem>> [Accessed 4 Apr 2020].

Etro, F., The Economics of Cloud Computing (March 8, 2012). The IUP Journal of Managerial Economics, Vol. IX, No. 2, pp. 7-22, May 2011. Available at: <<https://ssrn.com/abstract=2018109>>

European Commission., 2018. *COMMISSION DECISION of 26.4.2018 on setting up the group of experts for the Observatory on the Online Platform Economy*. Available at: <<https://ec.europa.eu/digital-single-market/en/news/commission-decision-group-experts-observatory-online-platform-economy>> [Accessed 4 Apr 2020].

European Commission, 2015. *Online Platforms*. [online] Available at: <https://ec.europa.eu/digital-single-market/en/online-platforms-digital-single-market> [Accessed 4 Apr 2020].

Evans, D., Hagiu, A. and Schmalensee, R., 2006. *Invisible Engines*. [online] Available at: <[https://www.researchgate.net/publication/23573518\\_Invisible\\_Engines\\_How\\_Software\\_Platforms\\_Drive\\_Innovation\\_and\\_Transform\\_Industries](https://www.researchgate.net/publication/23573518_Invisible_Engines_How_Software_Platforms_Drive_Innovation_and_Transform_Industries)> [Accessed 4 Apr 2020].

Evans, P. and Gawer, A., 2016. *The Rise Of The Platform Enterprise*. The Center for Global Enterprise. Available at: <[https://www.thecge.net/app/uploads/2016/01/PDF-WEB-Platform-Survey\\_01\\_12.pdf](https://www.thecge.net/app/uploads/2016/01/PDF-WEB-Platform-Survey_01_12.pdf)> [Accessed 4 Apr 2020].

Farrell, J. and Weiser, P., 2003. *Modularity, Vertical Integration, and Open Access Policies: Towards A Convergence of Antitrust and Regulation In The Internet Age*. Industrial Organization 0303007, University Library of Munich, Germany.

Gartner. n.d. *Digitalization*. [online] Available at: <<https://www.gartner.com/en/information-technology/glossary/digitalization>> [Accessed 4 Apr 2020].

Gawer, A. and Cusumano, M., 2013. Industry Platforms and Ecosystem Innovation. *Journal of Product Innovation Management*, [online] 31(3), pp.417-433. Available at: <[https://www.researchgate.net/publication/261330796\\_Industry\\_Platforms\\_and\\_Ecosystem\\_Innovation](https://www.researchgate.net/publication/261330796_Industry_Platforms_and_Ecosystem_Innovation)> [Accessed 4 Apr 2020].

Hagiu, A. and Wright, J., 2015. Multi-Sided Platforms. *SSRN Electronic Journal*, [online] 43. Available at: <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2794582](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2794582)> [Accessed 4 Apr 2020].

Hagiu, A., 2013. *Strategic Decisions For Multisided Platforms*. [online] MIT Sloan Management Review. Available at: <<https://sloanreview.mit.edu/article/strategic-decisions-for-multisided-platforms/>> [Accessed 4 Apr 2020].

- Hagiu, A., 2015. Strategic Decisions for Multisided Platforms. *MIT Sloan Management Review: Sloanselect Collection*, [online] pp.4–13. Available at: <<http://marketing.mitsmr.com/PDF/STR0715-Top-10-Strategy.pdf>> [Accessed 4 Apr 2020].
- Henderson, R.M. and Clark, K.B. (1990). 'Architectural innovation: the reconfiguration of existing product technologies and the failure of established firms', *Administrative Science Quarterly*, 9-30. Cited in Kim, 2015.
- Hyvönen, J., 2018. *Strategic Leading Of Digital Transformation In Large Established Companies – A Multiple Case-Study*. Master's Thesis. Aalto University School of Science.
- Iansiti, M. and Levien, R., 2004. The keystone advantage: what the new dynamics of business ecosystems mean for strategy, innovation, and sustainability. Boston: Harvard Business Press. Cited in Kim, 2015.
- Jeon, D., Kim, B., and Menicucci, D., 2015. *Price Discrimination by a Two-Sided Platform: With Applications to Advertising and Privacy Design*. NET Institute Working Paper No. 15-08. Available at: <<https://ssrn.com/abstract=2672058>>
- Jovanovic, B. & Rousseau, P.L., 2005. "General Purpose Technologies," *Handbook of Economic Growth*, in: Philippe Aghion & Steven Durlauf (ed.), *Handbook of Economic Growth*, edition 1, volume 1, chapter 18, pages 1181-1224 Elsevier. Available at: <<https://www.nber.org/papers/w11093>>
- Jurevicius, O., 2013. *Value Chain Analysis*. [online] Strategic Management Insight. Available at: <<https://strategicmanagementinsight.com/tools/value-chain-analysis.html>> [Accessed 4 Apr 2020].
- Karimi, J. and Walter, Z., 2015. The Role of Dynamic Capabilities in Responding to Digital Disruption: A Factor-Based Study of the Newspaper Industry. *Journal of Management Information Systems*, 32(1), pp.39-81.
- Kenton, W., 2018. *Winner-Takes-All Market*. [online] Investopedia. Available at: <<https://www.investopedia.com/terms/w/winner-takes-all-market.asp>> [Accessed 4 Apr 2020].
- Kim, J., 2015. *The Platform Business Model and Strategy: A Dynamic Analysis of the Value Chain and Platform Business*. Manchester Business School, Manchester Institute of Innovation Research, Manchester, U.K. Available at: <[www.research.manchester.ac.uk/portal/files/54581969/FULL\\_TEXT.PDF](http://www.research.manchester.ac.uk/portal/files/54581969/FULL_TEXT.PDF)> [Accessed 4 Apr 2020]
- Lee, R.S., 2012. *Competing Platforms*. [online] Available at: <<https://pdfs.semanticscholar.org/2068/fd074e516a6794c73a33863292119473f0cd.pdf>> [Accessed 4 Apr 2020].
- Marconi M., Larocca, A. and Visconti, R.M., 2017. *Big Data-Driven Value Chains and Digital Platforms: From Value Co-Creation to Monetization*. Available at: <<https://ssrn.com/abstract=2903799>> [Accessed 4 Apr 2020].
- Markus, M. and Loebbecke, C., 2013. Commoditized Digital Processes and Business Community Platforms: New Opportunities and Challenges for Digital Business Strategies. *MIS Quarterly*, [online] 37(2), pp.649-653. Available at: <<https://www.jstor.org/stable/43825930?seq=1>> [Accessed 4 Apr 2020].
- Miles, R., Miles, G., Snow, C., Blomqvist, K. and Rocha, H., 2009. *The I-Form Organization*. *California Management Review*, [online] 51(4), pp.61-76. Available at: <[https://www.researchgate.net/publication/262495286\\_The\\_I-Form\\_Organization](https://www.researchgate.net/publication/262495286_The_I-Form_Organization)> [Accessed 4 Apr 2020].
- Moore, M. and Tambini, D., 2018. *Digital Dominance*. New York, NY: Oxford University Press.
- Morvan, L., Hintermann, F. and Vazirani, M., 2016. *Five Ways To Win With Digital Platforms*. Accenture. Available at: <[https://www.accenture.com/us-en/\\_acnmedia/pdf-29/accenture-five-ways-to-win-with-digital-platforms-executive-summary.pdf](https://www.accenture.com/us-en/_acnmedia/pdf-29/accenture-five-ways-to-win-with-digital-platforms-executive-summary.pdf)> [Accessed 4 Apr 2020].
- Müller, C. and Böhme, E., 2014. The Monopoly Benchmark on Two-sided Markets. *Finnish Economic Papers*, [online] 27(1). Available at: <[https://www.taloustieteellinenyhdistys.fi/wp-content/uploads/2014/11/fep12014\\_Muller\\_bohme.pdf](https://www.taloustieteellinenyhdistys.fi/wp-content/uploads/2014/11/fep12014_Muller_bohme.pdf)> [Accessed 4 Apr 2020].

Nambisan, S., Lyytinen, K., Majchrzak, A. and Song, M., 2017. Digital Innovation Management: Reinventing Innovation Management Research in a Digital World. *MIS Quarterly*, 41(1), pp.223-238.

National Institute of Standards and Technology, 2011. *The NIST Definition Of Cloud Computing*. Gaithersburg, MD: U.S. Department of Commerce. Available at: <<https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf>>

OECD, 2019. *An Introduction to Online Platforms and Their Role in the Digital Transformation*, OECD Publishing, Paris. Available at: <<https://doi.org/10.1787/53e5f593-en>> [Accessed 4 Apr 2020]

Oxera, 2015. *Benefits of online platforms*. Oxera Consulting LLP for Google. Available at: <<https://www.oxera.com/wp-content/uploads/2018/07/The-benefits-of-online-platforms-main-findings-October-2015.pdf.pdf>> [Accessed 4 Apr 2020].

Posthumus, T., and Samsom, S., 2018. *How to monetize a platform*. [online] KPMG Netherlands. Available at: <<https://home.kpmg/nl/en/home/social/2017/12/how-to-monetize-a-platform.html>> [Accessed 4 Apr 2020].

Reddy, N., 2018. *How To Harness The Power Of Network Effects*. [online] Forbes. Available at: <<https://www.forbes.com/sites/forbescoachescouncil/2018/01/02/how-to-harness-the-power-of-network-effects/#7ad9e4f362e8>> [Accessed 4 Apr 2020].

Reinartz, W., Wiegand, N., Wichmann, J., 2017. *THE RISE OF DIGITAL (RETAIL) PLATFORMS*. IFH Sponsors, vol. 9. Available at: <[https://marketing.uni-koeln.de/sites/marketingarea/Document/Research/2019\\_IFH\\_Whitepaper\\_ENG\\_Reinartz\\_Wiegand\\_Wichmann.pdf](https://marketing.uni-koeln.de/sites/marketingarea/Document/Research/2019_IFH_Whitepaper_ENG_Reinartz_Wiegand_Wichmann.pdf)>

Schenker, J. 2019. *The Platform Economy*. [online] Medium. Available at: <<https://innovator.news/the-platform-economy-3c09439b56>>

Schenker, J., 2019. *Key Take Aways From Davos 2019*. [online] Medium. Available at: <<https://innovator.news/key-take-aways-from-davos-2019-e32fe420862f>> [Accessed 4 Apr 2020].

Schumpeter, Joseph A., Capitalism, Socialism, and Democracy (1942). University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship. Available at SSRN: <<https://ssrn.com/abstract=1496200>>

Skog, D., Wimelius, H. and Sandberg, J., 2018. Digital Disruption. *Business & Information Systems Engineering*, 60(5), pp.431-437.

Srnicek, N., 2017. *Platform Capitalism*. Previewed on Google Books. [Accessed 4 Apr 2020].

Strowel, A. and Vergote, W. (n.d.). *Digital Platforms: To Regulate or Not To Regulate? Message to Regulators: Fix the Economics First, Then Focus on the Right Regulation*. [online] European Commission. Available at: <[https://ec.europa.eu/information\\_society/newsroom/image/document/2016-7/uclouvain\\_et\\_universit\\_saint\\_louis\\_14044.pdf](https://ec.europa.eu/information_society/newsroom/image/document/2016-7/uclouvain_et_universit_saint_louis_14044.pdf)> [Accessed 4 Apr 2020].

Sun, M. and Tse, E., 2007. *When Does the Winner Take All in Two-Sided Markets?* Review of Network Economics, [online] 6(1). Available at: <<https://www.degruyter.com/view/journals/rne/6/1/article-rne.2007.6.1.1108.xml.xml>> [Accessed 4 Apr 2020].

Van Alstyne, M., Parker, G. and Choudary, S., 2016. *Pipelines, Platforms, And The New Rules Of Strategy*. [online] Harvard Business Review. Available at: <<https://hbr.org/2016/04/pipelines-platforms-and-the-new-rules-of-strategy>> [Accessed 4 Apr 2020].

Van Alstyne, M., Parker, G. and Choudary, S., 2016. *Platform revolution: how networked markets are transforming the economy and how to make them work for you*. 1<sup>st</sup> edition. W.W. Norton & Co, New York, NY.

Vaquero, L., Roderio-Merino, L., Caceres, J. and Lindner, M., 2008. A break in the clouds. *ACM SIGCOMM Computer Communication Review*, [online] 39(1), pp.50-55. Available at: <[https://www.researchgate.net/publication/220195477\\_A\\_Break\\_in\\_the\\_Clouds\\_Towards\\_a\\_Cloud\\_Definition](https://www.researchgate.net/publication/220195477_A_Break_in_the_Clouds_Towards_a_Cloud_Definition)> [Accessed 4 Apr 2020].



Vazquez Sampere, J. P. 2016. Why Platform Disruption Is So Much Bigger Than Product Disruption. *Harvard Business Review*, 94(4). Cited in: Korhonen, H. M. E., Still, K., Seppänen, M., Kumpulainen, M., Suominen, A., & Valkokari, K. (2017). *The core interaction of platforms: how startups connect users and producers*. *Technology Innovation Management Review*, 7(9), 17-29. Available at: <<https://doi.org/10.22215/timreview/1103>>

Walker, R. 2015. *From Big Data to Big Profits*, Oxford: Oxford University press. Cited in Marconi, Larocca & Visconti, 2017.

Wang, G., Ai, X. and Zhong, L., 2019. *Managing product variety on online platform: Consumer heterogeneity and diseconomies of scope*. *PLOS ONE*, [online] 14(8). Available at: <<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0219177>> [Accessed 4 Apr 2020].

Yahoo Finance. 2020. *S&P500 Historical Data*. Available at: <<https://finance.yahoo.com/quote/%5EGSPC/history/>> [Accessed 4 Apr 2020].

Yonatany, M. Platforms, ecosystems, and the internationalization of highly digitized organizations. *J Org Design* 6, 2 (2017). Available at: <<https://doi.org/10.1186/s41469-017-0012-3>>

Yoo, Y., Henfridsson, O. and Lyytinen, K., 2010. Research Commentary—The New Organizing Logic of Digital Innovation: An Agenda for Information Systems Research. *Information Systems Research*, 21(4), pp.724-735.

Zhu, F. and Iansiti, M., 2012. *Entry into Platform-Based Markets*. [online] Available at: <<https://www.semanticscholar.org/paper/Entry-into-Platform-Based-Markets-Zhu-Iansiti/a0ff427a1b832ae3617ae8d95e71d34082ab850b>> [Accessed 4 Apr 2020].

Zysman, J. and Kenney, M. (2016). *The Rise of the Platform Economy*. *Issues in Science and Technology*, XXXII (3). Available at: <<https://issues.org/the-rise-of-the-platform-economy/>> [Accessed 4 Apr 2020].

Zysman, J. and Kenney, M., 2015. *Choosing A Future In The Platform Economy: The Implications And Consequences Of Digital Platforms*. Amelia Island, FL: Kauffman Foundation New Entrepreneurial Growth Conference. Available at: <<https://brie.berkeley.edu/sites/default/files/platformeconomy2distributejune21.pdf>> [Accessed 4 Apr 2020].