

RIDE-HAILING APP STRATEGIES OF FINNISH TAXI DISPATCH ORGANIZATIONS

KARIN VÄYRYNEN¹

¹ University of Oulu, Faculty of Information Technology and Electrical Engineering, Oulu, Finland, e-mail: karin.vayrynen@oulu.fi

Abstract The Finnish taxi industry has already long been technologically developed, and since 2011 taxi hailing apps have been available in Finland. The amount of these apps has steadily increased, spurred by the arrival of Uber and Taxify in Finland in 2014, and by the de-regulation of the Finnish taxi industry in July 2018. In the present paper, the aim was to identify ride-hailing app acquisition related strategies that traditional Finnish dispatch organizations (DOs) employ. A qualitative case study with five focus organizations was conducted between 2018-2020. This study contributes to extant research in two ways. First, by identifying five ride-hailing app strategies employed by DOs (three related to the question of make vs. buy, two related to discontinuing/selling). Second, by showing that different ride-hailing apps can play different strategic roles – which helps explain DOs’ multihoming strategy – and that the strategic role of a specific ride-hailing app can change over time.

Keywords:

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1 Introduction

Taxi hailing platforms such as Uber, Taxify, Didi and Yango offer consumers the possibility to order or “hail” rides via an app (Harding et al. 2016). When Uber entered the San Francisco market in 2010, this service that allowed consumers to hail a ride with an app was quite unique. In 2014, Uber and Taxify (named Bolt in March 2019) entered the Finnish market, and only few other ride-hailing apps had been available at that time in Finland. Now, partly due to a de-regulation of the Finnish Taxi market in 2018 (Heikkilä and Heikkilä 2019), an abundance of ride-hailing apps is available in Finland. Interestingly, most of these apps are not provided by international ride sharing platform providers, but by traditional Finnish taxi dispatch organizations (DO). These DOs' apps represent a mobile channel (Crittenden et al. 2017) for ordering taxi rides, in addition to the more traditional channels such as phone, email, text message, and street hailing.

Extant research on ride-hailing apps has mainly focused on apps provided by large, internationally operating organizations such as Uber, Lyft and Didi (e.g., Zhang et al. 2020, Leng et al. 2018, Harding et al. 2016). Research on ride-hailing apps provided by smaller, local taxi dispatch organizations (DO) has been very rare (exceptions include Väyrynen et al. 2018; Niemimaa et al. 2019 touch upon the topic).

In order to provide a ride-hailing app, i.e., a mobile channel to hail a ride, the DO first has to acquire such an app – and whether to make or buy a good such as a mobile app is an important strategic question for the organization (Williamson 1973). Against this backdrop, we ask the following research question: *“What strategies related to ride-hailing app acquisition do traditional taxi dispatch organizations employ?”*

To answer this question, we conducted an empirical qualitative case study among a taxi owner-drivers' federation and four traditional taxi DOs and analyzed what different strategies they employed regarding ride-hailing apps. We make two contributions to extant research. First, we identify five different strategies traditional DOs employ related to providing consumers with the possibility to hail a taxi ride via an app. Second, we show that different ride-hailing apps can have different strategic roles (which can change over time). This helps explain why not only drivers and customers, but also DOs use several ride-hailing apps simultaneously, i.e., multihome.

2 Make or buy as strategic options for software acquisition

One important strategic question for any organization is how to acquire a good - whether to make or buy it (Williamson 1973). ‘Make’ refers to producing a good in-house, whereas ‘buy’ means that it is purchased on the market. Comparative production costs for making versus buying have the greatest influence on the decision of whether to make or buy something, but also volume uncertainty and supplier market competition affect the decision (Walker and Weber 1987). This logic can also be applied to software as a good, which mobile apps represent. From a strategic point of view, previous research has distinguished between different types of software. We here subscribe to Väyrynen and Iivari’s (2015) distinction between commercial off-the-shelf software (COTS), customizable/configurable software, and tailor-made software. COTS is software where many copies of the product are sold, that can be purchased on the market, and that is ready-to-run, whereas tailor-made software is developed for a specific company’s needs with only one copy of the software being produced (Xu and Brinkkemper 2007). Tailor-made software can be developed in-house or can be contractual tailor-made by an external software provider (*ibid.*). Customizable/configurable software, e.g., ERP software, is ready-made but not ready-to-run (Väyrynen and Iivari 2015). It can be purchased from a software provider but has to be configured (i.e., adjustments are made to software parameters without changing the software at the code-level) or customized (changes made to the software at the code level) before it can be used (Lee et al. 2003; Light 2001). From a strategic point of view, Software-as-a-Service (SaaS) is comparable to COTS software, as both are available to all on the market (Väyrynen and Iivari 2015). Whereas in COTS the customer pays a one-time fee and possesses full ownership of the software, in SaaS the customer usually pays a fee per transaction (Ma 2007). To summarize, the main strategic options for acquiring software (e.g., a mobile app) are to buy software (e.g., COTS/SaaS, customizable/configurable, or contractual tailor-made software) or make it (in-house developed tailor-made software).

3 Research methodology

Case and research context. The first Finnish taxi hailing app appeared in 2011. In 2014, both Uber and Taxify entered the Finnish market with their apps. In contrast to Uber who only collaborated with drivers, Taxify also sought collaboration with traditional DOs. DOs do not own the taxis they dispatch, but most DOs are owned

by the entrepreneurs whose cars are dispatched by the organization. During the past 2 years, the Finnish taxi industry has undergone the biggest changes in its history. Having been one of the most strictly regulated taxi markets in the European Union, it was de-regulated in July 2018. Before the de-regulation, the taxi market had been separated into geographic areas, each geographic area being served by one taxi DO. The number of taxi licenses was regulated, and the Finnish government defined the maximum taxi prices. With the de-regulation, the number of taxi licenses was not any more fixed, prices were not any more regulated, and DOs were overnight competing. It is in this context that more and more DOs started to acquire ride-hailing apps.

Data collection. This research is part of a larger, longitudinal research project on the digital transformation of the Finnish taxi industry which has been ongoing since autumn 2017. The present research is a qualitative, interpretive case study (Walsham 1995). For the present study, 20 interviews (see Table 1) were analyzed that were conducted with 4 DOs (Alpha, Beta, Gamma, Delta) in different regions in Finland, Taxify, a provider of contractual tailor-made software, and the Finnish Taxi Owner-Drivers' Federation (FTOF) who developed a taxi hailing app for DOs.

Table 1: Interviews with focus organizations

Organization	Interview # (when conducted, interview length)
FTOF	Int 1 (Q1/2018, 1:15:15); Int 2 (Q1/2018, 1:27:36); Int 3 (Q1/2018, 1:35:07); Int 4 (Q4/2018, 1:39:43); Int 5 (Q4/2018, 1:50:55); Int 6 (Q4/2019, 2:12:52)
Alpha	Int 7 (Q1/2018, 1:39:20); Int 8 (Q4/2018, 1:32:03); Int 9 (Q4/2019, 1:08:14); Int 10 (Q4/2019, 0:48:21)
Beta	Int 11 (Q1/2018, 1:48:07); Int 12 (Q2/2018, 0:31:00); Int 13 (Q4/2018, 1:30:56); Int 14 (Q4/2019, 1:29:25)
Gamma	Int 15 (Q4, 2018, 3:38:30); Int 16 (Q4, 2019, 1:46:54)
Delta	Int 17 (Q4/2018, 2:17:35); Int 18 (Q1/2020, 1:16:30)
Software provider	Int 19 (Q1/2018, 1:25:55)
Taxify	Int 20 (Q1/2018, 1:04:06)

Qualitative interviews represent one of the most important data gathering sources in Information Systems research (Myers and Newman 2007) and were the main source of information in this study. The interview themes revolved around the digitalization of the Finnish taxi industry, taxi hailing apps, the change of the law in July 2018 and its effects on the industry. In some interviews, two interviewees participated. All interviews were transcribed. Quotes are translations from Finnish to English.

Data analysis. NVivo software (version 12) was used when analyzing the interviews. First, all text passages were extracted from the interviews that concerned those apps that were available in the Finnish taxi market and through which rides dispatched by Finnish taxi DOs could be ordered. Second, information was extracted regarding the ride-hailing app strategies the focus organizations (FTOF, Alpha, Beta, Gamma, and Delta) employed over time. A timeline was created for each focus organization regarding when a certain app was acquired or sold or its use discontinued. Information from the interviews was triangulated with information from print media articles and material received from the organizations. As a result of the data analysis, five different strategies (see Table 2) were identified. The term “app” is used henceforth, while acknowledging that a ride-hailing app is not a stand-alone software but has to be integrated with some platform or dispatch system to function.

4 Findings

Next, for each focus organization the ride-hailing app acquisition related strategies that it employed over time are described. Five different ride-hailing app strategies (referred to as S1 – S5) could be identified: (S1) develop a ride-hailing app in-house, (S2) join an existing ride-hailing app/platform, (S3) purchase a ride-hailing app/platform, (S4) sell a ride-hailing app/platform, and (S5) discontinue use of a ride-hailing app/platform.

FTOF

The FTOF supports its members’ (taxi entrepreneurs and DOs) interests. Based on discussions initiated in 2013, in 2014 the FTOF’s business unit started to develop a taxi-hailing app in-house (**S1**) which would then be provided to the Finnish DOs. FTOF App was launched in April 2015. One reason for why the FTOF started developing the app was: “*Most of the DOs that are members of the FTOF are so small, and I also count our DO to those, that we do not have the resources to build our own app. [...] Those large DOs who have more than 1000 cars, 4000 drivers, they have enough volume that it makes sense [for them]F to develop their own app.*” (Beta representative) The FTOF App was integrated over the following two years with more than 30 Finnish DOs using five different types of dispatch systems. The DOs paid a fee to the FTOF’s business unit for each taxi ride that a customer ordered via FTOF App. The app was successful and used all over Finland, thus representing *the* app through which consumers could hail a taxi ride almost anywhere in Finland. After having provided the app for 2 years,

in the light of the coming de-regulation of the law, the FTOF decided to sell FTOF App to the highest bidding Finnish DO (**S4**) in spring 2018.

Alpha (large dispatch organization)

Alpha developed in-house and launched its first taxi hailing app (Alpha App 1) in 2011 (**S1**) and launched several updates of the app over the years. Alpha joined FTOF App in 2015 (**S2**). In 2016, Alpha App 2 replaced Alpha App 1 (**S5**). Alpha App 2 was developed in-house (**S1**), with functionalities very similar to those of Uber at the time. In November 2017, Alpha discontinued the FTOF App collaboration (**S5**). Especially two factors affected this decision: first, the slow technological development of FTOF App due to the need to integrate FTOF App with five different dispatch system types used by Finnish DOs. Second, the soon-to-come de-regulation of the Taxi market: as competition was expected to increase strongly, Alpha wanted to make sure their customers would be tied to their own Alpha App 2 instead of to FTOF App. In spring 2018, Alpha purchased FTOF App when it became available for sale (**S3**): *“Why we purchased FTOF App? Because it was for sale. That’s a quite good answer, that if such a good product is for sale, then why would we not have wanted to buy it? [...] it’s a working system and has maybe also future potential.”* In addition, Alpha started to offer its taxi dispatch services also to other geographic regions in Finland, and as part of this also offers their own app under a different name to other DOs (**S4**). Alpha thus used Alpha App1/Alpha App 2 concurrently with FTOF App between 2015-2017, and from spring 2018 onwards.

Beta (mid-sized dispatch organization)

In November 2014, Taxify entered the Finnish market and sought to collaborate with Finnish taxi DOs and individual drivers. Beta was one Finnish DO that joined the Taxify platform (**S2**). The decision to collaborate with Taxify was made with the expectation that Taxify would become a large international player that would increase customer numbers for Beta, and because Beta wanted to offer its customers an additional channel to hail cars apart from its more traditional channels (e.g., phone, email, text message, online form, street hailing). Taxify App was not integrated with Beta’s dispatch system, and taxi drivers had a separate phone in the car to take rides that customers ordered through Taxify App. In autumn 2015, Beta joined FTOF App (**S2**) because this app was expected to be more widely used than

if Beta would have developed or purchased an own app. Beta used Taxify App and FTOF App concurrently for one year, before it ended its collaboration with Taxify (**S5**) in autumn 2016. One reason for discontinuing Taxify App use was that Taxify App was more expensive for them to use than FTOF App. When FTOF App became available for sale in 2018, Beta participated in the bidding (**attempted S3**) which Alpha won. Due to speculations whether Alpha would be purchased by a big international taxi corporation, Beta feared to be dependent on an app owned by a (due to the legal change) soon-to-be competitor. They thus decided to also acquire an own app: *“We wanted to make sure that the control and ownership of our app rides would not directly flow to one of the biggest competitors.”* When the attempted purchase of FTOF App failed, Beta considered whether to acquire the app offered by their dispatch system provider, or a contractual tailor-made app. Beta was mainly concerned that the costs of integrating a contractual tailor-made app with their dispatch system would be very high. Thus, Beta purchased Beta App (**S3**), the taxi hailing app provided by their dispatch systems provider, as this was the fastest way to get a working app into use already in autumn 2018. Alpha was not sold to the international competitor, and Beta felt that they maybe should have acquired a tailor-made app, as they are a bit dis-contented with the Beta App. At present, Beta uses both FTOF App and Beta App.

Gamma (large dispatch organization)

Gamma launched its first app, Gamma App 1, in 2015. This app had come as part of the dispatch system that Gamma had purchased (**S3**). In addition, also Gamma joined FTOF App in 2015 (**S2**), but discontinued FTOF App use (**S5**) in 2018, when Alpha purchased FTOF App. Gamma has not been quite contented with Gamma App 1: *“From a usability perspective it was almost impossible: very rambling boring and difficult and really bad. We right away told them we were discontented, that usability is not at a present-day level.”* Despite promises from the dispatch system provider over several years, the agreed-on improvements to Gamma App 1 were not made. Therefore, in spring 2018, Gamma started to make specifications for the kind of app they were looking for, negotiated with different app providers, and finally ordered Gamma App 2 to be developed by a Finnish software company (**S3**) which already had developed several other taxi hailing apps. After four months of development, Gamma App 2 was launched in November 2018 and Gamma App 1 use discontinued (**S5**). Gamma App 1, if already installed on a customer’s phone, was automatically updated to

Gamma App 2. Between 2015-2018, Gamma used both FTOF App and Gamma App 1, whereas at present (May 2020) they only use Gamma App 2.

Delta (mid-sized dispatch organization)

Delta joined and was integrated with FTOF App in April 2015 (**S2**). Even though Delta was contented with FTOF App, they felt that ownership and control aspects were problematic: *“There was a problem with FTOF App, and that was the ownership structure, that it was not really in anyone’s control [...], but in any case it was in no way in our own control.”* Therefore, they started to consider other options and decided to acquire a contractual tailor-made app (**S3**), Delta App: *“We considered different options and collaboration options, can we make an application together with several other actors, and we studied existing apps and their prices, and after a lot of phases [of deliberation] we decided to acquire our own app.”* Delta made specifications for the app and then ordered it from a software company. One important aspect in purchasing their own app was control over customership. FTOF App was seen as an app that was linked to *some* taxi, but Delta App was seen as a way to link customers to Delta directly and a channel to be in direct contact with their customers. Delta App was launched in October 2018. At present, Delta uses both FTOF App and Delta App.

5 Discussion

We asked the question what strategies related to ride-hailing app acquisition traditional taxi DOs employ. We make two contributions. First, we identified five different ride-hailing app strategies employed by the focus organizations (Table 2). Three of these strategies concern the acquisition (make vs. buy) of the app (S1, S2, S3), whereas two strategies are related to the “flipside of the same coin” – strategies related to selling an app (S4) or discontinuing use of an app (S5). In line with the research question, and due to page limitations, we focus here on discussing the three app acquisition strategies (S1, S2, S3) in more detail. Second, we show that all DOs at some point in time used two different ride-hailing apps concurrently. In line with previous research we refer to this strategy as multihoming. One possible reason for multihoming are the different strategic roles that different ride-hailing apps play.

Table 2: Ride-hailing app strategies employed by focus organizations

Org	S1 (develop)	S2 (join)	S3 (purchase)	S4 (sell)	S5 (discontinue)
FTOF	FTOF App			FTOF App	
Alpha	Alpha App 1 Alpha App 2	FTOF App	FTOF App	Alpha App 2	Alpha App 1 FTOF App
Beta		Taxify FTOF App	Beta App (CS)		Taxify
Gamma		FTOF App	Gamma App 1 (CS) Gamma App 2 (CTM)		FTOF App Gamma App 1
Delta		FTOF App	Delta App (CTM)		

Legend: contractual tailor-made software (CTM); customizable/configurable software (CS)

One important strategic question for an organization is whether to make or buy a certain good (Walker and Weber 1987). In-house tailor-made software represents the **“make” strategy**, whereas COTS/SaaS, customizable/configurable software, and contractual tailor-made software represent options for a **“buy” strategy** (Xu and Brinkkemper 2007; Väyrynen and Iivari 2015). The strategies we identified correspond well to these strategic options. The strategy to develop a ride-hailing app in-house (S1), and to buy customizable/configurable software or contractual tailor-made software (both represented in S3) was employed by several DOs. Only Alpha developed their ride-hailing apps in-house, being a technological forerunner amongst Finnish DOs with their first ride-hailing app implemented already in 2011 when no suppliers for ready-made ride-hailing apps existed, only leaving the option of a tailor-made app. The competition of suppliers for a certain good influences the decision whether to make or buy a good (Walker and Weber 1987), and in the ride-hailing app market, the number of these different suppliers and strategic options for DOs to acquire a ride-hailing app certainly increased since 2014. Both the strategy to acquire a configurable/customizable app provided by the dispatch system provider (e.g., Beta App, Gamma App 1), and the strategy to order a contractual tailor-made app (e.g., Gamma App 2, Delta App) were employed by Finnish DOs. Acquisition of an app that was not provided by the dispatch system provider that the DO already used usually meant a more difficult technical integration of the app with the dispatch system. In addition to the different available (potential) providers of ride-hailing apps, also the DO’s available financial resources affected the app-strategy. Most Finnish DOs are small and do not have the resources to develop an app, which was

also one of the reasons why the FTOF business unit started to develop FTOF App. In addition to the above strategies, we also identified the **strategy to join an existing app** (S2). This strategy was employed by Alpha when collaborating with Taxify, but also by all four DOs in connection to FTOF App. In the context of ride-hailing, the strategy to join a ride-hailing app has been addressed concerning whether drivers or consumers choose to join a ride-hailing app as service providers or service consumers (e.g., Belleflamme and Peitz 2019). With our study, we show that this question surprisingly is also relevant for DOs, who otherwise act as the intermediary between drivers and customers. When considering what of the strategic options for acquiring an app this represents, we made an interesting observation: in this strategy, the DO did not buy the app, but paid the provider of the app (e.g., Taxify, FTOF business unit) a transaction-based fee. SaaS refers to software that is not owned by the customer (in contrast to COTS) but where customers pay based on the transactions done with the software (Ma 2007). Thus, Taxify and FTOF business unit could be seen to have acted as a “mobile app as a service” providers for Finnish DOs. DOs paid also a transaction-based fee for rides that had been hailed with FTOF App and did not own the app themselves, which would fit the SaaS scheme. However, there is one important difference between FTOF App and Taxify: FTOF App had to be integrated with the DO’s dispatch system, whereas Taxify did not. COTS ride-hailing apps do not seem to exist for dispatch organizations, as these apps seem to require quite effortful integration with the DO’s dispatch system.

Our second contribution concerns our finding that all DOs in our study at one time or another used simultaneously two different ride-hailing apps through which customers could order rides dispatched by that organization. Previous research has referred to the situation where service providers (such as DOs represent by providing their dispatch services to drivers and consumers) use different, competing platforms as “**multihoming**” (Belleflamme and Peitz 2019). In a ride-hailing (e.g., Uber, Lyft) and renting (e.g., AirBnB) platform context, multihoming has referred to situations where drivers/hosts offer their services concurrently in several ride sharing or rental platforms, or where consumers (e.g., riders, renters) use several platforms to search for the best price (e.g., Bryan and Gans 2019). We argue that when DOs provide their customers and drivers with two or more ride-hailing app channels, this, too, represents multihoming. The question then is why DOs engage in this practice? One reason is that **different ride-hailing apps play a different strategic role** for the DO and serve different types of customers. FTOF App

compared to DOs own “branded apps” is a good example of different strategic roles of ride-hailing apps. FTOF App – first developed when Finnish DOs represented regional monopolies and did not compete with each other – at that time represented a possibility for practically all Finnish DOs to offer their customers a mobile channel (Crittenden et al. 2017) to hail a ride. However, through the de-regulation of the industry, which turned DOs from regional monopolies into competitors, the importance of tying the customer to a specific DO significantly increased. Previous research already found that apps can take a role in the branding efforts of organizations (Zhao and Balagué 2015). The present research shows that the DOs own “branded” apps fulfil the strategic role of tying the customer to a specific DO. In contrast, nowadays FTOF App has the role of serving especially customers that travel within Finland and with which rides can be hailed from different DOs all over Finland. Therefore, the different roles that FTOF App and DOs’ “branded” apps play offer one explanation for why DOs multihome. In this context we also want to point out that **the strategic role of a specific ride-hailing app for a DO is not static** – it can change over time. A good example of this is FTOF App. It changed from a sought-for digital taxi hailing channel to a channel that was *not* tying customers directly to the DO. Then, when Alpha purchased the FTOF App in 2018, the app even turned into a potential threat as some DOs feared they might lose their customers to their competitor. This change in the strategic role of an app is also one reason for why a DO might acquire (S1, S2, S3), sell (S4), or discontinue use of a ride-hailing app (S5).

To summarize, which ride-hailing app strategy a DO employed at what point in time was dependent on the available options for acquiring or joining an app, financial resources available, urgency of acquiring an app (buying an existing app is usually “faster” than tailor-made software development), strategic role of an app, ownership over an app (who “owns” the customers), and changes to the institutional environment (from a heavily regulated to a de-regulated industry).

6 Conclusion

We asked what strategies related to ride-hailing app acquisition traditional taxi DOs employ. We make two contributions. First, we identified five strategies employed by the four Finnish DOs in the focus of the study. Three represented the make vs. buy options for acquiring an app (developing an app in-house, joining an existing app, and purchasing an app), whereas two are related to the flipside of that coin (selling

an app, and discontinuing use of an app). Second, we show that the concept of multihoming – i.e., of using more than one ride-hailing app simultaneously – not only applies to drivers and riders, but also to DOs. We explain this strategic choice through our observation that different ride-hailing apps can play different strategic roles. Our study has *practical implications* for DOs by pointing towards different options for ride-hailing app acquisition, and by drawing attention to the question of what strategic role a certain ride-hailing app can or should play. Our research also has *limitations*. We focused specifically on identifying the strategies employed, but not on the process of strategizing in more detail. In addition, our research is conducted in Finland at a time of a taxi industry de-regulation, and our findings thus might not be applicable to other contexts (e.g., taxi markets that are regulated differently). *Future research* should investigate in more detail the different aspects that affect, and practices that are related to, DOs' ride-hailing app strategies.

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