How Digital Platforms Compete Against Diverse Rivals

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Digital platform competition is an ongoing and unpredictable endeavor with platforms competing simultaneously against diverse competitors on several battlefronts. Based on a study of MobilePay, a prominent digital payment platform in Denmark, we propose the Digital Platform Competition Grid, which outlines four competitive approaches that platform owners can take when facing competitors with diverse characteristics. Within each approach, a platform owner can mix and match several competitive actions when competing offensively or defensively on various battlefronts.[1,2]

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The Challenges of Digital Platform Competition

"No battle plan ever survives contact with the enemy." Helmuth von Moltke, Prussian General

Digital platforms, such as Booking.com, Uber, Transfer, Kickstarter and Apple's App Store enable diverse users to seek and deliver a variety of related and unrelated functionalities through the provision of an underlying IT architecture. These platforms often compete simultaneously in multiple areas, which we refer to as battlefronts, against both existing and emerging competitors. Initially, digital platforms operate within a single competitive area, but as they evolve and expand the scope of their offerings in a bid to attract new users and lock in existing ones, their boundaries span various related and less-related competitive areas. For example, Uber started out as a ride-sharing platform but has now expanded into food delivery with Uber Eats.[3] Even if a digital platform manages to emerge as a winner in one competitive area, it will face new competitors as it ventures into other markets.[4] Moreover, previously unrelated digital platforms may threaten a platform's dominant position in a specific area when they venture into new markets (e.g., Apple challenged the dominant position of MasterCard and Visa with the launch of Apple Pay).

Scholars have recognized that the competitors a digital platform encounters across various battlefronts often possess different characteristics in terms of user base composition and size, portfolio of functionalities, technology capabilities, financial resources and more

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3   Eisenmann, T., Parker, G. and Van Alstyne, M. "Platform Envelopment," *Strategic Management Journal* (32:12), July 2010, pp. 1270-1285.
4   Cusumano, M., Gawer, A. and Yoffie, D. *The Business of Platforms: Strategy in the Age of Digital Competition, Innovation, and Power*, Harper Business, 2019.

(compare, for example, Uber's competitors Lyft and Deliveroo).[5] Even if a platform owner devises and deploys an elaborate competitive approach to defeat a challenger, the emergence of new competitors with different characteristics will most likely require the adoption of different competitive approaches. Thus, as platform owners encounter diverse rivals in a "hypercompetitive environment,"[6] they need to adapt their competitive approaches based on the challengers' characteristics. In addition, because digital platforms evolve in a "compressed" manner,[7] platform owners frequently encounter increasingly diverse competitors, meaning they have to constantly reevaluate their existing capabilities and competitive approaches and develop new, more adequate capabilities and approaches. Since failing to understand and adequately address competition dynamics can lead to platform demise,[8] the key question we address in this article is: What competitive approaches can a digital platform use to counter competitors with diverse characteristics?

Our recommendations for platform owners competing on multiple battlefronts against diverse rivals are derived from a study of MobilePay, a successful digital payment platform offered by one of the leading banks in northern Europe. We traced the competitive actions that MobilePay engaged in from the platform's inception in late 2012 through May 2020, when it was struggling to maintain its dominance. Details of our research method are provided in the Appendix. Although MobilePay was victorious on some battlefronts, its efforts were less successful on other fronts because new competitors kept emerging and existing rivals kept changing tactics. We identified 32 competitive actions that MobilePay mixed and matched to fend off diverse competitors on several battlefronts. From

the insights gained from the MobilePay case, we subsequently developed the Digital Platform Competition Grid, which outlines four competitive approaches that platform owners can adopt, depending on the characteristics of their rivals.

Overview of MobilePay's Evolution

MobilePay is a successful peer-to-peer (P2P) and consumer-to-business (C2B) digital payment platform in Denmark launched in May 2013 by Danske Bank, one of the largest banks in northern Europe. As a digital platform, MobilePay facilitates direct interactions between private users (i.e., P2P) and between private and commercial users (i.e., C2B) through the provision of an IT architecture. MobilePay's IT architecture consists of a platform core, with various modular components that represent functionalities, and boundary resources, such as application programming interfaces (APIs), to ensure platform connectivity to both third-party complementors and platform providers.

Throughout its evolution, MobilePay has competed simultaneously on several battlefronts. Initially, because of the platform owner's decision to solely target private users, MobilePay only competed on the P2P payment battlefront. As a first mover, MobilePay quickly managed to attract users, with approximately 250,000 Danes (about 9% of the population) having joined just two months after launch. The growing number of private users drew the attention of commercial users, who also wished to join the platform. As a result, in February 2014, MobilePay enabled C2B transactions (i.e., it began competing on the C2B battlefront), attracting approximately 2,900 small and medium-sized enterprises (SMEs) by June 2014. At that time—one year after its launch—MobilePay had approximately one million private users.

The increased adoption of P2P and C2B transactions led to users' demands for various functionalities, which resulted in MobilePay competing on two additional battlefronts: 1) online payments, and 2) in-store payments with large retailers such as supermarket chains. In early 2015, MobilePay added online stores, and by April 2015 MobilePay had signed up 388 online retailers that were transacting with
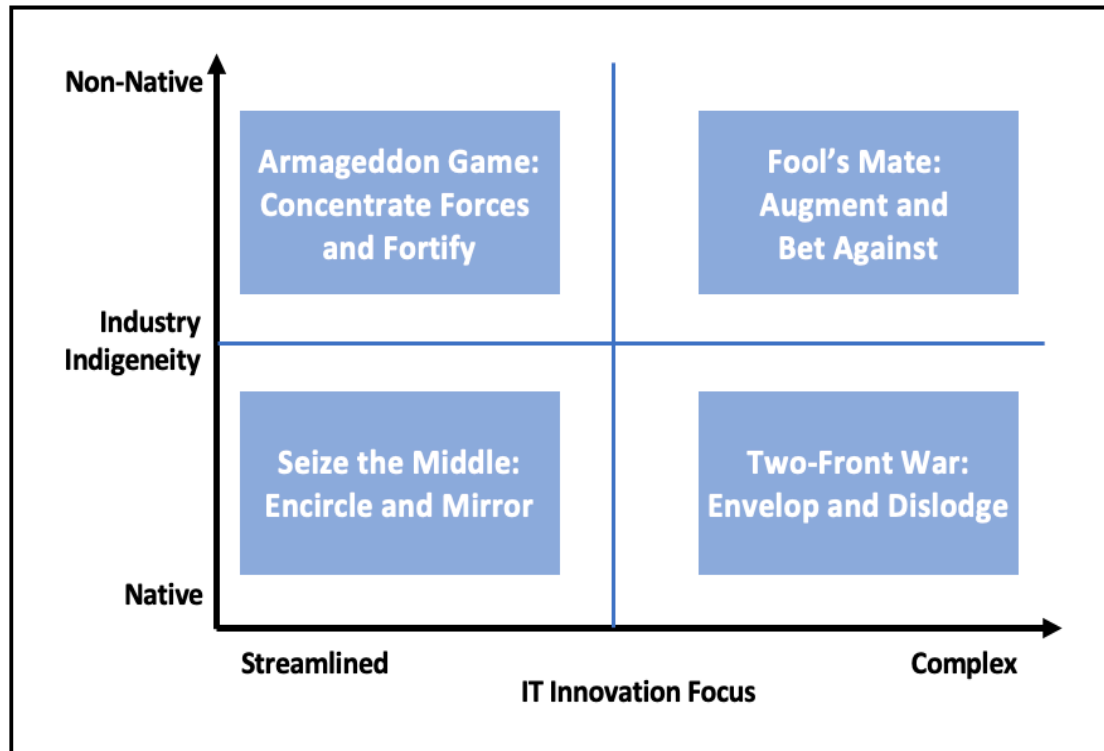
5   Cennamo, C. "Competing in Digital Markets: A Platform-based Perspective," *Academy of Management Perspectives* (35:2), July 2019, pp. 265-291, available at https://doi.org/10.5465/amp.2016.0048.

6   Lee, J. "A Review of Competitive Repertoire-Action-Based Competitive Advantage," *International Journal of Business and Management* (12:11), October 2017, pp. 120-129.

7   Papachristos, G. "Platform Competition: A Research Outline for Modelling and Simulation Research," *Journal of Engineering and Technology Management* (56) April-June 2020.

8   Ojala A. and Lyytinen, K. "Competition Logics during Digital Platform Evolution," in *Proceedings of the 51st Hawaii International Conference on System Sciences (HICSS 2018)*, January 2018, pp. 1026-1035.

Figure 1: Digital Platform Competition Grid

approximately 2.7 million private users. After months of development, MobilePay launched its point-of-sale (PoS) functionality in March 2015, which allowed large retailers to join the platform by installing an additional hardware device at the checkout counter that communicated with the retailers' cash register systems.

Throughout its evolution, MobilePay has encountered various contenders on these battlefronts, including:

- A consortium of 81 Danish banks (providing their own digital payment platform, Swipp)
- A joint venture between four Danish telecom operators (providing their own digital payment platform, Paii)
- The Nordic payment service provider Nets (which operated the card payment infrastructure used by MobilePay and subsequently offered its own digital payment platform, Mobil Dankort)

- Global tech companies, such as Apple and Google (TechFins[9]) that launched their own digital payment platforms (e.g., Apple Pay, Google Pay).

Each of these competitors commanded different resources and relied on different technologies and different relationships with private and commercial users. To date, MobilePay has emerged victorious, with a private user base encompassing approximately 93% of the Danish population, as of 2020. However, as the platform expanded from offering P2P payments to incorporating C2B payments across different areas (online, in-store and in-app), a growing number of contenders have been continuously challenging its market dominance, forcing the owner to reinvigorate its competitive efforts on several battlefronts. With some of these competitors defeated, and some prior

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9   TechFins are established technology companies that venture into financial service areas, compared to FinTechs, which are usually small financial technology start-ups.

collaborators having turned into competitors, MobilePay's journey provides an eventful account of how a digital platform can design and deploy various competitive actions to fend off competitors with diverse characteristics.

The Digital Platform Competition Grid Outlines Four Competitive Approaches Against Diverse Rivals

To compete successfully, platform owners can consult the Digital Platform Competition Grid (Figure 1), which consists of four different competitive approaches that a digital platform can adopt against its rivals, depending on their characteristics. Despite being derived from a single empirical case, we believe that the grid is useful for any platform owner in positioning its competitors vis-à-vis its own characteristics in a bid to determine the most appropriate competitive approach.

The grid has two dimensions that categorize the competitors that a digital platform may encounter:[10] 1) industry indigeneity, where we distinguish between native and nonnative, and 2) IT innovation focus, where we discern between streamlined and complex. In our analysis of MobilePay's competitive actions, industry indigeneity and IT innovation focus emerged as the two key sources of competitive advantage for the competing digital platforms. On the industry indigeneity dimension, we categorize digital platforms as being native or nonnative to a specific industry. This dimension therefore provides an estimate of the platform owner's knowledge of and ties to a particular industry. For example, industry natives will have existing relationships with users and platform providers,
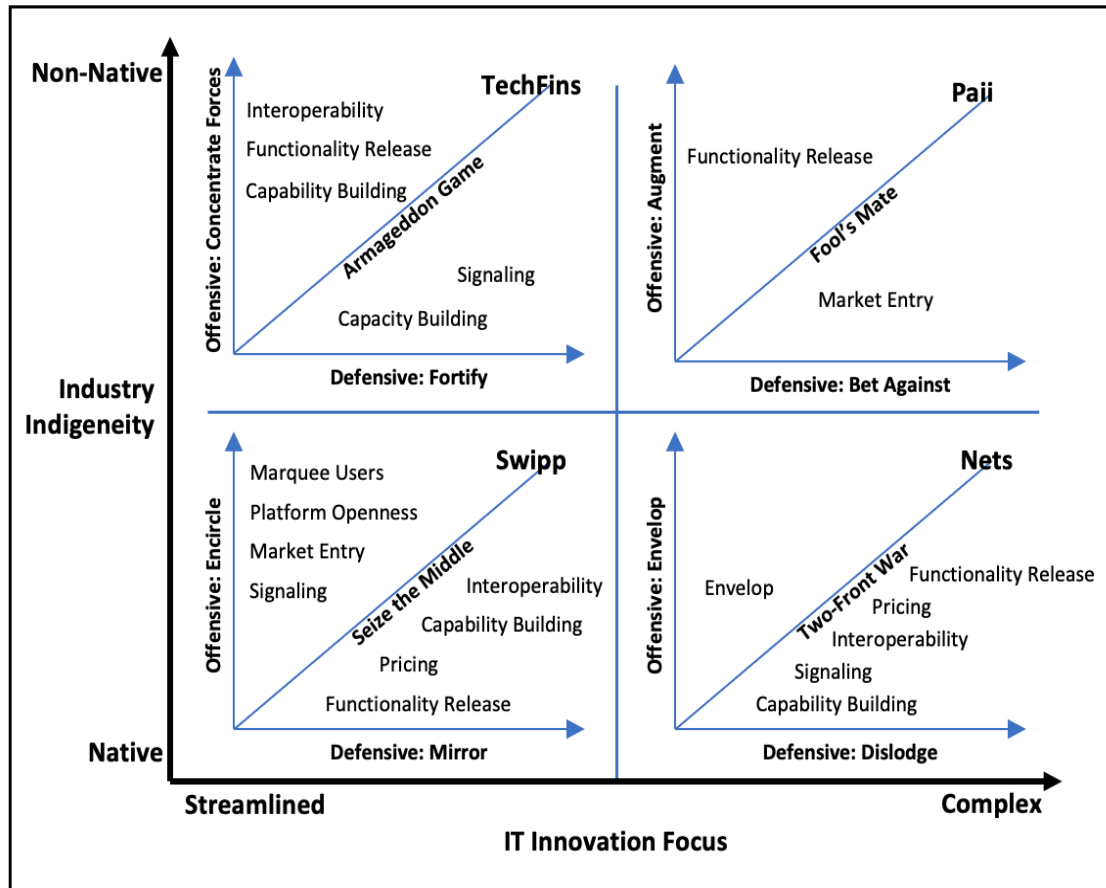
prior knowledge about competitors, regulatory knowledge and so on, all of which can constitute a source of competitive advantage.

The IT innovation focus dimension captures the views of digital platform owners regarding how specific IT innovations create competitive advantages that can be leveraged in subsequent rivalries. Based on our analysis, when competing with diverse rivals, digital platforms decide on pursuing streamlined or complex IT innovation. With streamlined IT innovation, a platform owner prefers to develop lean and flexible IT systems, often through creating synergies with existing internal or external IT systems and offering simple yet easy to use functionalities that address specific user pain points. Streamlined IT innovation therefore focuses predominantly on user centricity and less on technology advocacy, and allows the platform owner to prioritize speed when developing the underlying IT systems and to create a flexible IT architecture by avoiding technology lock-in. In contrast, complex IT innovation involves the development of an elaborate IT architecture (often almost from scratch), which reflects the owner's belief that betting on the right technological set-up is important for victory on specific battlefronts, even though this approach requires significant time and financial resources. When betting on complex IT innovation, platform owners often tend to emphasize technology supremacy rather than user centricity.

Using the Digital Platform Competition Grid, digital platform owners can choose between four distinct competitive approaches, depending on the characteristics of their rivals in terms of industry indigeneity and IT innovation focus. These approaches are: *1) Seize the Middle: Encircle and Mirror*; *2) Two-Front War: Envelop and Dislodge*; *3) Fool's Mate: Augment and Bet Against*, and *4) Armageddon Game: Concentrate Forces and Fortify*.[11] The grid, together with our three recommendations for interplatform competition, constitute a "playbook" (i.e., a stock of tactics or methods) that owners of both defending and challenger platforms can follow to help them compete successfully.

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10 Cennamo (2019) proposes the notion of platform identity, which is based on determining end-user commonality and platform architecture similarity. However, based on the findings from our case, we have identified industry indigeneity and IT innovation focus as the two important dimensions when considering the diversity of MobilePay's rivals. For example, all the competitors we studied exhibited significant end-user commonality; thus, we could not use this as a dimension, indicating distinctiveness between competitors when constructing our grid. Further, we argue that what matters is the competitors' approach to IT innovation and not so much the similarity in relation to the overall IT architecture. For example, MobilePay's and Swipp's approaches to IT innovation were similar (streamlined IT innovation), but the actual IT architectures they built were different (MobilePay relied on card-based infrastructure, while Swipp deployed an account-to-account infrastructure).

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11 We were inspired by classic chess strategies when labeling the competitive approaches. Due to the game's competitive nature, chess strategies are often applicable to the study of strategic management issues, including competition.

Figure 2: MobilePay's Digital Platform Competition Grid

Each of the four approaches has an offensive axis (e.g., "encircle") and defensive axis (e.g., "mirror"), which indicate the different competitive actions that a digital platform can undertake to attack rivals or defend itself against challengers' attacks (see Figure 2, which shows MobilePay's Digital Competition Grid). We define competitive action as "any externally oriented, specific, observable competitive move initiated by a firm to improve its relative competitive position."[12] Competitive actions may relate to price cuts, new product launches, modification or removal of functionalities, capacity- and scale-related actions (e.g., changing distribution channels), signaling actions, and more.[13]

By referencing the grid, a digital platform owner can quickly mix and match competitive actions to attack diverse challengers or defend itself against competitors' attacks. Although a digital platform seeks to leverage its own competitive advantages when taking competitive actions, an owner also aims to deploy competitive actions to erode (in offensive mode) or acquire (in defensive mode) rivals' competitive advantages.

We recommend that when a platform owner uses the grid, the starting point should be to identify where its own platform is situated in relation to the two dimensions. For example,

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12   Smith, K. G., Ferrier, W. J. and Ndofor, H. "Competitive Dynamics Research: Critique and Future Directions," in *The Blackwell Handbook of Strategic Management*, eds. Hitt, M. A., Freeman, R. E. and Harrison, J. S., John Wiley & Sons, 2001, pp. 315-36.

13   Li, H., Fang, Y., Lim, K. and Wang, Y. "Platform-Based Function Repertoire, Reputation, and Sales Performance of E-Marketplace Sellers," *MIS Quarterly* (43:1), March 2019, pp. 207-236.

Table 1: Overview of MobilePay's Competitive Actions Against Swipp

Axis	Competitive Actions
Offensive	Signaling (Nos. 1, 4, and 6), [14] preemptive market entry (Nos, 2, 5, 8 and 9), platform openness (No. 3), capability building (No. 7)
Defensive	Platform functionality release (No. 14), pricing (Nos. 11 and 15), capability building (Nos. 10, 12, 16 and 17), interoperability (No. 13)

MobilePay is native to the financial services industry because it is a digital payment platform offered by an established Nordic bank. MobilePay also deploys streamlined IT innovation because, from the onset, it has focused on offering an innovative, lean, and easy-to-use platform that uses synergies with existing IT systems and aims at solving users' persistent or recurring problems. After establishing the key characteristics of its platform, the owner should then determine how similar or different a competitor is in terms of industry indigeneity and IT innovation focus.

If a rival digital platform is an industry native and focuses on providing streamlined IT innovation, a platform owner should adopt the *Seize the Middle: Encircle and Mirror* competitive approach, whereas the *Two-Front War: Envelop and Dislodge* approach should be used for a native competitor with a complex IT innovation focus. When facing a nonnative competitor with a complex IT innovation focus, a digital platform should follow the *Fool's Mate: Augment and Bet Against* approach. Finally, a nonnative rival platform with a streamlined IT innovation focus requires the Armageddon Game: Concentrate Forces and Fortify competitive approach (see Figure 1).

To illustrate how a digital platform can use each of these competitive approaches against competitors with distinct characteristics, we outline MobilePay's competitive battles with four rivals—Swipp, Nets, Paii and TechFins (see Figure 2)—which we tracked from the platform's formation in late 2012 until May 2020, when new entrants seemed to have succeeded in partially eroding MobilePay's dominance.

How MobilePay Followed the "Seize the Middle: Encircle and Mirror" Competitive Approach

By adopting the *Seize the Middle: Encircle and Mirror* competitive approach, the platform owner aims to enter all relevant battlefronts before its competitors to establish control over them and limit retaliation attempts. The owner can take several offensive competitive actions to encircle the relevant battlefronts and later take defensive actions to guard its position by mirroring rivals' key competitive advantages. An example of this approach is MobilePay's battle with the digital payment platform, Swipp. The offensive and defensive actions taken by Mobile Pay as part of its battle with Swipp are summarized in Table 1 and described below.

Offered by a coalition of 81 Danish banks, Swipp was native to the financial services industry, and the platform leveraged its founders' payment-industry knowledge, capabilities and relationships. The digital platform allowed the founding banks' private users to transfer money to one another (P2P payments) and to pay at selected retailers (C2B payments). Swipp had a streamlined IT innovation focus, as it sought to use the core IT capabilities of its founders by establishing an underlying account-to-account (A2A) infrastructure, which required interoperability between the participating banks' own IT systems. Swipp developed a lean platform on top of this infrastructure, encompassing various innovative functionalities with a focus on user centricity.

MobilePay on the Offensive: Encircle

To fight against a native competitor with a streamlined IT innovation focus, MobilePay had to quickly achieve strong network effects across multiple battlefronts before Swipp could do so.

By creating strong network effects on several battlefronts, MobilePay was able to encircle Swipp and thus reduce its ability to retaliate. The actions MobilePay took to ensure encirclement include signaling, preemptive market entry, platform openness and capability building (see Table 1).

Before entering a competitive battlefront, in a situation of intense rivalry, a platform owner can signal to prospective users its intention to enter the market. This action will ensure that, even if a competitor launches first, users will not flock to the rival platform, thus preventing its competitor from gaining strong network effects. For example, in December 2012, shortly after negotiations with other Danish banks to develop a common platform failed, Danske Bank announced the development of its own digital payment platform (signaling action No. 1), which triggered a race to launch. Just six months later, Danske Bank launched MobilePay, which initially solely enabled P2P transactions in a bid to gain a first-mover advantage by attracting private users and establishing strong same-side network effects (preemptive market entry action No. 2).

Since swift entry into key battlefronts before a contender is at the center of the *Seize the Middle: Encircle and Mirror* competitive approach, a platform owner should engage in a preemptive market entry as an offensive competitive action, which ultimately requires the prioritization of speedy entry over the development of an elaborate IT architecture through complex IT innovations. For example, MobilePay opted to develop a lean platform with limited functionalities (solely P2P payments), instead of developing elaborate functionalities, which would have been time-consuming. MobilePay not only used existing Danske Bank's IT systems as much as possible instead of developing its own from scratch, but also built its platform on the existing card payment infrastructure provided by Nets (see below).

While preemptive market entry can ensure that a platform achieves early network effects, to strengthen them further, the platform owner should carefully consider the openness of its platform at the user level. For example, MobilePay's key value proposition focused on ease of use; Danes only needed their phone numbers to make transactions, regardless of their bank affiliation, which ensured wide adoption of the platform and thus created strong same-side network effects (platform openness action No. 3).

In response to MobilePay's preemptive market entry, other Danish banks rushed to develop their own platform, Swipp, which launched after a few months and initially only targeted the banks' private users by offering P2P payments. However, the different technical readiness among the banks slowed down the establishment of a common A2A infrastructure, which meant they could not coordinate a unified launch. Instead, each bank released its own version of Swipp, which was integrated into their existing mobile banking apps. The lack of interoperability among the banks undermined Swipp's ability to generate strong same-side network effects since users had to wait for banks to join one by one before transacting with other users in a different bank. Moreover, the creation of same-side network effects was further restricted because Danske Bank, the largest bank in Denmark in terms of private users, was not part of Swipp.

Swipp's entry onto the P2P battlefront did not pose an immediate threat to MobilePay, which had already amassed a significant number of private users (approximately 250,000 shortly after the launch). However, to further strengthen its encirclement of Swipp, MobilePay had to quickly find additional ways to boost network effects. First, in an effort to create cross-side network effects, it rushed to sign up various retailers with the platform (SMEs, online and large in-store retailers), which cemented MobilePay's position on the C2B battlefronts and strengthened existing same-side network effects on the P2P battlefront. MobilePay signaled its intention to enter the low-end C2B payment market (signaling action No. 4), before the preemptive launch of MobilePay Business in February 2014, which allowed SMEs to accept payments from MobilePay users without using a card payment terminal (preemptive market entry action No. 5).

The launch of MobilePay Business opened a second C2B SME payment battlefront, which coexisted and was intertwined with the P2P payment battlefront. The SME payments market segment was underserved because SMEs found that many of the payment solutions (e.g., payment terminals) offered by established

payment providers were too expensive. With its streamlined IT innovation focus, MobilePay did not rely on complex technology for its entry onto the C2B SME battlefront, but instead used existing IT systems as much as possible.

The wide variety of retailers, which included SMEs, online stores and large brick-and-mortar chain stores, meant that their payment needs and IT requirements were also widely different. These differences led to the formation of several battlefronts, which further fueled the entry race for MobilePay and Swipp. During 2014, both platforms made various statements indicating that the next battlefront would center around C2B in-store payments with large retailers such as supermarket chains (signaling action No. 6).

In June 2014, MobilePay entered into a long-term collaboration with the largest retail chain in Denmark, which operates some of the most popular supermarket brands. This deal with a key "marquee"[15] user (capability building action No. 7) indicated to MobilePay's more than a million private users and approximately 1,000 retailers that it was gaining a strong foothold on the C2B in-store battlefront and could offer an increased value proposition to them. By leveraging the technical knowledge of the marquee user, MobilePay made a preemptive move against Swipp in March 2015 when it launched its point-of-sale (PoS) functionality (preemptive market entry action No. 8). Large retailers could now join the platform by installing an additional hardware device at checkout counters that communicated with the retailers' cash register systems. This preemptive offensive action by MobilePay illustrates that a platform owner can facilitate speedy entry onto a given battlefront by leveraging the technical knowledge of marque users.

In parallel with its efforts on the C2B in-store battlefront with large retailers, MobilePay also made another preemptive attack on Swipp when it launched online payments in January 2015, thus opening a new C2B online battlefront, almost a year before Swipp opened its platform to online retailers (preemptive market entry action No. 9).

MobilePay on the Defensive: Mirror

To defend its advantageous position on key battlefronts, a platform owner can adopt several competitive actions related to platform functionality release, pricing, capability building and interoperability in an attempt to mirror rivals' main competitive advantages (see Table 1). Prompted by MobilePay's preemptive market entry actions, Swipp quickly responded by entering the respective battlefronts, which intensified competition between the two platforms. Having lost the first-mover advantage on the P2P battlefront, Swipp focused its efforts on ensuring a speedy entry onto the C2B battlefronts. Despite its efforts, however, Swipp lagged behind MobilePay because the initial uncoordinated launch hurt its ability to create strong network effects. To rectify this shortcoming, Swipp launched a new unified platform in September 2015. The main competitive advantages provided by this new platform and its underlying A2A infrastructure were that Swipp could offer high daily payment limits to private users, cheaper prices for retailers and faster execution of C2B payments, which could be initiated through the use of QR codes. Moreover, retailers did not have to install new hardware at checkout desks as they did for MobilePay.[16]

The biggest threat to MobilePay was that its users (both private and commercial) might multihome to Swipp, which offered similar functionalities (P2P and C2B payments). Moreover, because MobilePay was open to users of all Danish banks, the banks involved with Swipp already had customer relationships with some MobilePay users. To make it unattractive for its users to multihome, MobilePay had to reduce the value that its users could gain from being part of Swipp by imitating (i.e., mirroring) the competitive advantages of its rival. Thus, MobilePay twice increased the daily transfer limit to match those of Swipp (capability building action Nos. 10 and 12), which further cemented MobilePay's dominance. As of February 2014, MobilePay was processing 40,000 daily P2P and C2B transactions, compared to just 1,400 by

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15   Marquee users are the most established and profitable businesses within a specific industry.

16   Zigler, T. *Swipp Business will overtake MobilePay*, Børsen, September 9, 2014, available at https://borsen.dk/nyheder/finans/swipp-erhverv-vil-overhale-mobilepay-6bz9y.

Table 2: Overview of MobilePay's Competitive Actions Against Nets

Axis	Competitive Actions
Offensive	Envelopment (Nos. 18 and 19)
Defensive	Capability building (Nos. 20 and 21), signaling (No. 22), interoperability (No. 23), pricing (No. 24), platform functionality release (No. 25)

Swipp.[17] In another move to prevent private users from multihoming, MobilePay dropped plans to introduce a transaction fee. After an initial period of free usage for private users (with Danske Bank subsidizing the operating costs), the owner had intended to introduce a transaction fee, but the launch of Swipp, which did not charge its users for P2P transfers, caused MobilePay to change its mind (pricing action No. 11): "It is no secret that Swipp expected to introduce a price and that we did the same. Both have now gone away from it, and that is precisely because there is competition." Jesper Nielsen, Head of Business Development in Danske Bank.[18]

Another defensive action MobilePay took was to refuse an interoperability request from Swipp. Because more private users had adopted MobilePay than Swipp, in late 2013, Swipp initiated negotiations with MobilePay, seeking to establish interoperability between the two rival platforms. However, MobilePay pulled out of the negotiations because it did not believe that Swipp offered a compelling platform to its users in terms of user experience. In addition, interoperability with a rival would encourage MobilePay users to multihome (interoperability action No. 13).

Capitalizing on its main competitive advantage (its A2A infrastructure), in October 2014, Swipp again increased the daily spending limits for private users (which numbered approximately 450,000 at the time), anticipating that this would further increase C2B transactions and thus create strong network effects. In January 2015, it was reported that Swipp had acquired 5,000 merchants compared to MobilePay's

3,700,[19] which Swipp's CEO attributed to the increase in daily spending limits. In response, MobilePay sought to imitate (i.e., mirror) Swipp's competitive advantage by introducing a stronger user authentication mechanism (platform functionality release action No. 14), which enabled an increase in the daily spending limit. To further strengthen the attractiveness of its platform, MobilePay also introduced differentiated prices for retailers, reflecting their platform usage (pricing action No. 15).

Although MobilePay could not immediately mirror Swipp's A2A infrastructure, which was its rival's main competitive advantage, it focused on mirroring other IT innovations. For example, in 2016, Swipp collaborated with a leading payment terminal provider that had around 400,000 terminals installed in retailers across the Nordic countries so that these retailers could easily accept Swipp payments. MobilePay responded by establishing a similar deal with the same provider in September 2016 (capability building action No. 16), even though MobilePay offered its own payment terminal.

By obtaining a first-mover advantage on key battlefronts and quickly acquiring a significant private and commercial user base, MobilePay rapidly became the dominant payment platform in Denmark, with approximately 90 % of the population using the platform in 2017. MobilePay remained a clear winner on the P2P battlefront, but, despite the efforts of both MobilePay and Swipp, there was no clear winner on the C2B payment battlefront, with most retailers choosing to multihome on both platforms. For example, in May 2016, MobilePay reported 25,000 retailers among its users, compared to 22,000 merchants on the Swipp platform.

To fight against Swipp—a native competitor with a streamlined IT innovation focus—

17 Manniche, K. *The Payment App that Lost to Mobilepay*, FinansWatch, January 3, 2017, available at https://finanswatch.dk/Finansnyt/Pengeinstitutter/article9399449.ece.

18 Maajen, A. G. *Danske Bank Rejects Mobile Collaboration*, FinansWatch, July 3, 2014, available at https://finanswatch.dk/Finansnyt/article6470744.ece.

19 Fremmen, M. B. *Media: Swipp Now Has More Business Agreements than MobilePay*, FinansWatch, January 23, 2015, available at https://finanswatch.dk/Finansnyt/Pengeinstitutter/article7384142.ece.

MobilePay aimed at seizing the middle across key battlefronts by encircling its rival and mirroring its competitive advantages. This, however, proved to be a grueling endeavor for both competitors, with both having to dedicate significant resources to this head-to-head battle. The decisive moment came in September 2016, when Swipp's biggest supporter announced it was leaving the bank coalition to join MobilePay (capability building action No. 17). Most of the other Swipp supporters soon also exited the coalition, citing increasing costs to operate Swipp and the changing competitive environment. These defections ultimately led to the demise of Swipp.

How MobilePay Followed the "Two-Front War: Envelop and Dislodge" Competitive Approach

A digital platform owner should follow the *Two-Front War: Envelop and Dislodge* competitive approach when confronted by a native competitor with a complex IT innovation focus. As a native to the specific industry, such a rival might initially start out as the technology platform provider or might offer the underlying IT infrastructure upon which a platform operates. Over time, however, as their interests diverge, the relationship between platform owner and platform provider can become strained, resulting in the provider becoming a competitor.

An example of such a competitor to MobilePay is the Nordic payment service provider Nets, which started out as a platform provider, operating the card payment infrastructure used by MobilePay. Later, however, Nets became a competitor when it launched a rival C2B payment platform, Mobile Dankort, which meant that MobilePay had to wage a two-front war. Nets is native to the financial services industry and provides a range of IT financial services, some of which form the backbone upon which MobilePay operated. Because of its background as a provider of complex IT infrastructure and its limited experience of user centricity, when Nets developed its challenger platform, it concentrated on complex IT innovation. As described below, Nets spent several years and significant resources developing elaborate IT systems to underlie its digital payment platform. The offensive and defensive actions taken by MobilePay to counter the challenge from Nets are summarized in Table 2 and described below.

MobilePay on the Offensive: Envelop

MobilePay's offense against Nets comprised actions to envelop several of its rival's key functionalities. These actions aimed at preventing its users from multihoming to the new contender by increasing its own value proposition. Nets's announcement of its ambition to engage on the C2B large-retailer battlefront led to intensive clashes from mid-2016 on. Earlier, in March 2014, Nets had revealed its plans to launch a mobile version of the physical national Dankort debit card. Initially, MobilePay did not see Mobile Dankort as a competitor but rather as a complement to MobilePay because it could be added to the platform as a payment option. Nets reinforced this view by stating in December 2015 that Mobile Dankort, which it planned to introduce in fall 2016, would not operate as a separate digital payment platform but would be part of existing platforms such as MobilePay.

The biggest competitor that MobilePay initially faced when it entered the C2B in-store battlefront was Dankort itself; almost every Dane had a Dankort card and when Dankort introduced contactless payments in August 2015, cardholders could execute low-value C2B transactions without any PIN code in a fast and secure manner. The main limitation of MobilePay for C2B transactions was that it could not match the speed and convenience of contactless card payments. In an effort to secure dominance on the C2B in-store battlefront, in March 2016, MobilePay launched its own payment terminal, together with a partner, that could also accept well-known payment cards such as Dankort. (The terminal was predominantly targeted at SMEs.) This move was an offensive enveloping attack against Nets, which was the predominant payment terminal provider in Denmark (envelopment action No. 18). To retaliate, over the next few months, Nets invested in strengthening its capabilities on this battlefront, and in November 2016 announced a partnership that offered an all-inclusive PoS solution for SMEs. As the competition with Nets intensified, MobilePay took another offensive envelopment action in March 2017, when it launched new

Table 3: Overview of MobilePay's Competitive Actions Against Paii

Axis	Competitive Actions
Offensive	Market entry (No. 26)
Defensive	Platform functionality release (No. 27)

functionality that allowed users to set up recurring payments with selected retailers—a functionality that was one of Nets's main revenue sources (envelopment action No. 19).

MobilePay on the Defensive: Dislodge

In May 2016, and months before the launch of its digital payment platform, Nets had signed a deal with one of the largest retail chains in Denmark, thus strengthening its competitive position. Nets further continued to muster support for the upcoming launch by convincing another large retail chain in September 2016 to abandon MobilePay and support its platform instead. As a result, MobilePay lost access to 65 % of the Danish retail sector. As Nets was turning into a rival, MobilePay engaged in a series of defensive competitive actions that sought to dislodge its previous partner. These actions aimed at disentangling the MobilePay platform from the Nets infrastructure and building corresponding capabilities on its own or in collaboration with other infrastructure providers. For example, in early 2016, MobilePay moved its Danske Bank customers to an A2A infrastructure, decreasing its dependence on Nets (capability building action No. 20).

Another defensive dislodging action occurred when MobilePay signed a deal in late 2016 with one of the largest payment acquirers in the Nordic countries to act partially as its new infrastructure provider, thus further bypassing Nets (capability building action No. 21). Next, MobilePay used signaling as a defensive action, by indicating to its users an upcoming intention to erode the main competitive advantages of Nets's new platform. MobilePay pre-announced that it would provide the ability to "pay from black screen" in tap-and-go mode, which would allow users to pay without activating the app on their phones and thus increase the speed of C2B in-store transactions (signaling action No. 22). This pre-announcement aimed at stopping merchants from switching to Nets.

In January 2017, the battle intensified when the negotiations between Nets and MobilePay to enable Mobile Dankort as part of MobilePay broke down (interoperability action No. 23), largely due to MobilePay's concerns about the user experience provided by the Nets platform. By denying interoperability with Nets, MobilePay aimed at undermining the acceptance of the challenger platform by large retailers. In March 2017 (and three years later than expected), Nets launched Mobile Dankort with selected large retailers, prompting MobilePay to reduce prices to merchants in defense (pricing action No. 24) and launch "pay from lock screen" (platform functionality release action No. 25). These actions indicate that MobilePay was mimicking the competitive advantage provided by Mobile Dankort.

Despite great support from marquee users, by April 2017, both private users and retailers were expressing their dissatisfaction with Mobile Dankort; users did not like the platform design, which was launched in beta version, while retailers found the platform expensive. After a year-long struggle to establish itself, Mobile Dankort began to lose some of its early supporters. In November 2018, one of the largest retail chains switched back to MobilePay, indicating that large retailers did not view the Nets platform favorably.

How MobilePay Followed the "Fool's Mate: Augment and Bet Against" Competitive Approach

Owners of a native platform with a streamlined IT innovation focus should follow the *Fool's Mate: Augment and Bet Against* approach when challenged by nonnative competitors with a complex IT innovation focus (i.e., there is a high

degree of dissimilarity). This approach involves taking the fewest possible competitive actions to ensure victory over the rival.

An example of this approach is MobilePay's battle with the digital payment platform, Paii, which, as a joint venture between four major telecom operators, was nonnative to the financial services industry. As P2P and C2B payment processing was not a core competency for telecom operators, Paii could not fully leverage the existing IT systems of its founders. Instead of using existing payment service providers, Paii decided to develop almost from scratch its own complex IT systems to underpin its upcoming digital payment platform, which was to provide myriad functionalities for both private and commercial users. The development of the platform took several years (2011-2014), with the focus on building technical capabilities rather than on prioritizing user centricity. The offensive and defensive actions taken by Mobile Pay in its battle against Paii are summarized in Table 3 and described below.

MobilePay on the Defensive: Bet Against

Paii is a digital platform for P2P payments and in-store and online C2B transactions between private users and retailers. It was officially launched in February 2014, about nine months after MobilePay and five months after Swipp (by then, MobilePay already had one million private users). In contrast to MobilePay, Paii bet on online payments being its main factor of differentiation and entered into agreements with 20 online stores prior to its launch. Anticipating a threat to its ability to control the C2B online payment battlefront, MobilePay launched its own online payment functionality in January 2015 (market entry action No. 26). Thus, MobilePay came to this battlefront as a second mover because it had prioritized other battlefronts. According to Mark Wraa-Hansen, MobilePay's CEO: "Initially, we have prioritized that users could make transfers to each other and subsequently also in the physical stores. Now comes the opportunity to pay online, and of course you can always discuss whether it has been the right order. We take it one step at a time, so we are sure that things work properly and simply."[20]

MobilePay's plans for launching online payments first appeared in early 2014, but it took longer than expected for MobilePay to enter this battlefront because it first needed to work out how best to enable the functionality without depending too much on Nets as an infrastructure provider. Although, as described earlier, MobilePay and Nets were initially partners, the relationship had become strained. MobilePay was concerned that Nets could learn details about the design of its online payments and replicate it on its own upcoming platform, and feared that Nets (as provider-turned-competitor) could have "too much power/influence over MobilePay."[21] However, with Paii entering the online payment battlefront, MobilePay needed to prioritize speedy entry by relying on Nets (i.e., it adopted a streamlined IT innovation focus), rather than developing a more complex IT infrastructure over a longer time span. Thus, MobilePay bet on providing a different IT architecture to Paii's, which, because of the synergies with existing IT systems, was familiar to online retailers and would thus increase MobilePay's chances of gaining traction on this battlefront.

MobilePay on the Offensive: Augment

Despite its first-mover advantage on the C2B online payment battlefront, Paii was not popular with users, resulting in a low adoption rate. While Paii struggled, MobilePay strengthened its competitive positions by introducing new, innovative functionalities (albeit unrelated to online payments) to augment its value proposition for both private and commercial users and lock them in (platform functionality release action No. 27). Then, in November 2014, Swipp acquired Paii, just a few months after the telecom-backed platform had been launched, seeking to use Paii's IT systems to enable its own online payments, which were not part of Swipp's portfolio until then (an example of Swipp following a streamlined IT innovation strategy). However, Swipp struggled with the technical integration of Paii's IT systems and the launch of its online payments functionality was delayed

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20   Ernst, N. MobilePay Goes Online, Berlinske, July 3, 2014, available at https://www.berlingske.dk/virksomheder/mobilepay-gaar-paa-nettet.

21   Quoted from a MobilePay internal document.

Table 4: Overview of MobilePay's Competitive Actions Against TechFins

Axis	Competitive Actions
Offensive	Capability building (No. 28), platform functionality release (No. 29), interoperability (No. 30)
Defensive	Capability building (No. 31), signaling (No. 32)

until October 2016. With Paii ceasing to exist, largely due to the lack of take-up by users, and Swipp's delayed entry into online payments, MobilePay dominated this battlefront.

How MobilePay Followed the "Armageddon Game: Concentrate Forces and Fortify" Competitive Approach

Platform owners should follow the *Armageddon Game: Concentrate Forces and Fortify* competitive approach when facing nonnative competitors with streamlined IT innovation focused on user centricity. MobilePay's battle with TechFins such as Apple Pay and Google Pay, which were entering the digital payment battlefronts, is a good illustration of this approach. TechFins are nonnative to the financial services industry and follow a streamlined IT innovation strategy as they seek to improve the payment experience rather than reengineer the underlying payment IT infrastructure. To achieve this, many TechFins have established partnerships with existing payment providers (e.g., Apple Pay partnered with banks and card scheme providers). In addition, TechFins operate in multiple markets globally and seek to leverage synergies with their own vibrant ecosystems, which they have established prior to competing in the digital payment area. Their significant global user base, state-of-the-art technological capabilities, vast financial resources and strong user-centric value propositions for both users and retailers meant that TechFins were a very different type of competitor from the ones MobilePay had previously encountered. The offensive and defensive actions taken by Mobile Pay to counter the challenge of TechFins are summarized in Table 4 and described below.

MobilePay on the Offensive: Concentrate Forces

To counter the threat from TechFins, MobilePay used several offensive competitive actions that aimed to concentrate forces through collaborations with other platforms and platform providers and by strengthening the value proposition for users, seeking to prevent them from multihoming. After Swipp's demise in early 2017 and with Nets struggling to recruit significant numbers of consumers and retailers, MobilePay had cemented its dominance on several key battlefronts. However, since 2015, MobilePay had been anticipating the upcoming competition from TechFins on several payment battlefronts. Realizing that it did not possess the necessary capabilities to fight against TechFins, MobilePay decided it needed to join forces with other platforms—i.e., to concentrate their joint forces. First, in 2015, MobilePay reached out to the second-largest bank in Denmark and main Swipp supporter, which was also facing the same challenge. Soon after, recognizing that TechFins would be formidable competitors, the Danish banks behind Swipp decided to support MobilePay by acting as platform distributor providers, thus ensuring that MobilePay had enough user reach before TechFins entered the Danish market (capability building action No. 28). However, the banks did not support MobilePay alone, they opted later (2017-2020) to allow their users to multihome across several digital payment platforms. For example, the second-largest bank in Denmark, Nordea, offered its private and commercial users several digital payment platforms, namely MobilePay, Apple Pay, Google Pay, Fitbit Pay and Garmin Pay. Thus, the banks did not perceive MobilePay as the obvious winner and decided to bet on several digital payment platforms, while leaving it to their customers to decide the outcome of this competitive battle.

TechFins' entry into the Danish market created new competitive challenges on the P2P payment battlefront, as most of the new entrants had experience offering strong value propositions to their users. This put MobilePay back into innovation mode and, during the period 2019-2020, it released several innovative functionalities such as MobilePay Box, which allows users to easily collect payments for various purposes, and Money Gifts, through which users can send money as personalized gifts to their friends (platform functionality release action No. 29). These functionalities were aimed at driving user engagement and thus preventing users from multihoming on rival platforms.

TechFins' entry also intensified the battle on the C2B in-store payment battlefront. For example, cross-border payments were one of the key value propositions of Apple Pay, Visa Direct and PayPal. Although cross-border payments had been on MobilePay's radar for quite some time, this functionality was not prioritized until mid-2018. To enable cross-border payments, MobilePay entered into partnerships with seven other digital payment platforms across Europe (e.g., Vipps in Norway, Swish in Sweden, MP Way in Portugal), which combined had 25 million users and approximately one million retailers[22] (interoperability action No. 30). The partners were all facing a common threat from TechFins and chose to establish interoperability across their largely local digital payment platforms.

MobilePay on the Defensive: Fortify

Apple Pay was launched in Denmark in August 2017, initially just for C2B in-store transactions but later also for C2B online and in-app transactions. Apple Pay in Denmark used existing card-payment infrastructure through collaborations with card schemes such as Visa and MasterCard and card-issuing banks and was initially supported by two major banks. Even though it remained free for private users, Apple Pay's technical set-up made it relatively expensive for Danish retailers to use in comparison to other platforms. However, Apple Pay did not require retailers to install new payment hardware because it worked with any terminals that could

accept contactless payments. Unlike Mobile Dankort and MobilePay, both of which used Bluetooth technology for C2B payments, Apple Pay relied on the NFC chip in iPhones, making it easier for retailers to accept Apple Pay.

Several other TechFins followed Apple Pay's entry into Denmark. In October 2017, AliPay, offered by the Chinese e-commerce platform Alibaba, launched in Denmark but predominantly targeted Chinese tourists who wished to use AliPay at select Danish stores. In November 2017, Visa launched its own P2P and C2B payment platform, Visa Direct, which was offered through banks that distributed the platform to their customers. In the following months, Fitbit Pay (November 2017) and Garmin Pay (March 2018), both offered in collaboration with MasterCard and supported by several banks, launched in Denmark, allowing users of Fitbit and Garmin smartwatches to execute C2B transactions at NFC-enabled payment terminals. In October 2018, Google Pay, which supported C2B in-store and in-app transactions and allowed for storing loyalty and membership cards, gift cards and event tickets, entered Denmark, again distributed through Danish banks. The entry of these challengers intensified competition on several battlefronts, such as in-store C2B for large retailers, C2B online payments and P2P payments.

In response, MobilePay took several defensive competitive actions to fortify its positions (see Table 4). For example, the collaboration with Danish banks allowed MobilePay to strengthen its IT capabilities by migrating from the existing, expensive card-based payment infrastructure to the cheaper A2A infrastructure. Swipp's demise also allowed MobilePay to focus on building resilient IT systems and more efficient processes. According to a manager at MobilePay: "When we were fighting with Swipp, we were interested in launching features and functionalities all the time. Now, we don't have to do this anymore. ... We do not need to be so stressed about it anymore [i.e., launching new features], so maybe we need to focus on doing other stuff, such as optimizing our resources." (Capability building action No. 31.)

In February 2020, Apple Pay processed twice as many C2B in-store transactions as MobilePay, indicating that MobilePay was being beaten on this battlefront. Apple Pay was generally easier to use at retailers' checkouts, which

caused MobilePay to consider strengthening its competitive position by improving the technology behind its own C2B functionality, which was based on Bluetooth (an example of streamlined IT innovation). Because MobilePay's developers could not access the functionality of the iPhone's NFC chip, in a bid to retain users, MobilePay announced that would explore other technical options. One was Scan and Pay, where users could scan their goods as they shop, with the required amount deducted from the digital payment platform they use (similar to Amazon Go)[23] (signaling action No. 32). MobilePay even considered abandoning its ambitions for winning the battle for large retailers and predominantly focusing on strengthening its proposition for SMEs because the platform could solve major pain points for this retailer segment.

In summary, by the end of 2020, Apple Pay had become MobilePay's biggest competitor, dominating the in-store C2B battlefront for large retailers, with MobilePay retaining its dominance on the P2P, C2B online and C2B SME payment battlefronts.

Summary of MobilePay's Offense and Defense Competitive Actions

Since digital platforms challenge established competition rules,[24] platform owners cannot rely on designing long-term competition strategies in the same manner as traditional businesses (also referred to as pipeline businesses[25]). Instead, they need to mix and match different competitive actions against diverse rivals—either offensively or defensively—as part of their competitive approaches. The 32 competitive actions taken by MobilePay, which we grouped into the seven categories,[26] are summarized in Table 5, along with examples of specific competitive actions

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23 De Boisseson, N. *How MobilePay Avoids Competing Directly with Apple Pay*, ComputerWorld, May 26, 2020, available at https://www.computerworld.dk/art/252020/saadan-undgaar-mobilepay-at-konkurrere-direkte-med-apple-pay.

24 Cennamo, C., op. cit., July 2019.

25 Parker G, Van Alstyne M. and Choudary, S. P. *Platform Revolution: How Networked Markets Are Transforming the Economy and How to Make Them Work for You*, W. W. Norton & Company, 2016.

26 The grouping of competitive actions is based on existing categories of competitive actions (e.g., pricing) as identified in the extant literature and on other categories that emerged from our data (e.g., interoperability).

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taken in each category in offensive and defensive mode.

Recommendations for Digital Platforms Competing Against Diverse Rivals on Multiple Battlefronts

From our analysis of the competitive actions taken by MobilePay against diverse competitors across several battlefronts, we have derived three recommendations that can help platform owners compete when facing existing and emerging contenders with different characteristics. These recommendations for interplatform competition apply to platform owners seeking to establish or defend their dominance. Although these recommendations are based on the empirical case of a prominent digital payment platform, we believe they are relevant for digital platforms operating in other contexts as well (e.g., e-commerce, social media, sharing economy, software development).

1. Leverage Existing IT Capabilities to Establish Control Over a Battlefront, but Abandon these Synergies to Retain Control Over a Battlefront

When facing head-to-head competition, digital platforms are more likely to prioritize entering new competitive areas (i.e., battlefronts) quickly by offering few innovative functionalities and leveraging existing IT systems as much as possible (that is, relying on streamlined IT innovation). Their aim should be to establish control over a battlefront as quickly as possible. However, those that follow the *Seize the Middle: Encircle* and Mirror competitive approach face grueling head-to-head battles as platforms compete to launch functionalities in a bid to attract new users and lock in existing ones, while also keeping an eye on competitors and mimicking their competitive actions to prevent users from multihoming. These battles are resource intensive and often lead to resource depletion. As a result, platforms that focus on quickly entering key battlefronts to create network effects and gain first-mover advantages usually do not prioritize building robust technical or governance capabilities.

Table 5: MobilePay's Competitive Actions for Offense and Defense

Competitive Action Category	Offense	Defense
Market Entry	Enter first into specific area (battlefront)—both related and nonrelated—to trigger network effects as barriers to entry Example: MobilePay's race to enter several battlefronts (Nos. 2, 5, 8 and 9)	Quickly follow competitor's entry into specific area that is important for attracting users (key for own value proposition) Example: MobilePay's entry into online payments soon after Paii (No. 26)
Platform Functionality Release	Preemptively offer innovative functionalities to ensure user lock-in when facing a competitor with a focus on user centricity Example: Launch of MobilePay Box and MobilePay Money Gift (No. 29)	Imitate key competitive advantage of a contender Example: MobilePay launched "pay from lock screen" to counter Nets's competitive advantage (No. 25)
Signaling	Inform current and future platform users about intentions (e.g., release of new functionalities) to prevent them from multihoming to rivals Example: MobilePay's announcement of a deal with marquee users (No. 7)	Pre-announce upcoming release of rival's key functionality to prevent users from multihoming Example: MobilePay's announcement of "paying from black screen" (No. 22)
Pricing	Subsidize platform users to kick-start initial adoption Example: MobilePay initially did not introduce fees for private users (No. 2 [27])	Adjust pricing to match those of rivals Example: MobilePay scrapped plans to charge demand-side users when Swipp entered the market (No. 11)
Envelopment	Incorporate competitors' offerings to enrich own functionalities and to prevent users from multihoming Example: MobilePay launched Subscriptions, a functionality offered by Nets (No. 18)	N/A
Capability Building	Reuse IT capabilities as much as possible to facilitate speedy market entry Example: MobilePay used existing IT systems and payment infrastructure (No. 2) [28]	Remove accumulated inefficiencies due to reuse of existing IT capabilities when facing a technologically superior competitor Example: MobilePay built more resilient IT systems (No. 31)
Interoperability	Partner to increase user network size when facing a competitor with a stronger user base Example: MobilePay partnered with other European digital payment platforms (No. 30)	Deny interoperability with rival platforms to prevent users from multihoming Example: Danske Bank refused interoperability with Swipp (No. 13)

Ironically, the technology set-up that MobilePay relied on for its market entry later proved to be inefficient for maintaining control over the battlefronts it entered, leaving the platform open to attacks. For example, the synergies between MobilePay's platform and the existing Danske Bank's IT systems and Nets's card payment infrastructure that enabled speedy entry later became a source of frequent episodes when the platform was offline. To retain control over key battlefronts, we recommend that digital platforms should engage in a series of competitive actions, with the goal of removing inefficiencies and building relevant capabilities on its own or in collaboration with platform technology providers (examples of offensive and defensive capability building actions are given in Table 5).

We expect that a digital platform will switch from predominantly innovation mode to capability building mode at some point in its evolution. Once a digital platform has established its dominance on key battlefronts by defeating its immediate competitors, there is less pressure to innovate constantly to stay ahead of competitors. This allows a platform to redirect its resources toward substantial capability building in preparation for the entry of upcoming competitors (as MobilePay's did in anticipation of competition from TechFins). We recommend that platforms should focus on capability building immediately after a head-to-head competitor stops posing a threat. In particular, platforms should redirect resources toward building scalable IT systems rather than engaging in an innovation and imitation race.

Nevertheless, it is equally important that digital platforms look out for new competitors signaling their upcoming entry and be prepared to switch back to innovation mode. Capability building efforts to retain control over a battlefront can require significant time and resources, which can slow down the development of innovative offerings. However, to prevent emerging rivals from gaining a competitive edge, we caution that such efforts should not last longer than necessary. We recommend that platform owners should not become entrenched in capability building efforts because this could prevent them from quickly switching back to innovation mode when new competitors emerge.

2. To Prevent Users from Multihoming to Rival Platforms, Grow the User Network Size Preemptively, Mirror Competitors' Key Advantages and Deny Interoperability

One of the key competitive threats for a digital platform is the possibility that its users may multihome to rival platforms[29] and thus weaken previously gained network effects. [30]Researchers have often concentrated on studying multihoming within a single group of users, whereas understanding how digital platforms can address multihoming across all its distinct user groups is largely understudied.[31] Based on our analysis of MobilePay's competitive actions, we have identified: 1) the probability of platform users' multihoming to rival platforms given the contenders' characteristics, and 2) the competitive actions that a platform owner can take to reduce multihoming by private and commercial users (see Table 6).

Our research shows that the probability for users of a given platform multihoming to rivals depends on the similarities or differences between the competing platforms. Thus, both private and commercial users of a digital platform that focuses on streamlined IT innovation are more likely to multihome to rival platforms with the same IT innovation focus. For example, MobilePay's private and commercial users multihomed to both Swipp and TechFins because these rival platforms offered similar functionalities and had a user centricity focus. In contrast, Nets and Paii concentrated on complex IT innovations, believing that this would give them competitive advantages that appealed to commercial users (e.g., cheaper prices, higher transaction volume and so on) at the expense of private user centricity. As a result, we noted that, while MobilePay's commercial users initially

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27   This pricing action was taken as part of the preemptive market entry action No. 2.

28   This capability building action was taken as part of the preemptive market entry action No. 2.

29   Bakos, Y. and Halaburda, H. "Platform Competition with Multihoming on Both Sides: Subsidize or Not?" *Management Science* (66:12), (2020), July 2020, pp. 5599-5607.

30   Gawer, A. "Digital Platforms' Boundaries: The Interplay of Firm Scope, Platform Sides, and Digital Interfaces," *Long Range Planning* (54:5), October 2021, available at https://doi.org/10.1016/j.lrp.2020.102045.

31   Bakos, Y. and Halaburda, H., op. cit., July 2020.

Table 6: Competitive Actions Against Diverse Competitors to Reduce Users Multihoming

Competitor	Probability of Private Users Multihoming	Competitive Actions	Probability of Commercial Users Multihoming	Competitive Actions
Native/ Streamlined IT Innovation	Medium	• Signaling • Deny interoperability • Lock in users through release of new functionalities • Allow openness at the user level • Pricing	High	• Signaling • Enter preemptively • Offer differentiated pricing • Develop close relationships with marquee users (capability building)
Native/ Complex IT Innovation	Low	• Deny interoperability • Signaling	Medium	• Signaling • Mimic technology advantage (capability building) • Adjust pricing
Nonnative/ Complex IT Innovation	Low	• Lock-in users through release of new functionalities	Medium	• Partner with established technology providers (capability building)
Nonnative/ Streamlined IT Innovation	High	• Signaling • Grow network size through interoperability with other platforms • Lock in private users through release of new functionalities	High	• Adjust pricing • Strengthen IT capabilities (capability building)

joined Paii and Nets, they soon abandoned these platforms due to the lack of take-up among private users.

Though platform users will always multihome to a certain extent, platform owners can reduce the chances of this happening by selecting relevant recommended actions from those listed in Table 6. To prevent private users multihoming to rivals, competitive actions include denying or enabling interoperability, releasing new platform functionalities to lock in existing users, promoting a broad level of openness at the user level to attract users from competitors and

adjusting pricing. All of these actions will likely involve mirroring the rival's main competitive advantages. To prevent commercial users from multihoming, platform owners should use competitive actions such as preemptive market entry, building necessary IT capabilities to match those of rivals and adjusting pricing when needed.

Our research also shows that platforms should use different competitive actions to restrict multihoming before a rival enters a competitive battlefront and after its launch. To prevent users from multihoming to an upcoming rival

platform, we recommend that platform owners preemptively grow their networks by taking competitive actions such as signaling, speedy market entry and expanding openness at the user level. Growing a platform's user network should also include establishing interoperability with other similar platforms that are equally threatened by the upcoming rival. After a rival's platform has been launched, a platform owner can prevent multihoming by mirroring the competitor's key advantages (e.g., adjusting pricing and developing new IT capabilities to match those of the rival) and denying interoperability.

As illustrated by the MobilePay case, platform owners can receive requests for interoperability from rival platforms or send such requests themselves. We recommend that owners do not grant interoperability when requested by rival platforms that have fewer users on the same battlefront, as this is seldom beneficial for the dominating platform. However, owners should proactively consider seeking interoperability with platforms in other geographical markets to create regional or global network effects, thus enabling their platforms to compete against challengers with a global presence.

3. Identify and Prioritize Users Who Will Ultimately Decide the Winner of the Competitive Battle

Digital platforms facilitate interactions between distinct groups of users, and platform owners should generally cater equally to all of them to ensure the proper functioning of the platform.[32] This general rule, however, becomes difficult to follow in an intensely competitive environment, with platform owners often prioritizing, although temporarily, one group of users over others. Identifying the user group that will ultimately decide the battlefront winner and dedicating efforts to influence them is an important and challenging strategic decision that has implications for interplatform competition.

For example, because MobilePay had a strong hold on private users but only a limited number of commercial users, Swipp, Paii and Nets deliberately targeted commercial users in order to convince them to first join their platforms, believing that private users would follow. Thus,

by focusing on users not yet signed up with MobilePay, these challengers saw an opportunity to compete effectively and counterbalance MobilePay's preemptive entry on key battlefronts. Moreover, the main source of revenue for these platforms was commercial users, and their competitive advantages in terms of pricing, transaction speed and use of technology were specifically related to these users. These platform owners believed that the commercial users would ultimately decide which platform would be the winner. This is not an unusual platform approach and has proven to be successful on several occasions.[33]

However, we found that private users are more likely to determine the winner[34] in situations where there is intense rivalry, switching and multihoming costs are low, and where commercial users are used to multihoming (e.g., retailers have historically supported multiple payment platforms such as Visa, MasterCard and so on). Though the importance of private users may seem intuitively true, it was far from obvious for MobilePay's main competitors, which spent a significant amount of time and resources on trying to attract retailers—hence our recommendation that platform owners should identify and prioritize the user group that will determine the ultimate winner.

Furthermore, our research shows that it is very difficult for a platform owner to prevent multihoming among a user group that will likely not determine the winner. Both commercial users and platform providers (e.g., banks that distributed MobilePay) did not believe that MobilePay would emerge as the winner and were therefore more likely to multihome by supporting several rival platforms. Though platform owners can take several of our competitive actions to try and prevent commercial users from multihoming, these users will most likely continue to engage in such behavior, negating the platform owner's attempts to convince them to bet on a single platform. For example, after Swipp's demise, its founding banks joined MobilePay as distribution partners but decided to also offer various TechFin payment platforms to their users. They realized that in an intensely competitive environment

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32   Parker, G, Van Alstyne, M, Choudary, S. P., op. cit., 2016.

33   Ibid
34   Note that it is not always private users who determine the winner at a competitive battlefront (see Parker et al., 2017).

characterized by diverse competitors, it was not possible for them to decide on the winner (a position, which many commercial users also adopted). Instead, the banks decided to multihome across several platforms and let their users decide which platform they would like to support.

Concluding Comments

Digital platforms operate in a dynamic and unpredictable environment, and often have to fend off diverse competitors simultaneously on several battlefronts. To guide their efforts, we have put forward the Digital Platform Competition Grid, which a platform owner can use against competitors with diverse characteristics. This grid was derived from our in-depth analysis of 32 competitive actions of a prominent digital payment platform in northern Europe, which we followed from market entry to market dominance and which is currently under threat. The grid's two dimensions—industry indigeneity and IT innovation focus—gave rise to four distinct competitive approaches that platform owners can follow by taking both offensive and defensive competitive actions. Because platform owners can compete simultaneously against several challengers with different characteristics on a specific battlefront, they may need to simultaneously follow more than one competitive approach.

We found consistent evidence for the validity and efficacy of the four identified approaches but we acknowledge there may be other relevant approaches. We also acknowledge that a digital platform owner can potentially use two or more of the competitive approaches at different stages in its battle against a single competitor.

We caution against devising long-term competitive strategies, which, once set, remain fixed and therefore cannot be adapted in response to rapid changes in the competitive environment. Instead, platform owners should mix and match selected competitive actions, which can be used both offensively and defensively.

We have also provided three recommendations for interplatform competition. These recommendations, together with the four competitive approaches, comprise a playbook that platform owners can use for guidance at different stages of their platform development.

Although our findings are derived from a case of a digital platform launched by an established company, we believe they are relevant for independent digital platforms as well.

Addressing digital platform competition issues is not a single event. When deciding which competitive approach to follow, digital platform owners need to be aware that their competitive actions influence and are influenced by other platform-related decisions in terms of launch, design, pricing strategy (including the role of subsidies), level of third-party control and autonomy, partnerships and more. We recommend that platform owners always consider the impacts that various platform-related decisions can have on competition (both supporting and constraining) and leverage those decisions accordingly.

Finally, we believe that platform owners can benefit from having and displaying a positive attitude toward their competitors. Because of the complex and interconnected environment in which most platforms operate, competitors can easily become future and important partners. Rather than being overly aggressive in both their offense and defense actions, platform owners should acknowledge the benefits that competition brings, such as the need to innovate constantly to unlock new sources of value for their users. Competing with creative and resourceful challengers that display high standards in user-centric IT innovation presents a valuable learning opportunity for any platform owner.

Appendix: Research Method

This article is based on our in-depth research of MobilePay, a prominent digital payment platform offered by Danske Bank, one of the largest banks in northern Europe. We followed MobilePay closely from its inception in late 2012 through to May 2020. As an Industrial Ph.D. fellow, the first author was employed by Danske Bank for the duration of her Ph.D. project (Oct 2015 to Sep 2018) and was directly involved in the development of MobilePay. She therefore observed at first hand MobilePay's competitive battles. The second author is an expert in the digitalization of the finance sector. He has enjoyed a close dialogue with Danske Bank's senior managers and has discussed several important

strategic decisions relating to MobilePay with them.

We collected a large amount of primary and secondary data, which allowed us to gain insights into MobilePay's competitive actions over time. Our primary source was participant observations, which we documented in a 61-page research diary and in 145 pages of meeting notes. We also conducted 16 semistructured interviews with MobilePay employees. Other sources included large amounts of archival data (presentations, strategic documents, emails and so on) dating back to the launch of MobilePay. To better understand the competitive environment of MobilePay and the competitive actions undertaken by its competitors, we also reviewed 720 news articles, covering the period May 2013 to May 2020.

To analyze the data, we first reconstructed MobilePay's evolutionary journey from its inception in late 2012 through May 2020, when its dominance was being threatened by TechFins. Based on theoretical insights into competitive dynamics, we identified 32 competitive actions that MobilePay had taken against its competitors. By analyzing the competitors' characteristics and the competitive actions taken against them, we identified the four different competitive approaches described in this article. Finally, by cross-referencing the competitive actions taken by MobilePay against specific competitors and on different battlefronts, we derived three recommendations for how platform owners can compete successfully when facing diverse contenders on multiple battlefronts.

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