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Towards a Market Entry Framework for Digital Payment Platforms

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Abstract:

This study presents a framework to understand and explain the design and configuration of digital payment platforms and how these platforms create conditions for market entries. By embracing the theoretical lens of platform envelopment, we employed a multiple and comparative-case study in a European setting by using our framework as an analytical lens to assess market-entry conditions. We found that digital payment platforms have acquired market entry capabilities, which is achieved through strategic platform design (i.e., platform development and service distribution) and technology design (i.e., issuing evolutionary and revolutionary payment instruments). The studied cases reveal that digital platforms leverage payment services as a mean to bridge and converge core and adjacent platform markets. In so doing, platform envelopment strengthens firms' market position in their respective core markets. This study contributes to the extant literature on digital platforms, market entries, and payment.

Keywords: Payment Platforms, Digital Payment, Multi-Sided, Platforms, Market Entry, Platform Envelopment.

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1 Introduction

The digital-payment landscape is a crowded place. New payment actors with different industry backgrounds (e.g., retail) and novice start-ups are attempting to gain a foothold in the once-protected payment market. In so doing, new payment actors are betting on various technologies (e.g., near field communication (NFC)) to connect payers and payees in novel ways. These new dynamics in the payment market are largely driven by falling operating costs (as new payment actors leverage on agile and affordable cloud systems) but, more importantly, by regulation. European policymakers introduced new regulations to reduce market-entry barriers for new payment actors to foster competition, innovation, and consumer welfare (European Commission, 2009).

To illustrate the competitive market space, AngelList, a well-known service for connecting start-ups with investors, lists about 996 U.S. and European mobile payment start-ups (AngelList, 2015) without including established actors such as MasterCard, PayPal or Visa. As more actors enter the payment market to diversify risk and tap into new business opportunities, payment actors increasingly find themselves in a saturated market space, which, in turn, transforms payment into a commoditized service. For instance, new actors (e.g., start-ups) deconstruct existing payment value streams (e.g., customer relationships) to their own benefit, which clearly challenges the business logic of incumbents in their own core markets.

As existing payment business models become less profitable (e.g., payment fee business models), payment actors have to explore new revenue sources. One avenue lies in creating entirely new markets by creating new products and services that have not existed before (Christensen & Bower, 1996; Schumpeter, 1962). Another way is the entry into existing markets, where products and services are based on proven business logics. Creating new markets, however, bears many risk factors (e.g., predicting demand). On the contrary, risk-averse organizations generally find entering existing markets more amenable since they can more easily predict risk, market size, and competitive positioning. In platform-driven markets (e.g., payment markets), a predominant way to enter other existing markets is via platform envelopment (Eisenmann, Parker, & Van Alstyne, 2011). Platform envelopment prescribes that owners of digital platforms equip their existing user bases (e.g., payers, payees) with new services (e.g., mobile ticketing) to bridge them into other existing platform markets (e.g., public transportation). In other words, platform envelopment refers to leveraging an installed user base and complementary services to enter other existing platform markets.

Digital platforms drive many markets, such as the payment market. Digital platforms are layered, modular technology artifacts (Yoo, Henfridsson, & Lyytinen, 2010) that have the logic to match different users (e.g., payers and payees) to derive business value (Eisenmann, Parker, & Van Alstyne, 2006; Stabell & Fjeldstad, 1998). Because these layered, modular IT artifacts create value through mediation, digital platforms are considerably sophisticated in their technology attributes. Contemporary digital platforms (e.g., PayPal) are equipped with application programming interfaces (APIs), which are access and distribution points for internally or externally developed services. Furthermore, digital platforms deliver services increasingly through physical means (e.g., mobile phones), which, in essence, represent physical proxies of digital platforms. Take PayPal as an example of a digital payment platform owner: PayPal offers APIs to third parties (e.g., app developers) to integrate payment functionalities into their own mobile services. In this way, PayPal empowers third parties' business, which ultimately supports PayPal's goal to increase its footprint in the payment market.

Based on the abovementioned observations, payment platforms comprise various components (e.g., APIs and mobile phones) in delivering their services. Accordingly, to support conditions for platform envelopment, one has to accordingly design and configure platforms and their corresponding components in the first place. Platform envelopment, however, is a complex task and novel for some prior protected markets, such as the traditional payment market. As new payment actors with different industry backgrounds encroach the payment market and, thereby, disturb market equilibrium, established payment actors in their core markets are compelled to respond to remain relevant. To shed light on platform envelopment in the payment market, we study and explain how digital platforms leverage payment services as a mean to enter other existing platform markets. Thus, we investigate:

RQ: How are digital payment platforms designed and configured to create conditions for platform envelopment?

To answer the research question, we draw on pertinent literature on 1) multi-sided platforms (Eisenmann et al., 2006; Hagiu & Wright, 2011; Rochet & Tirole, 2003b), 2) technology standards (Besen & Farrell,

1994; Shapiro & Varian, 1999; West & Dedrick, 2000), and 3) platform envelopment (Eisenmann et al., 2011). Accordingly, we provide insights and conceptual clarity on different design and configuration options to acquire platform-envelopment capabilities to enter other existing platform markets.

Our findings suggest that digital platforms create conditions for platform envelopment by leveraging payment services as a mean to bridge and converge core and adjacent platform markets. In so doing, the design and configuration of digital platforms and their corresponding components (e.g., payment instruments) have an impact on their market-entry capabilities. Because we have a platform-envelopment (i.e., the entry into existing markets) and platform-centric approach, we exclude end users and new market creation from our analysis.

In providing a framework to study the design and configuration of digital payment platforms, we contribute to the digital platform and payment literature by creating a descriptive and explanatory theory (Gregor, 2006). Specifically, this paper contributes to the platform market-entry literature (Eisenmann et al., 2011) by demonstrating how one can achieve the conditions for platform envelopment in the payment market. We are not aware of prior research that studies specifically the design and configuration of digital payment platforms to acquire platform-envelopment conditions.

The paper proceeds as follows. In Section 2, we provide the study's theoretical background. In Section 3, we present our framework by synthesizing key concepts that others have identified as being important in designing multi-sided payment platforms and how one can successfully enter platform markets. In Section 4, we present our research method. In Section 5, we analyze eight different European payment platforms. In Section 6, we synthesize our findings, discuss our limitations, and propose promising areas for further research. Finally, in Section 7, we conclude the paper.

2 Theoretical Background

In this section, we review pertinent literature to study and understand platform market entries. We focus specifically on the concept of platform envelopment (Eisenmann et al., 2011). Platform envelopment is a theoretical lens that originates from studies on network theory in industrial organization economics (Katz & Shapiro, 1985). Platform envelopment prescribes that firms in value networks (Stabell & Fjeldstad, 1998) enter into other platform markets by leveraging service-bundling and network effects. We also discuss the payment literature through the conceptual lens of multi-sided platforms (Hagiu & Wright, 2011; Rochet & Tirole, 2003b). We selected the multi-sided platform literature based on the notion that payment services (e.g., PayPal) are, in essence, manifestations of multi-sided platforms that have the function to connect and equip various platform stakeholders. Moreover, multi-sided payment platforms have the technological capability to provide bundled services, which is amenable with the concept of platform envelopment to enter other platform markets.

2.1 Business Design: Platform Market Entry

Firms constantly face complex and hyper-competitive business environments (D'Aveni, Canger, & Doyle, 1995) in gaining or maintaining market leadership. Firms enter markets to increase business value, reduce competitive pressure, or diversify risk (Porter, 1980; Stabell & Fjeldstad, 1998). Eisenhardt and Martin (2000, p. 1107) define dynamic capabilities as "organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die". In this sense, firms' dynamic capabilities play a vital role because it enables an organization to reconfigure existing resources and capabilities to achieve organizational goals, such as market entry (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997).

In value chain-dominated markets (e.g., manufacturing), firms enter and compete by converting inputs into valued market outputs in a sequential manner (e.g., outputs based price or quality) (Porter, 1985). In platform-driven markets (e.g., payment), however, firms create value and compete through efficient mediated products or services (Eisenmann et al., 2006; Stabell & Fjeldstad, 1998). Industrial organization research (Katz & Shapiro, 1985; Rochet & Tirole, 2003b) suggests that firms in platform markets obtain their competitiveness by having the capability to induce positive network effects. Specifically, competitive platform firms design their offerings in a way that creates reciprocal business value among different types of users (e.g., payer and payee) that, in turn, creates a self-reinforcing and expanding network effects. In other words, the stronger and durable the network effects are, the more dominant the firm becomes. In this sense, aspiring and existing platform firms need to strategically design their platform resources to ensure conditions for positive network effects in markets.

Few studies have focused on entering the platform market (Eisenmann et al., 2011). Gawer and Henderson (2007) studied the chip manufacturer Intel and its decision about whether or not to enter the adjacent markets of third party providers. It decided to do so because 1) it had the organizational capabilities to serve these markets and 2) the adjacent markets were characterized by high growth, which, in turn, could support Intel's business in its core market (i.e., computer chips). Intel was concerned about losing its market leadership towards upcoming and dominating third parties. These upcoming third parties could, in turn, dictate a new PC design (e.g., support of other chips) that could challenge Intel's business in its core market. In this sense, Intel entered into adjacent platform markets to solidify its position in its core market.

Besides protecting core markets, market saturation is another driver to enter (platform) markets. Burgelman and Grove (2007), who studied Apple as a "cross-boundary disrupter" (i.e., from the computer to the music and mobile phone industry), suggest that Apple was compelled to explore new revenue sources as its high-end computer market became increasingly saturated. Apple recognized opportunities in the music and mobile phone industry, which, in turn, could indirectly support Apple's computer business line. Literature on platform market entry illustrates that firms enter into adjacent (e.g., Intel) or unrelated markets (e.g., Apple) to remain competitive. Platform firms that may lose the ability to define and protect their core markets could share IBM's fate. IBM was once the dominant actor in the PC market but failed to defend its core business as third parties (e.g., Microsoft) originating from other markets (e.g., operating systems) took the lead to define what a PC constitutes (Gawer & Cusumano, 2002, p. 29). History demonstrates that digital platforms likewise have to evaluate their organizational resources and capabilities as markets change, emerge, or collide.

2.2 Market Entry through Platform Envelopment

Entering platform markets is particularly challenging for platform firms. Platform markets are sheltered by switching costs and network effects that enact barriers for other platform firms to enter markets (Chen & Hitt, 2002; Eisenmann et al., 2006, 2011; Katz & Shapiro, 1985). One way for platform firms to overcome market-entry barriers is in platform envelopment. Platform envelopment refers to leveraging an existing user base (e.g., payers, payees) by bundling a current platform service (e.g., mobile payment) with another service (e.g., mobile ticketing) (Eisenmann et al., 2011). In this sense, previously single-purpose platforms convert into multi-purpose platforms and, thus, simultaneously serve users with different needs (e.g., commuting). Compared to single-purpose platforms, multi-purpose platforms have the competitive advantage to entice new users from other platform services that are designed for a single purpose (see Figure 1). Specifically, multi-purpose platforms provide function overlaps, which may entice users to join multi-purpose platforms and abandon prior single-purpose platforms (Eisenmann et al., 2011). Nevertheless, single-purpose platforms can counteract platform envelopment by offering a matching service to increase market-entry barriers (Nalebuff, 2004).

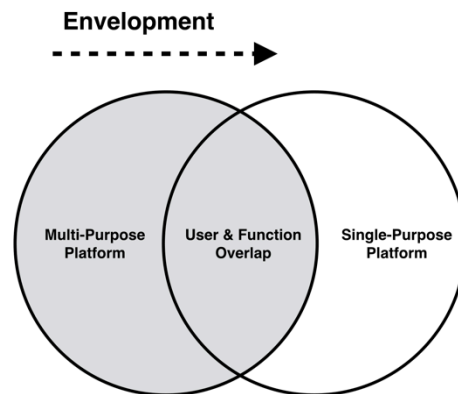


Figure 1. Platform Envelopment

Platform envelopment is already pervasive in the payment industry. Take PayPal as an example: in the beginning, PayPal was purely an online payment service provider that connected payers and payees on ecommerce websites (e.g., eBay). However, PayPal started to evolve by entering the physical payment market by bundling existing payment terminals with PayPal software (Verifone, 2012). By leveraging its large user base, PayPal attempted to encroach the retail payment market in brick-and-mortar stores. In

addition, PayPal collects highly valuable payment data to provide additional value-added services (e.g., customer analytics), an area dominated by credit card firms. With its large user base, PayPal has the attributes to be a platform enveloper for large credit card networks.

2.2.1 Payment as Multi-sided Platforms

Most payment services are based on a four-party scheme (i.e., payer, payee, acquirer, card issuer), where these actors process payment transactions through orchestrated business models. To have access to these payment services, payment actors are technically and commercially affiliated to a digital payment platform (e.g., VISA) that prescribes authorized payment instruments (e.g., NFC payment cards) and binding business agreements (e.g., payment fees). Scholars have studied payment services through the theoretical lens of two-sided platforms or markets that need to attract and match two types of users to create value (Evans, 2003; Rochet & Tirole, 2002, 2003b).

In the payment context, these user types are typically payers (e.g., cardholders) and payees (e.g., merchants). We adopt Hagiu and Wright's (2011, p. 2) definition for a multi-sided platform: "an organization that creates value primarily by enabling direct interactions between two (or more) distinct types of affiliated customers". Primarily, platforms coordinate and facilitate direct interactions in a controlled manner that provides the architecture and a set of rules (Eisenmann et al., 2006). In the payment context, these are efficient connections between payers and payees, which is achieved through the technical means of digital payment platforms (Evans, 2003; Rochet & Tirole, 2003a, 2003b, 2006). Research has emphasized that a payment platform's viability largely depends on whether it creates positive network effects whereby each additional user on one side (e.g., payer) adds demand on the other side (payee) (Rochet & Tirole, 2002). To ensure that initial positive network effects can occur, payment platforms mostly subsidize one side (e.g., payers with free payment instruments) to create a critical user base, which, in turn, attracts the revenue side (e.g., payees) (Eisenmann et al., 2006; Evans & Schmalensee, 2005). Figure 2 demonstrates the notion and logic of a two-sided (single-purpose) and multi-sided (multi-purpose) digital payment platform.

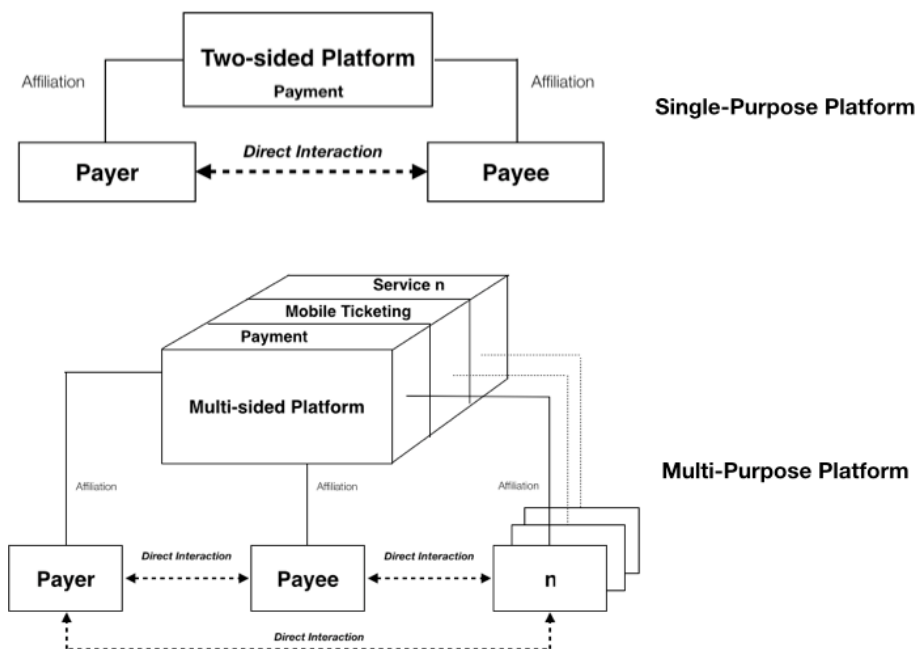


Figure 2. Two Types of Digital Payment Platforms

Evans, Hagiu, and Schmalensee (2006, p. 347) were among the first scholars to coin the term multi-sided payment platforms in studying the historical failure of "smart cards" in the U.S. payment market. Smart cards were novel and advanced payment instruments at their time. However, smart card proponents faced considerable challenges. Compared to the magnetic-stripe payment card, smart cards were more sophisticated payment instruments because they had a built-in computer chip that could store and execute Java applications. Furthermore, smart cards and their corresponding systems could use APIs. APIs enabled smart card providers to offer payment and payment-unrelated services, which gave them

the ability to operate beyond the payment market. However, the initial attempt to introduce smart cards failed. The inability to mobilize a critical user base on the payment side (i.e., the lack of users with smart cards and compatible payment terminals) and on the software side (i.e., lack of software) has resulted in the classic chicken-and-egg problem.

2.2.2 Governance of Digital Payment Platforms

Because contemporary digital payment platforms inherently have the capability to offer multiple services to different markets, digital payment platforms face the new and challenging task of governance. In the past, payment platforms were largely closed IT systems with rigid, few, or no access points. New digital payment platforms, however, are altering this notion because they provide third parties with access opportunities via APIs. As such, platform governance, which refers to managing third parties and their corresponding services, arises (Boudreau, 2010; Ghazawneh & Henfridsson, 2013). The technical and cultural shift in providing access to previously closed financial systems has a considerable impact on platform development from an internal viewpoint and on how services are distributed. Specifically, digital payment platforms have taken the new role to consider how deep the technical involvement with third parties should be to maintain platform control and resiliency. Another question is how to distribute services that third parties develop (i.e., moderated or unmoderated)? Most digital payment platforms have not explored the integration and governance of third party services, which ultimately effects service variety and the entry into different markets.

To summarize, past studies have laid the conceptual foundation to understand digital payment platforms as a multi-sided phenomenon, which have the capability to distribute multiple services to different users in platform-driven markets. By supporting and distributing payment-unrelated services, digital payment platforms can enter other platform markets, which corresponds to the notion of platform envelopment (Eisenmann et al., 2011).

In extending the literature that we reference above, in Section 3, we propose a framework that incorporates the aforementioned theories and concepts. First, we showcase different platform governance schemes (i.e., platform design) based on platform development and service distribution. Secondly, we leverage the technology standards literature to understand payment instruments in regards to compatibility (i.e., technology design). Technology compatibility is key in competitive technology-driven markets because it impacts market access and one's ability to create network effects.

3 Digital Payment Platform Design Framework

In this section, we present our framework (see Figure 4) that incorporates business design (i.e., platform envelopment) from Section 2 with platform design (i.e., platform governance) and technology design (i.e., technology standards). By embracing the contextual lens of digital payments, we argue that digital payment platforms can create conditions for platform envelopment by strategically designing and configuring platform- and technology-design elements to enter platform markets (i.e., business design).

We exclude payers and payees in this study because we focus on digital payment platforms and their corresponding payment instruments. We are aware that payers and payees are subject to network effects and switching and homing costs (Kazan & Damsgaard, 2013), and we realize that a payment platform is *sine qua non* without the payers and payees; however, we investigate the design logic of payment platforms and their corresponding instruments in achieving platform-envelopment conditions. Prior studies have indeed investigated the design of digital payment platforms from different research angles (e.g., architecture, adoption patterns, platform ignition) and focused largely on the competitive dynamics *within* the *payment market* (Kazan & Damsgaard, 2014; Mallat, 2007; Ondrus, Gannamaneni, & Lyytinen, 2015; Ozcan & Santos, 2014). However, we study specifically how digital payment platforms are designed and configured to create platform-envelopment conditions to enter other existing platform markets.

3.1 Platform Design: Platform Development and Service Distribution

Digital platforms apply different types of governance schemes on third parties while interacting with them to create and capture value. To make sense of different governance schemes, we adapted Iyer and Henderson's (2010) API management framework, which is a suitable theoretical lens to analyze and understand different types of governance schemes a platform owner can apply. Figure 3 illustrates that a digital payment platform may exercise 1) monopolistic power or collaboration with third parties in

developing the platform (i.e., closed or open) and 2) different ways for distributing platform services developed by third parties to the market (i.e., moderated or unmoderated).

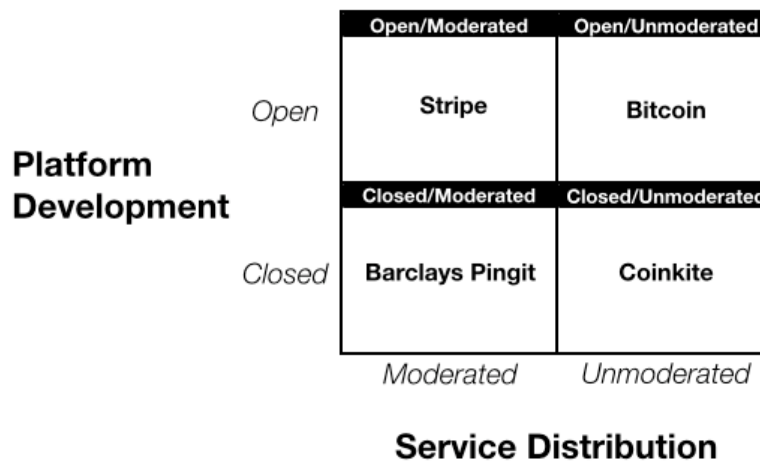


Figure 3. Platform Design

Platform development: we define platform development as the degree to which digital payment platforms and third parties co-develop and maintain a digital payment platform. Payment platforms that follow the closed development approach exercise monopolistic power in developing their platform and exclude third party participation. Barclays' mobile payment service "Pingit" represents such a payment platform. On the contrary, open platform development involves third parties (i.e., platform co-development). For instance, the payment start-up Stripe has a presence on GitHub.com, which is an online forum and repository service for sharing code. By being active on GitHub.com, Stripe invites third party developers to come up with new ideas and solutions to co-develop Stripe's platform further in a moderated manner.

Service distribution: we define platform service distribution as the ability and the degree of freedom that a payment platform grants third parties to distribute their own services. The moderated service distribution approach enables payment platforms to exercise control on third party service distribution. Barclays' mobile payment service Pingit, for instance, has moderated APIs, which grants authorized third parties access to their APIs. The unmoderated approach allows third parties the freedom to distribute their own services without platform approval. Coinkite, a Canadian Bitcoin merchant service that offers open and permissionless API towards third parties that does not interfere in their service provisioning, illustrates an unmoderated approach.

Based on these concepts, we can derive four different and generic platform governance schemes, which we define as platform design options (see Figure 3):

1. The open and unmoderated platform approach allows the highest degree of freedom to modify a payment platform and to distribute services without approval (e.g., Bitcoin).
2. The closed and moderated approach represents a closed system that excludes third parties from developing the platform. The distribution of third party services is moderated (e.g., Pingit).
3. The open and moderated strategy allows third parties to assist in developing the platform; however, the platform moderates service distribution (e.g., Stripe).
4. Lastly, the closed and unmoderated approach allows third parties to distribute services without approval. However, third parties cannot develop the platform (e.g., Coinkite).

3.1.1 Payment Platform Design Implications

Each of these four platform design options has its benefits and shortcomings. The closed and moderated approach requires a digital payment platform to have the organizational capabilities to review and distribute platform services, especially as the number of third party services grows (cf. Iyer & Henderson, 2010). Furthermore, payment platforms have to consider the risks of competing against their own user base (i.e., third parties), which may takeover valuable customer relationships (cf. Gawer & Cusumano, 2002, p. 29). The open and unmoderated approach may lead to permissionless and innovative platform developments and uncontrolled service distributions, but it bears the risk of fragmentation, which may

impact the platform's reputation and its incentive to develop services (Boudreau, 2012; West & Gallagher, 2006). Platform design has an impact on the quantity, quality, and distribution of platform services, which ultimately determines how effectively the platform can acquire platform-envelopment conditions on the platform-design level. Next, we portray different payment instruments, which are physical proxies and components of digital payment platforms, and discuss their implications for technology compatibility and entering the platform market.

3.2 Technology Design: Compatibility of Digital Payment Instruments

Technology standards (or dominant design) are a set of rules that provide compatibility and interoperability between different components (Chen & Forman, 2006; Weitzel, Beimborn, & König, 2006). Various payment providers compete to establish a dominant design for payment instruments to obtain a favorable market position (Besen & Farrell, 1994; Suárez & Utterback, 1995). A standardized payment instrument, which is basically a proxy of a payment platform (e.g., a payment card), allows the platform owner to reap economy-of-scale gains, gain positive network effects, and reach and serve an existing user base (e.g., merchants with their existing payment terminals). However, to establish a technology standard, temporary standard fragmentations and intended technology incompatibilities occur, which creates a competitive cycle of market inclusion and exclusion (cf. Anderson & Tushman, 1990; Utterback & Suárez, 1993).

One can classify physical devices as evolutionary or revolutionary devices in their attributes (Shapiro & Varian, 1999). Evolutionary devices offer a migration path to a new technology and have simultaneously backward compatibility to an existing standard system. The major benefit of these bridging technologies is that they allow one to access an existing user base in specific markets and set the ground for future technology transitions. For example, (plastic) payments cards are increasingly equipped with NFC chips that are evolutionary in their technology design attributes because, with them, one can make contactless payments. At the same time, NFC payment cards are backward compatible with existing payment terminals based on chips and PIN. As such, evolutionary devices exhibit the attributes of incremental innovation and, at the same time, compatibility with widely available technologies.

Revolutionary devices offer better performance and may provide a first-mover advantage. However, releasing revolutionary devices to the market is a risky endeavor. First, the technology itself may be incompatible with the prevalent industry standard and, hence, not accessible for a large user base. Second, it is uncertain whether a revolutionary technology design will take off to create a critical user base in the first place. In the payment context, mobile phones equipped with NFC chips have revolutionary technology-design attributes because they offer superior payment experience and functionality compared to payment cards (e.g., digital receipt management software). However, mobile payment based on NFC is incompatible with widely available chip and PIN payment terminals, which reduces market access on the merchant side. To illustrate different technology design options on the payer and payee side, Table 1 showcases four predominant payment instruments in the payment market (Smart Card Alliance, 2011). In this study, payment instruments are evolutionary in their technology-design attributes if they are compatible with widely available and existing devices between payers and payees. On the contrary, payment instruments are revolutionary in their technology design attributes if they are incompatible with widely available and existing devices between payers and payees. In this case, revolutionary technology design requires the abolishment of existing payment instruments.

Table 1. Technology Design of Payment Instruments

	Payer	Payee	Technology design (overall assessment)
SMS	Evolutionary Mobile payment based on SMS is evolutionary and functions well with existing and ordinary mobile phones on the payer side.	Evolutionary SMS payments are compatible with existing payment terminals (requires software update) on the payee side.	Implications: evolutionary SMS payment is compatible between both sides.
QR code	Evolutionary Mobile payment based on QR codes is evolutionary and functions with existing (camera-based) mobile phones on the payer side.	Evolutionary QR code payments are compatible with existing payment terminals (requires software update) on the payee side.	Implications: evolutionary QR code payments are compatible between both sides.
NFC	Evolutionary NFC payment cards is evolutionary and uses the existing payment card form factor. NFC mobile payment is evolutionary and uses the existing mobile phone form factor on the payer side.	Revolutionary NFC payments are incompatible with existing chip and PIN payment terminals on the payee side.	Implications: revolutionary NFC payment technology is incompatible between both sides. Requires strong network effects on the payee side to become a prevalent payment instrument.
Mobile card reader	Evolutionary Mobile card readers are compatible with existing payment cards (magnetic stripe or chip/PIN) on the payer side.	Revolutionary Mobile card readers are incompatible with existing card-based payment terminals on the payee side.	Implications: revolutionary Payment technology is incompatible between both sides. Requires strong network effects on the payee side to become a prevalent payment instrument.

3.2.1 Technology Design Implications

Digital payment platforms that issue revolutionary payment instruments might benefit from a first-mover advantage to obtain a favorable market position compared to their competitors. However, platform users may be not willing to incur the high adoption and switching costs (e.g., new payment terminals on the payee side). Contrary, issuing an evolutionary payment instrument might be a safe bet to ensure market compatibility and, thus, market access. For instance, banks are predetermined to offer new NFC payment cards as an evolutionary payment instrument because the NFC payment card with its form factor is still compatible with the prevalent card-based payment infrastructure. However, an evolutionary device strategy built on shared technology standards represents a low barrier to keep competitors at a distance.

In regards to platform envelopment, the choice of technology has additional implications for market entry that may serve either as an interface or obstacle to access platform markets from an operational viewpoint. Take the versatile QR code technology as an example. Many payment services leverage the QR code technology (i.e., evolutionary technology) to offer their mobile-payment service. At the same time, the QR code technology is a standard in other industries, such as in the airline industry in the form of mobile boarding passes. Accordingly, besides considering an evolutionary or revolutionary technology design approach, the choice of certain payment technologies may impact market entry and, by that, the convergence of platform markets in the first place (Besen & Farrell, 1994).

3.3 Market Entry of Digital Payment Platforms Framework

To understand how business, platform and technology design intertwine, Figure 4 overviews different design and configuration options. To reach platform-envelopment conditions, a payment provider has eight possible configuration options in entering existing platform-based markets. For completeness, Schumpeterian innovation (i.e., new market creation) represents a subcategory of business design; however, it is beyond our scope here.

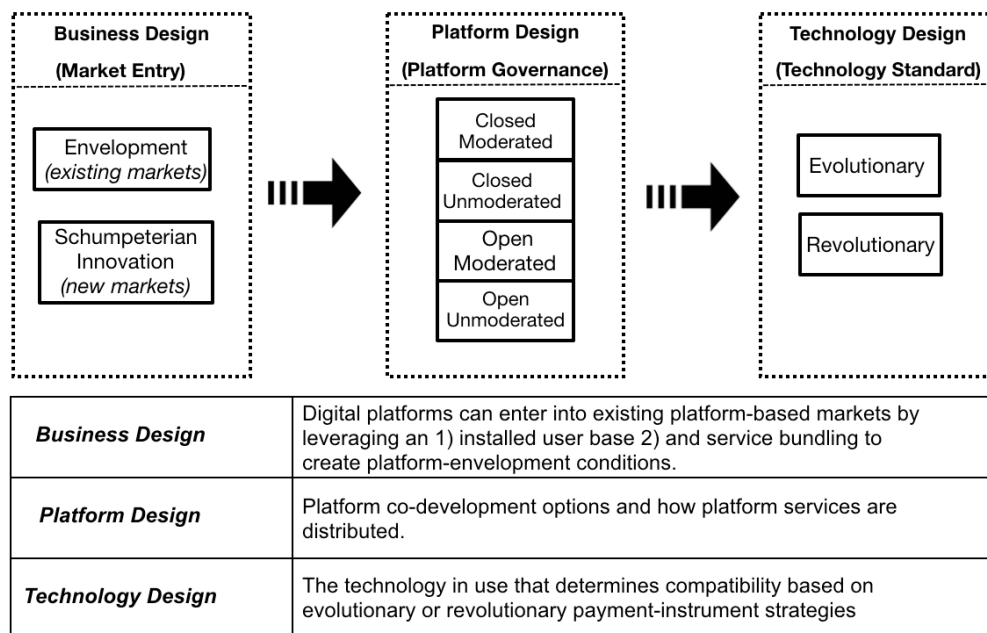


Figure 4. Digital Payment Platform: Eight Different Design Configurations Options

In Section 4, we present our research method and eight cases, the latter of which serve as illustrative examples to demonstrate the applicability and usefulness of our proposed framework. Our framework's practicality lies in its analytical capabilities to identify commonalities and differences based on different design and configuration options for digital payment platforms.

4 Research Method

We synthesize and consolidate key concepts and literature into the proposed digital platform-design framework; as such, our approach is descriptive (i.e., theory type I) and explanatory (i.e., theory type II) in nature (Gregor, 2006). The proposed framework serves as an analytical template for our empirical data set, which we use both to understand how the three different design elements of a platform interrelate or differ in a simultaneous manner (Kochen, 1985). To answer our research question, we performed a multiple case study (Dubé & Paré, 2003; Yin, 2009) in a European setting. Employing a positivist approach, we test our proposed framework on eight cases to identify platform-envelopment conditions. In so doing, we do not seek statistical generalizability but rather analytical generalizability of our proposed framework for different types of digital platforms (Yin, 2009).

The case study method has received ample attention in the IS community (Dubé & Paré, 2003), which has the advantage to answer "how" and "why" questions in situations in which the researcher has limited or no control over the study object (Yin, 2009). Because we analyze the logic of how digital payment platforms are designed to achieve platform-envelopment conditions, a multiple case study approach is suitable. By analyzing the idiosyncrasies of different digital payment platforms, a multiple case study promises to yield more general results (Yin, 2009) for understanding complex platform, technology, and business structures.

4.1 Case Selection

We selected the cases based on several criteria: we focused on European companies that offer digital and proximity-based payment instruments, payment actors with and without prior payment experience, that provide sufficient online data to test our conceptual framework, and that have a promising future to establish digital payment platforms based on their size or support from large firms. We divided the eight cases into four categories based on their industry backgrounds. From these four categories, banks are, according to our definition, the payment incumbents, whereas the other three actors (i.e., payment start-ups, merchants and mobile network operators) are new in the payment market and act as payment envelopers. Note that the cases are illustrative examples that we use to showcase different design and configuration options of digital payment platforms.

Table 2. Eight Digital Payment Platforms

Banks	Mobile network operators	Merchants	Payment start-ups
- Swish (Sweden) - girogo (Germany)	- Orange (France) - Turkcell (Turkey)	- Yapital (Germany) - Flash'N pay (France)	- iZettle (Sweden) - Payleven (Germany)

4.2 Data Collection

We collected publicly available data from different online sources: press releases, online news and industry articles, interviews, and speeches at conferences. We searched for data via online industry and technology magazines, search engines, and social media channels using certain relevant keywords: “(NFC) mobile payment”, “NFC payment card”, “NFC Micro SD card”, “NFC SIM card”, “NFC phone payment”, “mobile phone payment”, “contactless payment”, “QR code payments”, and “payment card readers”. We limited the period to May 2011 to March 2013. Online industry and technology magazines were particularly useful since they comprehensively cover factual reports on technological developments in the retail and payment area with in-depth background knowledge and cross-checked sources. Eight European companies emerged as we collected data due to large media coverage or their being leading market actors in their original industries (e.g., the mobile network operator Turkcell) with the potential to establish a dominant digital payment design. Table 3 presents the data sources we found.

We chose Web data because the selected digital payment systems were either planned, in the pilot stage, or currently (at the time of writing) in severe competition with their rivals and because collecting primary data through interviews is too sensitive and, thereby, partially inaccessible. Nevertheless, secondary data has its merits in information systems (IS) research (Ghazawneh & Henfridsson, 2013; Romano, Donovan, Hsinchun, & Nunamaker, 2003) because it avoids potential biases between interviewers and interviewees as they mutually construct data (Silverman, 2006). Furthermore, secondary data is accessible and, more importantly, verifiable through replication studies. However, to overcome potential biases in our data set, we triangulated data from various publicly available Web sources (blogs, industry- and technology-focused magazines, press releases, and payment conferences) to provide enough data for to illustrate our conceptual framework.

Table 3. Data Sources for the Analysis

Data Sources	Description
Interviews	<ul style="list-style-type: none"> • Four interviews with Yapital's CEO Nils Winkler: <ul style="list-style-type: none"> • Two transcribed interviews by derhandel.de and etailment.de. • Two interviews in video format by empiria group (DE) and paperJam TV (LU). • One transcribed interview by mobilemoneyrevolution.co.uk with Turkcell's Cenk Bayrakdar, Chief New Technology Businesses Officer. • One interview in video format by empiria group (DE) with Magnus Nilsson, iZettle's CFO.
Press releases	All press releases related to new payment instruments: girogo (3), Swish (5), Orange (3), Turkcell (13), Yapital (13), Flash'N pay (1), iZettle (21), and Payleven (13).
Conference	One of the authors attended the payment conference “The Nordic and Baltic CAC Mobile & NFC Conference 2013”, where Swish provided insights during and after the presentation.
Online articles and reports	girogo (18), Swish (2), Orange (4), Turkcell (2), Yapital (1), Flash'N pay (6), iZettle (9), and Payleven (7) (cisco.com, computersweden.se, derhandel.de, finextra.com, geldkarte.de, gsma.com, mobilepaymentstoday.com, nfctimes.com, nfcworld.com, spiegel.de, telecompaper.com, techcrunch.com, thenextweb.com, welt.de, WSJ.com).
Local radio news	Two radio news and radio interview about girogo (DAS HITRADIO and ddp direct)

4.3 Data Analysis

We adopted a differentiated role strategy to analyze the data (Adler & Adler, 1988). The first author acted as the primary data collector and coder. He was responsible for eliciting Web data sources, developing the coding schemes, and mapping relevant quotes to each of the components in our proposed framework. Conversely, the second author played the role of the devil's advocate by coming up with alternative interpretations and counterarguments.

To begin, the first author imported the Web data as PDF and audio files into Nvivo 10, a qualitative analysis software program that allows one to collect and categorize data in a structured way. Then, the

first author performed directed content analysis (Hsieh & Shannon, 2005; Potter & Levine-Donnerstein, 1999). Directed content analysis is a suitable approach when prior or existing research about a phenomenon is incomplete or requires further explanation; as such, this method helps to support or extend key concepts and theories. Based on this notion, we initially derived coding categories from existing research, which served as a theoretical guide during the analysis process.

To analyze the data, we used a coding scheme based on our conceptual framework, which we synthesized from existing literature. Furthermore, we practiced flexible coding to capture prominent and intriguing events that did not fit directly into the coding scheme. Nevertheless, flexible coding failed to yield additional components beyond the proposed framework. As part of the coding process, the first author constantly consulted with the second author about intermediate codes that emerged. Whenever disagreements surfaced, we revisited and discussed the respective codes until we reached consensus. The entire coding process followed an iterative cycle, and we finished analyzing the data only when we agreed on the placement of quotes in accordance with the proposed framework. Table 4 overviews how we coded one of the cases.

Table 4. Coding Sample

Framework element	Frequency ¹	Exemplary quote	Synthesis	Finding
Platform design	3	"Putting the secure element inside the SIM adds a very powerful layer of protection," says Hakan Tatlici, Product Manager for Turkcell Wallet. "It's like having a locked draw in a desk inside a locked room. I don't think the others can compete with this." (GSMA, 2013)	The secure element on the SIM card is a proprietary area to host third party services, which allows Turkcell to control third party distribution.	Turkcell follows a closed and moderated platform design approach.
Technology design	8	About SMS mobile payment: "The advantage of such a service is that it is useable by every mobile phone, so growing the available audience for Turkcell's Cuzdan mobile wallet." (Handford, 2013)	Turkcell offers SMS mobile payment, which ensures compatibility with ordinary mobile phones.	Turkcell issues evolutionary mobile payment instruments.
Business design	9	"Turkcell wants to introduce more nonpayment applications, such as couponing, loyalty and offers, which it sees as vital to ensuring the success of its wallet and earning more revenue for itself." (Balaban, 2012)	Turkcell bundles its mobile payment service with third-party services, increasing thereby its value proposition.	Through bundling, Turkcell enters into other platform markets.

5 Eight Digital Payment Platforms

5.1 Banks

5.1.1 girogo (Germany)

The saving bank group Sparkasse, one of the largest financial institutions in Germany, initially equipped 1.5 million cardholders with NFC payment cards called girogo. The proprietary chip and PIN debit card also featured a built-in NFC prepaid card with the NFC payment functionality's tied to the prepaid payment mode. On the merchant side, girogo payment cards are compatible with existing chip and PIN payment terminals, but the NFC functionality stays dormant. Nevertheless, the NFC rollout was accompanied by several retailers from various industries (e.g., gas stations to grocery stores) who showed their support by replacing old terminals with new girogo-compatible ones (i.e., 12000 girogo-compatible payment terminals by March 2015 of 720K in total in Germany (European Central Bank, 2012, p. 94)). To increase girogo's value proposition further, the Sparkassen group teamed up with a small number of soccer clubs to bundle soccer season tickets with girogo payment cards, which allows soccer fans to enter the stadium and make NFC payments at soccer games.

¹ Number of relevant codes from data sample for a single case.

5.1.2 Swish (Sweden)

Swish is a SMS-based mobile payment solution by a Swedish bank consortium comprising the six largest banks in Sweden: Danske Bank, Handelsbanken, Länsförsäkringar Bank, Nordea, SEB, and Swedbank. By joining their forces, Swish has the ability to reach 94 percent of Swedish bank customers. Swish is a mobile-payment application for Android, iOS, and Windows mobile phones and enables individuals and merchants to make mobile payments between themselves. Swish users (i.e., individuals and businesses) are asked to connect their mobile phone numbers with their existing bank accounts, which brings the convenience that money is directly transferred to existing bank accounts and avoids any intermediaries. Feature phones, which cannot install the Swish application, are still compatible with the Swish payment platform though limited in their functionality in receiving payments. To date, Swish is purely a mobile payment service without third party services and payment terminal integrations. In the latter case, merchants accept Swish payments through their existing mobile phones.

5.2 Mobile Network Operators

5.2.1 Orange (France)

“Mobile NFC & Orange Money” is a proprietary NFC service by Orange, which is technically built on NFC SIM cards. The mobile network operator issues circa five million new and replacement post-paid SIM cards each year in hopes to equip 27 million customers with new payment instruments over the following years. Orange emphasized that it does not have the ambition to roll out its own payment service; rather, it considers itself a universal NFC hub for different contactless services. In doing so, Orange depends on agreements with third party NFC providers, such as banks or public transport firms, to be a viable NFC mobile platform service. On the merchant side, there are currently 300,000 contactless payment terminals deployed (circa 1.8 million in total in France (European Central Bank, 2012, p. 94)), and future payment terminals will be equipped with NFC functionalities.

5.2.2 Turkcell (Turkey)

In cooperation with the Turkish Yapi Kredit Bank and MasterCard, Turkcell, the largest mobile network operator in Turkey with more than 34 million customers, launched its mobile-payment initiative called Turkcell Cüzdan (Wallet), a mobile-payment service based on NFC. Initially, Turkcell issued smartphones with built-in NFC chips that the Chinese handset manufacturer Huawei produced. For subscribers who do not own NFC phones, NFC SIM cards served as a workaround solution. However, Turkcell acknowledged that the NFC rollouts were taking longer than expected. To accelerate the adoption, Turkcell started to offer a SMS person-to-person (P2P) payment service for mobile phones. In this context, mobile phone numbers serve as accounts to settle payments among users or to withdraw cash at ATMs. On the merchant side, Turkcell benefited from an existing NFC payment terminal infrastructure (66,000 units², 2.1 million terminals in total (Bank for International Settlements, 2013, p. 382)). Banks and terminal providers hope to increase units up to two million over the next few years. Turkcell has been successful in teaming up with third parties, such as Turkish banks (e.g., Akbank, Denizbank, İşbankası or Yapi Kredi, Garanti Bank), to host their contactless services on Turkcell’s proprietary NFC SIM card. Turkcell is like Orange France only an NFC hub for these payment services: Turkcell does not offer its own payment service. Besides payments, Turkcell increases its value proposition by hosting loyalty programs or location-based deals that inform subscribers about nearby deals. From these promotions, Turkcell receives a commission of 10 percent for each purchased deal. Turkcell’s business model is based on a SIM rental model that charges NFC service providers a monthly fee for hosting their NFC applications.

5.3 Merchants

5.3.1 Yapital (Germany)

OTTO, the second-largest online retailer after Amazon, launched its own payment solution called Yapital, which is a mobile payment service based on QR codes. Yapital’s mobile payment platform is specifically designed to be compatible with the existing payment terminals and smartphones. By updating the software of ordinary chip and PIN payment terminals to display QR codes, updated payment terminals are

² https://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns1058/Cisco_Turkcell_CS.pdf

capable of processing Yapital payments. To date, the Görtz Group (shoe chain), SportScheck (sport equipment), and Baur (online fashion and furniture store)—all subsidiaries of the OTTO Group—accept Yapital. Furthermore, the parent company Yapital acquired the mobile commerce company NuBon, which is a specialist for mobile loyalty and couponing. NuBon and Yapital have announced their intention to exchange their know-how to offer a better and richer payment experience. At this stage, Yapital has acted solely as a mobile payment service without any third party involvement.

5.3.2 Flash'N pay (France)

The Auchan group, a French multinational retail group, developed and launched a QR code-based mobile-payment solution called Flash'N pay. Auchan hopes to create a mobile-payment standard across the French retail industry by inviting other retailers to adopt Flash'N pay. Developed for iOS handsets, Flash'N pay asks users to link their bank accounts and loyalty cards with it. To initiate payment transactions, customers can scan QR codes at existing payment terminals. Users are also free to choose to store any card by simply scanning the barcode of loyalty cards. Auchan emphasizes that its mobile-payment service is an independent solution and compatible with existing payment terminals (i.e., after a software update), which allows them to circumvent the control of mobile network operators by using the open QR code technology.

5.4 Payment Start-ups

5.4.1 iZettle (Europe)

The Swedish payment start-up iZettle, known as the “Square of Europe”, offers affordable mobile-payment card readers aimed at merchants. The initial service is based on chip card readers (signature for authentication) that transform existing iOS and Android mobile devices into mobile payment terminals by simply plugging the card reader into the headphone jack. In February 2013, iZettle launched a more secure version of its mobile card reader that supports chip and PIN payments, a common payment method in Europe. The new card reader with a built-in keypad establishes via Bluetooth a connection with ordinary mobile phones to process chip and PIN payments. To increase its payment ecosystem further, iZettle offers permission-based APIs, which allows third party developers to integrate iZettle's payment functionalities into their own mobile applications. In this setting, iZettle processes payments in the background.

5.4.2 Payleven (Europe)

Payleven is a Berlin-based payment start-up. Like its rival iZettle, Payleven offers mobile card readers for Android and iOS mobile devices based for chip and PIN payments. As a side note, Payleven and iZettle use the same payment hardware, which is a white-label solution from the same vendor. Payleven also offers permission-based APIs that allows developers to integrate Payleven payment functionalities into third party own apps.

5.5 Comparative Case Analysis

In Table 5, we analyze the cases to identify similarities and differences. The proposed framework (see Figure 4) serves as our analytical lens to obtain insights into how digital payment platforms are designed and configured that create conditions for platform envelopment.

Table 5. The Design and Configuration of Eight Digital Payment Platforms

Business design	Platform design	Technology design	Industry configuration
girogo			Banks Business design In general, banks' payment platforms have the capability to enter other platform markets
Market entry: NFC hub girogo enters into the NFC service provisioning market by leveraging its existing user base. (Multi-sided payment platform)	Closed & moderated Girogo controls platform development (closed) and controls third party service distribution (moderated).	Evolutionary The NFC payment card is compatible with existing chip and PIN terminals and uses the standard payment card form factor.	

Swish			Platform design Closed Technology design Evolutionary
Market entry: not present Swish operates only in the payment market. (Two-sided payment platform)	Closed Swish's controls platform development (closed). Being solely a payment service, there is no third party service distribution.	Evolutionary The mobile payment app (SMS) is compatible with existing mobile phones.	
Orange			Mobile network operators Business Design Both mobile network operators enter into the market of moderating NFC services Platform Design Closed & moderated Technology Design Revolutionary
Market entry: NFC hub Orange enters into the NFC service provisioning market by leveraging its existing user base. (Multi-sided payment platform)	Closed & moderated Orange controls platform development (closed) and controls third party service distribution (moderated).	Revolutionary Mobile payments based on NFC-SIM cards are incompatible with chip and PIN payment terminals.	
Turkcell			Platform Design Closed & moderated Technology Design Revolutionary
Market entry: NFC hub Turkcell enters into the NFC service provisioning market by leveraging its existing user base. (Multi-sided payment platform)	Closed & moderated Turkcell controls platform development (closed) and controls third party service distribution (moderated).	Revolutionary Mobile payments based on NFC-SIM cards are incompatible with chip & PIN payment terminals.	
Yapital			Merchants Business design Flash'N pay enters the marketing market. However, both parent companies enter from the retail to the payment market. Platform design Closed Technology design Evolutionary
Market entry: not present Yapital operates only in the payment market. (Two-sided payment platform)	Closed Yapital controls platform development (closed). Being solely a payment service, there is no third party service distribution	Evolutionary Mobile payment based on QR-Codes is compatible with existing payment terminals and camera-based mobile phones.	
Flash'N pay			Platform design Closed Technology design Evolutionary
Market entry: marketing Flash'N pay's enters the marketing market with loyalty card offerings. (Multi-sided payment platform)	Closed & unmoderated Flash'N pay controls platform development (closed). The distribution of loyalty cards does not require approval (unmoderated).	Evolutionary Mobile payment based on QR codes is compatible with existing payment terminals and camera-based mobile phones.	
iZettle			Payment start-ups Business design As new actors in the payment market, payment start-ups have not entered other platform markets, Platform design Closed & moderated Technology design Revolutionary
Market entry: not present iZettle operates only in the payment market. (Two-sided payment platform)	Closed & moderated iZettle controls platform development (closed) and controls third party services distribution (moderated).	Revolutionary iZettle's mobile card readers are incompatible with chip & PIN payment terminals.	
Payleven			Platform design Closed & moderated Technology design Revolutionary
Market entry: not present Payleven operates only in the payment market. (Two-sided payment platform)	Closed & moderated Payleven controls platform development (closed) and controls third party service distribution (moderated).	Revolutionary Payleven's mobile card readers are incompatible with chip & PIN payment terminals.	
Business design Four of the eight digital payment platforms enter into other existing platform markets.	Platform design Closed and moderated is the dominant platform-design approach among payment platforms.	Technology design Technology design is balanced between evolutionary & revolutionary payment instruments.	

6 Discussion

By embracing platform envelopment as our theoretical lens (Eisenmann et al., 2011), we study how digital payment platforms are designed and configured to enter other platform markets. We analyze eight digital payment platforms, six of which originate from different industries or were new actors in the payment market. We glean insights about how platforms are developed (i.e., closed or open) and how services are distributed (i.e., moderated or unmoderated), which we label under the umbrella term “platform design”. In addition, we study the payment instruments, which are physical proxies of digital payment platforms in regards to technology compatibility, which we label under the umbrella term “technology design”. Table 6 illustrates the findings from the studied cases. Key findings are that multi-sided payment platforms enter into adjacent platform markets to exploit new business opportunities. In so doing, these market entries simultaneously attempt to support and reinforce existing market positions in their core markets. For instance, girogo, Orange, and Turkcell entered into the NFC service market, which, in turn, supports their respective platforms, payment instruments (payment card and mobile phones), and, thus, their position in their core markets. Lastly, evolutionary payment instruments that are compatible with existing infrastructures in different platform markets help firms create positive platform-envelopment conditions because they bridge users from core to adjacent platform markets. Payment as a service acts as the binding glue to connect core and adjacent platform markets.

Table 6. The Design and Configuration of Eight Payment Platforms

	Two-sided payment platforms (Swish, Yapital, iZettle, Payleven)	Multi-sided payment platforms (girogo, Orange, Turkcell, Flash'N pay)
Business design	<p>Platform market entry: non-existent The design and the configuration of all two-sided digital payment platforms do not support platform envelopment. Accordingly, conditions to enter other platform markets are not given.</p>	<p>Platform market entry: NFC hub, marketing The design and configuration of all multi-sided digital payment platforms support conditions for platform envelopment to enter other platform markets.</p> <p>Identified markets:</p> <ul style="list-style-type: none"> • NFC Hub: girogo, Orange, Turkcell • Loyalty Marketing: Flash'N pay
Platform design	<p>Platform development: closed (4x) All two-sided payment platforms have a closed development approach, hence excluding third parties from co-development opportunities.</p>	<p>Platform development: closed (4x) All multi-sided digital payment platforms have a closed development approach, hence excluding third parties from co-development opportunities.</p>
	<p>Platform service distribution: moderated (2x) Two of the two-sided payment platforms have a moderated approach in regards to platform access and service distribution:</p> <ul style="list-style-type: none"> • Moderated: iZettle, Payleven 	<p>Platform service distribution: moderated (3x) & unmoderated (1x) Three of the four multi-sided payment platforms have a moderated approach regarding platform access and service distribution, and one is unmoderated:</p> <ul style="list-style-type: none"> • Moderated: girogo, Orange, Turkcell • Unmoderated: Flash'N pay
Technology design	<p>Evolutionary (2x) and revolutionary (2x) Two of the two-sided payment platforms issue evolutionary devices (i.e., SMS, QR code mobile payment) that are compatible between payers and payees. The other two-sided digital payment platforms issue revolutionary devices (i.e., payment dongles) that are incompatible on the payee side.</p> <ul style="list-style-type: none"> • Revolutionary: iZettle and Payleven • Evolutionary: Swish and Yapital 	<p>Evolutionary (2x) and revolutionary (2x) Two of the multi-sided payment platforms issue evolutionary devices (i.e., NFC payment card, QR-Code mobile payment) that are compatible between payers and payees. The remaining multi-sided payment platforms issue revolutionary devices (NFC mobile payment) that are incompatible on the payee side.</p> <ul style="list-style-type: none"> • Revolutionary: Orange, Turkcell • Evolutionary: girogo, Flash'N pay

In Sections 6.1 to 6.2.3, we discuss the insights from the Table 6 about how technology and platform design impact firms' ability to enter other platform markets (i.e., business design).

6.1 Technology Design

Four of the eight payment platforms follow an evolutionary technology-design approach that supports users to adopt new payment instruments with relatively low switching costs (Eisenmann et al., 2006; Shapiro & Varian, 1999). Issuing evolutionary payment instruments, in turn, enables the platform owner to extend the control over an existing user base. Furthermore, the findings suggest that industry background

determines the type of payment instruments: new payment actors with no prior experiences in the payment market (i.e., payment start-ups and mobile network operators) have the tendency to issue revolutionary payment instruments. Contrary, actors with payment expertise in their daily operations (i.e., banks and merchants) support evolutionary payment instruments.

One can argue that banks and merchants prefer payment instruments that are highly compatible and accessible with their current payment infrastructure to reduce adoption costs and, thus, reinforce existing customer and business structures. Contrary, mobile network operators and payment start-ups issue payment instruments that are relatively incompatible with the existing payment infrastructure, especially on the payee side.

For instance, girogo's NFC payment card is particularly evolutionary because it is highly compatible with existing ATMs and chip and PIN payment terminals. On the other hand, payment solutions by the mobile network operators and payment start-ups are incompatible with current chip and PIN payment terminals on the payee side. One can argue that mobile network operators and payment start-ups pursue a deliberate revolutionary technology design strategy to lock-in their newly created user bases. Banks and merchants, on the other hand, pursue rather an evolutionary technology design strategy to maintain and grow their existing user bases.

6.1.1 Implications for Business Design

Controlling and leveraging an existing user base is a precondition for platform envelopment. The findings suggest that girogo and Flash N' pay have created the best conditions for platform envelopment. These two payment platforms equip their large and existing user bases on the payer and payee side with accessible and evolutionary payment instruments, which creates conditions to bridge users into the NFC hub market (girogo) or loyalty card market (Flash'N pay). Payment platforms that issue revolutionary payment instruments (i.e., mobile network operators, payment start-ups) face challenges in achieving similar platform-envelopment conditions because they lack the access and leverage of an installed user base, especially on the payee side. Additional findings suggest that the type of payment instruments determine market accessibility in the first place. Payment instruments based on NFC are suitable to serve contactless dominated markets, such as ticketing, which girogo illustrates (soccer season tickets). Alternatively, QR code-based payment instruments are more amenable to optical reader- and display-dominated markets such as the (online) retail and marketing industry (see, for example, Flash'N pay).

To summarize, using evolutionary payment instruments supports platform-envelopment conditions in regards to technology design. Moreover, strategically choosing and using certain payment instruments (e.g., NFC or QR codes) impacts firms' platform-envelopment capabilities to enter specific markets.

6.2 Platform Design

6.2.1 Platform Development

The findings suggest that all eight payment platforms exercise closed platform development, which provides monopolistic power about how their platforms advance regarding functionality and governance. One can argue that a closed platform-development approach fulfills a firm's need to exercise control over current and future value streams, reduce platform and service fragmentation. Alternatively, payment platforms simply lack organizational capabilities and resources to accommodate third parties. Lastly, payment service providers are highly regulated organizations (e.g., anti-money-laundering laws, security), which impacts the degree and number of platform co-development instances in the first place.

6.2.2 Platform Service Distribution

Six of the eight payment platforms offer platform access to third parties; however, the quality and type of service distribution differs. Among the two-sided payment platforms, only payment start-ups practice service distribution; however, payment start-ups exclude any service offered by third parties. More specifically, payment start-ups grant rather co-distribution rights for their own payment services (i.e., moderated). For example, iZettle and Payleven authorize app developers to use their payment APIs, which helps them to extend their footprint in the payment market.

Contrary, multi-sided payment platforms integrate and distribute third party services. These platforms predominantly use a moderated service-distribution approach (e.g., see girogo, Orange, and Turkcell). A moderated service-distribution approach may allow firms to select complementary services to increase

overall platform value as with girogo (i.e., ticketing) and Turkcell (i.e., mobile location-based deals). Flash'N pay's merchant solution differs. Flash'N pay has an unmoderated service distribution approach that does not require approval because Flash'N pay grants one the freedom to store any loyalty card. This kind of configuration may support Flash'N pay's intended data-collection efforts in the loyalty card market.

Our findings suggest that two-sided payment platforms primarily seek to operate and grow in the payment market and, accordingly, support design measures to achieve these goals. Thus, two-sided payment platforms are inherently designed and configured to operate in the payment market. Contrary, multi-sided payment platforms are inherently designed and configured to support payment-unrelated services, which corresponds with the notion of platform envelopment.

6.2.3 Implications for Business Design

To achieve platform-envelopment conditions on the platform-design level, payment platforms need the necessary organizational and technical capabilities to incorporate and distribute payment-unrelated services to a large user base. In this study, girogo and Flash'N pay have created the best conditions for platform envelopment on the platform design level. First, girogo and Flash'N pay distribute payment-unrelated services to a ready-made user base. Second, girogo and Flash'N pay effectively distribute their payment unrelated services to their user base by leveraging accessible and evolutionary payment instruments. Orange and Turkcell distribute payment-unrelated services as well. However, they do not create platform-envelopment conditions as well as girogo and Flash'N pay do because they issue revolutionary payment instruments, which limits service delivery to existing users especially on the payee side.

To summarize, closed platform development and moderated/unmoderated platform service distribution are design options and configurations that support platform-envelopment conditions on the platform-design level. The current design and configuration of two-sided payment platforms do not support platform-envelopment conditions because they are purposefully designed to operate in the payment market.

6.3 Theoretical and Practical Implications

We contribute to the literature on multi-sided platforms (Hagiu & Wright, 2011; Rochet & Tirole, 2002, 2003a, 2003b, 2006), technology standards (Besen & Farrell, 1994; Shapiro & Varian, 1999; Tasse, 2000; West & Dedrick, 2000), and platform market entry (Eisenmann et al., 2011) by proposing a framework to study the design and configuration of digital payment platforms and how these firms create conditions for platform envelopment.

Our findings are novel in that they suggest that, due to technological advancements in the digital payment space, one can conceptually extend the notion of two-sided payment platforms (i.e., single-purpose platforms) (Rochet & Tirole, 2002, 2003a) to multi-sided payment platforms (i.e., multi-purpose platforms). Multi-sided payment platforms can create platform-envelopment conditions through strategic design and configurations while supporting multiple services. Our results illustrate that multi-sided payment platforms create conditions for platform envelopment by leveraging on 1) evolutionary payments instruments and 2) payment services as means to bridge users from core to adjacent platform markets. In so doing, core and adjacent platform markets reciprocally support each other, which, in turn, strengthens firms' market positions in their respective core markets. We are not aware of prior work that has specifically studied the design and configuration of digital payment platforms in terms of platform market entry. As such, this paper provides a conceptual contribution to better describe and understand contemporary digital payment platforms and their market-entry options. Moreover, we help practitioners make decisions by increasing their awareness of different digital platform design and configurations options they have to enter other platform markets. For instance, managers can evaluate strategies for alternative platform configurations as digital payment platforms evolve and mature over time (e.g., extending their platform design towards open and moderated to create a valuable platform ecosystem).

6.4 Future Research

Future research could study different payment platform design and configurations to understand successful platform-envelopment strategies. Because our conceptual framework illustrates correlational relationships among the platform elements, future research could study the causality between platform governance, technology compatibility, and overlapping users to prescribe effective platform market

entries. Lastly, research could also explore the different layers of payment platforms (Yoo et al., 2010). Mobile payment platforms comprise various technology layers (which handset makers, app stores, and communication networks provide) that may impact platform-envelopment capabilities.

6.5 Limitations

This paper has certain limitations. We adopt a platform-centric view, which does not cover an analysis about users, in-depth hardware specifications, or security requirements that may have an impact on market entries. Furthermore, because we only used triangulated data based on secondary sources, the proposed framework does not create theoretical generalizability. Nevertheless, we believe that this paper is a small but a concrete step to outline fruitful research avenues in the domain of multi-sided payment platforms. Another aspect that may reduce the framework's validity is that almost all presented cases were in their pilot stages; thus, current settings (e.g., partnerships or technology) may change in the future. In addition, we could not study actual clashes between different platforms and third party services that may hijack customer relationships. Studying tensions would provide valuable insights into the dynamics of platform control and platform envelopment.

7 Conclusion

This paper presents a conceptual framework that we distilled from existing literature to understand and explain the design and configuration of digital payment platforms and how payment platforms create conditions to enter other platform markets through platform envelopment. To provide an answer to our research question, we performed a multiple and comparative-case study in a European setting by using our framework as an analytical lens to identify similarities and differences among the cases. By synthesizing our observations, we identify that digital payment platforms enter into adjacent platform markets (i.e., business design), which is driven by platform design (i.e., platform development and service distribution) and technology design (i.e., the issuance of evolutionary and revolutionary payment instruments). The findings suggest that multi-sided payment platforms leverage on 1) evolutionary payment instruments and 2) payment services as a means to bridge users from core to adjacent platform markets. In so doing, platform envelopment strengthens firms' market position in their respective core markets.

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