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Private Security Industry Regulatory Authority





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**Safety at your Fingertips:
EXPLORING TECHNOLOGY-BASED
PLATFORMS IN THE PRIVATE
SECURITY INDUSTRY**

ABOUT THE REPORT

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ABBREVIATIONS AND ACRONYMS

Airbnb	Air Bed and Breakfast
App	Application
EIU	Economist Intelligence Unit
GPS	Global Positioning System
iOS	iPhone Operating System
IS	Information Systems
IT	Information Technology
PSI	Private Security Industry
PSiR Act	Private Security Industry Regulation Act No. 56 of 2001
PSiRA	Private Security Industry Regulatory Authority
SMS	Short Message Service

EXECUTIVE SUMMARY

Technology-based platforms are slowly but surely disrupting the provision of private security services thus necessitating a rethink in terms of policy and legal reform. The drafters of the Private Security Industry Regulation Act No. 56 of 2001 (PSiR Act) arguably foresaw the use of technology-based platforms in the provision of security services. Section 1(k) of the PSiR Act defines a security service to include “making a person or the service of a person available, whether directly or indirectly, for the rendering of any service referred to in paragraphs (a) to (j) and (l) to another person.” Now there exists technology-based platforms which make a person or the service of a person available for the rendering of a security service, as defined in the PSiR Act.

This study explores software technologies in the private security industry with a focus on technology-based platforms, including their development, application, and regulations (or lack thereof). To fully appreciate the phenomenon of technology-based platforms in the provision of private security, this study looked at the definition of digital platforms in general, the type of digital platforms in the open market, and the legal disruption resulting from the introduction of digital platforms. The study also considered the liability aspect of developers, owners and service providers associated with digital platforms in the private security industry.

This study found that technology-based platforms are very complex commodities which facilitate technological innovation and the creation of new goods and services. These platforms were not uniform in that, while there are platforms that only facilitates the provision of private security services, there are also those which provide for a plethora of services including private security services. Whilst other platforms are linked to private security businesses, other platforms are linked to inhouse security providers. The study also confirmed that the use of technology-based platforms in the private security industry is proving to be effective, given the insecurity challenges facing South Africans.

Owing to its novelty, the study found that there is still a long way to go regarding the governance of technology-based platforms in the private security space. It is for this reason that the study makes four main recommendations, namely: One, the listing of digital platforms and apps facilitating the private security services; two, the pronouncement of a PSiRA policy position on the regulation of technology-based platforms offering private security services, which will inform a possible development of regulations; three, the consideration and vetting of technology-based platforms; and four, the approval of technology-based platforms to be subjected to a possible regulatory framework.

1. Introduction

Over the last decade, software technology has witnessed a massive jump in improvement to address security challenges. In the case of South Africa, crime statistics remain alarming and software technology is seen to be providing a part solution to this problem. South Africa remains one of the countries with the highest crime rates in the world. According to the Crime Index for Country (2020). South Africa has a crime index of 75.50, making it the third highest in the World. The World Population Review (2024) states that South Africa has a notably high rate of assaults, rape, homicides, and other violent crimes, which is attributed to several factors including high levels of poverty, inequality, unemployment, social exclusion, and the normalisation of violence.

Among other things, a plethora of security measures, including technology-based platforms, have been developed. The maturity of technology is now proven by the constant presence of mobile applications (apps) wherever we go. These applications can be downloaded with ease on personal mobile devices and can track a user location in real time. Owing to the increased use of smartphones, apps are equally increasing as portable devices making them ideal for safety monitoring. Safety and security apps can be accessed from Apple App Store (for Apple products) and Google App Store (for Android products).

In a nutshell, this study seeks to explore software technologies in the private security industry with a focus on technology-based platforms, including their development, application, and regulation. The study will also discuss the aspects of liability in relation to the developers, owners, and service providers. Recommendations stemming from this analysis will offer guidance on navigating liability concerns and formulating effective strategies moving forward.

2. Background and rationale

Digital platforms are playing an increasing role in the private security space. Through these digital platforms consumers of private security are matched with private security providers which make the provision of private security experience an interesting one. According to Strowel and Vergote (2016), Digital platforms “create new market opportunities, including some labour, if not real jobs”. Over and above this, digital platforms bring new entrants to the market and the security sector is no exception.

It must be noted that the provision of private security services is regulated by the Private Security Industry Regulation Act 56 of 2001 (PSiR Act). For purposes of this study, it could be argued that the use of digital platforms for the provision of a security service is in fact a security service. Section 1(k) of the PSiR Act provides that a security service includes “making a person or the service of a person available, whether directly or indirectly, for the rendering of any service referred to in paragraphs (a) to (j) and (l), to another person.”

In this case, the digital platform acts as a conduit for the provision of a security service. Section 1 of the PSiR Act defines a security service as follows:

a) Protecting or safeguarding a person or property in any manner.	b) Giving advice on the protection or safeguarding of a person or property, on any other type of security service as defined in this section, or on the use of security equipment.	c) Providing a reactive or response service in connection with the safeguarding of a person or property in any manner.	d) Providing a service aimed at ensuring order and safety on the premises used for sporting, recreational, entertainment or similar purpose.
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e) Manufacturing, importing, distributing, or advertising of monitoring devices 50 contemplated in section 1 of the Interception and Monitoring Prohibition Act, 1992 (Act No. 127 of 1992).	f) Performing the functions of a private investigator.	g) Providing security training or instruction to a security service provider or prospective security service provider.	h) Installing, servicing or repairing security equipment.
i) Monitoring signals or transmissions from electronic security equipment.	j) Performing the functions of a locksmith.	k) Making a person or the services of a person available, whether directly or indirectly, for the rendering of any service referred to in Paragraphs (a) to (j) and (l), to another person.	l) Managing, controlling, or supervising the rendering of any services referred to in paragraphs (a) to (j).

It can be argued that when the PSiR Act was promulgated, digital platforms were not anticipated to make a person or services of a person available for the rendering of a security service. The Act was nevertheless drafted progressively to also include the use of digital platforms which arguably and directly or indirectly make a person or the services of a person available for the rendering of a security service.

Moving from this premise that digital platforms are capable of directly or indirectly making a person or the services of a person available for the rendering of a security service, it therefore follows that they ought to be regulated in terms of the PSiR Act. It can be argued that any person who makes use of a digital platform to directly or indirectly make a person or services of a person available for the rendering of a security service must be registered as a security provider in terms of the PSiR Act. Section 20(1)(a) of the PSiR Act provides that “[n]o person...may in any manner render a security service for remuneration, reward, a fee or benefit, unless such a person is registered as a security service provider in terms of this Act.”

3. Research aim, objectives, hypothesis and questions

The aim of the study is to discuss the impact of the disruption resulting from digital platforms for private security provision in so far as the law is concerned.

3.1 Objectives

The main research objectives of the study are as follows:

- Explore various digital platforms and their intricacies in the private security industry;
- Discuss the development (including coding), ownership, and use of the digital platforms in the private security industry;
- Discuss the disruption (including legal disruption) associated with digital platforms in the South African private security industry;
- Discuss the aspect of liability in relation to developers, owners, and service providers of digital platforms in the private security industry, and
- Offer recommendations on possible policy (and legal) reforms regarding the disruption associated with digital platforms in the South African private security industry.

3.2 Research hypothesis

The research hypothesis is as follows:

Digital platforms are slowly but surely disrupting the provision of private security services thus necessitating a rethink in terms of policy and legal reform.



3.3 Research questions

The study has a primary research question and secondary research questions.

The primary research question is as follows: -

- *How are digital platforms disrupting the provision of private security industry?*

The secondary research questions are as follows:

- What are the various digital platforms and their intricacies in the private security industry?
- What (who) is involved in the development (including coding), ownership, and use of the digital platforms in the private security industry?
- How has the disruption (including legal disruption) associated with digital platforms in the South African private security industry been?
- What are the aspects of liability in relation to developers, owners, and service providers of digital platforms in the private security industry?

4. Research methodology

This study is exploratory in nature. The qualitative research method was used. Both a desktop study and field research were undertaken in collecting data. A research questionnaire was developed to guide face-to-face interviews. The targeted participants were those involved and or associated with the development, ownership, and distribution of digital platforms. Once data was collected through the interviews, it was analysed to unpack the disruptive nature of digital platforms in this space.

In undertaking this study, ethics standards were strictly adhered to. Consent forms were completed by the targeted participants before interviews were conducted. The sample size included small, medium, and large companies which are involved or associated with digital platforms.

The first limitation to this study, which was identified in the initial stages, was the unreachability of companies developing digital platforms (available to the South African market) which are not based in South Africa. An attempt was made to ensure their participation via technology to address this limitation. The second limitation to this study was the dearth of literature in this area as related to the South African context. This is understandable in view of the fact that this innovative technology is slowly but surely permeating through the South African safety and security space. As a new phenomenon, it is hoped that this study will contribute to literature.

5. Literature review

This literature review focuses on the development, application, and regulation of technology-based platforms in the private security industry. Under this part, an attempt will be made to assess the current state of research on the digital platform phenomenon. The literature review will also reveal the experts who have written on this important topic. In undertaking this exercise, key questions on the use of digital platforms which need further research will be identified. This exercise enables a strategic process of determining the angle and approach best suited for purposes of this study.

The emergence of digital platforms has changed numerous industries (for the better), such as those in the hospitality sector, namely, Airbnb; those in the transport sector, namely Uber. These are just a couple of examples which are either powered or linked to software applications, such as iOS for Apple and Google Play for Android. Moreover, digital platforms are commonly used to arrange a variety of human tasks, such as social, political, and economical interactions (e.g., Tan *et al.* 2015; Kane *et al.* 2014). However, given its growing importance for practice, the changing nature of technology and its applications, and the numerous unsolved concerns in this field, calls for more in-depth research on the topic remain (e.g., Tiwana *et al.* 2010; de Reuver *et al.* 2017).



5.1 Definition of digital platforms

Gawer (2011) defines a digital platform as a base on which other businesses might create supplementary goods and services. Koh and Fichman (2014, p. 977) define digital platforms as the “dual-sided systems which promote interactions between different but interconnected categories of subscribers, such as users and sellers”. A platform-based ecosystem, as defined by Ceccagnoli, Forman, Huang, & Wu (2012); Gawer & Cusumano (2008); and Parida, Burstrom, Visnjic & Wincent (2019), refers to a scenario where a digital platform owner facilitates the creation of complementary technologies by other organisations, resulting in a network of businesses with significant interdependence. Rubén & Steven (2020) characterise digital platforms as internet companies that facilitate transactions between two distinct groups, such as suppliers and customers. Examples include Google, Facebook, and Airbnb, each employing various operations and interaction methods with users.

Sedera et al. (2016:367) explains that a digital platform is a type of technology design that enables a company to integrate information, computing and networking platforms, while also allowing for the development of its own computer features. For purposes of this review, the definition given by Schwarz (2017) will be used as a working definition for digital platforms. According to Schwarz (2017), digital platforms are commodities that create new social and business opportunities for various companies globally. They can be seen as areas that society and businesses can use for technological advancement on top of which new players might produce new products and services.

5.2 Digital platforms in general

Digital platforms are being used more extensively thus transforming industries and affecting our lives (Yoo, 2010). The development of businesses and society are being shaped by the rapid growth of the digital platform economy (Parker *et al.* 2017). In 2017, it was projected that by 2025, digital platforms would manage over 30 percent of the world economy (Atluri *et al.* 2017). According to a

global survey (Evans and Gawer, 2016), platforms have grown to be an important economic driver with an estimated value of \$4.3 trillion, at least 1.3 million direct employees, and countless of other employed. Many well-known companies such as Google, Amazon, Apple, and Facebook use a digital platform company structure (Constantinides *et al.* 2018; Forbes 2021). The prevalence of platforms is rising; 16 of the top 25 most valuable brands in 2014 serve as platforms (Taube, 2014).

Downes and Nunes (2013) caution the public to “big bang” disruptors that, although initially perceived as competitors, drastically alter the norms governing industries. The impact that smartphone had on portable navigation equipment companies such as Garmin and Tom-Tom are an example of “big bang” disruptions” (Downes & Nunes, 2013). This phenomenon’s popularity and reliance on IT capabilities, means information systems (IS) experts are becoming more interested in studying digital platforms. (e.g., Tiwana 2015; Kwark *et al.* 2017; Markus and Loebbecke 2013; Parker *et al.* 2017).

The credit card firms Visa and MasterCard are on the list and serve as a two-sided platform and promote communication between cardholders and stores. Tiwana (2014:6) states that a platform’s ecosystem is made up of the platform itself and any associated app. Gawer, 2014; Stummer *et al.* (2017) indicate that since technological companies like Apple have created a thriving platform ecosystem like the App Store, research on platform ecosystems is mostly focused on these companies.

Due to their popularity and portability, mobile apps are quickly taking over as the primary medium for digital interactions, with users spending more time using them than browsing the internet (Newark-French, 2011). Noteworthy, Rochet and Tirole (2006), contend that apps can also be thought of as dual-sided systems. In these systems users and developers, or app providers, are usually included, and the systems represent the integrated actions from the two groups. Thus, Gawer (2014) avers that the inclusion of platform owners, like Google and Apple, is necessary if apps are regarded as platforms.

In the context of service platforms like Facebook, Uber, and Airbnb, mobile app developers may also be considered as platform owners

since most apps are the first means of interaction for these service platforms. Moreover, Evans and Gawer (2016) state that prosperous businesses in the mobile app industry, especially the platform owners of the two main marketplaces for apps, Google Play and the App Store (both owned by Apple), are platform businesses.

Holst (2019) observes that the mobile applications market is growing rapidly with more than 2.7 billion smartphones users worldwide. Furthermore, Blair, (2019) avers that there are approximately 20-22 million cell phone users in South Africa. According to Verkasalo *et al.* (2010), new mobile applications are made easier by the use of smartphones. Kim, Kim & Rogol (2017) assert that apps, much like the widespread use of mobile devices, have shown significant expansion in recent years.

Libert *et al.* (2016) argue that digital platforms like Airbnb, Uber and other similar platforms have significantly altered their respective businesses and eliminated long-standing competitors. Additionally, Weill & Woerner (2015) maintain that the risk of disruption is more significant for established companies. Consequently, there may now be thousands of new competitors instead of the few that may have existed in the past (Hirt & Willmott, 2014). This phenomenon is especially significant in the internet market because it forces incumbents to cope with aggressive competitors, namely digital entrant platforms, with whom they must forge complementary relationships and mutually beneficial partnerships (e.g., Adner & Kapoor, 2010; Cusumano, Gawer, & Yoffie, 2019).

5.3 Characteristics of digital platforms

There are many features of digital platforms that explain why they have value. Firstly, digital platforms have a major impact on lowering costs related to transactions, which include those associated with shipping, search, and tracking (Eisenmann *et al.* 2006; Pagani 2013). For example, aggregation systems, like Expedia and TripAdvisor, collect and compile travel-related data from several sources onto a single platform, which lowers the expense of doing research and hiring middlemen. Secondly, platforms create new and different markets, especially if the platform has the prerequisites to operate

as an integrated system if, for example, the platform serves as the foundation for linking multiple related services or goods.

This suggests that platforms guarantee connectivity within the integrated system and, as a result, lower the costs associated with transactions (coordination) for the participants within the platform's ecosystem. The effects of networks continue to exist on digital platforms. These take place in these two- or multi-sided marketplaces where, for example, businesses or marketers gain more from a rise in buyers and subscribers on a platform and *vice versa*. Three fundamental features of digital platforms are common to all of them: they are technologically mediated, they facilitate communication between user groups, and they enable those groups to perform specific jobs (Cusumano et al., 2019; deReuver et al., 2018; Gawer, 2009).



5.4 Types of digital platforms

Platforms are different from other types of digital relics. Hanseth and Lyytinen (2016) present apps, platforms, and infrastructure as distinct categories of design with escalating levels of depth in architectural design and regulation in their analysis of the internet as information infrastructure. With infrastructures are at one end of this continuum and applications at the other, platforms are in the middle because they allow for some degree of openness and sharing, although much of the power over them is consolidated (Hanseth & Lyytinen, 2016).

Evans & Gawer (2016) identifies four categories of digital platform organisations, namely, Transaction, Innovation, Integrated, and Investment. In addition, Cusumano *et al.* (2020:48) defines transactions platforms as middlemen or online markets that allow participants to trade goods and services. For example, Airbnb connects landlords and guests in need of accommodation. By making it easier for various agents to connect with one another and by generally lowering some of the tensions in the transaction process, transaction platforms can be particularly helpful in lowering transaction costs (Evans & Gawer, 2016). Additionally, Nicholson *et al.* (2016) notes that social media platforms like Facebook, which are transaction platforms with consequences for socio-economic development, may help reduce poverty by facilitating greater access to knowledge and resources (such as opportunities for employment).

Innovation Platforms offer data (through application programmers) that platform-affiliated parties can use to develop new answers. Salesforce, allows programmers to design cutting-edge Salesforce services (Westerski *et al.*, 2011). Google's Android mobile operating system, which enables outside developers to create applications on top of an installed operating system, is a classic illustration of an innovation platform (P. Evans & Gawer, 2016). Platforms that integrate both the Transaction and Innovation types include Amazon. Apple's iOS mobile operating system is an illustration of an integration platform. Apple iOS is a transactional platform for developers to sell their programs to users while also serving as an innovation platform for external developers. Investment platforms function as a holding firm, a proactive investor, or both. They have devised a platform asset approach (Evans and Gawer, 2016, p. 9).

Organisational, technical, and economic positions can be used to group digital platform ecosystems (Eisenmann *et al.*, 2009; McIntyre and Srinivasan, 2017; Tiwana *et al.*, 2010; Constantinides *et al.*, 2018). At this point, economics (Jiang *et al.* 2018), technological (Tiwana, 2015), marketing (Parker and Van Alstyne, 2017), and societal (Theis *et al.* 2016) have been the primary frameworks used to examine digital platforms. There is a difference between 'winner takes all' and 'distinctiveness' sectors, according to academics and not all platforms are exactly alike (Cennamo, 2019). Three distinct types of digital (platform-based) business models for digital service providers are identified by Peitz and Valletti (2014). This review discusses two of the types of digital platform-based business models.

Platforms employing a direct payment strategy offer services to users without intermediaries and generally charge service fees. Examples of direct payment platforms include but not limited to [Bol.com](https://www.bol.com) and Netflix. Another contractual option is for the Internet Service Provider (ISP) to provide the service and charge customers for it (carrier billing). Others (such as Apple) offer 'direct payment' by selling both software and hardware. The second type of digital platform-based business models are built on a model of advertising that provides its services to users without asking them to pay up front. Platforms offer a service, and by exposing users to advertising, they indirectly generate income. Furthermore, the platform (like Facebook) can increase the efficacy of its advertising by utilising private information (Peitz and Valletti, 2014).

5.5 Digital platforms for security purposes

People worldwide now attach significant importance to smartphones and other mobile devices because they offer features and conveniences that were traditionally associated with desktop workstations. Security, however, continues to be a major challenge (Luo & Kang, 2011). Furthermore, Westerman *et al.* (2014) asserts that social media, and mobile devices are essential for business expansion and communication between a corporation and its new or existing clientele. Since, physical items are becoming more and more outfitted with sensors, connection, and software, digital platforms are becoming an indispensable source of digital innovation (Porter and Heppelmann, 2015; Yoo *et al.*, 2012). Consequently, the market for

mobile applications has grown significantly and is currently expanding quickly. According to a survey from 2010, there were 25 000 Android applications and 300 000 Apple applications available in each market (Mobithinking Mobile Statistic, 2013). The same survey also revealed that 26 percent of the downloaded applications were used once only.

The advanced technology of smartphones is being used more frequently as an application to enhance safety for individuals. An example of a safety digital platform is the personal safety triggering system. The following groups make up the app's purpose: personal safety, security risks, heartbeat-based emergencies, and car crashes. The app is mainly focused on the safety of a person driving a car. The app detects the heartbeat of a person while driving the car, a heart rate tracking device will be required (Zephyr Bluetooth Heart Rate equipment). This application tracks Global Positioning System (GPS) location and sends location-related information to predetermined contact numbers, emails, and Facebook pages if any abnormalities are detected.

5.6 Legal disruption associated with digital platforms

Digital disruption is an emerging trend that challenges the traditional way of social interactions, thinking and transactions, that is, ways of delivering information/products from one end to another end (Møller, Gertsen, Johansen, Stine & Rosenstand, 2017; Molla, Cooper & Karpathiou, 2015; Smith & Plummer, 2017). The Economist Intelligence Unit (EIU) (2015) found that while technology had a significant impact on the workplace, the rate of change has accelerated and has begun to have a disruptive impact on companies globally.

Thus, Molla et al (2015) caution that the Digital platform disruption results in an important shift that alters the foundation of long-term effects on society and business procedures. Molla *et al.* (2015) argue that digital platform disruption is not a minor and transient change. Hence, Ablyazov *et al.* (2018) agrees and adds that both digital and physical systems and the diffusion of new technologies are affecting companies. According to Busch, Schulte-Nölke, *et al.* (2016) digital platforms have been viewed as disruptive facets of modern-day society.

For this reason, platform governance requires careful consideration regarding who and what governs digital platforms (Schrieck *et al.*, 2016). Thus, Gorwa, (2019) advises that determining the ideal platform governance balance is essential since a platform's flexibility and engagement might be hampered by an extremely regulated environment. Gillespie (2015) argues that platforms participate in governance at the individual level. Bucher and Helmond (2018) maintain that platform researchers have found that platform operations can greatly influence the way people act.

Elert & Henrekson (2016) observe that digital platforms function in a 'legal void', as if current laws and regulations would be incompatible with new technological platforms. On the incompatibility assertion, Pelzer *et al.* (2019) state that Uber used a similar argumentative approach to suggest that laws and regulations are outdated and have failed to keep up with the evolution of technology that users are embracing. Hence, at the United Nations Conference on Trade and Development (2019), it was observed that while the lack of adequate technology governance and regulation across numerous countries of the Global South may foster greater creativity, it also raises the risk of significant lawful and governmental harm.

Dhar V (2017: 277–278) explains that the reason for this is essentially because regulators have disregarded the use of data, giving digital platforms the freedom to do anything they want without regulation. Linz, Müller-Stewens & Zimmermann, (2017) maintain that due to the spectacular rebirth of the platform concept brought on by digital transformation, traditional businesses across industries are under threat. By word of caution, Dann, Teubner, and Weinhardt (2019) state that while some states impose taxes on digital platforms like Airbnb rentals, informal digital platforms frequently have no legal protection, thus permitting users to evade paying tax. However, Plummer *et al.* (2017) propose that businesses should prioritise digital disruption in their proposes and cultivate a culture that fosters proactive development of disruptive innovation plans.

5.7 The liability aspect of developers, owners, and service providers of digital platforms in PSI

Researchers have made numerous efforts to address the digital platform liability issues that have been explored in the literature (Busch, Dannemann, *et al.*, 2016; Maultzsch, 2018; Twigg-Flesner, 2018). Busch, Schulte-Nölke, *et al.* (2016) note that most transactions that take place on internet platforms are between a user and a platform service provider. Consequently, the most disputable matter is whether platform owners could be held accountable to platform users for wrongful or unlawful violations of contracts committed by platform companies.

According to most researchers (Busch, Schulte-Nölke, *et al.*, 2016; Maultzsch, 2018), platform owners could be held accountable to platform users for wrongful or unlawful violations of contracts committed by platform companies. It remains unclear, however, on what justifications platform operators may be held accountable for and how their liability is based. Considering this, Lee *et al.* (2018) contends that it is challenging for platform service providers to properly regulate the platform data by themselves owing to the substantial ongoing interaction between platform users.

Napoli and Caplan (2017) maintain that platforms themselves have thus been able to claim that they are technology companies rather than media companies. Flew, Martin, and Suzor (2019, 45) assert that platform themselves are merely “the intermediaries for the communication endeavours of others”. This implies that platform developers avoid regulations that are applicable to conventional media. The Working Group on the Collaborative Economy (2016) cautions that platform operators must abide by a legal obligation of care for the users they serve that results from the agreement between the platform operator and platform users.

This suggest that when a platform provider fails to perform or performs improperly, the platform operator may be held accountable for violating the standard of care (Filatova-Bilous, 2021). These strategies make it unclear which regulatory body has the power to monitor them (Filatova-Bilous, 2021). Additionally, Flew (2018) warns that regulators

have difficulties when attempting to merely adapt conventional mechanisms for content legislation governing conventional media to digital platforms.

5.8 Development, ownership, and use of the digital platforms in PSI

Identifying data ownership, delineating decision-making responsibilities, and determining the regulatory framework governing data within the platform industry pose emerging challenges (Abraham *et al.*, 2019). Long-term success of digital platforms depends on a careful balance between ownership-level control and independent operator authority (Ciborra *et al.* 2000; De Reuver *et al.* 2017; Henfridsson and Bygstad 2013; Lusch and Nambisan 2015; Tan *et al.* 2015; Tilson *et al.* 2010). Furthermore, Janssen *et al.* (2020) maintains that it is more difficult to define positions, establish their level of power, and decide their scope of duties in a platform environment.

Schreieck *et al.* (2016) states that much of the research on platform governance concentrates on the viewpoint of the platform owner. A platform owner is thus described by Tan *et al.* (2015) as a person or legal company that creates, executes, maintains, and/or regulates a digital platform. It also indicates that control over the platform's operations, users, and policies rests with the platform owner (Schreieck *et al.*, 2016).

The worth of platforms, however, is crucially not contingent on the ownership of specific tangible assets, but rather on the ability to avoid ownership and the associated responsibilities of owning assets. Gawer & Cusumano (2014) argue that instead of starting from scratch and creating a 'finished' product, complementors might use the platform's (often substantial) technical infrastructure to create new ideas or new application fields.

Therefore, Jacobides *et al.* (2018: 2263) advises that platform owners should develop regulations that complementors are required to adhere to. Authors such as Ghazawneh & Henfridsson (2013) argue that while the platform gives the complementor a platform on which to grow their business, participation in a (industry) platform ecosystem typically requires adherence to specific rules and regulations. Whilst platform

owners consistently earn a substantial profit, regulations may occasionally serve to shift most of the risk and development costs to complementors (BergvallKåreborn & Howcroft, 2014; Tiwana, 2014).

Platform owners, platform suppliers and platform users need to manage data governance challenges due to the expanding number of platforms available (Janssen *et al.*, 2020). Thus, Parker *et al.* (2017) contends that the ecosystem in which a digital platform exists determines the platform's effectiveness, not its own internal assets. According to Tiwana, Konsynski, and Venkatraman (2013), three questions must be addressed while developing a platform ecosystem, who is governed?, what is governed?, and how is it governed? Thus, Smedlund & Faghankhani, (2015) emphasise that one of the most important factors in creating a successful platform ecosystem is governance; the trick is to employ the proper architecture and establish an ethical governance structure. Hence, Schrieck *et al.* (2017) agrees with (Smedlund & Faghankhani, 2015) and cautions that, for a successful composition, digital platforms require proper governance.

Tiwana *et al.* (2010) aver that technically digital platforms are built on software and have expandable codebases. The hardware, such as servers and databases, as well as the codes that support the creation of the material offered on the platform are all included in the technological infrastructure. Schrieck *et al.* (2018) reiterates and maintains that technological infrastructure and governance make up the main parts of the ecosystem that the platform creates. Furthermore, physical resources of a digital platform are linked through various interfaces like code documentation (Schrieck, Hakes, *et al.* 2017).

Woodard *et al.* (2013) notes that although a multi-purpose device like a smartphone or a laptop may need hardware that delivers both excellent performance as well as excellent adaptation, there are many applications for which less expensive, less competent technology is enough. Phuc Huy & VanThanh (2012) state that the developer's preferences and the environment in which the application is being used will always influence the mobile application used. According to Bergvall-Kreborn and Howell (2013), the short lifespan, competitive marketplaces, and unpredictability faced by mobile application developers have an impact on how they create their applications.

6. Research Findings

This section presents the research findings. As previously mentioned, the main objective of this study is to examine the legal implications of the disruption caused by the utilisation of digital platforms for private security provision.

6.1 Digital platforms and their intricacies in the private security industry

The study found that, indeed, digital platforms are highly complex commodities that facilitate technological innovation and the creation of new goods and services. As coined by Schwarz (2017), digital platforms create new social and business opportunities for various companies. Within the digital platform space, new products and services are constantly introduced into the South African market, including the private security consumers. Goods and services vary according to what the developers and/or users (or consumers) want or need depending on what makes business sense. Accordingly, digital applications refer to any application that can be used by a computer, mobile device, or tablet to perform useful tasks.



It was gathered that there are those who are focusing on creating digital platforms rather than applications (apps) and those who focus on apps rather than digital platforms. Digital platforms can be downloaded on a mobile device or even a computer device. The study confirmed that while digital platforms and digital apps differ, digital platforms create a space for digital apps to function.

The market for mobile apps has grown significantly with consumer high demand for smartphones. Smartphones are now being used more frequently and come in handy as a tool for ensuring safety and security for individuals. The use of digital apps is even more convenient, particularly in emergency situations, such as accidents and attacks. The findings show that as digital apps indicate advances in technology development, most security-related companies strive to have them as an element of security. These apps serve as a fundamental bridge that facilitate seamless communication between the service providers and consumers of private security, streamlining interactions between them.



6.2 Examples of safety and security apps

A quick scan of the internet shows that the mobile safety and security apps are on the rise worldwide such as Mobile Safety App, which is a safety and emergency resource app for students and staff of Algonquin College. In the case of South African institutions of higher learning, there is the Buzzer App which informs the nearest security control room in case of emergency and/or safety issue. Additionally, it monitors real-time location in case the SOS button is pressed, alerting local and/or nearest response units to promptly address the emergency. Just like other safety and security apps, using the Buzzer App also comes at a fee. At the University of Western Cape, the Sistahood Watch App - designed by university students - connects students with one another and has an SOS button that is linked to campus security and connects to GPS via data (Adriaanse, 2016).

PSiRA registered companies have developed safety and security apps such as the TSU Protect Mobile Safety and Security App - an innovative product developed by TSU Protect (Pty) Ltd. This app enables subscribers to use their mobile phones as a panic button for a security or medical emergency. Of importance, the TSU Protect Safety and Security App is linked to a 24/7 monitoring centre and supported by a national Security and Medical Rescue Response Network in South Africa.

The app is turned on before the consumer is in a potentially dangerous situation and tracks in real time from the moment it is activated. Once the alert is activated, the current location and the route from the time the activation of the alert is sent to the TSU Protect Monitoring Centre via app tracking as well as to the consumer's emergency contacts via SMS and email. The app automatically starts recording a video in secrecy as soon as the alert is activated. Examples of such apps support Westerman *et al.* (2014), who argue that mobile devices are essential for business expansion and communication between a corporation and its new or existing clientele. It was found that just by adding a new product such as a safety and security app, security businesses can retain and expand their clientele base. Hence, the introduction of safety and security apps have become a viable tool for profit maximisation.

There are also safety and security apps which facilitate the provision of services from several PSiRA registered security providers. One such example is the SAFER App which claims to be linked to 265 independently owned security companies, 1600 emergency response vehicles and 3600 armed-response officers. Once downloaded, the SAFER App raises an alert once activated through shaking the phone or pressing an on-screen panic button. As soon as the alert is received, a call is made within seconds to confirm the nature of the emergency. If the call made is not answered, a closest armed response officer will respond to the place where the alert was activated. Any selected emergency contacts on the SAFER App also receive an SMS and email in real time. A monthly or yearly subscription is required to access these services.

In South Africa, a notable safety application is the Namola App, which primarily tracks the user's movements. This free-to-use app features a 24/7 call center staffed by responders who handle various reported emergency situations. Users can also share their location with others through the app. In case of an emergency, selected contacts receive notifications when the user arrives at or leaves any specified location. The Namola App can provide the user's precise location, which can be shared with emergency services, including the police, if needed. Another safety app, Life 330, offers similar features to the Namola App but allows users to request emergency assistance from specific service providers. Additionally, Life 330 enables users to add family and friends who can access their real-time location and vice versa. Notably, the group is also notified if anyone's device battery is running low.

There is also a locally developed application called the Bull Horns App, which is free and specifically designed to promptly and discreetly alert members of a community and emergency service providers about any urgent situation. The Bull Horns App features a control room that receives notifications about the user's location, which can also be forwarded to the user's emergency contacts via SMS. Additionally, the app can collaborate with private security companies to provide them with the user's precise real-time location for immediate response to emergencies. Furthermore, the Bull Horns App includes an option for users to receive alerts about crimes or suspicious activities occurring within their community or vicinity.



Another digital application, GO SAFE, is available for download on Android smartphones. The objective behind creating this app was to leverage smartphones to establish a secure environment, considering that most people carry them wherever they go.

6.3 The effectiveness of digital apps

The study discovered that some armed response teams within the industry are not paid for reacting to security alerts from safety and security apps. However, the businesses use the application because they think it will enable them and their clients to keep ahead of their competitors when it comes to new technological developments. It is not disputed that we are all moving into a world dominated by technology. It is also possible that the business strategy of making use of the app for free would be for marketing purposes (as in most apps). Once consumers are hooked into using the app, a subscription amount would be required.

The study found that most digital apps used by companies are effective and offer a variety of services. While security apps have saved many lives, medical products, rather than just armed response products, have contributed significantly to this success. Additionally, the study revealed that assessing the effectiveness of saving lives in medical emergencies is more straightforward compared to security incidents. There was a view that creating a single data portal for private security would be more beneficial. The findings of the study suggested that an integrated platform, incorporating medical professionals who could coordinate responses during emergencies, could further enhance life-saving efforts.

6.4 Advantages and disadvantages of digital apps

The research highlighted accessibility and affordability as key challenges associated with digital applications. It was noted that most digital apps require a monthly subscription fee for usage. Nevertheless, certain apps provide free access to their services to attract more subscribers. The study also uncovered that many individuals are unable to afford the monthly fees associated with security apps. Moreover, utilising security apps can prove challenging, particularly in remote areas with limited or no mobile network coverage, poor connection quality, or limited access to mobile devices.

Accessing a digital safety and security application enhances safety and convenience, especially during emergencies, for those privileged to have it. Nonetheless, sluggish network connectivity can delay response times. In the South African setting, this challenge is exacerbated by load shedding. Nevertheless, the study revealed that armed response companies, when equipped with a stable internet connection, react to security alerts from digital apps much quicker than the police.

6.5 Accountability of developers, owners, and service providers of digital platforms

The issue of accountability will be a subject of interesting debate in the not-so-distant future. This is largely because the Authority, as a regulator of private security services, is not fully appreciative of the technological advancement in this field. It should be noted that most participants did not make many comments regarding the accountability issue. However, the data shows that just a small percentage of platform developers believe they are responsible for any technical issues that arise when they get notifications on their apps. This is contrary to most armed response companies that assume complete responsibility when an individual uses their app to request assistance in an emergency to which they respond rapidly.

It was observed that the issue of accountability for developers should be considered particularly on the part of developed digital platforms. Currently, if digital platforms compromise the safety and security of the consumers, the developer is arguably not accountable to the consumer. This is where the Authority should play its role in

ensuring that public interest is always upheld. The study also found that occurrences of compromised digital platforms are mainly brought to the attention of senior executives of the developers, who investigate the matter to determine what went wrong and implement corrective measures. This is as far as the accountability issue goes.

6.6 Disruption of digital platforms in the private security industry

The EIUs (2015) found that while technology had a significant impact on the workplace, the rate of change has accelerated and has begun to have a disruptive impact on companies globally. The growth and application of digital platforms seems to be improving the provision of the private security worldwide. Not only is the private security industry benefiting from the emergence of digital platforms, but the level of safety and security is guaranteed to improve. To this end, the introduction of safety and security apps should be regulated by PSiRA in line with the PSiR Act.

Arguably, the regulation of safety and security apps cannot be the sole responsibility of PSiRA. The study found that, as the use of safety and security apps involves a level of electronic communication, the Independent Communications Authority of South Africa (ICASA), as the official regulator of South African telecommunications, is also obliged to oversee this area. Under the Electronic Communications Act, No 36 of 2005, ICASA is mandated to promote convergence in broadcasting, broadcasting signal distribution, and the telecommunications sector, as well as to provide a legal framework for the convergence of these sectors.



7. Recommendations

Based on the research findings, the following recommendations are made to enable PSiRA to better appreciate its response in respect of the governance of digital platforms.

7.1 List of digital platforms and apps offering private security services

Before the Authority can contemplate regulating technology-based platforms within the private security sector, it is imperative to compile a comprehensive list of these digital platforms and applications and gather extensive data on their functionalities. This listing procedure will also offer insights into their ownership (whether local or foreign) and their connections to the private security industry, including any affiliations with PSiRA registered companies.

7.2 PSiRA policy position on the regulation of technology based platforms

As the study suggests, there are digital platforms and apps that facilitate, or make available, security services as defined in the PSiR Act. It would be remiss of the Authority to not have a policy position on technology-based platforms used for the provision of security services as defined in the PSiR Act. Once a policy position is established, it is recommended that regulations be developed to ensure that technology platforms, used for private security provision, are effectively regulated. The PSiRA policy position cannot however be developed without the involvement of the ICASA, which is responsible for regulating, among other sectors, the telecommunications industry in the public interest, and for ensuring affordable services of a high quality of service for all South Africans. While ICASA is entrusted with protecting consumers from poor-quality services, among other duties, PSiRA is responsible for encouraging and promoting efficiency and responsibility in the rendering of security services as outlined in Section 3 of the PSiR Act.

7.3 PSiRA approval of technology-based platforms

It is recommended that once a policy position is taken by PSiRA and regulations are developed, a system of approvals of technology-based platforms could be considered to keep track of which platforms offer which services and facilitate the provision of which security services. This will ensure that the Authority effectively regulates the private security industry and exercises effective control over the practice of the occupation of security providers in the public interest. This means that not all technology-based platforms could be approved by PSiRA as there would be a vetting process for all platforms to be approved by PSiRA.

7.4 PSiRA approved list of technology-based platforms

Once vetted, it is recommended that PSiRA should have a system where consumers can check if their preferred technology-based platforms are in fact approved by the Authority. This will align with section 4(p) of the PSiR Act which states that one of the functions of PSiRA is to “provide information to the users, prospective users or representatives of users of security regarding compliance of security providers with the provisions of this Act.”



8. Conclusion

There is no denying the value of digital platforms in enhancing the provision of private security services, serving as assets rather than liabilities. Safety and security apps, among other digital platforms, offer security access beyond what the police can provide. However, effective governance of digital platforms remains essential. From the PSiRA perspective, there is a need for a clear policy stance on its role in regulating digital platforms facilitating security services as defined in the PSiRA Act.

While technology's value lies in its role as a facilitator for enhancing accessibility, affordability, and quality service provision, digital platforms arguably fulfill the criteria outlined in section 1 of the PSiRA Act by making services available, directly or indirectly. Whether it is practical for the Authority to regulate digital platforms is a question beyond the scope of this report.

In conclusion, the emergence of digital platforms in the private security sector represents a novel phenomenon. The exploratory nature of the research findings presented in this report only scratches the surface. As technology continues to evolve in this domain, further studies will be imperative. Additionally, establishing a policy stance on the Authority's role will be crucial moving forward.

REFERENCES

Books

Libert, B., Beck, M., & Wind, J. (2016) *The network imperative: How to survive and grow in the age of digital business models*. Boston: Harvard Business Review Press.

Journal Articles

Ablyazov, T., Asaturova, J., & Koscheyev, V. (2018) Digital technologies: new forms and tools of business activity. Saint Petersburg: EDP Sciences.

Abraham, R., Schneider, J., and vom Brocke, J. (2019) "Data governance: A conceptual framework, structured review, and research agenda" *International Journal of Information Management* (49), pp.424–438

Andersson Schwarz, J., (2017) Platform logic: An interdisciplinary approach to the platform-based economy. *Policy & Internet*, 9(4), pp.374-394.

Anssi Smedlund and Hoda Faghankhani (2015). Platform Orchestration for Efficiency, Development, and Innovation. doi: <https://doi.org/10.1109/hicss.2015.169>.

Barbe, A.S. (2021) 'What's new (for scholars) about transaction platforms? A systematic literature review', *Academy of Management Proceedings*, 2021(1), p. 15981. doi:10.5465/ambpp.2021.15981abstract.

Bergall-Kåreborn, B., & Howcroft, D. (2013) *The future's bright, the future's mobile: A study of Apple and Google Mobile application developers*. Social Informatics Luleå University of Technology & Manchester Business School.

Bonina, C. *et al.* (2021) 'Digital Platforms for development: Foundations and Research Agenda', *Information Systems Journal*, 31(6), pp. 869–902. doi:10.1111/isj.12326.

Busch, C., Schulte-Nölke, H., Wiewiórowska-Domagalska, A., & Zoll, F. (2016) The Rise of the Platform Economy: A New Challenge for EU Consumer Law? *Journal of European Consumer and Market Law*, 5(1), 3–10. <https://ssrn.com/abstract=2754100>.

Ceccagnoli, M., and Rothaermel, F.T. (2008) "Appropriating the Returns from Innovation," in Technological Innovation: Generating Economic Results, G.D. Libecap and M.C. Thursby (eds.), Amsterdam: Elsevier, pp. 11-34.

Cennamo, C. (2019) Competing in digital markets: A platform based perspective. *Academy of management perspectives*. <https://doi.org/10.5465/amp.2016.0048>

Constantinides, P., Henfridsson, O., & Parker, G.G. (2018) Introduction — Platforms and Infrastructures in the Digital Age. *Information System Research* 29(2), 381–400.

Cozzolino, A., Corbo, L., and Aversa, P. (2021) 'Digital platform-based ecosystems: The evolution of collaboration and competition between incumbent producers and entrant platforms', *Journal of Business Research*, 126, pp. 385–400. doi:10.1016/j.jbusres.2020.12.058.

Cusumano, M.A., Yoffie, D.B., & Gawer, A. (2020) The Future of Platforms. *MIT Sloan Management Review*, 61(3), 46-54.

Dann, D., Teubner, T., and Weinhardt, C. (2019) "Poster Child and Guinea Pig—Insights from a Structured Literature Review on Airbnb." *International Journal of Contemporary Hospitality Management* 31 (1): 427–473.

de Reuver, M., Sørensen, C., and Basole, R.C. (2017) "The digital platform: a research agenda," *Journal of Information Technology*, Palgrave Macmillan UK, pp. 1–12.

Dhar V (2017) Should we regulate digital platforms? *Big Data* 5:4, 277–278.

Dhar, V., and Sundararajan, A. (2007) "Information Technologies in Business: A Blueprint for Education and Research," *Information Systems Research* (18:2), pp. 125-141.

Divya S. (2016) 'A women secure mobile app for emergency usage (go safe app)', *International Journal of Research in Engineering and Technology*, 05(03), pp. 412–414. doi:10.15623/ijret.2016.0503074.

Downes, L., & Nunes, P. (2013) Big bang disruption. *Harvard Business Review*, (2), 44–56. *Dynamics, Information Systems Research* 21(4): 675–687

Drewel, M. *et al.* (2020) 'Pattern-based development of digital platforms', *Creativity and Innovation Management*, 30(2), pp. 412–430. doi:10.1111/caim.12415.

Elert, N., & Henrekson, M. (2016) Evasive Entrepreneurship. *Small Business Economics*, 47, 95–113. <https://link.springer.com/article/10.1007/s11187-016-9725-x>.

Eisenmann, T., Parker, G., and Alstyne, M.W. Van. (2006) "Strategies for Two-Sided Markets," *Harvard Business Review* (84:10), pp. 1–12.

Filatova-Bilous, N. (2021) 'Once again platform liability: On the edge of the "Uber" and "Airbnb" cases', *Internet Policy Review*, 10(2). doi:10.14763/2021.2.1559.

Flew, T., Martin, F., and Suzor, N. (2019) Internet regulation as media policy: Rethinking the question of digital communication platform governance. *Journal of Digital Media & Policy*, 10(1), pp.33–50. doi:https://doi.org/10.1386/jdmp.10.1.33_1.

Forman, C., Ghose, A., and Goldfarb, A. (2009) "Competition Between Local and Electronic Markets: How the Benefit of Buying Online Depends on Where You Live," *Management Science* (55:1), pp. 47–57.

Frenken, K., and Fuenfschilling, L. (2020) "The Rise of Online Platforms and the Triumph of the corporation", *Sociologica*, 14(3), pp. 101–113. Doi: 10.6092/issn.1971-8853/11715.

Fu, X., Avenyo, E., and Ghauri, P. (2021) 'Digital Platforms and Development: A Survey of the literature', *Innovation and Development*, 11(2–3), pp. 303–321. doi:10.1080/2157930x.2021.1975361.

Gawer, A., & Cusumano, M.A. (2014) Industry platforms and ecosystem innovation. *Journal of Product Innovation Management*, 31(3), 417–433.

Ghazawneh, A., and Henfridsson, O. (2012) Balancing platform control and external contribution in third-party development: the boundary resources model. *Information Systems Journal*, 23(2), pp.173–192. doi:<https://doi.org/10.1111/j.1365-2575.2012.00406.x>.

Gillespie T (2015) Platforms Intervene. *Social Media Society*. Epub ahead of print 11 May 2015. DOI: 10.1177/2056305115580479.

Gorwa, R. (2019) 'What is platform governance?', *Information, Communication & Society*, 22(6), pp. 854–871. doi:10.1080/1369118x.2019.1573914.

Gorwa, R. (2019) The Platform Governance Triangle: Conceptualising the Informal Regulation of Online Content. *Internet Policy Review*, 8(2) (June 30). <https://policyreview.info/articles/analysis/platform-governancetriangle-conceptualising-informal-regulation-online-content>.

Hanseth, O., and Lyytinen, K. (2016) Design Theory for Dynamic Complexity in Information Infrastructures: The Case of Building Internet. *Enacting Research Methods in Information Systems*, pp.104–142. doi:https://doi.org/10.1007/978-3-319-29272-4_4.

Hautamäki, A., and Oksanen, K. (2018) 'Digital platforms for restructuring the public sector', *Translational Systems Sciences*, pp. 91–108. doi:10.1007/978-981-10-8956-5_5.

Heimburg, V., and Wiesche, M. (2023) 'Digital Platform Regulation: Opportunities for Information Systems Research', *Internet Research*, 33(7), pp. 72–85. doi:10.1108/intr-05-2022-0321.

Hein, A. *et al.* (2019) 'Digital platform ecosystems', *Electronic Markets*, 30(1), pp. 87–98. doi:10.1007/s12525-019-00377-4.

Henfridsson, O., & Bygstad, B. (2013) The generative mechanisms of digital infrastructure evolution. *MIS Quarterly*, 37(3), 907–931.

Hirt, M., and Willmott, P. (2014) "Strategic principles for competing interdigital age", *McKinsey Quarterly*, Vol. 5 No. 1, pp.1-13.

Huang, P., Ceccagnoli, M., Forman, C., and Wu, D.J. (2009) "When Do ISVs Join a Platform Ecosystem? Evidence from the Enterprise Software Industry," in *Proceedings of the 30th International Conference on Information Systems*, Phoenix, AZ, December 15-18

Jacobides, M.G., Cennamo, C., & Gawer, A. (2018) Towards a theory of ecosystems. *Strategic Management Journal*, 39(8), 2255–2276.

Janssen, M., Brous, P., Estevez, E., Barbosa, L.S., and Janowski, T. (2020) "Data governance: Organizing data for trustworthy artificial intelligence," *Government Information Quarterly* 37 (3), 1-8.

Kane, G.C., Alavi, M., Labianca, G., and Borgatti, S.P. (2014) "What's Different About Social Media Networks? A Framework and Research Agenda," *MIS Quarterly* (38:1), pp. 275–304.

Koh, T.K., and Fichman, M. (2014) "Multi-Homing Users' Preferences for Two-Sided Exchange Networks," *MIS Quarterly* (38:4), pp. 977–996.

Luo, J. and Kang, M. (2011) 'Application lockbox for mobile device security', 2011 *Eighth International Conference on Information Technology: New Generations* [Preprint]. doi:10.1109/itng.2011.66.

Lusch, R.F., and Nambisan, S. (2015) "Service Innovation: A Service-Dominant Logic Perspective," *MIS Quarterly* (39:1), pp. 155-176.

M., S., M., B. and M., R. (2016) 'Mobile Application Security Platforms Survey', *International Journal of Computer Applications*, 133(2), pp. 40-46. doi:10.5120/ijca2016907736.

Mancha, R. Steven, G. (2020) "Incumbent Organizations Transform Through Digital Platforms". *AMCIS 2020 Proceedings*. 6. https://aisel.aisnet.org/amcis2020/org_transformation_is/org_transformation_is/6

McIntyre, D.P., & Srinivasan, A. (2017) Networks, platforms, and strategy: Emerging views and next steps. *Strategic Management Journal*, 38(1), 141–160.

Molla, A., Cooper, V., and Karpathiou, V. (2015) IT Managers' Perception and Response to Digital Disruption: An Exploratory Study, In *Australasian Conference on Information Systems*. Adelaide: RMIT.

Møller, L., Gertsen, F., Johansen, S.S., & Rosenstand, C. (2017) Characterizing digital disruption in the general theory of disruptive innovation. *The International Society for Professional Innovation Management (ISPIM)*, Jun 2017, 1-12.

Nicholson, B., Nugroho, Y. and Rangaswamy, N. (2016) Social Media for Development: Outlining Debates, Theory and Praxis. *Information Technology for Development*, 22(3), pp.357–363. doi:<https://doi.org/10.1080/02681102.2016.1192906>.

Napoli, P., & Caplan, R. (2017) Why media companies insist they're not media companies, why they're wrong, and why it matters. *First Monday*, 22(5). <https://doi.org/10.5210/fm.v22i5.7051>

Oksiutycz, A. & Lubinga, E. (2021) 'Factors affecting the adoption of personal safety apps among millennials in Johannesburg, South Africa', *SA Journal of Information Management*, 23(1). doi:10.4102/sajim.v23i1.1246.

Pagani, M. (2013) "Digital Business Strategy and Value Creation: Framing the Dynamic Cycle of Control Points," *MIS Quarterly* (37:2), pp. 617–632.

Parida, V., Burstrom, T., Visnjic, I. and Wincent, J. (2019) Orchestrating industrial ecosystem in circular economy: A two-stage transformation model for large manufacturing companies. *Journal of Business Research*, 101, pp. 715-725. doi:<https://doi.org/10.1016/j.jbusres/2019.01.006>.

Parker, G., Van Alstyne, M., & Jiang, X. (2017) Platform ecosystems: How developers invert the firm. *MIS Quarterly*, 41(1), 255–266

Pelzer, P., Frenken, K., & Boon, W. (2019) Institutional Entrepreneurship in the Platform Economy: How Uber Tried (and Failed) to Change the Dutch Taxi Law. *Environmental Innovation and Societal*

Transitions, 33, 1–12. <https://www.sciencedirect.com/science/article/pii/S2210422418301631?via%3Dihub>

Peitz and Valletti (2014) 'Reassessing competition concerns in electronic communication markets', *ZEW Discussion paper* 14 (101).

Phuc Huy, N. & Van Thanh, D. (2012) Evolution of mobile app paradigms. MOMM 2012, 3-5 December, 2012, Bali Indonesia. Copyright 2012 ACM.

Popiel, P., & Sang, Y. (2021) Platforms' Governance: Analyzing digital platforms' policy preferences. *Global Perspectives*, 2(1), 1-13. <https://doi.org/10.1525/gp.2021.19094>.

Porter, M. & Heppelmann. (2015) "How smart, connected products are transforming competition", *Harvard Business Review*, Vol 93 No. 10, pp. 96-114.

Ravele, K.J. and Mtotywa, M. (2022) 'Factors influencing quality and performance of cloud computing platforms defined by personal users in South Africa', *International Journal of Research in Business and Social Science* (2147- 4478), 11(7), pp. 78–91. doi:10.20525/ijrbs.v11i7.2027.

Rochet, J.-C., Tirole, J. (2006) Two-sided markets: a progress report. *RAND Journal of Economics* 35, 645–667.

Ruggieri, R. *et al.* (2018) 'The impact of digital platforms on business models: An empirical investigation on innovative start-ups', *Management & Marketing*, 13(4), pp. 1210–1225. doi:10.2478/mmcks-2018-0032.

Sedera, D., Lokuge, S., Grover, V., Sarker, S., and Sarker, S. (2016). "Innovating with enterprise systems and digital platforms: A contingent resource-based theory view", *Information & Management*, Vol. 53, No. 3, pp. 366-379.

Smedlund, A. and Faghankhani, H. (2015) 'Platform orchestration for efficiency, development, and Innovation', 2015 *48th Hawaii International Conference on System Sciences* [Preprint]. doi:10.1109/hicss.2015.169. *Systems Research* 21(4): 724–735.

Tan, B., Pan, S. L., Lu, X., and Huang, L. (2015) "The Role of IS Capabilities in the Development of Multi-Sided Platforms: The Digital Ecosystem Strategy of Alibaba.com", *Journal of the Association for Information Systems* (16:4), pp. 248–280.

Tilson, D., Lyytinen, K., & Sørensen, C. (2010) Research commentary — Digital infrastructures: The missing is research agenda. *Information Systems Research*, 21(4), 748–759.

Tiwana, A., Konsynski, B., and Bush, A.A. (2010) "Platform evolution: Coevolution of platform architecture, governance, and environmental dynamics", *Information Systems Research* (21:4), pp. 675–687.

Thies, F., Wessel, M., & Benlian, A. (2016) Effects of social interaction dynamics on platforms. *Journal of Management Information Systems*, 33(3), 843–873.

Trabucchi, D. and Buganza, T. (2019) 'Fostering Digital Platform Innovation: From Two to multi-sided platforms', *Creativity and Innovation Management*, 29(2), pp. 345–358. doi:10.1111/caim.12320.

Verkasalo Hannu, López-Nicolás Carolina, Molina-Castillo, Francisco J. Bouwman Harry, Analysis of users and non-users of smartphone applications, *Telematics and Informatics*, Volume 27, Issue 3, 2010, Pages 242-255, ISSN 0736-5853, <https://doi.org/10.1016/j.tele.2009.11.001>.

Weill, P., Woerner, S.L., (2015) Thriving in an increasingly digital ecosystem. *MIT Sloan Management Review*, 56(4), pp. 27-34.

Westerman, G., Bonnet, D., and McAfee, A. (2014) The Nine Elements of Digital Transformation. *MIT Sloan Management Review*. Retrieved from <http://sloanreview.mit.edu/article/the-nine-elements-of-digital-transformation/>.

Yoo, Youngjin, Ola Henfridsson, and Kalle Lyytinen. "Research Commentary: The New Organizing Logic of Digital Innovation: An Agenda for Information Systems Research." *Information Systems Research* 21, no. 4 (2010): 724–35. <http://www.jstor.org/stable/23015640>.

Reports

Evans, P. (2016). The Rise of Asian Platforms: A Regional Survey. New York, NY: Center for Global Enterprise. https://www.thecge.net/wp-content/uploads/2016/01/PDF-WEB-Platform-Survey_01_12.pdf

Schrieck, M., Wiesche, M., & Krcmar, H. (2016). Design and governance of platform ecosystems—key concepts and issues for future research. In ECIS proceedings (Vol.76). Research Papers. https://aisel.aisnet.org/ecis2016_rp/76.

Working Group on the Collaborative Economy, Koolhoven, R., Neppelenbroek, E.D.C., Santamaría Echeverría, O.E., & Verdi, P.L. (2016). Impulse paper on specific liability issues raised by the collaborative economy in the accommodation sector [Impulse Paper]. University of Groningen. <https://ec.europa.eu/docsroom/documents/16946/attachments/1/translations/en/renditions/native>

Dissertations

Bassa, N.Y. (2021) *An Investigation into Modes of Technological Disruption in South African Businesses*. dissertation.

Ender, L.A. (2021) *Data Governance in Digital Platforms A Case Analysis in the Building Sector*. thesis.

Hermansson, C.-T. (2013) *The difficulties in developing useful mobile applications: Guidelines for app developers in cross media platforms*. dissertation.

Jeza, S. (2021) *The influence of digital transformation on the growth of small and medium enterprises in KwaZulu-Natal*. dissertation.

Lögdal, N. and Calissendorff, P. (2018) *Digital platforms challenges and opportunities: Evidence from a traditional market sector*. dissertation.

Internet Sites

Airbnb - <https://www.airbnb.co.za/>

Bull Horns App - <https://play.google.com/store/apps/details?id=net.app.panic.button&hl=en&gl=US>

Buzzer App - <https://buzzer-app.co.za/>

Expedia - <https://play.google.com/store/apps/details?id=com.expedia.bookings&hl=en&gl=US>

GO safe - <https://play.google.com/store/apps/details?id=app.gosafefleet>

Namola - <https://www.namola.com/>

SAFER App - www.saferapp.co.za

Sistahood App - <https://www.uwc.ac.za/news-and-announcements/news/sistahood-app-hacks-safety-and-womens-empowerment-938>

TripAdvisor - <https://play.google.com/store/apps/details?id=com.tripadvisor.tripadvisor&hl=en>

TSU Protect Mobile Safety and Security - App <https://tsuprotect.co.za/mobile-safety-security/>

Uber - <https://www.uber.com/za/en/ride/>



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