HARVARD | BUSINESS | SCHOOL

N9-622-011

SEPTEMBER 15, 2021

CHIARA FARRONATO

STEFANO DENICOLAI

SARAH MEHTA

Telepass: From Tolling to Mobility Platform

On a Sunday afternoon in September 2020, Davide Cervellin, Telepass's chief marketing and data officer, pulled off the highway on his drive from Rome to Milan. He needed to refuel, and he planned to pay with TelepassPay, a mobile payment application (app) he had helped his company refine. Three years earlier, Telepass, the sole processor of electronic toll payments on Italy's highways, had launched TelepassPay. This new offering allowed subscribers to pay for dozens of mobility-related services and products—such as bicycle rentals, parking, ski passes, taxis, and train tickets—from their smartphones. Cervellin, a loyal TelepassPay user, pulled up to a pump and opened the TelepassPay app. With a few simple taps, he was able to refuel, pay, and quickly merge back onto the highway.

Since launching, TelepassPay had generated valuable information that complemented Telepass's existing trove of data, gleaned from the 700 million toll transactions it processed each year for its nearly seven million customers. Telepass's executive team wanted to better utilize these data to implement CEO Gabriele Benedetto's vision of Telepass becoming the leading mobility platform in Italy. It fell to Cervellin to lead the company's overarching data strategy.

Recent years had also seen Telepass establish additional adjacent services. In June 2019, for example, the company launched a car insurance brokerage service. Using Telepass data, the brokerage service offered tailored insurance products to existing customers on behalf of insurance companies. Telepass earned a commission for each converted lead. Now, Benedetto was considering a new growth opportunity: moving Telepass beyond the brokerage model to become the primary insurance seller. Doing so would allow Telepass to keep the full proceeds from each sale, rather than just a commission.

While Cervellin thought the idea held promise, he was unsure whether Telepass's data provided sufficient insights into individual drivers' risk profiles to build competitive, customized insurance products. Alternatively, Telepass could continue to improve the brokerage model and focus its resources on adding new mobility services to TelepassPay. An expanding menu of services would likely both attract new subscribers to TelepassPay and add value for existing subscribers.

But as Cervellin approached Milan, he questioned whether the time was right to invest in *any* new mobility product. Italy had been a major epicenter of the global COVID-19 pandemic when it first emerged in March 2020. The rate of new infections was climbing again, and the country had introduced new restrictions on the public's movements, which might limit the utility of Telepass's products.[1]

HBS Professor Chiara Farronato, Professor Stefano Denicolai (University of Pavia), and Case Researcher Sarah Mehta (Case Research & Writing Group) prepared this case. It was reviewed and approved before publication by a company designate. The clients and the variables in the supplementary dataset and in some exhibits are mock-up data that aim to represent the kind of data the company collects, but are not the true data. Variable names may have been changed from the naming standards at the company. Funding for the development of this case was provided by Harvard Business School and not by the company. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

Copyright © 2021 President and Fellows of Harvard College. To order copies or request permission to reproduce materials, call 1-800-545-7685, write Harvard Business School Publishing, Boston, MA 02163, or go to www.hbsp.harvard.edu. This publication may not be digitized, photocopied, or otherwise reproduced, posted, or transmitted, without the permission of Harvard Business School.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

The Origin and Evolution of Telepass

The Telepass tolling device was a small, rectangular transponder called an onboard unit (OBU) that attached to a car's windscreen (see **Exhibit 1**). As drivers with Telepass approached a toll plaza, the OBU used dedicated short-range communication (DSRC) technology to exchange customer and payment information with the plaza in real-time, allowing drivers to pass through without stopping.

"It's a smart solution because it's really simple," said Benedetto. "The DSRC technology works perfectly 99.7% of the time, and it outperforms cameras. While cameras can capture vehicle plate numbers when cars are stopped, this is harder to do when cars are moving and the plates are close together. Cameras can easily miss one." The Telepass OBU was the first device of its kind to use DSRC technology.[2] "This is a really Italian story," said Benedetto. "Today, tolling systems in nearly all European countries use the same DSRC technology that was developed here in Italy."

The Telepass OBU was first introduced in 1990 to help streamline the flow of traffic between Milan and Turin during the FIFA World Cup soccer championship. Located about 90 miles apart, Milan and Turin were home to two of the tournament's largest stadiums. Italian officials worried that the country's motorways would quickly clog as traffic between these cities backed up at tollbooths. Officials hoped the Telepass option would help to fast-track drivers through toll plazas.

When Telepass first launched, Autostrade per l'Italia, the main Italian highway management and maintenance company, owned the service. This company introduced Telepass on a subscription basis. Customers paid 2,500 lire[a] per month in exchange for the convenience of using Telepass. When subscribers first signed up, they provided their bank account information, and Telepass directly debited any toll charges from their accounts at the end of each month. Subscribers received a statement of charges every three months. When Italy transitioned to the euro in 2002, Telepass began collecting the subscription fee in the new currency. Directly converted from the lire, the fee became €1.26 per month.[b] As of September 2020, Telepass had not increased this fee.

In 2008, Autostrade per l'Italia spun off Telepass, and the Atlantia Group—an Italian holding company with investments in infrastructure and transportation verticals across 25 countries—took an ownership stake. This group expanded Telepass's offerings. Starting in 2010, Telepass subscribers could use their OBUs to pay for off-street parking. In 2012, when Milan introduced "Area C," a €5 congestion fee for motorists driving non-electric cars into the city center during weekdays, Telepass added the ability for subscribers to pay via OBU.[3] Starting in 2014, subscribers could use their OBUs to pay for on-street parking. In 2016, the Atlantia Group assumed full ownership of Telepass.[4]

Using the Telepass OBU on Italy's Highways

Italy's major highways were part of the *autostrade*, a network of nearly 7,000 kilometers (about 4,300 miles) of roads that each began with the letter "A."[5] The A1, for example, ran from Milan to Naples. Ownership and management of the *autostrade* was divided between the public and private sectors. The government managed about 1,000 kilometers, and 26 private companies oversaw the remainder.[6] Unless otherwise noted, the speed limit on the *autostrade* was 130 kilometers, or 80 miles, per hour.

In exchange for a quick trip on well-maintained roads, drivers on the *autostrade* paid tolls, which were calculated based on the vehicle type and the distance traveled, among other considerations.[7] Tolls

[a] Before transitioning to the euro in 2002, Italy used a currency called the lira. One euro was worth about 1,936 lire.

[b] In September 2020, €1.00 was equivalent to $1.17. Thus, the monthly Telepass subscription fee converted to about $1.50.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

could exceed €30 for a 400-kilometer trip, placing the *autostrade* among Europe's most expensive motorways.[8] On the *autostrade* there was a toll plaza every 13 kilometers, on average, although drivers only had to pass through when they entered and exited the highway.[9] Drivers unwilling to pay tolls could travel on another set of roads called the *superstrade*, which traversed smaller towns and generally increased overall travel time.[10]

As drivers on the *autostrade* approached toll plazas, they maneuvered into one of several marked lanes (see **Exhibit 2**). Drivers in the cash lane could pay either an automatic toll machine or a human toll taker. Drivers planning to use a credit card entered lanes marked with blue signs and the word *carte*. Finally, drivers with Telepass followed yellow marked signs. Lines for the cash and card options could stretch back for a kilometer or more, while Telepass users rarely had to wait. As of 2020, Telepass was the only electronic tolling option available to drivers traveling the *autostrade*.

Telepass users paid only the monthly subscription fee (plus their tolls); they were not subject to any transaction fees. While they received no discounts on the toll amounts, many Telepass users saw value in the convenience of passing directly through toll plazas. "Customers also enjoy the status conferred by Telepass," opined Luca Daniele, TelepassPay CEO and Telepass CFO. "On social media, Telepass users will write, 'I can pass directly through the plaza. I don't understand why other people choose to wait.'" By 2018, six in ten drivers on the *autostrade* paid their tolls with Telepass (see **Exhibit 3**).[11]

Telepass charged road owners a 0.28% transaction fee on all payments it processed. This was cheaper than the typical fee levied by credit card companies (~1.1%). Individual road owners managed the other payment options. Costs associated with these options included maintenance and upkeep of the automatic payment machines, the process of periodically retrieving cash from these machines, and paying human toll operators' wages, which averaged around €3,200 per month.[12]

Telepass aimed to provide a simple, uniform customer experience, even as it managed payments to an array of road owners on the back end. Noted Benedetto, "When Telepass first launched, the service connected 26 different toll roads across the country. As a driver, if you enter the *autostrade* in a northern city and drive to the south, the entire seven-hour journey is one singular experience for you. But in the background, Telepass is managing payments to eight different road owners."

Telepass: Italy's Oldest Fintech?

In 2016, when the Atlantia Group took full ownership of Telepass, Benedetto was working as a management consultant in financial services. In this role, he sometimes advised the Benetton family office, which was the major shareholder of the Atlantia Group. When the office asked for his advice on investing in a bank focused on payment systems, his response surprised them. He recalled:

> At the time, Telepass had six million customers, all using direct debit. It had a well-developed billing system, and a very strong, trusted brand at a large scale. Many Telepass users do not even open their Telepass statement every month, while nearly everyone checks their credit card statements. Moreover, Telepass bills customers at the end of the month. During the month, Telepass acts like a bank, managing the customer's credit risk. So to me, Telepass looked like a fintech company. I asked the family office why they were considering investing in a bank when Italy's oldest fintech was already in their portfolio.

Benedetto's observations led the family office to take a closer look at Telepass. By 2016, there were 12 million Telepass OBUs in use across Italy and five additional European countries (Belgium, France, Poland, Portugal, and Spain). The company processed more than 60% of Milan's Area C congestion charges as well as 60% of tolls on the *autostrade*. Telepass's annual transaction volume approached €7

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

billion,[13] netting it a reliable income each year (in 2016, revenues totaled €168 million). But a number of existing assets and capabilities had been underutilized. Most notably, Telepass was sitting atop petabytes of data, yet the company had never considered the value of these data on their own merit.

In 2016, the Atlantia Group asked Benedetto to become Telepass's CEO. In this role, he would oversee two major strategic objectives: 1) leading a digital transformation process that would enable Telepass to become more data-driven; and 2) transitioning Telepass from a product-based company focused only on tolling to a platform-based company capable of offering a wide range of interrelated mobility services. "When I joined," said Benedetto, "Telepass was a strong company with a 26-year history and a solid reputation, but with limited exposure to the future. At the time, the payment ecosystem was changing, sharing services were emerging, and the nature of mobility was evolving. If Telepass failed to adapt in this new environment, it risked becoming another Kodak."[c]

The Changing Mobility Landscape

For many Italians, car ownership had long been an important cultural marker of adulthood. Said Daniele, "When I was a teenager, I felt that I became autonomous when I turned 18. I could get my driver's license. I could vote. Getting my first car was a big deal." While eight in ten Italians still owned a car,[14] Daniele had seen that people were starting to move about differently—especially young urban-dwellers. "Today, 18-year-olds in the city don't want a car," he said. "They want to rent kick scooters." Added Benedetto, "In 2016, we were seeing a dramatic shift in consumers' mobility habits, yet the Telepass business model was still linked to a car, its registration plate, and its tag. All of our IT systems were set up to identify the car and link it back to its owner. Yet people's needs were changing."

In the early 2010s, car and bicycle sharing services flourished, especially in Italy's metropolitan areas. By 2015, car sharing services, offered by a multiplicity of companies like Enjoy and Share Now, were available in 26 cities, up from 18 in 2012.[15] At 130,000, Italy had the fourth highest number of car share users in Europe, trailing only Germany, the U.K., and France.[16] Bike sharing, too, was on the rise. Leading providers included Bicincitta, Jump, and Helbiz. By 2016, there were roughly 16,000 bicycles for rent across Italy.[17] In Milan, Turin, and Bergamo alone, the number of bike share users doubled from 89,000 in 2015 to 208,000 in 2016.[18] Scooter sharing services were just starting to arrive in Italy, but they would grow increasingly popular by the end of the decade (see **Exhibit 4** for select providers).

Benedetto and Daniele began to consider how they might build on Telepass's strengths to expand its mobility offerings to better meet the shifting needs of consumers. The Atlantia Group had already added parking and Area C congestion fee payments to Telepass's offerings, but these services were still tied heavily to the physical vehicle, rather than the driver. They pondered how Telepass might expand into additional, subscriber-centric mobility services, like car, bike, and scooter sharing.

Because of the regulatory restrictions imposed on companies facilitating digital payments, Telepass could not simply add these offerings to its existing services. "Both the European Union and the Bank of Italy regulate this space," said Daniele. "Becoming a diversified digital payment provider meant that we needed to create a new company to ensure compliance with these regulations." Thus, in 2017, Telepass incorporated a separate company called TelepassPay. A mobile payment processor of mobility services, TelepassPay would fully comply with all regulations, including a rule called Know Your Customer, which required banks to vet and verify account holders' identities.

[c] Kodak, a film processing company, failed to recognize the threat posed by the rise of digital photography and in 2012 filed for bankruptcy. Source: Chunka Mai, "How Kodak Failed," *Forbes,* January 18, 2012, https://bit.ly/3wg1b2B, accessed March 2021.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

Before TelepassPay could launch any services, however, Telepass needed to undergo a digital transformation. The company's data systems had been designed to link a vehicle registration plate back to the driver and their bank account; their utility beyond this function was limited. Similarly, most of the company's 214 employees were veterans of the transportation industry; they were not experts in data management and analysis. Benedetto committed Telepass to making the necessary investments in technology, people, culture, and processes that would enable it to become more data-driven. TelepassPay would gradually launch services over time, as the company's capabilities allowed.

Becoming a Data-Driven Company

Investing in Technology

Historically, Telepass had stored its data across two databases on traditional IBM mainframe computers. The company had designed these databases to enable seamless billing for tolls. "And they worked very well for this purpose," said Telepass Chief Technology Officer Mauro Giorgi, "but the solution was not good for managing digital services." Thus, Telepass decided to transition to the cloud.[d] After a competitive bidding process, Telepass selected Google Cloud as its provider. "At that time," said Giorgi, "Google was newer to cloud storage. The clear market leader was Amazon, but we chose Google because they gave us a good proposal, and they were looking for an interesting story like ours to reference for other new clients. We liked the fact that we would be on this journey together."

Once Telepass selected its cloud provider, the company needed to decide how to migrate its data to the cloud. "You have a few options," explained Giorgi. "You can use a lift-and-shift approach, where you just take your system and move it onto the cloud, you can re-platform, or you can develop a new solution on the cloud." Because of the need to move quickly and the complexity of re-platforming, Telepass chose the lift-and-shift approach for all systems except its customer relationship management (CRM) software and its billing software. "Our existing CRM system was limited," said Giorgi. "It allowed us just to manage clients, so we decided not to move that solution over, but instead to create a new CRM platform directly on the Google cloud." Following another competitive bidding process, Telepass chose a CRM solution called PEGA and a billing solution provided by SAP.

"While we were shifting our systems to the cloud and implementing PEGA, we also built a data lake," said Giorgi. Data lakes were centralized places where companies stored their raw data. At their best, data lakes helped companies avoid data siloes and ensure that all data users were pulling from a universal repository.[19] "Storing all the customer data in one place—their history, how much they paid us, their transactions, etc.—really helps with our marketing efforts," noted Cervellin. "We can build on a layer of machine learning-driven messaging. If a customer hasn't used the highway in the last year, for example, I won't send tolling promotions to them."

In the digital transformation process, Telepass faced several challenges. "Although we were collecting data," said Giorgi, "Telepass was not a completely data-oriented company." He continued:

> We had to completely change our mindset, and a lot of the decisions were made in collaboration with third-party experts. The first challenge was a knowledge gap. We had been an IT structure with nearly 30 years of IBM experience, and no one really knew what a data lake was. Another hurdle was limited understanding about which kinds of data we

[d] The cloud referred to remote data storage. Before the cloud, companies stored their data physically on-site. Cloud providers like Amazon Web Services (AWS), Google Cloud, and Microsoft Azure offered companies the option of renting remote data storage that could expand and contract as companies' needs changed.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

should collect and how to glean useful information from the data. The third hurdle was technology. We were evaluating how to develop our technology stack and which third-party cloud solution to adopt.

Investing in People

To manage this process, Telepass partnered with industry experts and consultants, invested in (or acquired) companies with complementary skillsets, and adjusted its hiring practices. In 2017, Telepass entered into a three-year partnership with a systems integration company called NTT Data to oversee the transition to the cloud. Telepass planned to hire some NTT Data employees at the end of the partnership to ensure that it could continue to manage the new systems on its own. Telepass also bought a 75% stake in InfoBlu, a mobility technology company, and in 2017, acquired Urbi, a car, bicycle, and scooter sharing platform.

Concurrently, Telepass sought out new hires skilled in data science. Senior leadership created a new organizational unit dedicated to data management and analytics. To staff this team, Telepass looked to MBA programs with an emphasis on data science. At first, Telepass's strong brand awareness hindered these efforts. As Carlo Goretti, Telepass's chief people and organization officer, explained, "Early on, we would spend 30 minutes of each interview explaining why a company that was almost synonymous with tolling was even looking for someone with data management and analytics skills." Recruitment had gradually become easier as applicants began to understand the company's evolution.

In late 2019, Telepass recruited Cervellin to lead the new data management and analytics team as chief marketing and data officer. Cervellin, who brought 15 years of experience in data analytics roles at eBay, PayPal, and booking.com, was impressed with Telepass's commitment to its new strategy. "Hiring me to not only lead the data strategy but also to lead marketing—which I had never done before—speaks to how data-driven Telepass aimed to become," he reflected. He would manage a team of seven: two data scientists, two data analysts, one data architect, one manager, and an analytics intern.

Cervellin was not the only new hire from outside the transportation industry. "We hired people from technology companies and other sectors," explained Marco Micheli, Telepass's external relations and strategic communications director. "The head of legal came from the telecommunications, services, and infrastructure sectors. I came from the banking sector. This was an intentional strategy of bringing together a mix of people from different fields to create what we called 'magma.'" Many new hires were also young. The average Telepass C-suite executive was just over 40 years old, compared with an overall average of more than 50 in Italy.[20] This approach was a departure from the hierarchical nature of many other established Italian companies.

Goretti explained that the company also identified a new set of desired soft skills. "We came up with a dozen traits—like enthusiasm, freedom, trust, and a sense of revolution—that we look for in each candidate," he said. "We call these characteristics the 'Telepass factor' or the 'T-factor.' If a candidate has the experience and skills we want, but we don't think he or she possesses the T-factor, we move on to another candidate."

Investing in Processes

Lastly, Telepass invested in transitioning to more data-driven processes. "When I joined," said Cervellin, "everything was done manually with Excel." Benedetto instructed Telepass staff to ground their discussions and decisions in data. "In meetings," recalled Cervellin, "Gabriele would say, 'I don't want to see slides. I just want a data tool that allows each of us to look at the same data and base our

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

conversation around that.' This tool also allows us to see correlations between things like customer data and sales data, which we couldn't easily see before."

Since beginning this journey, Telepass had invested over €200 million in its technology, people, and processes. "We have come a long way," said Giorgi, "but claiming that we are completely data-driven is not accurate. This is an ongoing process, and we still have work to do." Despite this, starting from 2018, TelepassPay had begun introducing new mobility services to its mobile payment offering.

Mobile Payment Apps in Italy

Mobile payment apps, like PayPal and Satispay, allowed consumers to pay for goods and services without using a debit or credit card at the point of sale. Consumers linked the payment app to their bank account or credit card and then paid via the app. These apps charged either the consumer or the merchant (or both) a fee to use the service. In each country of operation, payment app companies had to comply with regulations to protect users' privacy and prevent fraud, theft, and money laundering.

In 2018, the European Union (EU) introduced two important directives relevant for payment apps. In January, an edict called the Second Payment Services Directive (PSD2) came into effect, which made the EU a friendlier regulatory setting for payment apps. PSD2 required banks to allow authorized payment apps to connect to individual bank accounts, so long as the account owner consented.[21]

Five months later, the General Data Protection Regulation (GDPR) went into effect. Sometimes called "the toughest privacy and security law in the world,"[22] GDPR required companies to protect consumers' privacy, obtain explicit consent when using their data, and collect no more data than the minimum amount necessary for completing the business purpose.[23] GDPR violations came with costly penalties, sometimes exceeding several million euros.[24] Ensuring compliance, however, was not a straightforward process. Noted one expert, "The regulation itself is large, far-reaching, and fairly light on specifics, making GDPR compliance a daunting prospect."[25] Mobile payment providers, thus, needed to devote considerable resources to avoid GDPR violations.

In Italy, mobile payment apps were a small but growing segment of the digital payment landscape. In 2019, Italians used so-called "innovative payment methods," like mobile apps and wearables, to pay for transactions worth €3.1 billion.[26] Since 2018, use of these payment methods had grown by 109%,[27] but they still comprised just 1.1% of Italy's total 2019 digital spend of €270 billion.[28] (See **Exhibit 5**.)

Popular digital payment services in Italy included PayPal, PostePay, and Satispay (**Exhibit 6** provides a comparison of five common apps). Launched in 2003 by the Italian postal service, PostePay offered consumers a prepaid, rechargeable physical card accepted anywhere Visa and MasterCard could be used. Users paid €10 when they first signed up for PostePay; there were no annual fees.[29] Over time, PostePay had introduced an app as well. By 2017, 28% of the Italian population used PostePay.[30] Founded in 2013, payment app Satispay claimed 1.3 million users and a merchant network of 130,000.[31] "There are many different options for paying nowadays," observed Goretti. "The last time I took a taxi, I counted 21 different options to pay. There was Apple Pay, Samsung Pay, Satispay, Google Pay, the app of each taxi aggregator, and the major credit card processors like Amex and Visa."

Even with the growth of digital payment options, however, Italians generally still preferred cash, which was used for nearly 70% of transactions in the country (and as much as 90% of purchases at small cafés and bars).[32] One in four Italians used cash to pay their utility bill,[33] and less than half (48%) of Italians used online banking, compared with an average rate of 88% in Europe.[34]

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

Both consumers and business owners drove this cash culture. "The reflex of paying by cash is quite simply an old habit in Italy," wrote one observer.[35] Consumers worried that electronic purchases might leave them vulnerable to being hacked; this fear had reportedly driven the popularity of prepaid cards like PostePay.[36] On the merchant side, many small- and medium-sized businesses refused to accept electronic payments to avoid the fees charged by credit card companies.[37] Those that did often charged a higher price to customers paying with cards, and a lower price to those paying with cash.[38]

In December 2019, the Italian government announced plans to launch a program that would reward consumers who used digital payment methods with rebates up to a certain spending threshold.[39] The government hoped that the program might help it recover some of the estimated €109 billion in tax revenues lost each year to fraud.[40] In 2020, the COVID-19 pandemic had led to an increase in electronic and contactless payments, but it was not clear whether these trends would persist long-term.[41]

TelepassPay

It was into this landscape that the TelepassPay service debuted in 2017. Only existing Telepass subscribers were eligible to sign up for the new TelepassPay service. Interested users paid a bundled subscription rate of €2.50 per month for both Telepass and TelepassPay. Because existing Telepass subscribers' bank account information was already in the company's system, the process of adding TelepassPay was straightforward. Users simply downloaded the TelepassPay app, signed in using their existing Telepass credentials, and began using the new service immediately.

All TelepassPay services were accessible through the TelepassPay app (see **Exhibit 7** for a screenshot). Subscribers opened the app and selected the service they wanted. If they were purchasing an item, for example a train ticket, the item appeared in the TelepassPay app. They then scanned the ticket upon entering the train. If they were purchasing other products, like fuel, they opened the app, selected the fuel station and pump number, and refueled. As was the case with tolling, TelepassPay directly debited all charges from users' bank accounts at the end of the month.

From 2017 to 2020, TelepassPay grew its ecosystem of mobility services from three to 15 (see **Exhibit 8**). "We are constantly adding services," said Daniele. "The more services on the platform, the more value for the customer." TelepassPay expanded its offerings in three main ways. First, it moved into entirely new mobility categories (for instance, adding train passes to TelepassPay for the first time). Second, it introduced existing services (e.g., payment for on-street parking) into new cities. Third, it brought new merchants within an existing TelepassPay service category onto the platform (for instance, adding Zig-Zag, an Italian company similar to Lime, to its list of existing kick scooter merchants). TelepassPay had employed a start-up approach to stay ahead in the increasingly competitive mobility services landscape (see **Exhibit 9**). Said Cervellin, "We're trying to be the first-movers in all the spaces where we're competing. Then, the next wave of companies will have to come to us, rather than us going to them."

"From a regulatory point of view, the challenge is exciting," said Head of Legal Daniele Ciccolo. "Every day, we come up with innovative solutions that respect the highly specialized and detailed regulations with which we comply (e.g., privacy, financial, insurance, consumer, etc.). Some of these regulations are recent and innovative, like GDPR, while many other rules date back to the last century."

Collection and Use of TelepassPay Data

When subscribers first signed up for TelepassPay, they had to answer three consent questions related to data collection and use. The first read: "I allow you to use the data that I generate to do your

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

job for me." Subscribers who did not agree to this statement could not sign up for TelepassPay. "We can't do our job unless subscribers agree to this," said Cervellin. The second consent question read: "I allow you to send me communications that go beyond the service I'm buying from you," and the third read: "I allow you to use my data to send me targeted services and offers."

The language of this third question was particularly important. "The key word here is 'use,'" said Cervellin. "It's not 'record.' If you say no, I will not *use* your data to send you targeted offers, but I will *record* your data so that I can do my job for you, back to the first question." This meant that Cervellin's team could analyze the data of all users to understand aggregate trends and create statistical models, but they could only send personalized offers to customers who gave their explicit permission. "When analyzing the data, we ensure full anonymity of users' data within our system so there is no trace of their identity."

With the user's consent, TelepassPay used its data to offer services to subscribers in real-time. The app did not track customers' geolocation to recommend nearby services; rather, it recommended services that customers would likely find useful based on their prior interactions with Telepass and TelepassPay. "For example," said Benedetto, "if a Telepass subscriber is driving from Milan to a major ski area on Friday afternoon, I don't need sophisticated forms of artificial intelligence to understand that they are going to ski. Thus, five minutes after they pass through a toll plaza heading in that direction, the TelepassPay app might send them a notification, in compliance with current rules, asking if they want to buy their ski pass through the app and skip the line upon arrival."

Cervellin offered another example. "Let's say you use TelepassPay to book a train ticket from Milan to Rome. Near the train's arrival time, the app will send you a notification saying, 'Click here to book a taxi to pick you up in Rome.' That is the power of having a marketplace of interrelated services." Benedetto believed that an ever-expanding menu of valuable mobility services would lead to increased subscriber engagement with the platform. He compared this aspect of TelepassPay to the video streaming service Netflix. He explained:

> When I initially signed up for Netflix, it was because I wanted to watch season 1 of the series, *Narcos*. When I finished the season, Netflix not only served me season 2, but also suggested other similar shows to keep me engaged with the platform. For Telepass, *Narcos* is analogous to tolling. Customers sign up for our tolling service, so you could say that Telepass season 1 is tolling. But then we need to identify season 2 and season 3 for each customer. It might be a scooter rental for one subscriber and a ski pass for another, so it is our job to offer a range of valuable services. The critical question is not how much money they are spending on our products or how much they are paying overall; rather it is how frequently are they engaging with the platform? Because if they are not engaging with us, the value of the platform will diminish and they will eventually cancel their subscription.

Before TelepassPay, Telepass had few opportunities to engage subscribers. As Daniele explained, "Our only interface with the customer was through the OBU device. You attach it to your windscreen and you have no reason to interact with it until the battery dies. But with the mobile app, we can interact with our subscribers much more frequently."

Benedetto and Daniele had devised creative ways to maximize subscriber engagement. As an example, car owners in Italy were required to pay an annual tax called the *bollo auto*. "But it's not a very organized system," said Benedetto. "You don't receive a bill through the mail noting that it's time to pay, but after three years, you receive a notice from the government saying that you owe back taxes, plus a fine." Thus, in 2018, TelepassPay began comparing subscribers' vehicle plate numbers against a

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright.
Permissions@hbsp.harvard.edu or 617.783.7860

Ministry of Transportation database of *bollo auto* payment due dates.[e] As subscribers' due dates approached, TelepassPay sent them reminders to pay the tax. "The customer can either ask us to pay on their behalf or they can use another payment service," said Benedetto. "We don't care. We earn no money for paying the tax. Rather, the value we are adding for the subscriber is in the reminder itself. And the value to us is that it provides yet another opportunity for engagement."

The Value Proposition for Subscribers and Merchants

To subscribers, TelepassPay marketed itself as a convenient, simple payment option. User value was TelepassPay's single most important objective. Benedetto explained that mobility services had become exceedingly complicated. "Nowadays in Milan," he said, "every taxi company has its own app. The sharing services each have their own apps. The public transportation system has its own app. It's a big mess. Just like Telepass manages toll payments to the complicated array of road owners, TelepassPay can manage payments to all of these mobility merchants, but the customer has one singular experience." Benedetto believed that this ability to offer subscribers a uniform, merchant-agnostic service would help TelepassPay gain an edge in this competitive space. "Every single mobility service is a competitor," he said, "but no one has an ecosystem like us."

But identifying the most effective messaging to attract customers to TelepassPay had been an ongoing struggle. "Many people find it difficult to separate Telepass from the OBU device," said Micheli, "so it has been challenging to change customers' perception of our brand. One of the reasons we created TelepassPay was to differentiate the brand from the tolling service." By September 2020, about 8% of Telepass's existing subscribers had signed up for TelepassPay (see **Exhibit 10**).

For merchants, TelepassPay's value proposition was two-fold. First, the platform's processing fee was significantly cheaper than that of most credit card companies. Second, TelepassPay was a post-paid system. "This is really important for merchants operating in mobility," said Benedetto. "When you take a taxi, you don't know how much the total charge will be until the end of the ride. One of the main types of fraud in the mobility system is that people use pre-paid cards to rent a scooter, for instance, but they might only have €2.00 on the card when the ride costs €10.00. Merchants prefer a post-paid system." An important downside for merchants on the platform, however, was that TelepassPay did not share its data. Thus, merchants interested in using customer data to run their own analyses on trends and buying behaviors were unable to do so for purchases made via TelepassPay.

From 2019 to 2020, TelepassPay's revenues grew by 76% (from €5.7 million to €10 million). In 2019, Telepass generated 21% of its total revenues from non-tolling services (see **Exhibit 11**).

Maximizing the Value of TelepassPay's Data

Since joining Telepass in November 2019, Cervellin had worked to ensure that the company was maximizing the value of its data for both Telepass and for its subscribers. Selling its data to third-party marketers was out of the question. Not only would this risk violating GDPR, but senior company leaders believed that doing so would dilute Telepass's value for subscribers. "Back to the Netflix analogy," said Benedetto, "if you are paying a subscription fee, you don't want advertisements." Thus, all strategies under consideration involved Telepass using its data internally. In September 2020, Telepass senior leaders were mulling two main options: 1) focusing Telepass's efforts and resources on

[e] To use subscribers' data in this way and remain GDPR-compliant, Telepass had to demonstrate to the government that it was providing value to the customer and that it was not profiting from the service.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

continuing to grow TelepassPay, or 2) using Telepass's data to understand subscribers' driving behaviors and offer them customized insurance products.

Continue to Grow TelepassPay?

Continuing to expand TelepassPay's service offerings would likely keep subscribers engaged with the platform, but it would also take resources. While some service line expansions came with few up-front costs, others required substantial investment. For instance, in June 2020, the company acquired 70% ownership of Wash Out, a car washing service platform.[42] Drivers used the Wash Out app to share their car's location, and the company sent someone to that location to wash the car. Following the acquisition, Wash Out services were absorbed into the TelepassPay platform. Additional acquisitions could be costly, especially as TelepassPay moved into less traditional service lines.

Moreover, TelepassPay served a diverse array of customers, each with their own reason to subscribe. Because of this, it would be difficult to prioritize which services would be most valuable to its customers. Regardless, Cervellin believed that a continuously expanding universe of TelepassPay services would help the company compete in an increasingly "multi-modal" future. He explained:

> In the next 10 years, it will become more and more difficult to reach city centers with just one mobility service. You might drive your car to a public parking lot, pay for parking, and then take a bus, a cab, or the metro into the city. Once there, you might rent a bike or a kick scooter to get around. Even if you drive your private car into the city, you have to pay a congestion fee, so you still need at least two mobility services. This is what I mean by multi-modal. Given the increasing number of mobility services our subscribers will likely need, TelepassPay can continue to add value by constantly growing its offerings.

Moving from Insurance Broker to Direct Provider?

The other option was pivoting to selling car insurance directly. "Insurance is an attractive adjacent market where we might have a competitive advantage," explained Cervellin. "Our tolling and TelepassPay data paint a picture of driver behaviors. We could use those insights to build tailored insurance products that save our subscribers money."

Moving into this entirely new market, however, would require Telepass to create another separate company to comply with insurance regulations. Telepass had already started acting as a broker of insurance products by offering third-party insurance to their customers who needed to renew through Telepass Broker. Created in June 2019, Telepass Broker was a separate company fully owned by Telepass. In the first eight months of 2020, Telepass Broker had sold more than 10,000 insurance policies on behalf of providers. But selling insurance directly would mean entering another highly competitive market in direct competition with current Telepass Broker merchants.

Still yet, Cervellin and his colleagues saw opportunity in the insurance market. In 2019, Italians spent €16.4 billion on premiums to insure 40 million vehicles, down from €18.7 billion in 2013.[43] On average, policyholders spent €406 on car insurance premiums in 2019, down from €558 in 2012.[44] UnipolSai was the market leader, underwriting 22% of car insurance policies, followed by Allianz (13%), Generali (9%), and Genial Loyd (9).[45] Most (66%) policyholders secured car insurance in person from a traditional company, followed by an online site (31%), and a bank (6%).[46]

One industry report attributed the decline in insurance premium spending to increased competition and advances in telematics, or "black box," technology, which could price risk more accurately and drive down average prices.[47] Since the early 2010s, Italian car insurers had offered drivers black boxes,

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

which tracked a vehicle's travel speed, acceleration and deceleration patterns, and trip frequency.[48] Insurance companies used these data to offer cheaper rates to demonstrably safer drivers. By 2020, UnipolSai had installed 4.2 million black boxes in vehicles it insured in Italy.[49] Still, most (61%) car insurance policies in Italy were traditional, risk-based ones that used a driver's age, gender, driving record, and experience to determine the premium.[50] Only one in five (18%) car insurance policies was black box-based.[51] The negative perception of being monitored was a key driver of limited uptake.

Cervellin believed that Telepass's data gave it an opportunity to provide interesting services to its customers, as compared to traditional, risk-based policies. "For example," he said, "insurance companies lump two 40-year-old men living in Milan into the same risk category. But customers can give us access to their data across the entire Telepass ecosystem, allowing us to see that while one customer commutes to work every day, the other has a public transportation pass and drives just once a month." (See **Exhibit 12a** for a sample of Telepass's customer transaction data from June 2019 to June 2020.) Cervellin continued, "The second man is clearly lower-risk, but a traditional insurance provider would charge both the same rate." Whether Telepass's mobility data would outperform what was collected by black boxes, however, was an open question.

Through Telepass Broker, the company had already begun to broker policies on behalf of insurance companies. With subscribers' consent, Telepass Broker could check when their policies were up for renewal and offer them a new one. "In our brokerage model," said Cervellin, "we are procuring a lead. For any converted leads, Telepass earns a brokerage fee, which is a percentage of the annual premium."

Insurers proved interested in working with Telepass because it was a cheaper customer acquisition option. The commission on the premium was often less expensive than other lead acquisition strategies. "The main insurance player in Italy pays €50 for a referral," said Cervellin. The other option for insurers was to pay an Internet search engine for favorable ad placement. "Insurance" was among the most expensive keywords on Google's advertising platform, costing $48.41 on average.[52]

Cervellin believed that useful insights could be gleaned from Telepass's insurance brokerage data, both to optimize the current brokerage offering and to evaluate the potential of Telepass data to price risk. From January to June 2020, he had tracked the number of insurance policies offered to Telepass users and, in compliance with applicable regulations, several additional customer data points. (See **Exhibit 12b** for a screenshot of sample data.)[f]

In the short-run, Cervellin was hoping to incorporate data on customer behavior across the Telepass ecosystem (refer to **Exhibit 12a**) to better predict purchasing behavior of insurance products (refer to **Exhibit 12b**). He had asked a data scientist at Telepass to build a new prediction algorithm and evaluate its performance. In the long-run, Cervellin hoped to use Telepass's data to offer customized insurance products to customers who requested products tailored to their needs.

An uptick in COVID-19 cases As Cervellin prepared to discuss the future of insurance at Telepass with Benedetto in September 2020, he was well aware of the broader context. When the global COVID-19 pandemic first emerged in early 2020, Italy had been hit hard, with a death toll second only to China.[53] For two months, the government had imposed strict lockdowns, prohibiting residents from gathering in large groups and shuttering schools and many businesses. In September, infections had peaked again (see **Exhibit 13**).[54] It was not yet clear if this was the start of a new wave of infections or a blip as people returned from summer vacations. With cases on the rise, Cervellin wondered whether it was the right time to invest in any new mobility product.

[f] Note – the variables in the exhibit aim to represent the kind of data that Telepass collects, but they are not the true data.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

Exhibit 1 Telepass OBU Device, 2020

Source: Company documents.

Exhibit 2 Tollbooth Lanes on the *Autostrade*, 2020

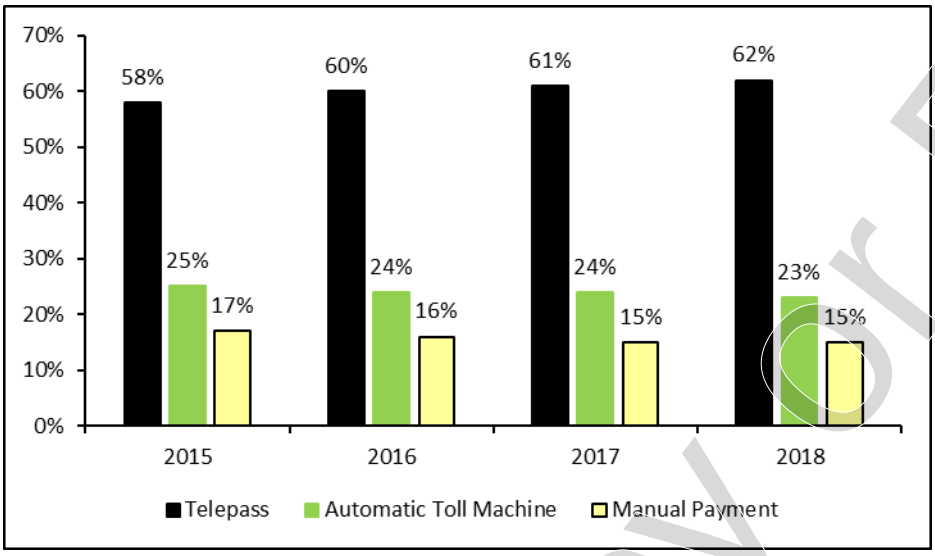
Source: Company documents.

Note: This image shows a typical tollbooth on the *autostrade*. Drivers wishing to pay by cash or credit card followed signs to one of the two far right lanes. Lanes accepting cash had white signs depicting images of coins (as shown here). Lanes accepting credit cards had blue signs depicting images of cards (as shown here) or the word *carte*. Drivers with Telepass followed the yellow signs with the word "Telepass." Telepass users could also pass through the middle lane with a yellow "T" on the bottom left, but they shared this lane with credit card users, who might clog traffic.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright.
Permissions@hbsp.harvard.edu or 617.783.7860

Exhibit 3 Share of Motorway Toll Payments in Italy, by Payment Type, 2015-2018



Source: Associazione italiana società concessionarie autostrade e trafori, "Distribution of motorway toll payment systems in Italy from 2015 to 2018, by type of payment," April 2019, via Statista, accessed March 2021.

Exhibit 4 Selected Car, Bike, and Scooter Rental Companies Operating in Italy, 2013-2020

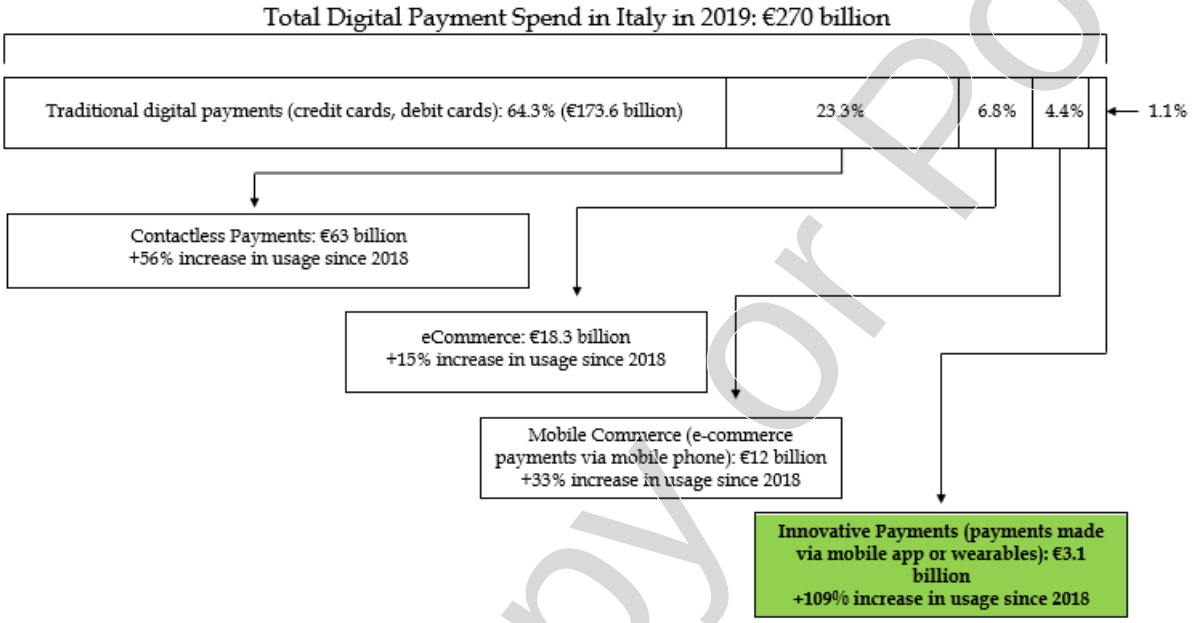
Company	Type of Service	Launched in Italy	Rental Fee
Enjoy	Car Sharing	2013	€0.25/minute
Share Now	Car Sharing	2014	€0.19-€0.26/minute
Share n'go	Car Sharing	2015	€0.28/minute
Bicincitta	Bike Sharing	2004	€30 annual membership fee; €1/hour
Jump (owned by Uber)	Bike Sharing	2019	€0.20/minute; €1 to unlock bike
Helbiz	Bike Sharing	2019	€0.07/minute; €0.25 to unlock bike
Ecooltra	Scooter Sharing	2019	€0.29/minute
Zigzag	Scooter Sharing	2019	€0.26/minute
Acciona	Scooter Sharing	2020	€0.29-€0.40/minute
Helbiz	E-Scooter Sharing	2020	€0.15/minute; €1 to unlock scooter
Lime	E-Scooter Sharing	2020	€0.25/minute; €1 to unlock scooter
Bird	E-Scooter Sharing	2020	€0.25/minute; €1 to unlock scooter
Wind	E-Scooter Sharing	2019	€0.19/minute; €1 to unlock scooter
Dott	E-Scooter Sharing	2020	€0.19/minute; €1 to unlock scooter

Source: Casewriter, compiled from: Emily Rosu, "Car, Scooter, Electric Scooter and Bike Sharing in Rome," Romeing, October 15, 2020, https://www.romeing.it/car-bike-scooter-sharing-in-rome/; Bikeoff, "Bicincitta, Italy," http://www.bikeoff.org/dr_PDF/schemes_public_bicinetta.pdf; both accessed March 2021.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

Exhibit 5 Digital Payments in Italy, 2019



Source: Casewriter, compiled from: Valentina Magri, "Digital payments strike an 11% growth in Italy in 2019, while banks startup working with BigTech companies, the Milan Polytechnic Observatory on Innovative Payments says," BeBeez, April 16, 2020, https://bit.ly/3syM2r9; and Raynor de Best, "Growth rate of new digital payments value in Italy 2019, by type," Osservatori Digital Innovation, April 2020, via Statista; both accessed March 2021.

Note: *Traditional digital payments* refers to swiping a credit or debit card at the point of sale. *Contactless payments* refer to paying at the point of sale via a "wave and go" or "tap and pay" modality (e.g., by tapping a chip embedded in a credit card to the card reader). *eCommerce* refers to purchases made online from either a computer or tablet. *Mobile commerce* refers to purchases made online from a mobile phone. Finally, *innovative payments* refers to payments made via a mobile payment app or a wearable. The total digital spend in Italy increased by 11% from 2018 to 2019.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright.
Permissions@hbsp.harvard.edu or 617.783.7860

Exhibit 6 Features of Five Common Payment Apps Available in Italy, 2020

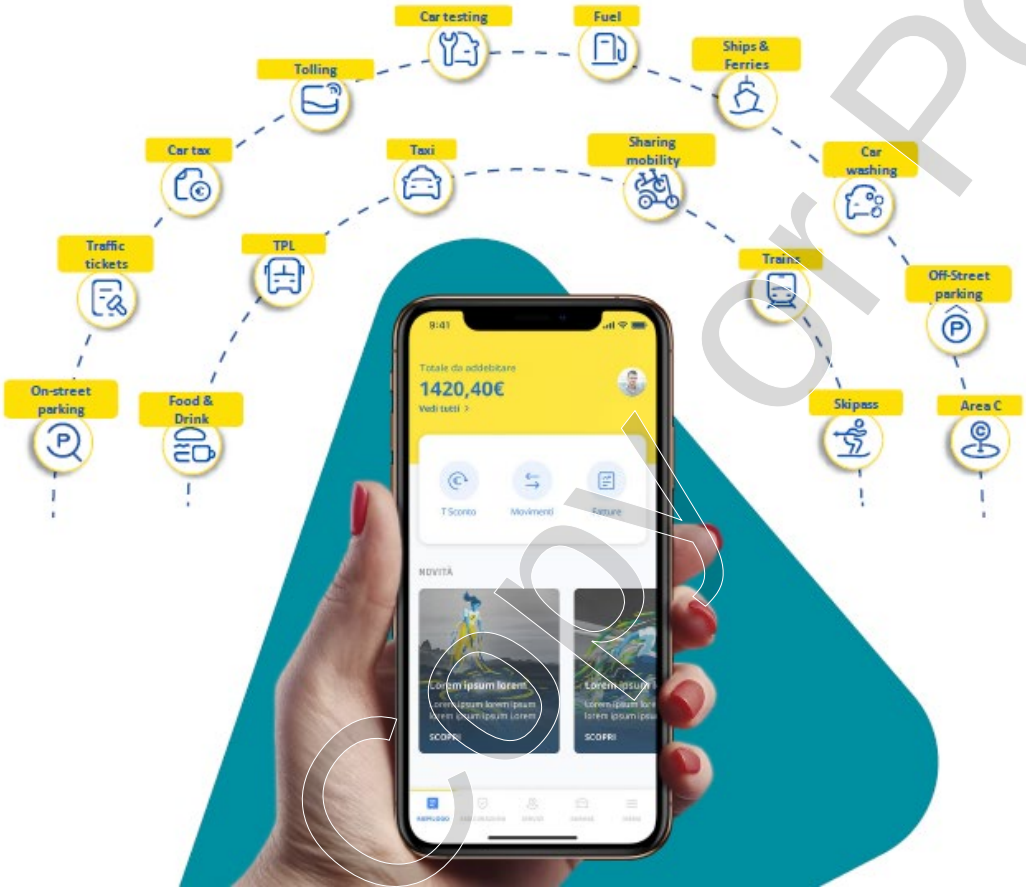
	Fees to Customer?	Fees to Merchant?	Scope in Italy
PayPal	No, unless spending money via a card, which incurs a 1% fee.	3.40% plus a €0.35 fee. Lower rates if paying by QR code (between 0.50% and 2.00%, plus a €0.35 fee.)	7.5% of Italian websites accept PayPal
PostePay	€10 for physical cards; free transactions	Fees associated with the co-branded PostePay credit cards (usually Visa or Mastercard)	13 million physical PostePay cardholders; 5.4 million digital e-wallet transactions in FY 2019; 4.8 million digital wallets in February 2020
Satispay	No, except for paying some bills	In store: free for transactions less than €10, a flat €0.20 for transactions above €10. Online or in a mobile app: 1% of transactions under €10. 1%+€0.20 for transactions over €10. For vending machines: 1% of a transaction	1.3 million users; 130,000 merchants
Bancomat Pay	Free up to €50 to transfer money from one person to another; free in affiliated shops. Service fee of up to €0.75 per month	No fee for transactions under €15. Fee of 0.6% for transactions between €15 and €50. Fee of 0.8% for transactions greater than €50. (Slightly higher fees apply in 2022.)	9 million app users
Tinaba (linked with Alipay)	No	€129 one-off for each POS Free remote payments "Cash In" payments are free up to €50, then 1% afterwards. For Business Premium, there is a 5% commission on all platform sales, and a €10 monthly fee for other services	Three million Chinese tourists and 300,000 Chinese residents in Italy

Source: Casewriter, compiled from: Satispay, "Pricing," https://www.satispay.com/en-it/pricing/; Satispay, "Terms and Conditions," https://www.satispay.com/en-it/legal/; *Fortune*, "Satispay arriva a 1 milione di utenti," March 20, 2020, https://www.fortuneita.com/2020/03/20/satispay-arriva-a-1-milione-di-utenti/; PayPal, "PayPal Merchant Rates," updated January 29, 2020, https://www.paypal.com/it/webapps/mpp/merchant-fees?locale.x=it_IT#fixed-fees-commercialtrans; PayPal, "PayPal Consumer Rates," updated January 29, 2020, https://www.paypal.com/it/webapps/mpp/paypal-fees?locale.x=en_IT; Built With, "Payment Acceptance Usage Distribution in Italy," https://trends.builtwith.com/payment/payment-acceptance/country/Italy; Business Wire, "Western Union and Italy's Postepay Enable Cross-Border Payments," February 6, 2020, https://www.businesswire.com/news/home/20200206005477/en/Western-Union-and-Italy%E2%80%99s-Postepay-Enable-Cross-Border-Payment; Tinaba, https://www.tinaba.bancaprofilo.it/pages/business; About Payments, "PostePay," https://www.about-payments.com/knowledge-base/method/postepay; Intesa Sanpaulo, "Bancomat Pay," https://www.intesasanpaolo.com/it/persone-e-famiglie/prodotti/pagamenti-digitali/bancomat-pay.html; Intesa Sanpaolo, "BANCOMAT Pay ® Nexi Mobile POS," https://www.intesasanpaolo.com/it/catalogo-prodotti/catalogo-pos/jiffy-move-and-pay-business.html; Daniele Lepido, "Jack Dorsey's Square Invests $18 Million in Italy's App Satispay," *Bloomberg*, November 19, 2020, https://bloom.bg/39Rv7c3; "PostePay: one of the leading Italian payment methods explained," PaySpace Magazine, July 1, 2020, https://bit.ly/3udTUhZ; all accessed April 2021.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

Exhibit 7 TelepassPay App, 2020



Source: Company documents.

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

Do Not Copy or Post

Exhibit 8 Growth of TelepassPay Services, 2017-2020

Service	Year Launched	Availability
On-Street Parking	2017 or before	43 cities
Area C congestion fee	2017 or before	Milan
Fuel	2017 or before	825 fuel stations
Car Tax (*bollo auto*)	2018	20 regions
SkiPass	2018	1 ski resort
Taxi	2018	11 cities
Bike Sharing	2019	1 city
Car Washing	2019	1 city
Ferry Tickets	2019	3 ferry lines
Kick-Scooter Sharing	2019	3 cities
Public Transportation	2019	1 city
Car Rental	2020	1 vendor
Food	2020	41 *autostrade* services areas
Scooter Sharing	2020	1 city
Train Tickets	2020	Entire national rail network

TelepassPay Growth: Number of Merchants, Cities, and Points of Sale, 2017-2020

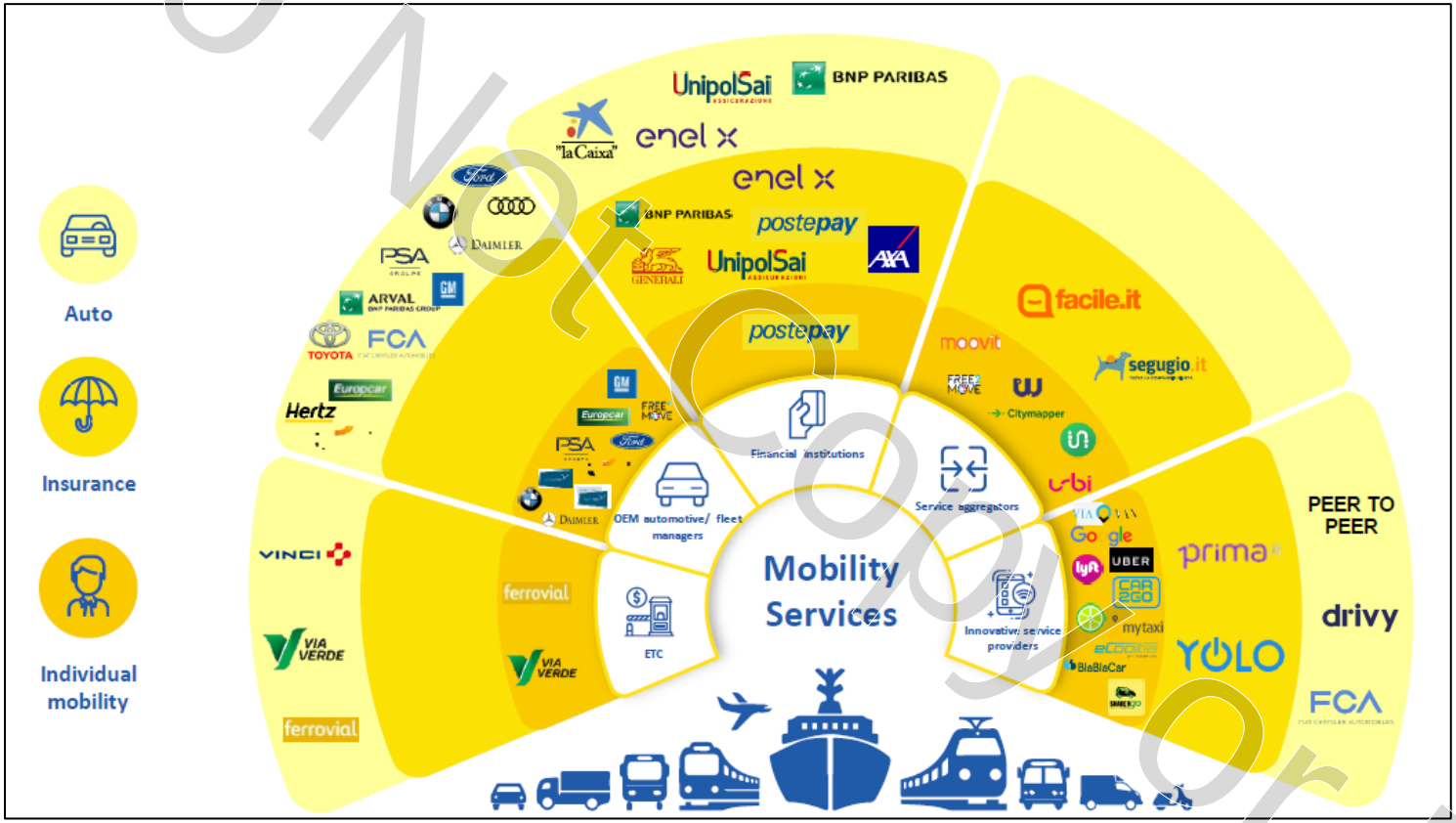
	2017	2018	2019	2020
Number of Merchants	20	45	95	126
Year-Over Year Change (%)	-----	*125%*	*111%*	*33%*
Number of Cities	636	913	1,216	1,754
Year-Over-Year Change (%)	-----	*44%*	*33%*	*44%*
Number of Points of Sale	853	1,373	2,762	4,285
Year-Over-Year Change (%)	-----	*61%*	*102%*	*55%*

Source: Company documents.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

Exhibit 9 TelepassPay Competitive Landscape, 2020



This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright.
Permissions@hbsp.harvard.edu or 617.783.7860

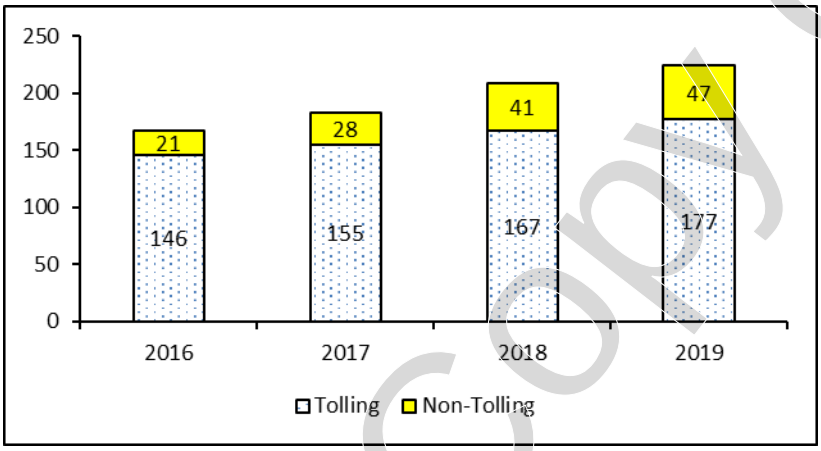
Do Not Copy Or Post

Exhibit 10 Number of TelepassPay Subscribers, 2017-2020

	Total Number of TelepassPay Subscribers	YoY % Change	Total Number of Telepass Subscribers	% Telepass Subscribers Also Subscribing to TelepassPay
2017	158,000	-----	6 million	2.6%
2018	327,000	107%	6.2 million	5.3%
2019	450,000	38%	6.4 million	7.0%
2020	550,000	22%	6.6 million	8.3%

Source: Company documents.

Exhibit 11 Telepass Revenues, Tolling vs. Non-Tolling Services, in Million Euros, 2016-2019



Source: Company documents.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright.
Permissions@hbsp.harvard.edu or 617.783.7860

Exhibit 12a Snapshots of the Data Dictionary and Sample Data from TelepassPay Transactions, June 2019-June 2020

Data Dictionary		
"Transactions" Tab		
Variable	**Type**	**Definition**
client_id	Numeric	This number identifies the Telepass customer. It can be used to merge data between the "Insurance Quotes" and "Transactions" tabs.
year_month	Date	Year-month of activity
service_type	Character	Type of service purchased
telepass_pay	Dummy	This variable takes value 1 if the service belongs to TelepassPay, while it takes value 0 if it belongs to the standard Telepass services (those that use the OBU).
number_transactions	Numeric	Number of unique transactions in that given year-month-service category
expenditures	Numeric	Total expenditures in that given year-month-service category. In Euros.

Snapshot of Transactions Data

client_id	year_month	service_type	telepass_pa	number_tra	expenditures
20785	May-20	PARCHEGGI/	0	1	2
20785	Sep-19	PARCHEGGI/	0	1	2
34153	Feb-20	PARCHEGGI/	0	1	3.75
21141	Jan-20	PARCHEGGI/	0	1	3.5
21141	Feb-20	PARCHEGGI/	0	1	7
21141	Oct-19	PARCHEGGI/	0	1	2.8
12199	Feb-20	FUEL CON AF	1	5	15
12199	Mar-20	FUEL CON AF	1	8	30.01
12199	Jun-20	FUEL CON AF	1	1	3.5
12199	Jun-20	TURBO RICAI	1	3	100
22347	May-20	ASSICURAZIC	0	1	0
11539	Jan-20	PARCHEGGIC	1	4	12.855021
11539	Mar-20	PARCHEGGIC	1	3	4.671858
11539	Jun-19	PARCHEGGIC	1	3	15.826558
11539	Jun-20	PARCHEGGIC	1	4	23.32333
11539	Jul-19	PARCHEGGIC	1	5	25.891036
11539	Aug-19	PARCHEGGIC	1	5	10.315544
11539	Sep-19	PARCHEGGIC	1	2	13.098361
11539	Oct-19	PARCHEGGIC	1	1	9.594155
11539	Feb-20	FUEL CON AF	1	5	71.689689
11539	Mar-20	FUEL CON AF	1	6	117.11815
11539	Apr-20	FUEL CON AF	1	2	42.578141

Source: Casewriters.

Note: This snapshot is available as a case supplement. The instructor may choose to assign the case without the data supplement. The clients and the variables in the supplementary dataset are mock-up data that aim to represent the kind of data the company collects, but are not the true data. Variable names may have been changed from the naming standards at the company.

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

Do Not Copy or Post

Exhibit 12b Snapshots of the Data Dictionary and Sample Data from Telepass Insurance Quotes, January-June 2020

Data Dictionary		
"Insurance Quotes" Tab		
Variable	**Type**	**Definition**
client_id	Numeric	This number identifies the customer being offered the insurance policy. It can be used to merge data between the "Insurance Quotes" and "Transactions" tabs.
quotation_id	Numeric	Insurance policy quote ID. This number is different for each row.
driving_type	Character	This variable denotes the age group of the customer. It can take three values: less_than_23; between_23_and_25; and more_than_26
car_immatriculation_date	Date	Car registration date
car_brand	Character	Brand of the car
car_model	Character	Model of the car
insurance_expires_at	Date	Date when current insurance expires, when available
birth_date	Date	Date of birth of the customer, when available
gender	Character	Gender of the customer, when available
county	Character	County of residence of the customer, when available
base_subscription	Date	Date when customer signed up for Telepass base subscription
base_type	Character	This variable can take two values: "FA" for a Telepass family subscription; "OR" for a Telepass company subscription
pay_subscription	Date	Date when customer signed up for TelepassPay subscription. If empty, the customer never signed up for a subscription.
pay_cancellation	Date	Date when customer canceled their TelepassPay subscription. If empty, the customer never signed up for a subscription.
premium_subscription	Date	Date customer signed up for Telepass Premium subscription. If empty, the customer never signed up for a subscription.
premium_cancellation	Date	Date customer canceled their Telepass Premium subscription. If empty, the customer never signed up for a subscription.
operating_system	Character	Mobile operating system of the customer, when available. "and" stands for Android; "ios" stands for iOS
policy_quoted_at	Date	Date when the insurance policy was quoted to the customer
broker_id	Numeric	Identifier of the insurance company offering the quote
issued	Boolean	This variable is equal to "TRUE" if the insurance policy quoted was purchased by the customer, "FALSE" otherwise
guarantees_purchased	Character	If the insurance was purchased, this variable lists the details for the selected insurance (both required and optional). Each option is separated by the " - " symbol
guarantees_available	Character	This variable lists all the insurance options that the quote offers. Each option is separated by the " - " symbol
roadside_assistance	Dummy	This variable takes value 1 if roadside assistance is included in the quote, 0 otherwise.
driver_injury	Numeric	If the quote offers insurance for driver injury, this variable includes the price for that option. In Euros.
basic_coverage	Numeric	This variable includes the premium for the minimum required insurance. It is equal to price_sale. In Euros.
legal_protection	Numeric	If the quote offers additional legal protection, this variable includes the price for that option. In Euros.

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

Do Not Copy or Post

Data Dictionary		
waive_right_compensatio	Numeric	If the quote offers additional rights for driver, this variable includes the price for that option. In Euros.
uninsured_vehicles	Numeric	If the quote offers additional protection in case of accidents with uninsured vehicles, this variable includes the price for that option. In Euros.
protected_bonus	Numeric	If the quote offers additional protection for the driver, this variable includes the price for that option. In Euros.
windows	Numeric	If the quote offers additional protection for car windows and windshields, this variable includes the price for that option. In Euros.

Snapshot of "Insurance Quotes" Data

client_id	quotation_id	driving_type	car_immatric	car_brand	car_model	insurance_ex	birth_date	gender	county	base_subscri	base_type	pay_subscrip	pay_cancella	premium_sut	premium_ca
23789	3649	more_than_2	7/20/2011	FORD	C-MAX	6/12/2020			FC	6/24/2019	FA			6/11/2020	12/31/9998
10133	28552	more_than_2	3/1/2007	FIAT - INNOC	FIAT CROMA	1/22/2020			MS	11/12/2012	FA			12/29/2014	12/31/9998
20785	31958	more_than_2	8/30/2017	NISSAN	NISSAN QASH	10/2/2020	9/22/1992	M	SA	8/26/2019	FA	8/26/2019	12/31/9998		
33892	27614	more_than_2	7/25/2017	FIAT - INNOC	FIAT PANDA	7/25/2020	2/9/1996	M		9/12/2017	FA			9/13/2017	12/31/9998
34153	1529	more_than_2	12/19/2006	FIAT - INNOC	FIAT PUNTO	10/13/2020	1/8/2000	M	CN	8/29/2019	FA				
14006	32192	between_23_	3/14/2016	AUDI	Q2	4/3/2020			PI	1/26/2016	FA				
21293	29336	more_than_2	3/30/2017	MINI	COUNTRYMA	4/18/2020			MS	5/24/2011	FA			3/28/2013	7/31/2013
18529	7882	more_than_2	12/18/2013	BMW	X1 XDRIVE20	4/17/2020	1/7/1977	M	LU	12/12/2017	FA			12/12/2017	12/31/9998
25330	29973	more_than_2	7/16/2007	LAND ROVER	FREELANDER	7/26/2020	1/27/1967	M	AP	12/28/2016	FA	12/28/2016	12/31/9998		
21141	10960	between_23_	7/20/2009	CHEVROLET	AVEO	1/23/2020			MB	7/3/2003	FA			12/29/2014	12/31/9998
7507	29552	more_than_2	8/31/2009	VOLKSWAGE	POLO	5/19/2020			RM	5/24/2017	FA				
22486	12253	more_than_2	10/29/2018	TOYOTA	TOYOTA COR	12/29/2020			RO	7/13/2014	FA				
12199	11661	between_23_	11/13/2000	VOLVO	Unknown	5/4/2020	12/5/1973	F	BO	2/13/2020	FA	2/13/2020	12/31/9998		
31369	34156	more_than_2	5/17/2012	FORD	GRAND C-MA	2/13/2020				7/16/2015	FA			7/19/2015	10/31/2016
29886	14686	more_than_2	10/18/2017	KIA	SPORTAGE	6/6/2020			LT	6/4/2015	FA			7/4/2016	12/31/9998
26066	5552	more_than_2	6/23/2002	SKODA	Unknown	2/26/2020	7/22/1969	M	BG	6/24/2016	FA	9/21/2016	12/31/9998	2/24/2019	12/31/9998
23467	34949	more_than_2	6/21/2018	TOYOTA	TOYOTA YAR	4/10/2021	4/1/1984	M	RM	7/13/2016	FA				
22347	24382	more_than_2	7/21/2008	CITROEN	Unknown	6/4/2021			CT	4/23/2013	FA			1/15/2016	12/31/9998
5506	10561	more_than_2	2/25/2007	FIAT - INNOC	FIAT PANDA	2/27/2019	7/1/1952	M	FI	12/6/2016	FA			12/6/2016	12/31/9998
11539	11465	more_than_2	9/22/2019	VOLKSWAGE	UP!	4/27/2020	5/30/1982	M	RM	10/24/2016	FA	10/24/2016	12/31/9998	2/20/2020	12/31/9998
21698	13030	more_than_2	6/1/2015	FIAT - INNOC	FIAT 500L	1/30/2021			LT	7/20/2015	FA				
26809	23423	more_than_2	4/20/2005	LANCIA - AUT	LANCIA MUS	5/5/2020	1/17/1964	M		2/16/2016	FA			12/11/2016	2/28/2017
8212	20043	more_than_2	2/29/2012	FIAT - INNOC	SEDICI	4/22/2020			MB	10/6/2018	FA			10/6/2018	12/31/9998
35794	30968	between_23_	7/21/2019	HYUNDAI	TUCSON,IX35	6/11/2020	10/10/1966	M	RM	7/12/2017	FA	7/12/2017	12/31/9998	8/23/2017	12/31/9998

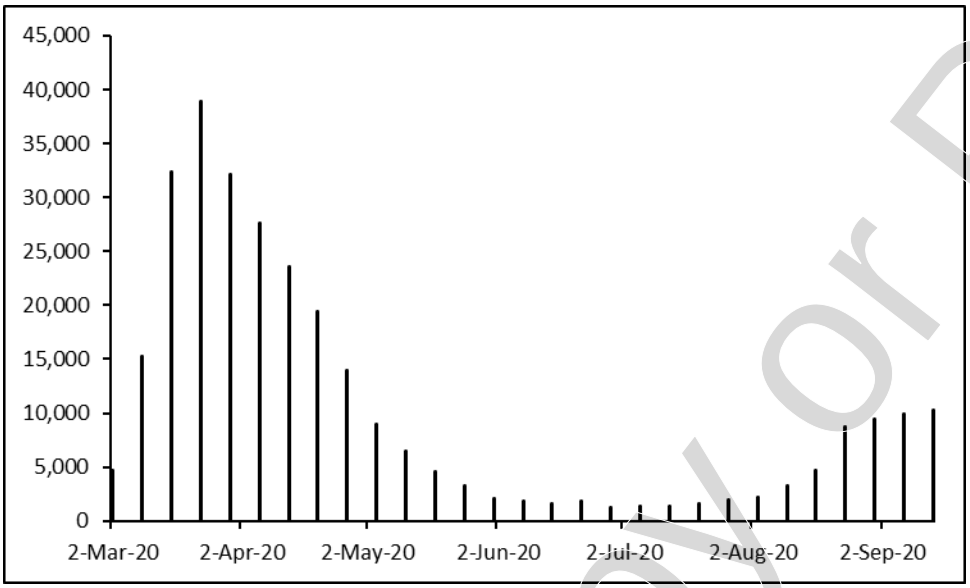
Source: Casewriters.

Note: This snapshot is available as a case supplement. The instructor may choose to assign the case without the data supplement. The clients and the variables in the supplementary dataset are mock-up data that aim to represent the kind of data the company collects, but are not the true data. Variable names may have been changed from the naming standards at the company.

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright.
Permissions@hbsp.harvard.edu or 617.783.7860

Do Not Copy Or Post

Exhibit 13 Number of Confirmed Weekly COVID-19 Cases, Italy, March 2, 2020-September 14, 2020



Source: Data excerpted from World Health Organization, "Italy Situation," https://covid19.who.int/region/euro/country/it, accessed March 2021.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860

Endnotes

[1] Sylvia Poggioli, "After Italians Endured Harsh Lockdowns, COVID-19 Cases Spike Again," Morning Edition, NPR, September 3, 2020, https://n.pr/38uP478, accessed March 2021.

2 National Academies of Sciences, Engineering, Medicine, "Lessons from History: Development of Toll Collection in Italy," December 1996, https://trid.trb.org/view/482038, accessed March 2021.

3 Wanted in Milan, "Access Area C now also by Telepass," February 15, 2012, https://bit.ly/3koIiW0, accessed March 2021.

4 Autostrada per l'Italia, "Atlantia: Group Begins Restructuring Process," December 15, 2016, https://bit.ly/3gDDQBT, accessed March 2021.

5 Martha Bakerjian, "Tips for Driving on the Autostrada in Italy," TripSavvy, June 3, 2019, https://bit.ly/3sU5KOR; Annalisa Girardi, "Who Pays The Most For Traveling On Motorways In Europe?" Forbes, December 7, 2018, https://bit.ly/3mF6p5O; both accessed March 2021.

6 Girardi, "Who Pays The Most For Traveling On Motorways In Europe?"

7 Autostrade per l'Italia, "Calculating Toll," https://bit.ly/3jtkfGx, accessed March 2021.

8 Girardi, "Who Pays The Most For Traveling On Motorways In Europe?"

9 Autostrade per l'Italia, "Traffic Management," https://bit.ly/3zpOUtM, accessed March 2021.

10 Martha Bakerjian, "Tips for Driving on the Autostrada in Italy," TripSavvy, June 3, 2019, https://www.tripsavvy.com/tips-for-driving-on-the-autostrada-in-italy-1547231, accessed March 2021.

11 Associazione italiana società concessionarie autostrade e trafori, "Distribution of motorway toll payment systems in Italy from 2015 to 2018, by type of payment," April 2019, Statista, accessed March 2021.

12 Glassdoor, "Autostrade per l'Italia Toll Collector Salaries in Italy," https://bit.ly/3yoUfAe, accessed March 2021.

13 Reuters, "Italy's Atlantia agrees $1.2 billion Telepass stake sale to Partners Group," October 17, 2020, https://reut.rs/3gEupCl, accessed March 2021.

14 Alexander Kunst, "Car ownership in Italy 2020," Statista Global Consumer Survey, November 19, 2020, via Statista, accessed March 2021.

15 Istat, "Number of cities with car sharing services in Italy 2011-2015," November 23, 2016, via Statista, accessed March 2021.

16 Frost & Sullivan, "Car sharing users in Europe 2014, by country," September 1, 2014, via Statista, accessed March 2021.

17 Samantha Wong, "Bike sharing fleet size in Italy 2015-2018, by type," Osservatorio Nazionale Sharing Mobility, March 19, 2021, via Statista, accessed March 2021.

18 Statista Research Department, "Number of bike sharing users in the Italian cities of Milan, Turin, and Bergamo from 2015 to 2018," Osservatorio Nazionale Sharing Mobility, March 19, 2021, via Statista, accessed March 2021.

19 dataeaze, "From Data Silo to Data Lake—The Path to Business Insights," https://bit.ly/3kzQrXZ, accessed March 2021.

20 John Elkann, "In Italy you become a top manager first, but there are older Ad's," AGI, March 9, 2021, https://bit.ly/3BdzsBk, accessed August 2021.

21 Charlene Heaney, "'PSD2 in Plain English' – What Banking Startups Should Know," StartUs Magazine, July 23, 2016, https://magazine.startus.cc/psd2-in-plain-english-banking-startups/, accessed March 2021.

22 Ben Wolford, "What is GDPR, the EU's new data protection law?" GDPR.EU, https://gdpr.eu/what-is-gdpr/, accessed March 2021.

23 Wolford, "What is GDPR, the EU's new data protection law?"

24 Wolford, "What is GDPR, the EU's new data protection law?"

25 Wolford, "What is GDPR, the EU's new data protection law?"

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright.
Permissions@hbsp.harvard.edu or 617.783.7860

26 Valentina Magri, "Digital payments strike an 11% growth in Italy in 2019, while banks startup working with BigTech companies, the Milan Polytechnic Observatory on Innovative Payments says," BeBeez, April 16, 2020, https://bit.ly/3kvgjnL, accessed March 2021.

27 Raynor de Best, "Growth rate of new digital payments value in Italy 2019, by type," Osservatori Digital Innovation, April 2020, via Statista, accessed March 2021.

28 Magri, "Digital payments strike an 11% growth in Italy in 2019."

29 PaySpace Magazine, "PostePay: one of the leading Italian payment methods explained," July 1, 2020, https://bit.ly/3sUsIWb, accessed March 2021.

30 Posteitaliane, "Payments, Mobile and Digital," https://bit.ly/2WwZPTX, accessed March 2021.

31 Daniele Lepido, "Jack Dorsey's Square Invests $18 Million in Italy's App Satispay," Bloomberg, November 19, 2020, https://bloom.bg/3DrzZl1, accessed March 2021.

32 Sophia Furber, "Dirty cash: Italians could embrace digital payments amid coronavirus lockdown," S&P Global Market Intelligence, March 11, 2020, https://bit.ly/3Bj0rM2, accessed March 2021.

33 Sophia Furber, "After slow start, Italy looks to Open Banking to transform payments space," S&P Global, November 9, 2020, https://bit.ly/3Dsxu2a, accessed March 2021.

34 Furber, "After slow start, Italy looks to Open Banking to transform payments space."

35 Ludovic Esteves, "Italy: the 'cash' culture," Limonetik, https://bit.ly/3DpGGUD, accessed March 2021.

36 Esteves, "Italy: the 'cash' culture."

37 Elisa Anzolin and Gavin Jones, "Cash no longer king in Italy as COVID helps government push for plastic," Reuters, October 8, 2020, https://reut.rs/38h9LU2, accessed March 2021.

38 Anzolin and Jones, "Cash no longer king in Italy as COVID helps government push for plastic."

39 PYMNTS, "Italian Gov't To Pay Consumers To Ditch Cash For Digital Payments," December 27, 2019, https://bit.ly/38lfFDO, accessed March 2021.

40 Anzolin and Jones, "Cash no longer king in Italy as COVID helps government push for plastic."

41 PR Newswire, "COVID-19 Impact on the Payments Industry: Italy Forecast Snapshot," April 16, 2020, https://prn.to/3jlsxzR, accessed March 2021.

42 "Telepass acquires 70% of Wash Out," Telepass press release, June 16, 2020, https://bit.ly/3mEJCXJ, accessed March 2021.

43 Instituto per la vigilanza sulle assicurazioni, "Motor insurance gross direct premiums written in Italy 2013-2019," November 27, 2020, via Statista, accessed March 2021.

44 ANIA, "Average price for passenger car insurance in Italy, 2012-2019," via Statista, accessed March 2021.

45 YouGov Italy, "Most common car insurance companies in Italy 2020," November 5, 2020, via Statista, accessed March 2021.

46 YouGov Italy, "Most common car insurance providers in Italy 2020."

47 Marco Falchero, "The Italian Insurance Market," PwC, https://pwc.to/3jndMNd, p. 6, accessed March 2021.

48 Eamonn Walsh and Vanessa Barford, "The proliferation of the little black box," BBC, October 31, 2012, https://www.bbc.com/news/magazine-20143969, accessed March 2021.

49 UnipolSai Assicurazioni, "UnipolSai: Preliminary Consolidated Results," https://bit.ly/3jpB70N, p. 4, accessed March 2021.

50 YouGov Italy, "Most common car insurance coverage in Italy 2020."

51 YouGov Italy, "Most common car insurance coverage in Italy 2020."

52 A. Guttmann, "Most expensive keywords in Google Adwords 2017," WordStream, November 26, 2020, via Statista, accessed March 2021.

53 Rachael Rettner, "Why Deaths from Coronavirus Are So High in Italy," *Scientific American*, March 10, 2020, https://covid19.who.int/region/euro/country/it, accessed March 2021.

54 World Health Organization, "Italy Situation," https://covid19.who.int/region/euro/country/it, accessed March 2021.

Do Not Copy or Post

This document is authorized for educator review use only by CHIARA FARRONATO, Harvard Business School until Nov 2022. Copying or posting is an infringement of copyright. Permissions@hbsp.harvard.edu or 617.783.7860