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Telepass: From Tolling to Mobility Platform (Abridged)

In September 2020, Davide Cervellin, Telepass's chief marketing and data officer, pulled off the highway to refuel his car. He planned to pay with TelepassPay, a mobile payment application (app) he had helped his company refine. Three years earlier, Telepass, until very recently the sole processor of electronic toll payments on Italy's highways, had launched TelepassPay. The app 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 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 nearly seven million customers. Pelepas's executive team wanted to better utilize these data to implement CEO Gabriele Benedetto's vision of making Telepass 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, which offered insurance products to existing customers on behalf of insurance companies. Now, Benedetto was considering a new growth opportunity: selling insurance directly. 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 devote resources to adding new mobility services to TelepassPay. Expanding its menu of services would likely both attract new subscribers and add value for existing subscribers.

The Origin and Evolution of Telepass

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." 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.[1]

As drivers on the *autostrade* approached toll plazas when entering or exiting the highway, they maneuvered into one of several marked lanes. 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 on the *autostrade*.

The Telepass tolling device was a small, rectangular transponder called an onboard unit (OBU) that attached to a car's windscreen. As drivers with Telepass approached a toll plaza, the OBU used dedicated short-range communication technology to exchange customer and payment information with the plaza in real-time, allowing drivers to pass through without stopping. The OBU was first introduced in 1990 to help streamline the flow of traffic during the FIFA World Cup soccer tournament.

Telepass users paid a monthly subscription fee of €1.26. As of September 2020, Telepass had never increased this fee. When subscribers first signed up for the service, they provided their bank account information, and Telepass directly debited any toll charges from their accounts at the end of the month. Telepass users paid only the monthly subscription fee (plus their tolls). Many users saw value in the convenience of passing directly through toll plazas. By 2018, six in ten drivers on the *autostrade* paid their tolls with Telepass.[2] 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%).

In 2010, Telepass started expanding its offerings. For example, subscribers could use their OBUs to pay for both on- and off-street parking. In 2012, when Milan introduced "Area C," a €5 congestion fee for Milan downtown, Telepass added the ability to pay via OBU.[3]

Telepass: Italy's Oldest Fintech?

In 2016, a company called the Atlantia Group obtained full ownership of Telepass. At the time, Benedetto was working as a management consultant in financial services, a role in which he sometimes advised the Benetton family office—the major shareholder of the Atlantia Group. When the office asked 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. Moreover, Telepass bills customers at the end of the month, acting like a bank to manage the customer's credit risk. 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. 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 billion,[4] 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 mountains 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. If Telepass failed to adapt, it risked becoming another Kodak."[a]

The Changing Mobility Landscape

For many Italians, car ownership had long been an important cultural marker of adulthood, but in the early 2010s, people were starting to move about differently—especially young urban-dwellers. "Today, 18-year-olds in the city don't want a car," said Luca Daniele, Telepass CFO and TelepassPay CEO. "They want to rent kick scooters." Added Benedetto, "In 2016, we were seeing a dramatic shift in mobility habits, yet the Telepass business model was linked to a car, its registration plate, and tag."

Car and bicycle sharing services were flourishing, especially in Italy's major cities. By 2015, car sharing services, offered by many companies including Enjoy and Share Now, were available in 26 cities.[5] At 130,000, Italy had the fourth highest number of car share users in Europe, trailing only Germany, the U.K., and France.[6] Leading bike share providers included Bicincitta, Jump, and Helbiz. By 2016, there were roughly 16,000 bicycles for rent across Italy.[7] Scooter sharing services were just starting to arrive in Italy, but they would grow increasingly popular by the end of the decade.

Benedetto and Daniele began to consider how they might build on Telepass's strengths to expand its mobility offerings to better meet shifting consumer needs. Due to regulatory restrictions, Telepass could not simply add the ability for subscribers to pay for these emerging mobility services to its existing offerings. Thus, in 2017, Telepass incorporated a separate company called TelepassPay.

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 his or her 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.

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 that 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.[b] 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."

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[a] 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.

[b] 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.

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. 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 repositories for storing raw data.[8] "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, I won't send her tolling promotions."

Telepass also partnered with industry experts and consultants, and invested in (or acquired) companies with complementary skillsets. 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.

Investing in People

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 speaks to how data-driven Telepass aimed to become," he reflected. He would manage a team of seven.

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 sector. 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.[9] Finally, Goretti explained, the company 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.'"

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 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."

Mobile Payment Apps in Italy

Mobile payment apps, like PayPal and Satispay, allowed consumers to pay for goods and services without using a cash or 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.[10] Five months later, the General Data Protection Regulation (GDPR) went into effect. Referred to by some as "the toughest privacy and security law in the world,"[11] GDPR required companies to protect consumers' privacy, obtain explicit consent when using their data, and collect only a minimum amount of data.[12] GDPR violations came with costly penalties.[13] Noted one expert, "The regulation itself is large, far-reaching, and fairly light on specifics, making GDPR compliance a daunting prospect."[14]

In Italy, mobile payment apps were a small but growing segment of the digital payment landscape. Popular digital payment services in Italy included PayPal, PostePay, and Satispay. 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.[15] Over time, PostePay had introduced an app as well. By 2017, 28% of the Italian population—some 17.7 million people—used PostePay.[16] Founded in 2013, payment app Satispay claimed 1.3 million users and a merchant network of 130,000.[17]

"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." Since 2018, use of these payment methods had grown by 109%,[18] but they still comprised just 1.1% of Italy's total 2019 digital spend of €270 billion.[19] And even with the growth of digital payment options, Italians generally still preferred cash, which was used for nearly 70% of transactions in the country.[20]

TelepassPay

It was in this landscape that the TelepassPay service debuted in 2017. Only existing Telepass subscribers were eligible to sign up for the new TelepassPay service. 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 1** for a screenshot). Subscribers opened the app and selected the service they wanted. If they were purchasing a physical item, like a train ticket, it appeared in the TelepassPay app. They then scanned the ticket upon entering the train. If they were purchasing a product, like fuel, they opened the app, selected the fuel station and pump number, and refueled. As 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 **Exhibits 2a** and **2b**). "We are constantly adding services," said Daniele. "The more services on the platform, the more value for the customer." TelepassPay expanded 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 into new cities. Third, it brought new merchants within an existing service category onto the platform. TelepassPay had employed a start-up approach to stay competitive. 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."

Collection and Use of TelepassPay Data

When subscribers 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 job for me." Subscribers who did not agree to this statement could not sign up for TelepassPay. 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."

With the user's consent, TelepassPay used its data to offer tailored 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 transactions. "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 artificial intelligence to understand that they are going to ski. Five minutes after they pass through a toll plaza heading in that direction, the TelepassPay app might send them a notification asking if they want to buy their ski pass through the app and skip the line." 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, in compliance with current rules, saying, 'Click here to book a taxi to pick you up in Rome.' That is the power of a marketplace."

Benedetto believed that an ever-expanding menu of mobility services would lead to increased subscriber engagement, somewhat akin 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, but you have little reason to interact with it. 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*. Benedetto said, "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 Ministry of Transportation database of *bollo auto* payment due dates.[c] 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 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 the opportunity for engagement."

To subscribers, TelepassPay marketed itself as a convenient, simple payment option. User value was TelepassPay's single most important value proposition. But identifying the most effective messaging to attract customers had been a 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." By September 2020, about 8% of Telepass's existing subscribers had signed up for TelepassPay.

For merchants, TelepassPay's value proposition was two-fold. First, the platform's processing fee was significantly lower than that of most credit card companies. Second, TelepassPay was a post-paid system. "When you take a taxi, you don't know how much the total charge will be until the end of the ride," said Benedetto. "One of the main ways people commit fraud in the mobility system is by using pre-paid cards with an insufficient balance. Merchants prefer a post-paid system." An important downside for merchants on the platform, however, was that TelepassPay did not share its data.

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.

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 its subscribers. Selling its data to third-party marketers not only risked violating GDPR, but senior company leaders believed it 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's senior leaders were considering whether they could use Telepass's data to understand subscribers' driving behaviors and offer them customized insurance products.

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[c] 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.

In 2019, Italians spent €16.4 billion on premiums to insure 40 million vehicles.[21] On average, policyholders spent €406 on car insurance premiums in 2019.[22] UnipolSai was the market leader, underwriting 22% of car insurance policies, followed by Allianz (13%), Generali (9%), and Genial Loyd (9%).[23] Most policyholders (66%) secured car insurance in person from a traditional company, followed by an online site (31%), and a bank (6%).[24]

In recent years, the Italian insurance market had seen increased use of telematics, or "black boxes" — devices that tracked a vehicle's travel speed, acceleration and deceleration patterns, and trip frequency to price risk more accurately.[25] By 2020, UnipolSai had installed 4.2 million black boxes in vehicles it insured in Italy.[26] Still, most (61%) insurance policies were traditional, risk-based ones that used a driver's age, gender, driving record, and experience to determine the premium.[27] Only one in five policies was black box-based.[28] Driver concerns about being monitored contributed to 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. "Our tolling and TelepassPay data paint a picture of driver behaviors," he said. "We could use those insights to build tailored insurance products that save our subscribers money. For example, 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 commutes to work every day, the other uses public transportation and drives just once a month." (See **Exhibit 3a** for a sample of Telepass's customer transaction data from June 2019 to June 2020.) "The second man is clearly lower-risk," continued Cervellin, "but a traditional insurer would charge both the same rate."

In June 2019, Telepass had introduced a car insurance brokerage service, selling third-party insurance policies to its customers. To be compliant with regulations, Telepass had created a new, independent, but fully owned company called Telepass Broker to offer this service. 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." In the first eight months of 2020, Telepass had brokered more than 10,000 policies.

For insurers, selling through Telepass Broker was cheaper than many other common customer lead acquisition strategies. For example, insurers often paid Internet search engines for favorable ad placement. "Insurance" was among the most expensive keywords on Google's advertising platform, costing $48.41 on average.[29]

Cervellin believed that he and his team could glean useful insights from Telepass's brokerage data, both to optimize the current brokerage offering and to evaluate the utility of Telepass's data for pricing 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 3b**).

In the short-run, Cervellin hoped to use data on customer behavior across the Telepass ecosystem (refer to **Exhibit 3a**) to better predict insurance product purchasing behavior (refer to **Exhibit 3b**). 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 sell customized insurance products directly to customers who requested products tailored to their needs—moving beyond the brokerage service. But selling insurance directly would mean entering another highly competitive market in direct competition with current Telepass Broker merchants. He was also unsure whether Telepass's mobility data would outperform what was being collected by black boxes. As he merged back onto the highway in September 2020, Cervellin found himself lost in thought.

Exhibit 1 TelepassPay App, 2020
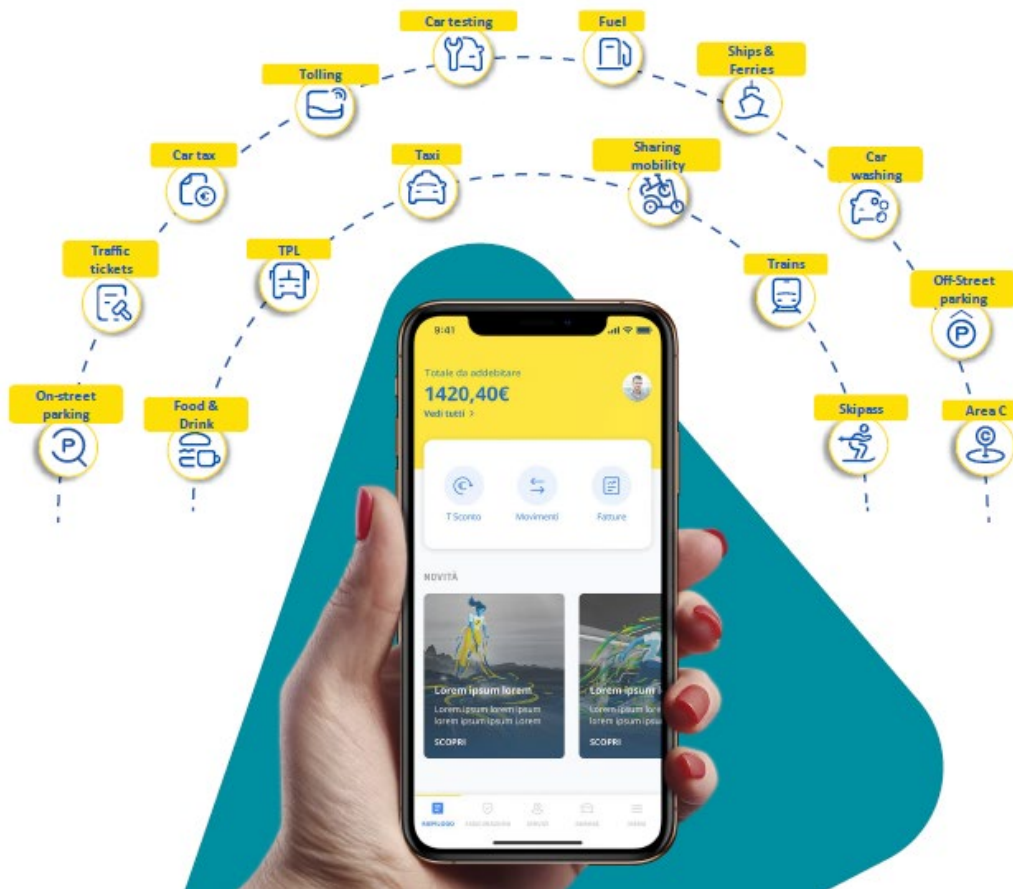
Source: Company documents.

Exhibit 2a   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

Source: Company documents.

Exhibit 2b   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/Towns	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.

Exhibit 3a Snapshots of the Data Dictionary and Sample Data from Telepass and 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 RICA	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.

Exhibit 3b Snapshots of the Data Dictionary and Sample Data from TelepassPay Insurance Quotes, January 2020-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
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
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.

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legal_protection	Numeric	If the quote offers additional legal protection, this variable includes the price for that option. In Euros.
waive_right_compensation	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_sub	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	9/13/2017	12/31/9998
33892	27614	more_than_2	7/25/2017	FIAT - INNOC	FIAT PANDA	7/25/2020	2/9/1996	M	CN	9/12/2017	FA				
34153	1529	more_than_2	12/19/2006	FIAT - INNOC	FIAT PUNTO	10/13/2020	1/8/2000	M		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	VOLKSWAGEN	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			1/15/2016	12/31/9998
22347	24382	more_than_2	7/21/2008	CITROEN	Unknown	6/4/2021			CT	4/23/2013	FA				
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	VOLKSWAGEN	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 MUSA	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	LANCIA 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.

Endnotes

1 Annalisa Girardi, "Who Pays The Most For Traveling On Motorways In Europe?" *Forbes,* December 7, 2018, https://bit.ly/3mF6p5O; both accessed March 2021.

2 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.

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

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

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

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

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

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

9 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.

10 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.

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

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

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

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

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

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

17 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.

18 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.

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

20 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.

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

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

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

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

25 Eamonn Walsh and Vanessa Barford, "The proliferation of the little black box," BBC, October 31, 2012, https://www.bbc.com/news/magazine-20143969; and Marco Falchero, "The Italian Insurance Market," PwC, https://pwc.to/3jndMNd, p. 6; both accessed March 2021.

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

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

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

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