Super Apps: Opportunities and Challenges

by

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ABSTRACT

Super apps are accelerating digital adoption in developing markets with marketplaces that offer a wide range of products and services and mobile payments (QR codes). They bundle many single apps' functionalities and bring them together in one app that works as the umbrella for many services.

This thesis is aimed to help companies to understand the opportunities and challenges created by super Apps. It covers super apps as a concept and how they differentiate from aggregators. It deep dives into business models, payment systems, user experience, mini-programs, and open APIs ecosystems while exploring the super app offering in Asia and Latin America.
It also explores opportunities for super apps in two markets: the elderly and healthcare. These chapters investigate the existing digital offering for the two segments while examining how a super app for this segment would be.

Thesis Supervisor: Michael A. Cusumano
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1. Introduction

In 1998, Nokia, the Swedish telecommunications company, decided to include a small application into their mobile phones so that its users could kill time while queuing at the supermarket or on a train journey. It was the snake, an old video game that had caused a sensation in the seventies. Today, the world of mobile applications is more diverse and complex.

The most developed economies, such as the United States and Europe, have created friendly ecosystems for creating startups, leading to the creation of many new companies that leveraged technology to meet users' needs on different fronts. It is very common to see mobile applications that solve only one need for a demographic segment; for example, there are applications that only serve to create a market list, while other applications simply count the number of calories the user ingests, and others that just show cooking recipes.

But what if there is one mobile application that merges all of these functionalities and adds additional ones? It could suggest a grocery shopping list based on the cooking recipes or foods that the user likes. It could also ensure that the user does not eat more than the necessary calories needed in a day for his fitness goals. Additionally, the user could buy all the ingredients online and get discounts on ride-sharing rides during weekends to go to restaurants that offer his favorite dishes. Well, that is a super App.

Super apps are proliferating across the emerging markets where most users have Android phones with limited storage capacity. Users need to carefully select the few apps they want to keep on their home screen; they should be relevant to their daily lives. They can’t afford to have many single-purpose apps. From Rappi in Latin America to Opay in Nigeria, every Startup working on Super Apps wants to have the same success as WeChat in China.

WeChat, with over one billion active monthly users, started as a mobile single-function app before branching out to other services. Nowadays, it offers shopping, food delivery, ridesharing, bike renting, phone top-up, medical care, flight booking, train tickets, movie tickets, hotels, games, pay utilities, and public services.

This thesis covers super apps as a concept and how they differentiate from aggregators. It deep dives into super business models, payment systems, user experience, mini-programs, and open APIs ecosystems while exploring the super app offering in Asia and Latin America.

It also explores opportunities for super apps in two markets: the elderly and healthcare. These chapters research the existing digital offering for the two segments while examining how a super app for this segment would be.

2. Super Apps

The term "super app" was introduced in 2010 by the BlackBerry founder Mike Lazaridis. He defined it as "a closed ecosystem of many apps" used daily because of their convenience and seamless, integrated, contextualized, and efficient experience.

Super Apps are marketplaces that offer a wide range of products and services. They bundle many single apps' functionalities and bring them together in one app that works as the umbrella for many services. Super apps improve customer experience because they have an unprecedented amount of customer data to offer customized experiences and special deals. They remove the need for logging into different apps, and they save phone space.

However, before going deeper into what super apps are, it is important to understand its predecessor, single purpose or standalone apps, and their importance in the rise of super apps.

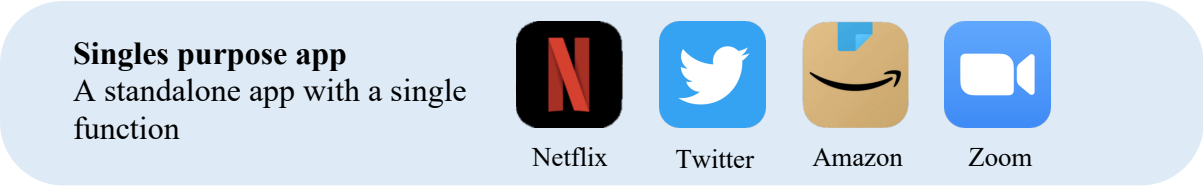

Figure 1. Single-purpose apps

Single-purpose apps are standalone apps with a single function. They usually serve one consumer's need, such as buying online groceries or requesting a taxi, and many of them are available internationally. Take Netflix as an example, the American content platform and production company headquartered in California is available for streaming in over 190 countries. It provides users with a wide variety of TV shows, movies, and documentaries.

These apps emerged from early personal digital assistants (PDAs), through the addictively game snake on Nokia phones, to the first 500 apps in the Apple App Store. The rise of more app stores such as Google Play, the Amazon App Store, and Blackberry's App World into the technology ecosystem accelerated the adoption of single-purpose apps and created new digital business models.

Developed economies, such as the United States and Europe, helped in the creation of new startups that leveraged technology to meet the needs of users on different fronts, kicking off the mobile app boom. Adults in the US spend 88% of their mobile time within apps[1], and

[1] The Majority of Americans' Mobile Time Spent Takes Place in Apps https://www.emarketer.com/content/the-majority-of-americans-mobile-time-spent-takes-place-in-apps

according to a survey done by the manifest in 2018, 21% of Millennials open an app more than 50 times per day, with social media apps dominating as the most frequently used apps (39%)[2].

According to a report done by Google, the average number of finance apps that smartphone users have installed on their phones is 2.5, and 63% of those apps are used weekly[3]. As of February 2021, there were 10,605 financial technology startups in the United States, each of which has at least one single-purpose mobile app solving one or a few user's needs in the financial sector. There are standalone apps for personal banking, retail investments, lending, cryptocurrency transactions, digital wallets, insurance, payments and transfers, and remittances.

There is not a multipurpose app in the financial sector in the U.S that allows users to perform all the functions listed above in one single app. Government regulations, user behavior, and a mature single-app ecosystem in developed markets do not provide a fertile ground for super apps or multipurpose apps to succeed.

Developing countries with cost-conscious consumers and a low but growing purchasing power have relatively recently adopted smartphones. It helped the proliferation and success of super apps across the emerging markets, where most users have Android phones with limited storage capacity. Users can't afford to have many single-purpose apps, needing to select the few apps they consider relevant to their daily lives. Super apps are the right solution to the limited storage phone capacity, the high relative costs of internet data, and the non-evolved local apps ecosystem for developing markets.

The decreasing prices of smartphones have made them more accessible for developing countries[4], making super apps a phenomenon in India, East Asia, Africa and Latin America[5]. A country or a region becomes super app-ready when its large base of the population gives a preference to smartphone instead of desktop (mobile-first mentality).

Super apps started in China with WeChat and Alibaba[6], and due to geographical proximity, the concept emerged in East Asia with KakaoTalk in Korea, Line in Japan and Gojek in Indonesia. Super apps create monopolies in one region and become an array of services such that they become a platform to support all platforms[7]. Instead of growing vertically, creating

[2] Mobile App Usage Statistics 2018 https://themanifest.com/mobile-apps/mobile-app-usage-statistics-2018
[3] The finance app in mobile banking https://www.thinkwithGoogle.com/marketing-strategies/app-and-mobile/app-marketing-mobile-banking/
[4]Are Super Apps The Future? https://www.forbes.com/sites/betsyatkins/2019/09/03/are-super-apps-the-future/#2a713c996fd5
[5] What are super apps, why is India getting another one? https://indianexpress.com/article/explained/explained-what-are-super-apps-and-why-is-india-getting-another-one-6568079/
[6] China Leads Rise Of Mobile 'Super Apps' https://www.spglobal.com/marketintelligence/en/news-insights/blog/china-leads-rise-of-mobile-super-apps
[7] [6] LINE as Super App: Platformization in East Asia https://journals.sagepub.com/doi/pdf/10.1177/2056305120933285

multiple single apps, super apps aggressively expand horizontally and dominate a specific geography.

These do-everything mega-platforms are displacing the smartphone operating system. They usually start as simple apps, offering few services, and extend their offerings over time[8]. Most begin with one function, such as messaging, payments, or ridesharing. And start expanding they offer to the point in which the user does not need to use any other apps, turning this app into an operating system inside the user's Android or iOS.

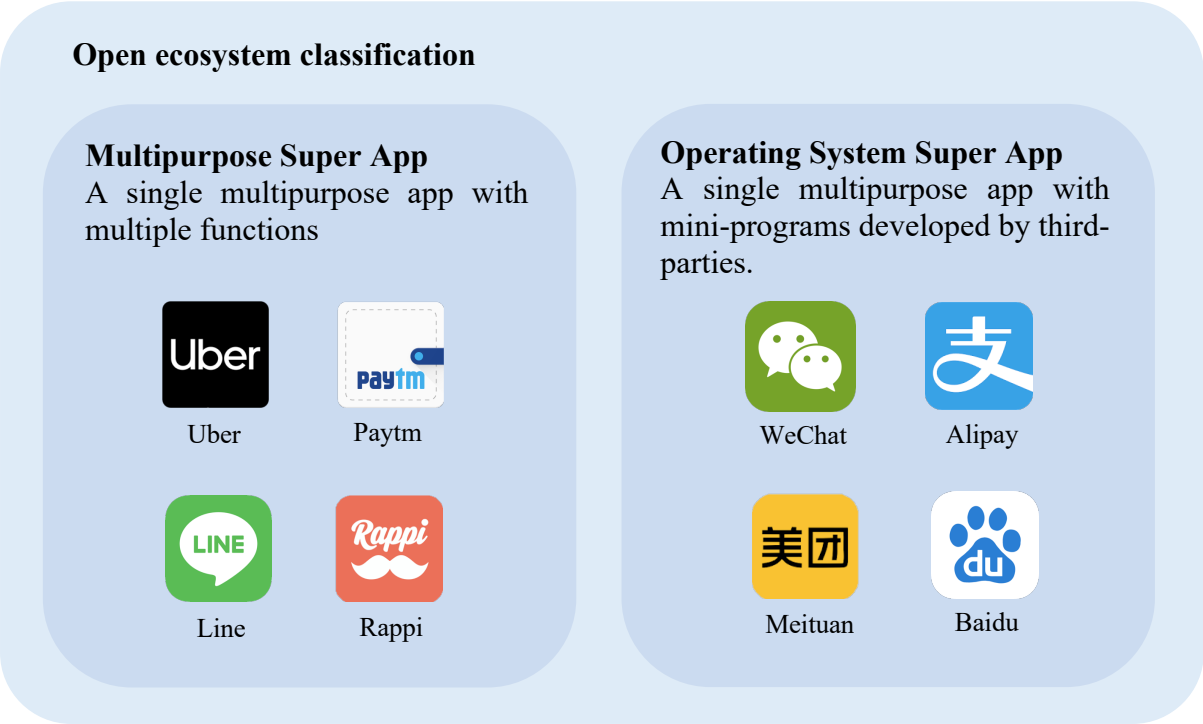

Figure 2. Open ecosystem super app classification

Super apps can be classified into two groups: multipurpose and operating system super apps. A multipurpose super app is a single multipurpose mobile application with different functions or use cases, often facilitated by a core underlying asset shared across functions. Take Grab as an example, the South East Asian ridesharing super app also offers food and package delivery, couriers, freight transportation, electric bicycle, and motorized scooter rental. Another company, Rappi, started as an on-demand delivery app in Latin America, and it's moving toward financial services and online travel booking.

Both companies, Grab and Rappi, are 100% in charge of the software development of the functionalities that go inside its super apps. They are continuously developing new business

[8] What Are "Super Apps," and Which Companies Are Building Them? https://www.maketecheasier.com/what-are-super-apps/

models that are translated into new functionalities and launch them under the same app umbrella backed by their allies such as airlines and retailers.

An operating system super app is a single multipurpose app that runs mini-programs developed by third-parties, often facilitated by a seamlessly integrated payment system. Such is the case of WeChat, which pioneered the concept of mini-programs or apps-within-an-app.

As of today, it has more than 4 million mini-programs with 450 million daily active users (DAU)[9].

There is a second classification for super apps: one-industry or daily life. One-industry super apps refer to single multipurpose apps with most of its functions coming from the same industry. An example of this would be an app that incorporates all the standalone functions of financial single-apps into one platform or supper app.

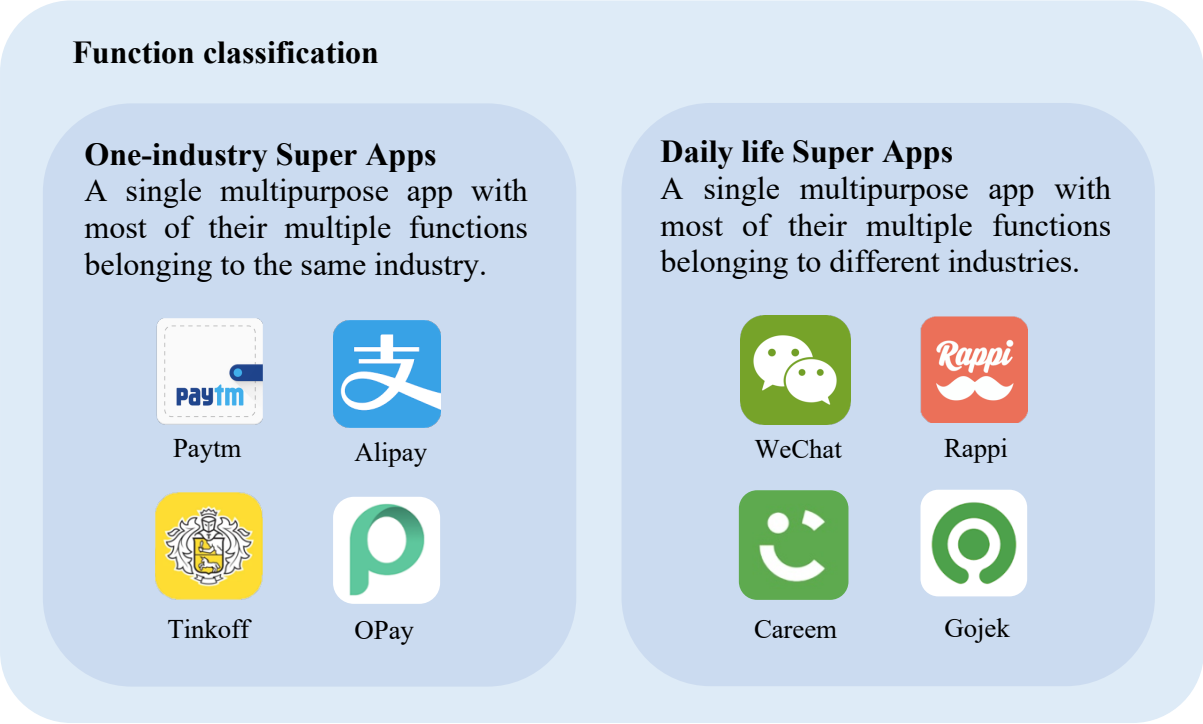

Figure 3. Super app classification by function

Many neobank apps are considered super apps that focus on one industry, the financial. These financial technology firms offer internet-only financial services and lack physical branches; they usually start offering financial services and later increase their offering with supplementary services from other industries. They transition from one-industry super apps to

[9] The WeChat Mini-Program bible https://wechatwiki.com/wp-content/uploads/wechat-mini-program-light-app-report-fabernovel-31ten.pdf

daily life super apps. An example of this is the Russian super app Tinkoff, which started with financial services, and nowadays, it includes hotel booking and movie ticket purchase services.

Daily life super apps offer everything needed in the day-to-day, including grocery shopping, food delivery, ridesharing, medical services, flight booking, gaming, financial services, and everything else we might need in a typical day. WeChat is the largest and most successful app in this category.

There are several benefits of super apps over single apps. First, they pay less for customer acquisition. After a super app has built user trust around its core functionality (ride-sharing, food delivery, messaging), it can add new functionalities to its app without investing too much in advertising. Another advantage is having a bigger picture of the customer, thanks to data sharing between mini-programs and functionalities. Companies that use mini-programs to reach their customers can access user data to improve their marketing. This data is provided by the super app and is collected from the user interactions with the digital platform.

Super apps provide a unique single sign-on, which means users do not need to have one username and password for their food delivery service and a different one for booking a taxi. There is one unique login to access all functionalities and mini-programs. It allows the super app to offer various services with a uniform and individual user experience; this is possible thanks to the user interface standardization and customization based on user preferences.

The last benefit of super apps over single apps is using less memory storage on the user's device. Mini-programs or mini-apps are lightweight apps that run within super apps. These are web-based developments that run inside a native application (the super app). It enables users to access third-party services without leaving the super app or even downloading separate standalone apps.

Benefits of super apps over single apps:

- Pay less for customer acquisition.
- Share data between mini-programs or mini-apps.
- Provide one unique single sign-on.
- Offer a variety of services.
- Offer a uniform and individual user experience.
- Save the memory storage on the user's device

Figure 4. Benefits of super apps over single apps

2.1. Line

LINE is currently the most popular chat app in Japan, with 80 million monthly active users, which amounts to 60% of Japan's entire population. It is the dominant messaging app in Thailand and Indonesia, and it is also available in Taiwan, Korea, Malaysia, and Mexico[10].

The Japanese super app started as a messaging app and moved towards a feature-rich integrated services provider. It announced its platformization plans in July 2012, unveiling services (mostly free), contents (mostly paid), and its currency of payment (LINE coins).

Unlike simple apps, it includes voice calling, video conferencing, live self-broadcasting video service, freemium games, food delivery, taxi hailing, job searching, indoor maps of shopping malls, news hub, music and direct-to-user advertising.

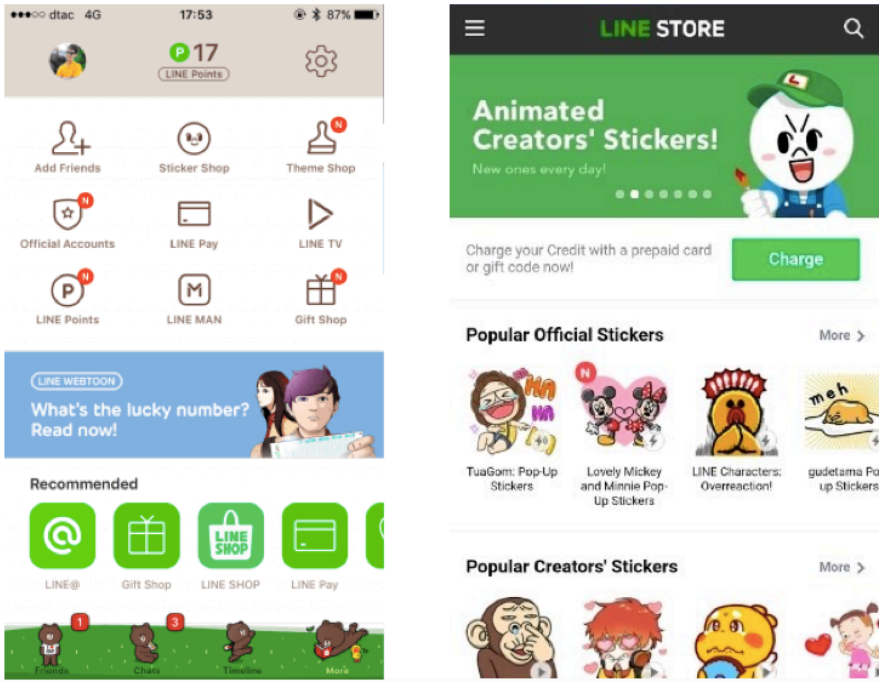

Figure 5. Line Super App[11]

LINE operates as a suite of services, with many features built into the main chat app. Its payment system is the default option in transactions on the app, as well as other online and in-store payments as well. It possesses a strong stickers strategy that is part of their regional appreciation of character culture. LINE gains a significant percentage of its revenues from stickers' sales. Marc Steinberg call this "platformization of cultural production".

[10] Line Revenue and Usage Statistics (2020) https://www.businessofapps.com/data/line-statistics/
[11] Line app https://line.me/en/

As of Q2 2019, 74% of LINE revenue was generated in Japan, and 26% overseas, where 55% came from advertising, 32% from communication/content/other, and the remaining 13% from strategic business[12]. The revenue for 2019 was USD 2.1 billion and USD 1.9 billion in 2018. However, it had annual losses of USD 55 million in 2018 and USD 488 million in 2019, and it was not profitable in 2018 nor 2017.

2.2. Rappi

Rappi, the first Colombian unicorn funded by SoftBank, is a 3-sided platform. It offers value to consumers, couriers (Rappitenderos), and restaurants and grocery stores. It received one billion USD investment by SoftBank vision fund, and it is currently expanding to all of Latin America.

Rappi started as a food delivery and package delivery app and has expanded to other businesses such as travel booking, vehicle insurance, cash delivery, gaming, live events, and bets. Rappi is a multipurpose super app, not an operating system super app, which means it does not offer third-party companies the possibility to develop mini-apps inside their super app; instead, they have created partnerships with big retailers to provide them with an e-commerce inside their platform.

The food delivery service has been very successful in Latin America's largest cities, where heavy traffic, poor public transportation, and geography have helped Rappi grow fast. In 2019, the two cities that topped the list of Global cities with the highest traffic congestion for commuters were Bogota and Rio de Janeiro, with the average person losing 191 hours and 190 hours to traffic each year, respectively.

Also, Latin American wealth inequality and the massive immigration of Venezuelans to their neighbouring countries have helped Rappi to easily attract Rappitenderos (couriers), mostly low-income men, who cannot find formal jobs. Rappitenderos continuously complain about their working conditions due to their low income, lack of social security, little support service, and the cost of their working supplies.

[12] Line Financial statement https://d.line-scdn.net/stf/linecorp/en/ir/all/FY19_QuarterlyReport(IFRS)_2.pdf#page=2&zoom=180,-91,457

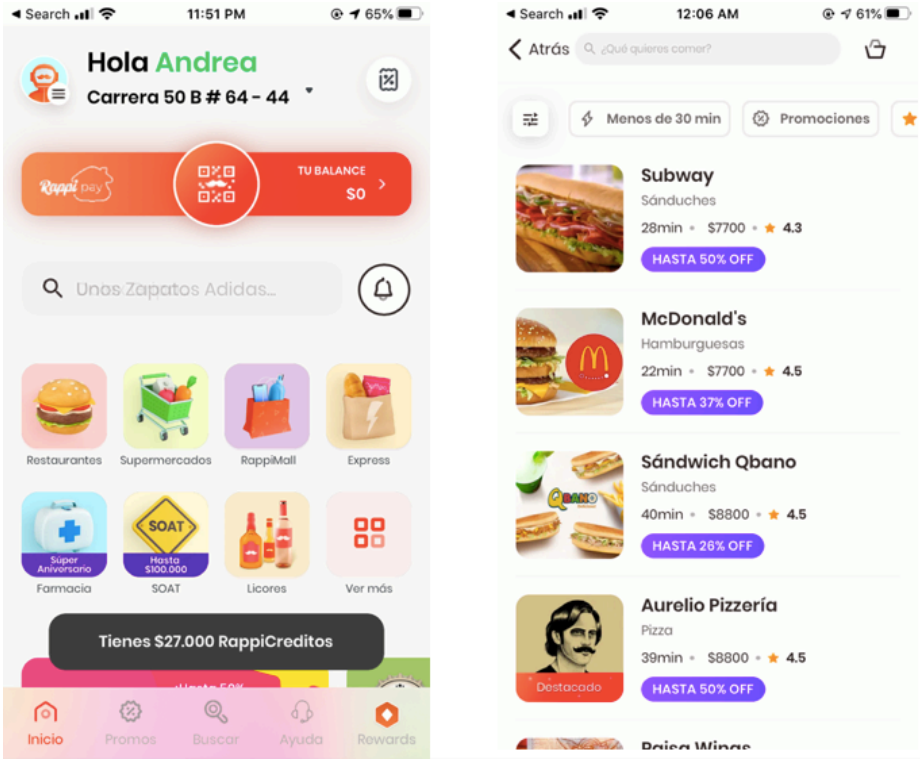

Figure 6. Rappi super app[13]

In 2016, Rappi's revenue was USD$ 1.6 million, and its losses were USD$ 5.2 million. In 2018, its revenue was USD$ 20 million, while the losses were USD$ 42.2 million. And in 2019, the accumulated loss was USD$ 64.4 million[14]. Currently, Rappi has a 1.97% ROE (return on equity); they need to scale fast and grow their business to generate returns comparable to investors' investments in the Startup.

2.3. WeChat

WeChat is a Chinese multi-purpose messaging, social media and mobile payment app developed by Tencent, with over one billion active monthly users. It started as a mobile money single-function app before branching out to other services. Nowadays, it offers shopping, food delivery, ridesharing, bike renting, phone top-up, medical care, flight booking, train tickets, movie tickets, hotels, games, pay utilities, and public services.

[13] Rappi https://www.rappi.com/
[14] A journey into Rappi's accounting https://www.larepublica.co/empresas/un-viaje-al-interior-de-la-contabilidad-de-Rappi-asi-son-las-cuentas-de-la-startup-colombiana-que-se-convirtio-en-unicornio-2884246

WeChat Pay is a daily payment tool used by Chinese consumers around the world with over 800 million monthly active users, providing a smart and efficient payment solution for both consumers and merchants[15].

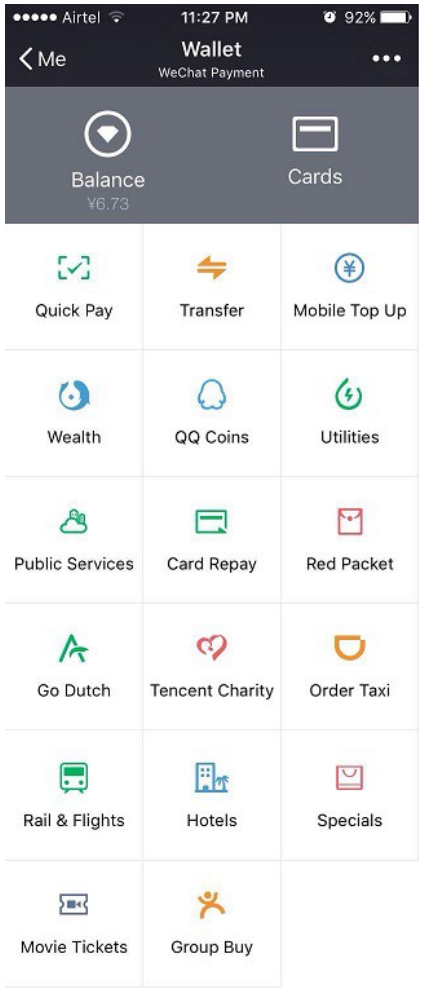

Figure 7. WeChat super app 16

WeChat[16] is an operating system super app; it permits third-party companies to create their mini-programs within the super app. Companies can create an official development account; it enables them to develop their apps and make them available in the WeChat app.

The WeChat APIs and SDK allow developers to access and integrate the native functionalities of WeChat within different types of applications: Native mobile applications, APP Web-based applications powered within WeChat in-app browser, and WeChat Mini-

[15] WeChat website https://pay.weixin.qq.com/index.php/public/wechatpay_en
[16] WeChat https://www.wechat.com/

programs. It is very common for companies in China to offer their services through WeChat, regardless of the industry.

The Chinese airline, China Southern Airlines, has a chatbot to manage its customers' check-in process, and DiDi, the Chinese ridesharing giant, created a mini-app for people to request taxis from the chatting app[17].

Figure 8. China Southern Airlines Chatbot in WeChat 17

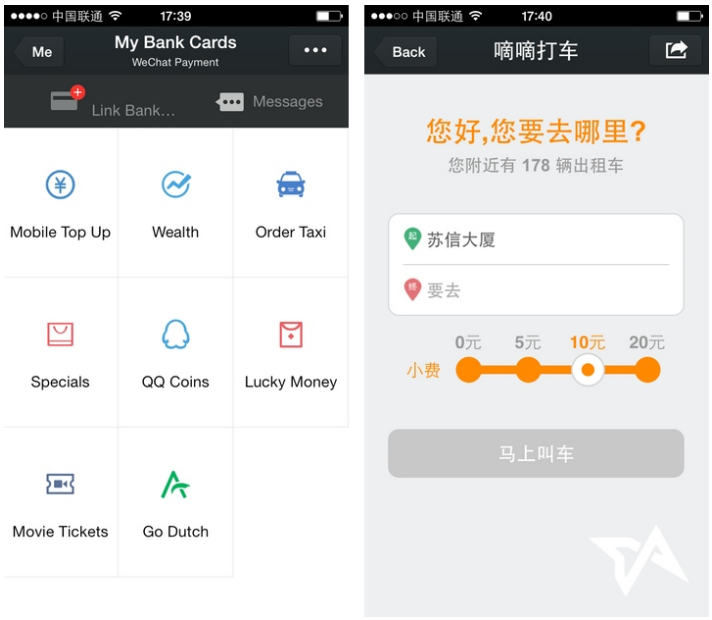

Figure 9. Didi – Request taxi functionality in WeChat 17

[17] WeChat is morphing so Chinese smartphone owners will never have to download an app again https://qz.com/880926/wechat-is-morphing-so-chinese-smartphone-owners-will-never-have-to-download-an-app-again/

The super app has more than 1 million mini-programs[18], covering over 200 various categories, including e-commerce, games, food & lifestyle, news, tools, entertainment & media, and travel & recreation.

Tencent's annual report shows that the WeChat mini-program transaction volume in 2019 was USD 117.8 billion, with a social network revenue of USD 12.2 billion in 2019, and with 21% of Tencent's revenue coming from its social networks WeChat, QQ, and Qzone as of Q4 2019[19] [20].

[18] WeChat mini-programs https://chozan.co/all-you-need-know-wechat-mini-programs/#:~:text=After%20three%20years%20of%20WeChat,media%2C%20and%20travel%20%26%20recreation.
[19] ¥800 billion WeChat Mini-Program Transaction Volume https://walkthechat.com/¥800-billion-wechat-mini-program-transaction-volume-in-2019-tencent-annual-report/
[20] WeChat Revenue https://www.businessofapps.com/data/wechat-statistics/#4

3. Aggregators

Greater access to personal technology devices and the internet helped not only single-purpose apps but also website aggregators to emerge. A content aggregator website is a site that collects data from other sources across the internet and puts the information in one place where users can access it.

Some examples of content aggregator are:

- Job ads aggregator
- Air travel aggregators
- Car rental aggregators
- News aggregator
- Poll aggregator
- Product review aggregator
- Search aggregator
- Social network aggregation
- Video aggregator

The aggregator business model consists of providing access to the offering of particular providers. There is a contract between the aggregator company and the provider for the aggregator company to sell the provider's services under its brand. Since the aggregator is a brand, it provides uniform quality and pricing for all the providers' products and services[21].

Aggregators have different business models depending on the industry they operate in. However, all of them work on the principle of gaining traffic to capture leads for their advertising companies, receiving a commission in return. They are the intermediary between sellers and buyers; the aggregator provides a platform where many sellers expose their products or services. Buyers have access to varied offers from many vendors and have additional tools from the aggregator to help the user in the purchasing decision, such as customer rating.

The buyers find it very convenient to find filters to narrow their searches and find the option that best accommodates their needs or interests.

[21] Aggregator Business Model https://www.feedough.com/aggregator-business-model/

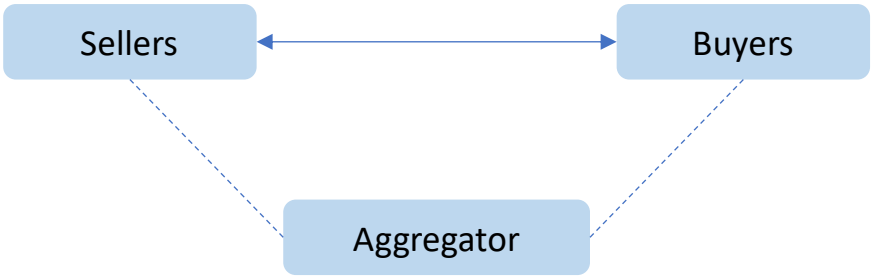

Figure 10. Aggregator ecosystem

Aggregators do not allow companies to develop mini-apps to expose them to their websites; instead, companies can access and expose data from the aggregator via APIs. Expedia, the travel company, offers APIs for availability and rates, booking, and property management. For a company to have access to Expedia APIs, it needs to contact an Expedia connectivity manager to express interest in adding an integration[22].

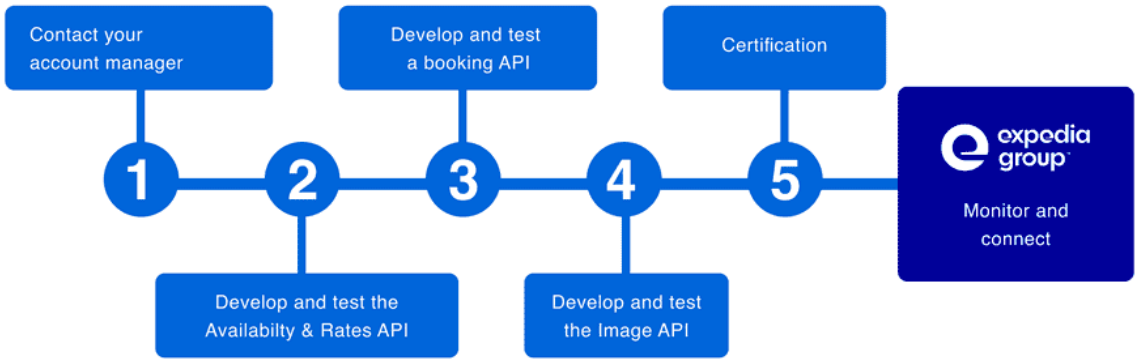

Figure 11. Expedia API Integration overview [18]

3.1. Skyscanner

Skyscanner operates as a website and a mobile phone application. It is a meta-search company offering flights, hotels, and car rentals comparisons. The results screen shows the different booking options for the customer's specific search. The search service is completely free for customers as there are no added fees associated with using Skyscanner's search engine to find the websites to book a flight, hotel, or car rental.

[22] Image API https://developers.expediagroup.com/supply/lodging/docs/property_mgmt_apis/image/getting_started/integration-overview-landing-page/

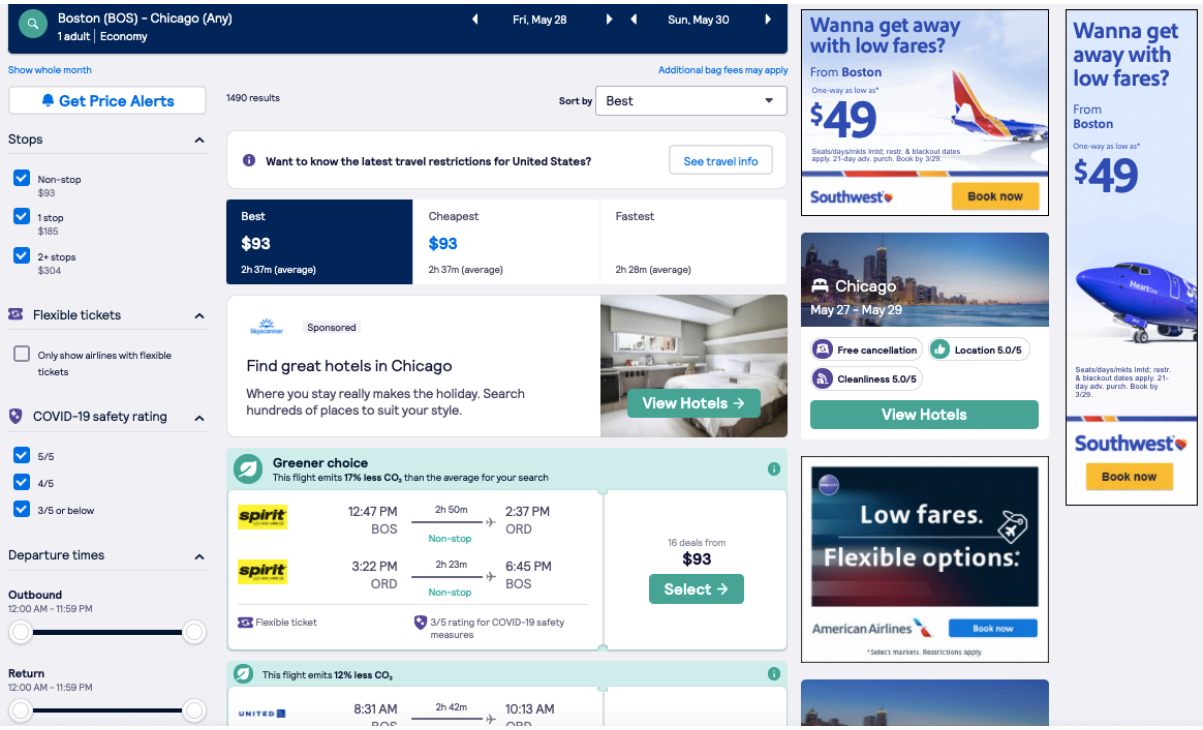

Figure 12. Skyscanner website[23]

Over 1,200 airline and travel partners now connect directly into Skyscanner's flight distribution network. The travel aggregator's primary business model is based on commissions and clicks to book or inquire, where partners (online travel agency and airlines) pay fees for traffic or transactions. If users are brought to Skyscanner by an affiliate partner, the aggregator will share the generated revenue with them, starting at 20%. Also, Skyscanner pays commission on its generated revenue, not booking or basket value. For example, if Skyscanner earned $10 USD revenue from a booking, they will pay a commission to the publisher starting at USD 2[24].

Airlines enjoy the highest volume of sales through Skyscanner. Flights contribute to the majority of Skyscanner's revenue (over 50%), followed by hotel services and car rentals[25].

Skyscanner also offers direct booking for some airline partners; it allows travelers to complete their flight booking process without ever leaving the site. There is a lot of frustration from mobile users with being offloaded to the partner site to secure the booking, and that is why the aggregator wants to move away from the metasearch-only model. Skyscanner's CEO, Bryan Dove, says a marketplace-style platform is a necessary transition for Skyscanner and

[23] Skyscanner website https://www.skyscanner.com/
[24] Affiliate Networks https://www.partners.skyscanner.net/affiliates/affiliate-networks
[25] In order to compete in Asia Pacific's one-stop travel market, Skyscanner reinvented itself from the inside out. https://cmp.smu.edu.sg/sites/cmp.smu.edu.sg/files/pdf/8.AMI_Issue7_Skyscanner.pdf

adds that, in reality, often consumers will not care where the flight is secured, as long as the customer service is watertight, and the ticketing and payment are handled efficiently[26].

The second business is selling data. Skyscanner leverages on the data collected from its operation and sells it as data insights products to airlines such as American Airlines, British Airways, and Vueling. They have access to travel reports, APIs, and dashboards with information from over 100 million travelers a month. Business partners benefit from this data by using it to optimize pricing strategies, plan routes, analyze catchment areas, analyze competitors, anticipate market trends, analyze fares and identify unserved and underserved routes.

The third business model is advertising. The aggregator offers advertising products for travel companies to reach a larger global audience and maximize conversions. Companies can deliver powerful and engaging messages across all travelers' touchpoints.

Finally, Skyscanner is also interested in integrating to third-party applications to show their products outside their ecosystem. Skyscanner Travel APIs connect developers to all the data needed to build an innovative website or app. Including APIs that retrieve the following data: flights browse prices, flights live prices, hotels live prices, localization, places, booking redirects, and referrals.

3.2. Google news

Google News is a news aggregator service developed by Google. It presents a continuous flow of publishers and magazine articles, and it is available as an app and on the web[27]. The news-driven search results generate around $1bn for Google per year, as a direct driver of ad revenue from Google search. Its business model includes subscriptions, promoted content, and ads display within the news app.

[26] Skyscanner pivots from original model https://www.phocuswire.com/Skyscanner-booking-launch

[27] How Google News Makes Money https://www.kamilfranek.com/how-Google-news-makes-money/

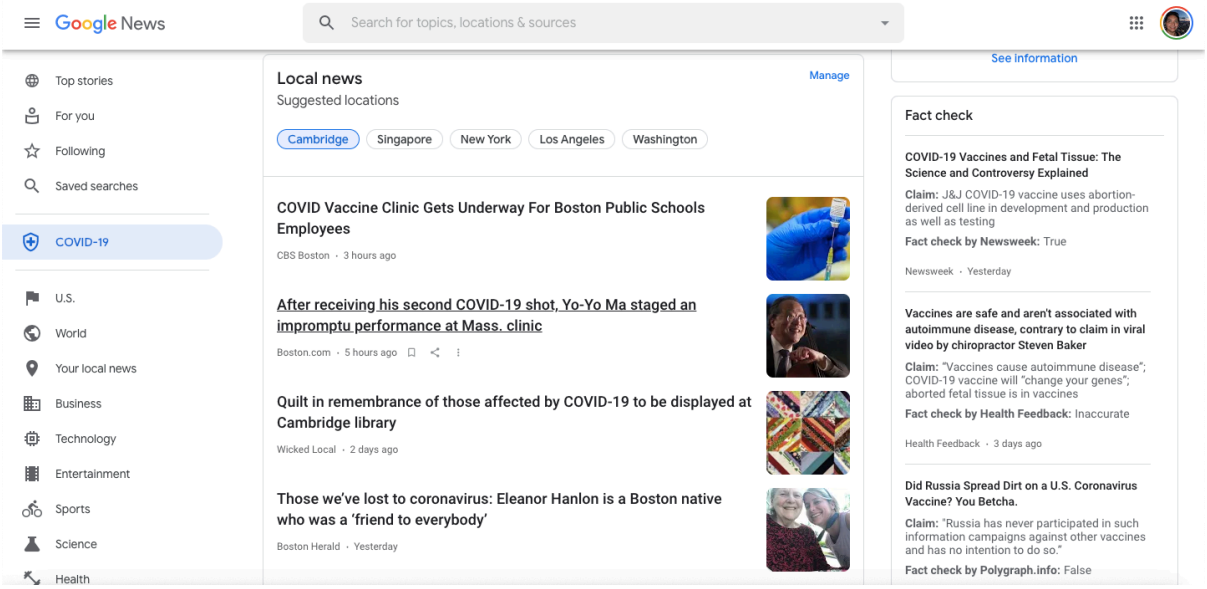

Figure 13. Google news[28]

Publishers engage with Google news users while having prominent branding and monetization opportunities, like advertising and streamlined subscription. Publishers receive benefits by signing up through the publisher center, such as content and branding control, monetization opportunities, and placement eligibility.

The content and branding control helps publishers design, brand, and customize their publication's sections and content in Google News. Publishers can run ads inside their content area in the app to monetize the content. And, publications are independently selected for Newsstand by Google's merchandising team based on promotional timing, quality of user experience, and relevance to the promotional theme[29].

Although, publishers were not always able to monetize their content posted in Google news. That is why Google had to shut down its news website in Spain after a 2014 law required it to pay publishers. In 2020, Facebook announced it would pay U.S. news organizations, which means that the financial balance between tech giants, internet companies, and news organizations might be shifting. The Australian Government now requires Google, Facebook, and other internet companies to pay news outlets and other publishers for the material. Indeed, this will be adopted or at least considered by governments in other geographies.

Google uses AI-powered reinforcement learning technology to keep getting better at understanding each reader's tastes and match them to publishers who best cater to their specific preferences. The company is also using AI to fight against misinformation.

[28] Google news website https://news.google.com/
[29] Appear in Google News https://support.Google.com/news/publisher-center/answer/9607025?hl=en

3.3. Supper Apps vs Aggregators

Aggregators have been on the market the longest and are well adopted all around the world. Each continent has a travel aggregator largely used by everyone in the region, such as Expedia in North America and Despegar in South America. However, the same cannot be said for super apps, which have only triumphed in the Latin American and Asian markets.

Aggregators always focus on one industry, such as Expedia, which offers only travel-related products like flight tickets, hotel accommodations, and car rentals. Indeed, the biggest job ads aggregator, offers only job search-related services, such as company reviews, salary information, and job posting.

On the other hand, super apps offer multiple functions belonging to the same industry or multiple industries. Most super apps are focused on day-to-day needs, meaning they offer services from different industries. Just like WeChat, the Chinese supper app developed by Tencent, it helps people to book a doctor's appointment (healthcare), take a taxi (transportation), apply for a loan (banking), order food (food and beverages), book a flight (travel), etc.

WeChat offers very diverse services and products because it allows third-parties to create mini-programs or mini-apps inside their ecosystem. This is a capability that aggregators do not provide to their business partners; they cannot develop apps or functionalities inside the aggregator ecosystem. The aggregator is the only entity in control of the development of the functionalities offered inside their platform. Third-parties or business partners need to create a business relationship to become part of the network, and then, they could exchange data with the aggregator via APIs.

It is important to mention that not all super apps allow third-parties to create applications within their ecosystems. In most cases, the development of new functionalities within the super app is carried out by the super app itself after entering into a partnership with a company that seeks to offer its services through the platform. Examples of super apps that do not allow third-parties to create mini-apps inside their ecosystem are Uber, Rappi, and Paytm.

Another difference is that super apps tend to be more focused on one geography, so local strategic partnerships become very important. Oppositely, Aggregators target a broader audience, having a presence in many countries or continents. Aggregators are not limited to local partners. Instead, they have representation in several countries.

Super apps can offer more compelling deals at the right time to their users. They can collect data from all the mini-apps and have a complete picture of the user's interest and needs. A super app has information about this user's credit limit, a salary estimation, places frequently visited, preferred restaurants and grocery brands, spending behavior, etc. This help the platform to predict trend and user behavior. The aggregator does not have this advantage because it does not have the capabilities of an operating system that can oversee multiple apps and uses one single-sign-on. The data the aggregator has access to is limited to the industry in which it operates. The business models for super apps and aggregators depend primarily on the industry they focus on. Aggregators' monetization is mainly through business partnerships and exchange of data via APIs. On the other hand, one super app encompasses grocery shopping, food, travel, entertainment, beauty, government services, utilities, medical services, and more—each using a different monetization within the same app using a one payment platform.

4. Deep dive into super apps

It is hard to tell if super apps are going to continue being so successful in the long term. But certainly, they will continue dominating and scaling in the Asian and Latin American markets in the next years. Everyday more countries are embracing a mobile-first culture, the pandemic accelerated the digital solutions adoption, and forced non-digital users to embrace the digitalization.

Companies need to re-evaluate their digital presence and need to invest more than ever before in a data-driven business models. Super apps are native data-driven companies, they can easily bring data insights from transactional data to risk assess loan applicants, to better target financial products to customers. All mini-apps share complete profile from a user, helping super apps to offer more compelling products and services to the user.

After comparing three of the most successful super applications in Asia and Latin America (Rappi, Line, and WeChat) can be concluded that for these do-everything apps to be successful, they need to bring many companies (partners) to their ecosystem. High operating costs make it necessary for super apps to let third parties be part of the ecosystem; it could help super apps to generate additional revenue streams and to (hopefully) become profitable.

4.1. Bundles

Super apps are digital ecosystems bundling multiple functionalities into one platform offering a range of daily services using one payments wallet at the core. Quoting Sidu Ponnappa, Senior Vice President of Engineering at Gojek , “Once you’re handling money for a user, you can build a castle of services”[30].

This castle of services bundles functionalities that are usually found separately in many different standalone apps. Bundling is when companies package several of their products or services together as a single combined unit, often for a lower price than they would charge customers to buy each item separately[31].

Bundled products and services are usually related, but this is not the case for super apps. These platforms have dissimilar items which appeal to one group of customers (most of the

[30] Your Guide to Understanding Super Apps and Strategies for Becoming One https://www.rapyd.net/blog/your-guide-to-understanding-super-apps-and-strategies-for-becoming-one/
[31] Bundling https://www.investopedia.com/terms/b/bundling.asp

time millennials). Super apps do price bundling at the functionality level or mini-app level, which means that they do not bundle a ridesharing ride with a movie ticket. This capability would offer better deals to the user; unfortunately, super apps' mini-programs and functionalities have a siloed behavior.

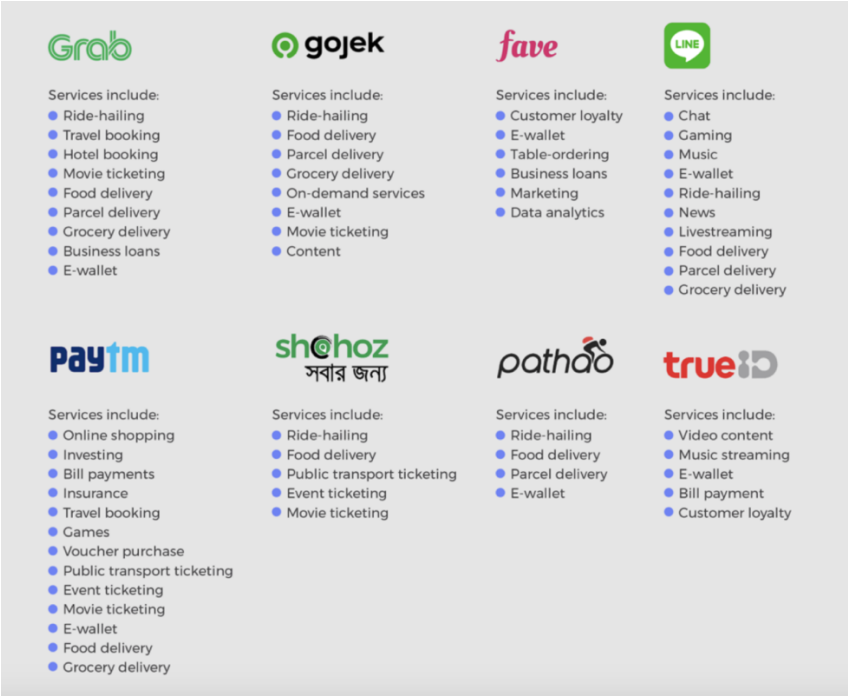

Figure 14. Bundled products and services[32]

The most common example of bundling at the functionality level is food delivery. A restaurant, like McDonald's, sell products separately at individual prices or in packages of products (Big Mac). McDonald's cannot create bundles with other restaurants that offer their products in the same food delivery super app's functionality; they can bundle just their products.

Offering discounts through bundles can stimulate demand, enabling companies to sell products or services they otherwise had difficulty offloading and generate a greater volume in sales. One special consideration about bundling is that many consumers, especially younger people, do not take advantage of it, preferring to buy different items à la carte as needs arise. That is basically the super app value proposition.

Some organizations devise entire marketing strategies based on bundling. In 2020, GrabFood, the leading online food delivery platform in South East Asia and part of Grab,

[32] Understanding Super Apps and Strategies for Becoming One https://www.rapyd.net/blog/your-guide-to-understanding-super-apps-and-strategies-for-becoming-one/

offered exclusive food bundles in partnership with 150 merchants to promote more shared food in the Philippines during San Valentines. Sharing meals is a big part of Filipino culture, so this marketing campaign was very adequate for the timing and culture in which it was launched[33].

Product bundles have lower marketing costs because they promote two or more products with the effort and resources for one. Bundling helps companies to sell their lesser-known, unpopular, or unwanted products with the popular ones. It will also help attract buyers looking for deals, buyers looking for convenience, and buyers looking for advice on items that complement each other. Some consumers will be spending more than they initially wanted when they see something they wanted to try but never got to it[34].

4.1.1. Bundling travelling solutions

One of Google's strategies over the past years has been to bundle their products so customers can get the most value out of their cloud applications. The Silicon Valley giant developed several travel products, including a travel aggregator and a trip planner app. In 2019, Google decided to centralize all its travel products around Google Maps, Google's dominant mapping, and navigation app. It bundled all Google's travel-related functionalities and travel app (Google trips) under the Google Maps brand.

In April 2011, Google launched Google Flights after acquiring ITA for $700 million. The app helps users easily spot the cheapest date to fly to the destination through open-ended searches based on criteria other than the destination[35]. In 2015, Google launched Google Local Guides, a volunteer program launched by Google Maps to enable its users to contribute to Google Maps. Local Guides is a global community of explorers who write reviews, share photos, answer questions, add or edit places, and check facts on Google Maps.

In September 2016, Google launched Google Trips, a trip planner mobile for the Android and iOS operating systems[36]. The app helped users plan for upcoming trips by summarizing info about the user's destination in several categories, such as day plans, reservations, and things to do. The app launched with complete day guides to more than 200 major cities and facilitated locating flight, hotel, car, and restaurant reservations for the trip

[33] GrabFood Promotes Shared Food Moments https://www.grab.com/ph/press/consumers-drivers/grabfood-promotes-shared-food-moments-unveils-exclusive-food-bundles-and-the-first-grabkitchen-in-the-philippines/
[34] The Advantages and Disadvantages of Bundle Pricing Strategy https://price2spy.medium.com/the-advantages-and-disadvantages-of-bundle-pricing-strategy-ce479c66e134
[35] Google Flights https://en.wikipedia.org/wiki/Google_Flights
[36] Google Trips https://en.wikipedia.org/wiki/Google_Trips

based on emails from the user's Gmail. On August 5th, 2019, the app was shut down as part of their centralizing strategy around Google Maps.

In 2019, Google Maps launched an augmented reality feature inside the app; it shows your surroundings and points you to the right street in real-time. It also added offline storage for flights, hotel reservations, and Google Maps monthly recap. Google Maps sends out a monthly recap or timeline update, which uses location history tracking to remember all the places you went each month. This is the same data that the platform uses to create daily tips for your usual commute based on real-time traffic updates. It breaks down the types of places, shopping, food, and drink, etc. It also shows how many miles you walked, drove, highlights of visited cities and places. Google builds individual profiles with demographics and interests and then lets advertisers target people based on those traits.

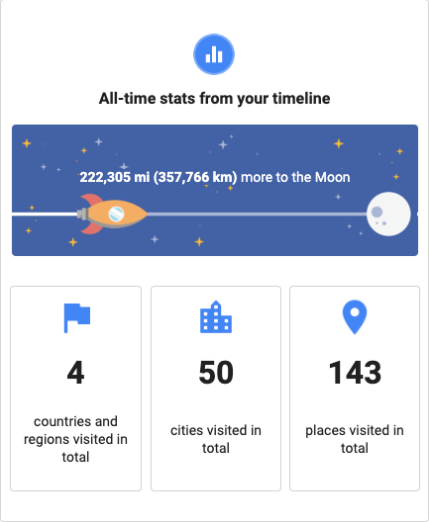

Figure 15. Google maps monthly timeline[37]

Google's bundling strategy helped Google Maps achieve higher earnings by increasing the number of app users, making the platform more appealing to companies that want to advertise on it. Google Maps has over 5 billion downloads, and more than 154,4 million unique users monthly. Google also monetizes the app through Google Maps APIs, companies use the APIs for navigation, tracking, and mapping. It also provides companies a tailored version of the Maps for their applications,

Another company making huge efforts in traveling is Meituan, a Chinese super app for locally found consumer products and retail services, including entertainment, dining, delivery,

[37] Google maps monthly timeline

and travel. Meituan-Dianping, part of China's largest group-deal platform, launched Meituan Travel to offer accommodation, domestic travel, outbound travel, and transportation for the Chinese[38]. Its travel and leisure business have over 240 million active consumers. The company has partnerships with more than 340,000 hotels in China and 200,000 hotels abroad. Meituan bundles the functionalities of many U.S standalone apps into one super app.

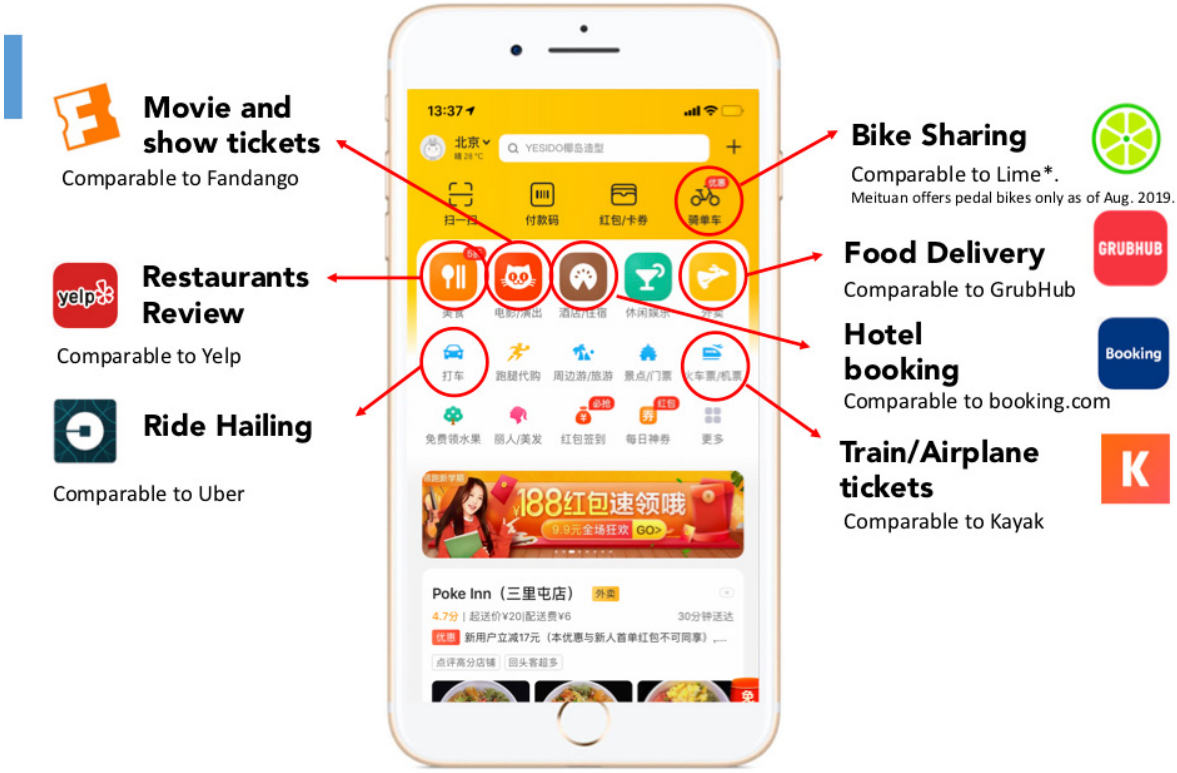

Figure 16. Meituan mobile app functions and its USA app equivalents[39]

4.1. Business models

4.1.1. Core functionality

Every Super App requires a strong core use case or functionality, such as messaging, payments, e-commerce, ridesharing, or food delivery. This is the functionality that they develop, mature, and grow their ecosystem around. Companies which core functionality is

[38] Meituan https://en.wikipedia.org/wiki/Meituan
[39] Mary Meeker's report www.moonshotio.com/2019/06/28/chinese-super-apps-shine-in-mary-meekers-2019-internet-trends-report/

ridesharing are likely to start growing their ecosystem offering services in the same industry, transportation. Grab, Gojek and Uber started as ridesharing companies, and the following functionalities they added were food and packages delivery.

Super App	Main Location	Core functionality	Monthly active users (MAU) (in Million)
WeChat	China	Messaging	1,213
AliPay	China	Payments	785
Meituan	China	E-commerce	290
Gojek	Indonesia	Ridesharing	38
Grab	South East Asia	Ridesharing	125
Line	Japan	Messaging	84
KakaoTalk	Korea	Messaging	45
Paytm	India	Payments	150
Zalo	Vietnam	Messaging	60
Opay	Nigeria	Payments	5
Gozem	Africa	Ridesharing	0.2
Rappi	Latin America	Food delivery	10

Table 1. World's Super Apps

In June 2012, Grab ridesharing app was first launched, two years later it launches its motorcycle service, in 2015 it moves into logistics delivery with GrabExpress, and in 2016 food delivery space with GrabFood.

The following figures correspond to the timelines of three of the most popular ride-sharing super apps, Grab, Gojek and Uber.

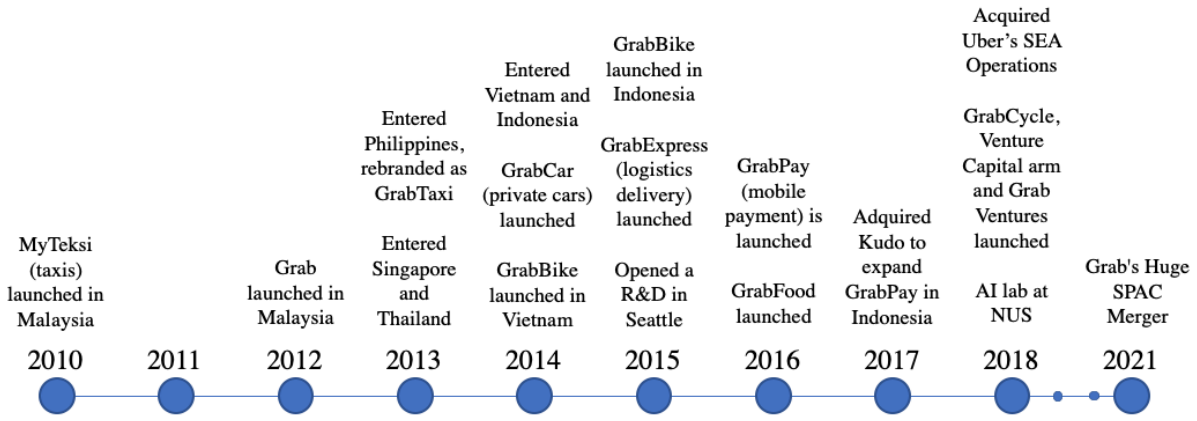

Figure 17. Grab timeline[40]

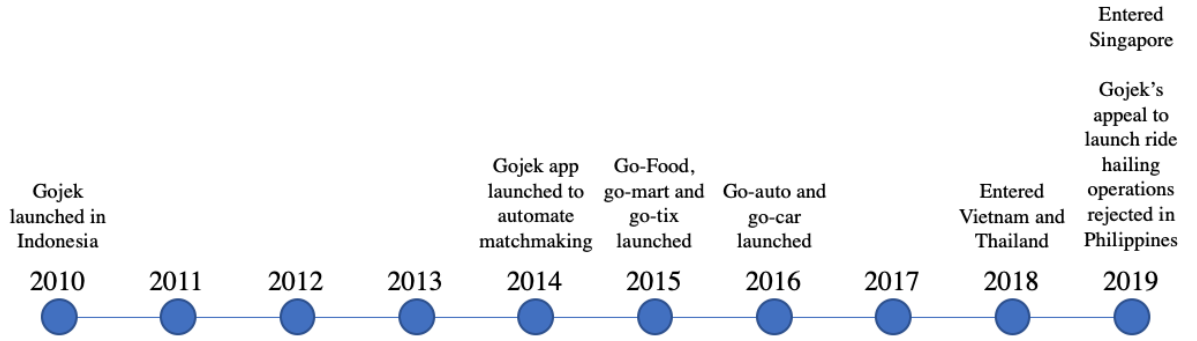

Figure 18. Gojek timeline[41]

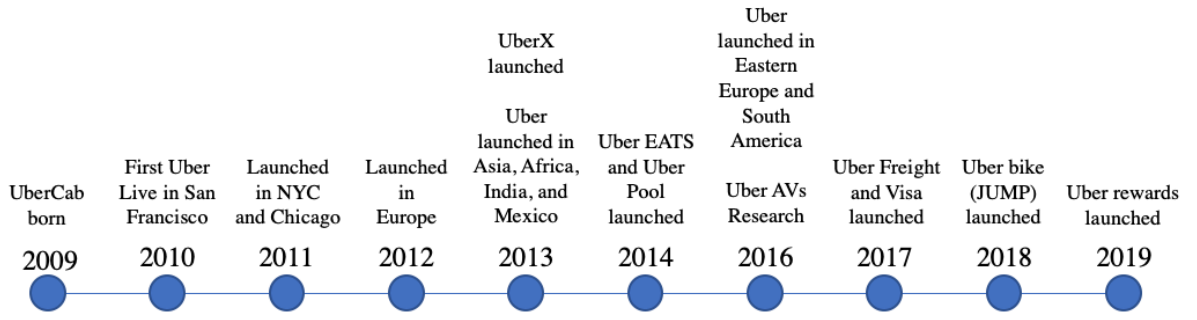

Figure 19. Uber timeline[42]

Uber started in the US, launching the service in the most congested cities of the country, later it expanded to Europe, starting in Paris, then growing outside the western worlds it expanded

[40] How Grab's CEO steered it from a garage in Malaysia to Southeast Asia's most valuable tech unicorn https://www.scmp.com/tech/article/2157177/how-grabs-ceo-steered-it-garage-malaysia-southeast-asias-most-valuable-tech

[41] Scaling In Southeast Asia: Lessons From The Region's Biggest Startups https://www.forbes.com/sites/jonathanmoed/2019/06/21/scaling-in-southeast-asia-lessons-from-the-regions-biggest-startups/?sh=79f9e2df1cff

[42] Uber metrics 3.214.18.196/blog/uber-metrics.php

to Asia, Africa, and India in 2013, and China in 20014. It also expanded from ride sharing to food delivery and freight. Super apps expand not just their functionalities but also the territories in which they operate. Starting in one geography and then moving to other places where the market is similar.

All ridesharing apps have found success and failure with different services and geographies. However, there is a common failure that these apps share, and that is bike-share business. In 2018, Uber said it would focus more on its electric bike and scooter business than on cars and acquired Jump for $200 million. At the time of the acquisition, Jump had 12,000 bikes in 40 cities and six countries[43]. Jump was losing money when it was acquired, even more so than Uber's core ride-hailing business. Today, Uber is sending tens of thousands of its electric Jump bikes to the scrap yards, after offloading the money-losing bike-share division.

Super apps are not the only apps failing in the bike-sharing business. Bike-sharing firms with standalone apps have also failed. In Singapore, indiscriminate parking by users and abuse of bicycles put the brakes on these companies' growth. Ofo, oBike, and Mobike had to exit the Singaporean market, leaving many users scrambling for their deposits to this day.

4.1.2. Scaling outside the core functionality

There is no doubt that financial services are the ones that generate the most profitability, and that is why all super apps want to offer these services. Expanding from their core services to the banking/financial services industry is not easy; it requires a large user base and trust from their users.

Alibaba, China's online shopping market leader, wanted to expand to financial services. That is why it introduced Alipay to improve trust between customers and merchants. The seller would not receive the payment until the buyer confirms that the product was received in good condition[44].

[43] Uber is scrapping tens of thousands of Jump bikes during a nationwide bike shortage https://www.theverge.com/2020/5/27/21271927/uber-jump-bike-scooter-scrap-photos-video-lime-junkyard
[44] Super App Strategy https://agiletech.medium.com/super-app-strategy-how-to-make-a-profit-from-super-apps-e4d1f2c865c2

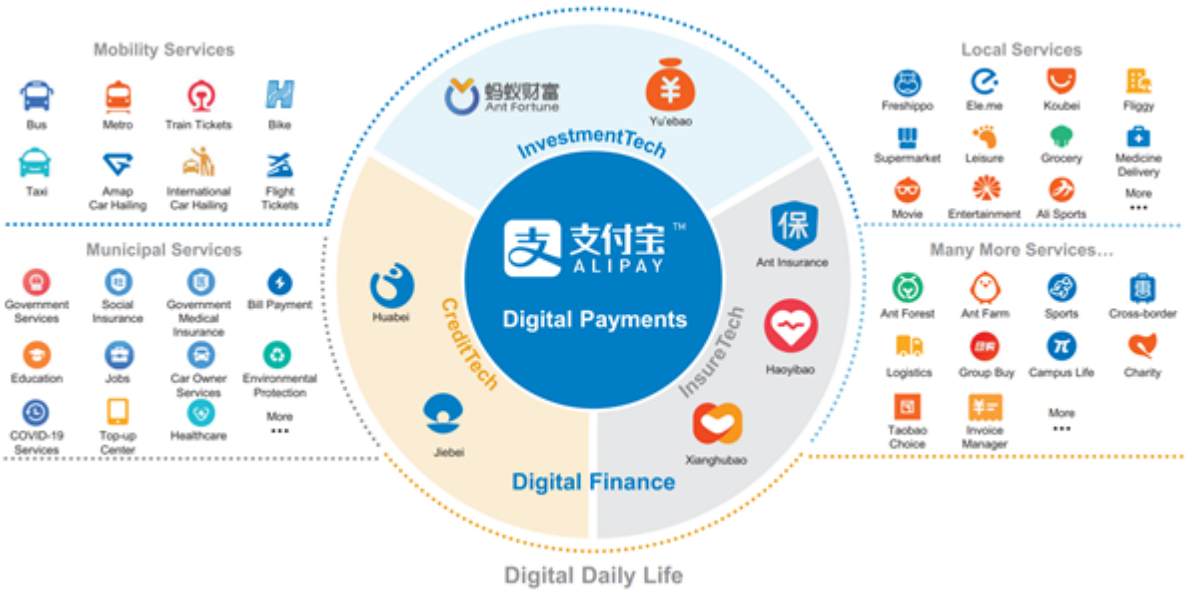

Figure 20. Alibaba's digital payments ecosystem[45]

Alipay has over one billion individual users, 80 million merchants, over 2,000 partner financial institutions, and is synonymous with Ant Group. As of June 2020, Alipay had over 2 million mini-programs, covering all facets of consumers' daily needs, with over 1,000 daily life services. Over 60% of Alipay users come to the app for these daily life services.

On its 11.11 global shopping festival in 2019, Alipay processed a peak of 459,000 transactions per second. In July 2020, Alibaba launched the 7.17 Shopping Festival in China, a nationwide marketing campaign allowing offline merchants to distribute e-coupons. Approximately 7 million merchants participated in this event[46].

Merchants can assess consumers' creditworthiness by accessing Alipay's Zhima Credit score. Customers receive a score based on various factors based on social media interactions and purchases carried out on Alibaba Group websites or paid for using its affiliate Ant Financial's Alipay mobile wallet. Having a high score helps users access Ant Financial's loans and have a more trustworthy profile on e-commerce sites within the Alibaba Group.

Ant Group payments volumes are considerably higher than global large-scale payment peers such as Visa, Mastercard, and Paypal[47].

[45] The World's Largest Fintech Is Going Public https://www.cbinsights.com/research/ant-group-success-obstacles/
[46] Ant Group: How Alipay is driving China's digital payments revolution https://tellimer.com/article/ant-group-how-alipay-is-driving-chinas-digita
[47] Zhima Credit https://en.wikipedia.org/wiki/Zhima_Credit

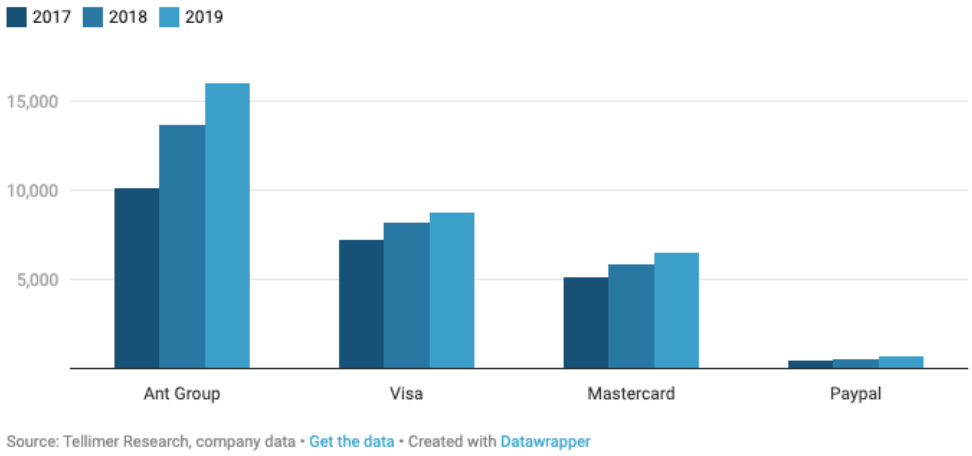

Figure 21. Total payments volume – Global payment platforms (US$bn)[48]

Besides financial services, super apps expand their services to many other industries. The next table lists the services offered by the most popular super apps worldwide:

Service	WeChat	AliPay	Meituan	Gojek	Grab	Line	KakaoTalk	Paytm	Zalo	Opay	Gozem	Rappi
Messaging	✓					✓	✓	✓	✓	✓		
E-wallet	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Invoice payments	✓	✓		✓	✓	✓	✓	✓	✓	✓		
Public transportation	✓	✓		✓			✓	✓	✓	✓		
E-commerce	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓
Travel reservations	✓	✓	✓		✓	✓		✓	✓	✓		✓
E-government services	✓	✓										
Health services	✓	✓		✓	✓	✓						
Insurance services	✓	✓		✓	✓	✓		✓				✓
Gaming	✓	✓	✓	✓	✓	✓	✓	✓				✓
News	✓					✓						
Stickers	✓					✓	✓	✓	✓			
Music	✓					✓	✓					
Food delivery*	✓	✓	✓	✓	✓			✓		✓		✓
Courier services*	✓	✓	✓	✓	✓					✓	✓	✓
Ride sharing*	✓	✓	✓	✓	✓		✓	✓		✓	✓	
Bicycle sharing*	✓	✓	✓		✓							
Gig economy*												

Table 2. Services offered by most popular super apps worldwide

[48] Ant Group: How Alipay is driving China's digital payments revolution https://tellimer.com/article/ant-group-how-alipay-is-driving-chinas-digita

Super apps create partnerships with other companies to expand their current offering; some also allow third parties to develop mini-programs inside their ecosystems. This openness enables the super apps to expand their services to any industry.

Companies also see a great opportunity in creating partnerships and mini-programs inside the super app ecosystem. Gaming companies in India have already started publishing limited and downsized versions of their games as mini-programs in super-apps. Paytm, India's first super app-in-the-making, built a solid gaming consumer base that rivals some of the most prominent players in the industry over the coronavirus pandemic. The digital payments leader counts over 80 million registered users currently and 20 million monthly active users in its gaming unit, with a 200 percent growth rate in its user base in the first half of 2020.

Figure 22. Paytm first games ad in India[49]

The kickoff of the IPL (Indian Premier League) cricket event in the middle of the pandemic helped boost and create interest in fantasy sports, which helped Paytm drive the highest traffic on First Games[50]. The IPL 2020 season was expected to push its user base to over 100 million, with 40 million MAUs, according to statistics revealed by Paytm First Games.

Rappi, the Colombian unicorn, and food delivery app launched Rappi Travel, confirming its status as a Super App. Rappi Travel is a new service that allows customers to

[49] Paytm IPL ad https://paytmfirstgames.com/blog/play-ipl-fantasy-cricket-league-and-win-cash-daily/
[50] Paytm's mission to becoming India's first super-app is paved with gaming now https://yourstory.com/2020/11/paytm-first-games-superapp-indian-fintech?utm_pageloadtype=scroll

reserve flights to any destination through the Rappi app. Its customers have access to exclusive discounts and travel insurance, tourist trips, car rental, and more.

The Colombian unicorn also launched RappiBank, which offers bill payments, purchases, and loans. Their financial services are now available in Colombia, Mexico, and Peru and will soon be available in Brazil.

4.1.3. Partnerships and acquisitions

Super Apps do not build from scratch all the different services they offer. They are aware that partnerships are the key component for future growth, and they see themselves as facilitators (intermediaries).

Grab strategy has been focused on partnering with the best service providers to add their services onto its platform[51]. Grab adds partners through a curated process to keep the quality of their customers' experience at a high level. The partnership are two ways, they do not just look for partners to integrate their services into their super app, but also expose their services for partners to offer them in their platforms. Airline partners can incorporate Grab ride-sharing service through the Rides API into their website, allowing customers to book airport pickups as they schedule their flights, as well as e-commerce partners who integrate GrabPay as a payment method[52].

Service	Partnership/in-house/acquisition
Hotel bookings	Grab partnered with Agoda and Booking.com to allow users to compare prices and book hotels and apartments.
Healthcare	Grab formed a joint venture partnership with China's Ping An to provide integrated medical services such as consultation, medicine delivery, and appointment bookings through an online platform.
Financial service	Grab has acquired several startups to expand their services, especially in the financial sector. Most of it acquisition aim to strengthen the former's grip in the digital payments sector in South East Asia.

[51] Super App Strategy: How To Make A Profit From Super Apps https://agiletech.medium.com/super-app-strategy-how-to-make-a-profit-from-super-apps-e4d1f2c865c2
[52] Planting a thriving forest https://www.techinasia.com/planting-thriving-forest-partnerships-key-grabs-superapp-vision

In May 2017, Grab acquired Kudo, Indonesia's leading Online-to-Offline (O2O) platform. Kudo enables digital entrepreneurs (agents) across Indonesia to become the gateway for unbanked & less tech-savvy customers to the digital ecosystem. Kudo's extensive agent network across more than 500 cities in remote towns and rural areas of Indonesia enables customers to transact and pay online for the first time in their lives. Kudo offers a wealth of services through partnerships with various merchants and suppliers, ranging from cell phone top-up, bill payments, online shopping, and digital payment services.

In 2018, Grab acquired Indian payments startup iKaaz to strengthen its payments platform and Vietnamese mobile payment firm Moca to strengthen its presence in the digital payments sector in Vietnam. IKaaz' technology spans across areas like NFC, QR-code, audio-based payments, bill payments, online payments, and peer-to-peer transactions.

In 2020, Grab acquired Bento to bring retail wealth management and investment solutions to its ecosystem of users, driver-partners, and merchant-partners. Bento is planned to be rebranded as GrabInvest, and its products will be available in South East Asia, with Singapore as the first market.

As you may already noticed, super apps require substantial investments to grow their ecosystems. Many super apps have already reached the status of unicorns. Some examples are Grab, Gojek, WeChat, Uber, and Rappi.

Grab and Gojek have fierce battle for South East Asia; both companies have raised significant investments over the past years. Gojek has a valuation of $5B and has run 11 funding rounds and Grab a valuation of $12.2B and has run 33 funding rounds.

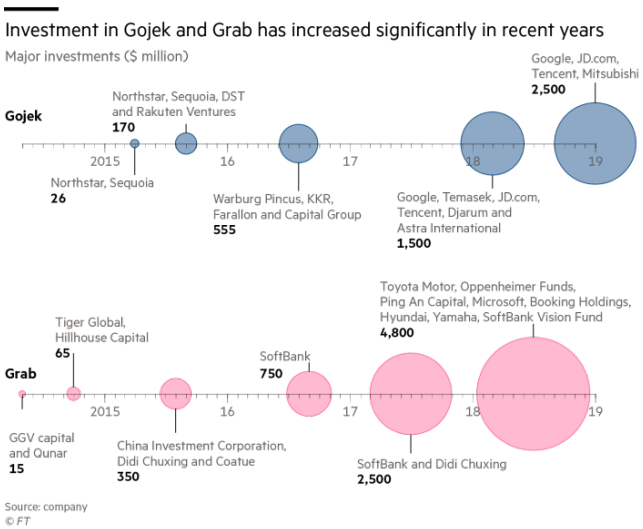

Figure 23. Investment in Gojek and Grab has increased significantly in recent years[53]

[53] Grab v Gojek : inside the tech battle for south-east Asia https://www.ft.com/content/04e0523c-2256-11ea-b8a1-584213ee7b2b

4.1.4. Digital business models

Super apps' digital business models are not different from a traditional digital business model. A super app merges the functionalities of many standalone apps using; each functionality or mini-program has a different purpose and business model. The following table shows the most common digital business model and the super app services that use them.

Digital Business Model[54]	Description	Super apps service
Free	Companies offer a product or service free of charge. Examples: search engines and social. Monetization is easier to achieve once users have become accustomed to the product or service.	Messaging Invoice payments Public transportation E-government services E-wallet
Freemium	Companies make a product or service with limited functionality available free of charge and try to persuade the user to subscribe to a paid subscription within these free services. This allows for customer acquisition with minimal advertising. Spotify, for example, offers its music streaming service for free with advertising. If users opt for the premium service, they can listen to music and download music for offline use without advertising breaks.	Gaming Music News Stickers

[54] Digital Business Models https://venture-leap.com/2020/10/29/digital-business-models-an-overview/

Digital Business Model[54]	Description	Super apps service
On-demand	Companies provide services for consumer to access or use at their own pace and according to their own schedule. Netflix, in particular, has made this model popular. Our favorite movies can be accessed on the platform at any time. Services such as Uber or Lyft also use the on-demand model and have thus revolutionized public transport.	Music Games Food delivery Ride sharing Bicycle sharing
E-commerce	Online marketplaces offer various providers a central platform for offering products and services at competitive prices. For each sale, the e-commerce platforms then earn a commission. A successful online marketplace scores points with its users with various factors such as reliability, buyer protection or free delivery.	E-commerce Travel reservations Insurance services
Advertising	Companies offer ad space on their sites, generating money from the number of visitors who see or click on them.	News Food delivery E-commerce
Subscription	Instead of buying a product or service once, customers pay a monthly or annual fee for regular use.	Food delivery Ride sharing Bicycle sharing
Peer-to-peer (Two-sided marketplace)	A P2P network is a decentralized platform where two parties participate in a transaction. Users can use the platform to buy or sell goods or services	Food delivery Courier services Ride sharing Bicycle sharing

Table 3. Digital business models

4.1.5. WeChat B2B model

A company that wants to access WeChat large user base needs to create a WeChat Official Account. WeChat Official Account (OA) is a China-based marketing platform that acts as a complete brand hub to gather followers; it sends them targeted content, push-notifications and redirects them to a website or e-commerce[55].

There are two types of WeChat Official Accounts: WeChat subscription account and WeChat service account. The WeChat subscription account's primary purpose is to share information and content with customers; it helps companies to produce high-quality content and push it on a high-frequency (daily) basis. The WeChat service account's primary purpose is to provide after-sales services, access to tools to sell online, and send push notifications to users (order information, booking information, etc.)[56].

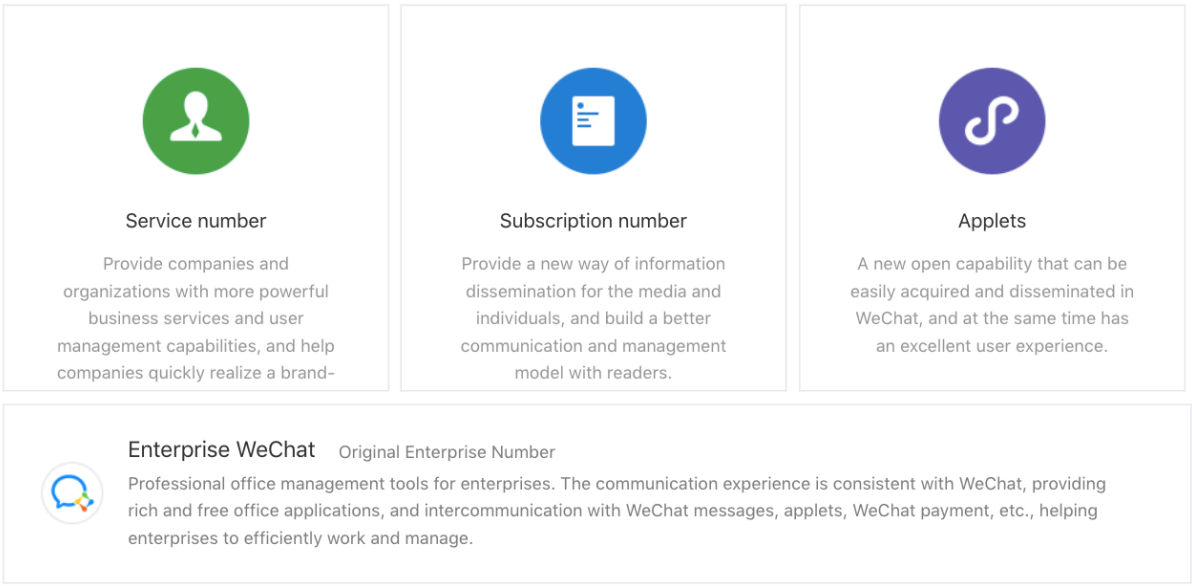

Figure 24. WeChat account types[57]

While subscription accounts and service accounts target external markets, WeChat enterprise accounts are primarily for internal communication and management. This makes this type of WeChat official account similar to Slack and Workplace by Facebook[58]. Finally,

[55] WeChat Official Accounts: an epic guide https://wechatwiki.com/wechat-resources/wechat-official-account-marketing-platform-epic-tutorial-guide
[56] WeChat Subscription vs. Service Account https://wechatwiki.com/wechat-resources/wechat-official-account-type-subcription-service/
[57] WeChat Account classification https://mp.weixin.qq.com/?lang=en_US
[58] The Ultimate Beginner's Guide to WeChat Official Accounts for Business https://www.dragonsocial.net/blog/beginner-guide-wechat-for-business

WeChat applets, or mini-programs, are apps that can be used on WeChat without need to be downloaded or installed.

It is free to sign-up for a WeChat Official Account, but companies need to pay to verify the newly created Official Account. A local WeChat Official account would have to pay 300 RMB (46 USD) per year and an overseas account 99 USD per year.

4.1.6. APIs

Over the past few years, companies have adopted API strategies to monetize their services outside of their ecosystems, and to consume services and data from business partners. An open API is a publicly available application programming interface that provides developers with programmatic access to a proprietary software application or web service[59].

APIs help super apps grow their user base by enabling them to offer their services through third-party applications. In southeast Asia, companies can provide Grab's on-demand ride service through their apps, which means Grab's ridesharing functionality can be offered through any third-party application.

On the other hand, super apps consume third-party APIs to extend their offering by providing access to services from third parties. That is how Grab can offer Citibank loans from their app. Qualified customers who meet Citi's lending criteria can seamlessly apply for a loan from Citi through the Grab app, with flexible repayment options ranging from 12 to 60 months at attractive rates to help them manage their personal finances[60].

Other Grab APIs offered to third-parties include:

- Food APIs: Restaurant business can integrate their POS system with GrabFood.
- Delivery APIs: Integrate GrabExpress with an ecommerce to access to the largest fleet of drivers in Southeast Asia to deliver goods to customers.
- Payments APIs: Enable users to add a variety of payment methods to their GrabPay wallets.
- Identity APIs: Provide a secure and easy way for users to log into your app or website using their Grab account.

[59] Open API https://en.wikipedia.org/wiki/Open_API
[60] Citi Launches First Lending API Partnership With Grab in Asia Pacific https://www.citigroup.com/citi/news/2020/201221a.htm

- Loyalty APIs: List your service in the GrabRewards catalogue.

APIs provide super apps to reach more customers through third parties, access new customer data, and monetize their services. The industry that has developed the APIs business model the most has been the financial industry through open banking. Since all super apps seek to expand into the financial sector, it is worth checking out traditional bank's open banking strategies (Open APIs for banking).

4.1.6.1. Open banking

Currently, much of the success of companies in the financial sector is due to partnerships created with third parties. Digital ecosystems that fulfill diverse user's needs not just through financial services but also through non-financial services offer greater value to customers by providing an all-in-one experience.

Open banking is also known as open bank data. It is a banking practice that provides third-party financial service providers open access to consumer banking, transaction, and other financial data from banks and non-bank financial institutions through the use of APIs (application programming interfaces)[61]. Open banking strategies help traditional banks and neobanks expose their services and products into business partners' third-party applications, helping them reach a larger number of users.

One of the leading financial institutions in open banking is the Singaporean bank DBS. They currently have over 150 APIs available for business partners and developers, which can experiment and test new features in DBS's API sandbox. These are some of their open APIs[62]:

API	Details
Cards	Enables customers to apply for a new debit card
Deposit	Generates list of deposit accounts, including the details retrieval of savings, multiplier and multi-currency accounts.
Loans	Enables your customers to instantly evaluate their eligibility for the purchase of a home - and powers up the loan application.

[61] Open Banking https://www.investopedia.com/terms/o/open-banking.asp
[62] Discover APIs https://www.dbs.com/dbsdevelopers/discover/index.html

API	Details
Public Information	Offers quick access to DBS' public information such as on DBS ATMs, branch details and articles. It also features e-appointments with the branch.
Bill Payments	Enables customers to settle payments electronically to credit cards, loans and other billing organizations authorized by the bank.
Fund Transfer	Allows customers to transfer money to their own account, third-party accounts or external accounts.
Payees	Provides payee management functionalities such as adding new payees, retrieving payee details, and retrieving registered payee lists.
Rewards	Empowers customers to instantly redeem their DBS points as a form of payment, providing a more seamless and efficient way to burn their points.
Transaction Analytics	Presents insights on customer spending patterns, money movements such as total spending on categories, monthly totals and more.

Table 4. DBS Open Banking APIs

Open APIs help banks and non-financial institutions to reach a larger audiences, and develop new business models.

4.2. Strong payment ecosystem

Digital payments are key to the success of super apps because they facilitate the introduction of services while ensuring that users stay within the super app ecosystem. Each service offered by the super app uses the same payment system, offering consistency and convenience. Users do not have to set up their payment information for each individual service because the information inside the platform is shared, which means that e-commerce, ride-hailing, and food delivery use the same payment system and user profile.

It is not surprising that the two more used digital payment applications or digital wallets in China correspond to their two most popular super apps, WeChat and Alipay. Also, it can be observed in the figure below that super apps can overperform banks' financial products. UnionPay, a traditional financial services corporation headquartered in Shanghai, has been relegated to third place. Its payment product UnionPay's QuickPass falls behind the super apps. None of the four largest banks in China matches the popularity of Alipay and WeChat Pay.

Figure 25. Mobile payment usage in China[63]

Super apps want money to stay inside their ecosystem; that is why they try to fulfill every possible user need through their functionalities and mini-apps. However, money is still circulating in physical stores and external e-commerce, making it essential for super apps to offer payments at physical commerce. WeChat and Alipay support different payment scenarios such as in-store payment via QR-codes, in-store payment via NFC, and payments in e-commerce websites and apps.

[63] Profiling "Lifestyle Super Apps" and mobile payments in China
https://www.paymentscardsandmobile.com/profiling-lifestyle-super-apps-and-mobile-payments-in-china/

Overview of popular payments apps in China

	Payment features/apps	Alipay	WeChat Pay	UnionPay's Quickpass
Payment methods	E-wallet account balance	●	●	
	Money market fund balance	●	●	
	Unsecured credit	●	●	
	Linked debit/credit card	●	●	●
Payment scenarios	Supports in-store payments via QR codes	●	●	●
	Supports in-store payments via NFC[2]			●
	Supports payments on e-commerce websites/app	●	●	●
In-app payment use cases	Person-to-person transactions	●	●	●
	Ride-hailing	●	●	
	Order groceries	●	●	
	Bill payments, mobile top-up	●	●	●
In-app financial services	Wealth management	●	●	●
	Loans	●	●	●
	Insurance	●	●	
Other in-app features	Check bank account/credit card balance			●
	Mini programs (access third-party apps)[3]	●	●	
Domestic network	Users (million)[4]	711	800	300
	Merchants (million)[4]	80	50	29
	Financial institution partners[5,6]	2,000	NA	1,500
International network	In-store payment in countries outside Mainland China	50	64	61
	Currencies supported	27	24	NA
	Financial institution/payment solution partners	250	NA	NA

Data compiled Aug. 27, 2020.
NA = not available
[1] WeChat Pay represents the digital wallet embedded in Tencent's WeChat app, the local version of which operates as Weixin in mainland China.
[2] UnionPay supports contactless payments via mobile devices from Huawei, Xiaomi, OPPO, vivo, Apple, Samsung and Meizu at UnionPay-accepted merchant stores.
[3] Mini programs are lightweight apps of third-party companies that function within WeChat and Alipay apps, covering hundreds of services for app users.
[4] WeChat Pay had more than 800 million monthly active accounts and 50 million active merchant accounts at the end of 2019. Alipay had 711 million monthly active users and 80 million merchants as of June 2020. UnionPay's registered users reached 300 million in August 2020.
[5] Alipay works with more than 2,000 financial institutions, including banks, insurance companies, asset managers and licensed payments providers.
[6] UnionPay has ties with more than 1,500 financial institutions to support mobile payments in China and overseas.
Sources: Company websites and disclosures

Table 5. Overview of popular payments apps in China

Zalo, the most popular messenger app in Vietnam, has more than 100 million users worldwide and has been trying to promote the use of QR codes in Vietnam. Since many already use Zalo for messaging, it is easy for users to adopt ZaloPay, Zalo's mobile payment application with use cases for daily life and business needs. ZaloPay joined the growing list of Vietnam's super apps. The super app includes features such as bus routes, weather information, airline tickets, health information, book medical examinations, pay utilities bills, and Zalo Shop to purchase commodities online.

Notwithstanding Zalo's success, it is not the most used e-wallet use in Vietnam. A study made by Hanoi Times showed that consumers tend to have multiple e-wallets. Momo, another super app, is the most popular e-wallet in Vietnam with 68% of the market. Momo and Zalopay are mostly used for mobile top-up, and money transfer, while Airpay is the preferred e-wallet for online payment (shopping and food delivery), followed by Viettelpay and Zalopay.

The report found the highest motivation to use mobile payments were convenience and promotion. One of the strongest factors that triggers the usage of mobile payment are promotions, being the top preferred promotions: cash back (66%), point accumulation (49%), and discount percent based on transaction amount (46%)[64].

4.2.1. Digital financial adoption

Daily life super apps offer different payment options and methods that depend on the country's culture and digital financial adoption. Unwillingness on paying online is a huge entry barrier for digital ventures launching new online applications with no physical presence. In some countries, many do not feel comfortable sharing their credit card details, and that is why cash options are still important.

This sub-chapter will focus mainly on Colombian online buyer behavior, including my experience launching an online e-commerce during the 2020 Christmas season. The majority of Colombians (93%) access the Internet through smartphones, spending most of their time on search engines and social networks. Social media messaging channels play a crucial role in the online purchase decision; this is how buyers interact with sellers.

Internet use among the population over 15 years of age continues to grow, with 82% using it every day and 14% using it at least once a week. The adoption of e-commerce is not yet very high, with only 2 out of 10 people making purchases and payments online.

In December 2020, I launched an e-commerce website of custom paint by number kits in Colombia, it included a direct chat to WhatsApp. Only 8% of the sales did not involve a conversation on WhatsApp, the remaining 92% included a conversation on WhatsApp. The most frequently asked question was about the price, indicating that people interested in the products would rather start a WhatsApp conversation with the seller than navigating through e-commerce to find the information they were requesting.

Another interesting finding was related to the preferred payment method. Many people were reluctant to pay online because they did not want to provide credit account information on a new e-commerce website, which led to most money transactions taking place over peer-to-peer bank transactions.

During one month, I rented a booth inside one of the most popular malls in Bogota, which helped me increase my online sales during that period. A physical location increases the

[64] Consumers in Hanoi use more multiple e-wallets than in other locations http://hanoitimes.vn/consumers-in-hanoi-use-more-multiple-e-wallets-than-in-other-locations-survey-314449.html

prospects' confidence because they can corroborate the existence of the online store; it also gives them peace of mind to know that there is a physical place to visit in case of a claim, refund, or guarantee.

Several people asked about the possibility of paying 50% up front and the other 50% when receiving the product. Current e-commerce platforms do not offer this option; this could be an interesting feature to implement in countries like Colombia, where many people do not trust new e-commerce. In this model, 50% could be paid at the time of purchasing the product, and the other 50% is automatically debited when the logistics provider (a third-party) confirms the delivery of the product at the buyer's address. Rocketfy is a Colombian startup that competes with Shopify in the region, and their most significant differentiator is their payment collection on delivery.

Super apps and e-commerce platforms need to adapt their payment options to the countries where they operate. In May 2015, Uber broke from its tradition of only accepting payment via card by piloting a cash option into the app's payment options in Hyderabad, a city in India with nearly eight million people. Following its success, they extended the choice to four more cities in India, completing a billion rides by the end of the year. By 2016, Uber offered the cash payment option to over 150 cities, and in 2018, this number grew to over 400. Now, riders can choose cash in 51 countries[65].

If super apps want their user's money to circulate inside their ecosystem, they need to adopt additional payment methods. In Colombia, where the majority has not embraced online payments, there are other options for retailers to get money flowing into their ecosystem. These are the most common payment methods in Colombia:[66]

25% Cash on delivery (house or office)
24% Pagos Seguros en Línea (PSE) - clients pay online, directly from their bank accounts
21% Cash payment at collection point
21% Credit card online payment

Pagos Seguros en Línea (PSE) is a payment solution that works as an interface for the consumer during checkout. With this option, clients can pay directly from their bank accounts. The buyer is redirected to PSE, and the e-commerce does not collect credit or debit card information[67].

[65] Uber Cash https://www.cashmatters.org/blog/everything-you-want-to-know-about-uber-cash-and-cash/
[66] Medición de Indicadores de consumo del Observatorio eCommerce https://www.observatorioecommerce.com.co/wp-content/uploads/2019/03/estudio-consumo-ecommerce-colombia-observatorio-2019.pdf
[67] It is time to reach more online buyers in Colombia https://business.ebanx.com/en/colombia/payment-methods/pse

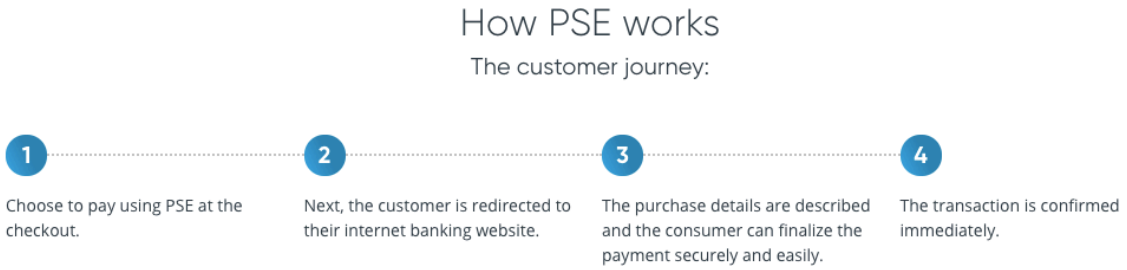

Figure 26. Pagos Seguros en Línea (PSE) Customer Journey[68]

For people who do not want to make a monetary transaction online, there is the option of payment in cash at the collection point. This practice is widespread in Latin America; people receive a code from the e-commerce to make the payment in a shopping center, supermarket, or convenience store. The physical commerce notifies the electronic commerce that the customer has already made the payment, and it proceeds to send the product to the customer. This is how it works for the vendor:

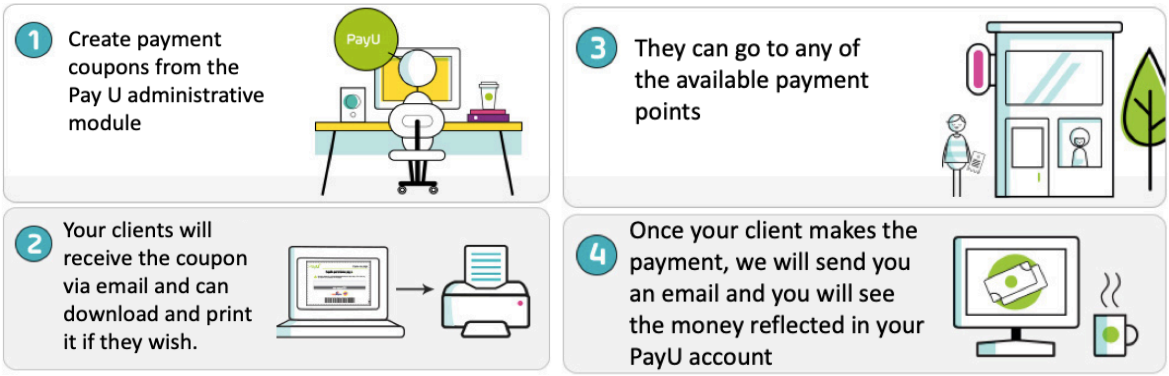

Figure 27. PayU Customer Journey[69]

4.2.2. In-chat payment feature

WhatsApp has 2 billion active users worldwide, and it is ranked as the most used mobile messenger app in the world. Latin America is one of the strongest market regions for WhatsApp, it facilitates daily communication and has practically replaced SMS. One reason for WhatsApp popularity in Latin America is iPhone's low market share.

[68] Pagos Seguros en Línea (PSE) https://business.ebanx.com/en/colombia/payment-methods/pse
[69] Payment coupons developers.payulatam.com/es/solutions/payment_coupons.html

In 2018, WhatsApp released WhatsApp Business, which helps small businesses with their business presence on WhatsApp. It includes quick replies, label and tag contacts and chats, and showcase products and service with a catalog.

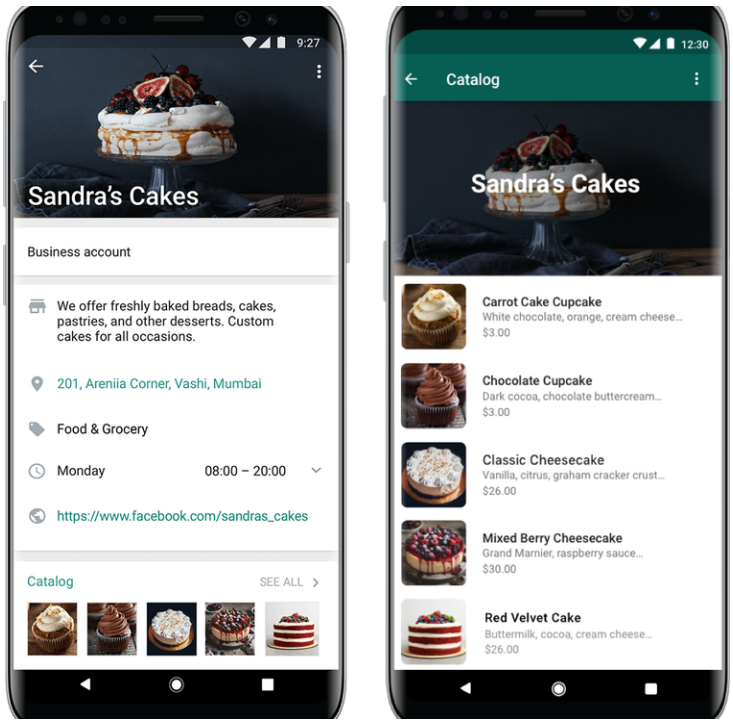

Figure 28. WhatsApp Business product catalogue[70]

It is a natural step for WhatsApp to transition from a static content catalog to allow payments. In March 2021, WhatsApp Pay was allowed in Brazil after being delayed due to anti-competitive concerns. WhatsApp announced in 2020 the rollout of a new feature that lets users transfer money through the messaging app, just like Apple Cash. However, it was pushed back in the country due to anti-competitive concerns and later was authorized in 2021.

WhatsApp Pay has not been rolled out in other countries; today, WeChat has managed to achieve a $7 average revenue per user (ARPU), that is 7X the ARPU of WhatsApp.

[70] WhatsApp Business Catalog Feature https://www.guidingtech.com/whatsapp-business-catalog-feature/

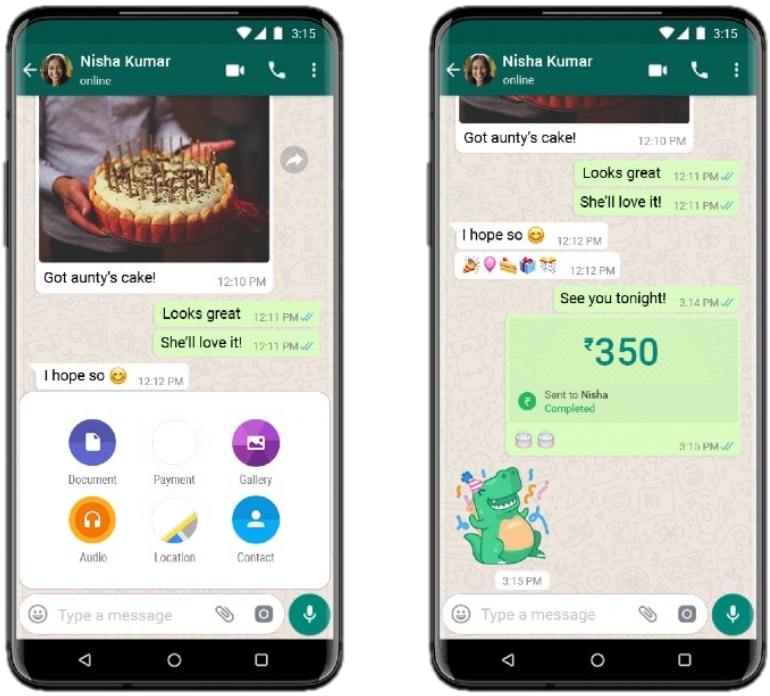

Figure 29. WhatsApp Pay[71]

4.3. Mini-apps or mini-programs

Mini-programs or mini-apps are lightweight apps (smaller than 10 megabytes) that run within super apps. WeChat introduced mini-programs in January 2017, allowing users to access third-party services without leaving WeChat or even downloading separate standalone apps. By allowing third-party companies to create their mini-programs, Tencent was able to rapidly scale up the use cases of its app without directly venturing into other lines of business[72].

Mini-programs running in most popular Chinese platforms focus on the major services provided by the super app. WeChat mini-programs focus on mobile shopping, mobile games, and offline services, different from Alipay mini-programs, which focus on traveling and transportation.[73].

[71] WhatsApp Payments: How to Send and Receive Money gadgets.ndtv.com/apps/features/whatsapp-pay-india-launch-payment-update-apk-feature-how-to-send-money-2321769
[72] Mobile payments, mini-programs are key features of Chinese super apps https://www.spglobal.com/marketintelligence/en/news-insights/research/mobile-payments-mini-programs-are-key-features-of-chinese-super-apps
[73] The WeChat Mini-Program Bible https://wechatwiki.com/wp-content/uploads/wechat-mini-program-light-app-report-fabernovel-31ten.pdf

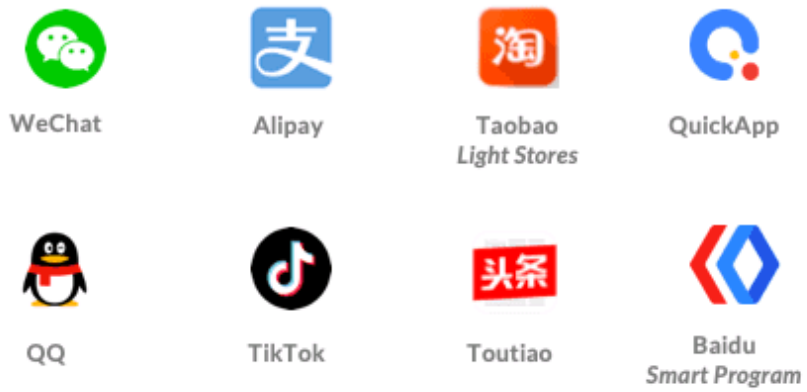

Figure 30. Chinese mini-program platforms[74]

WeChat allows third-party companies to develop mini-programs providing advanced features to users that can run within the WeChat app. Some of the advanced features are e-commerce, task management, coupons, games, utility, transportation, and news. Chinese companies from all industries offer their services and products through mini-apps. One of these companies is the shared-bike company Mobike, which has a mini-program to enable users to locate bikes, unlock them, and top-up their account:

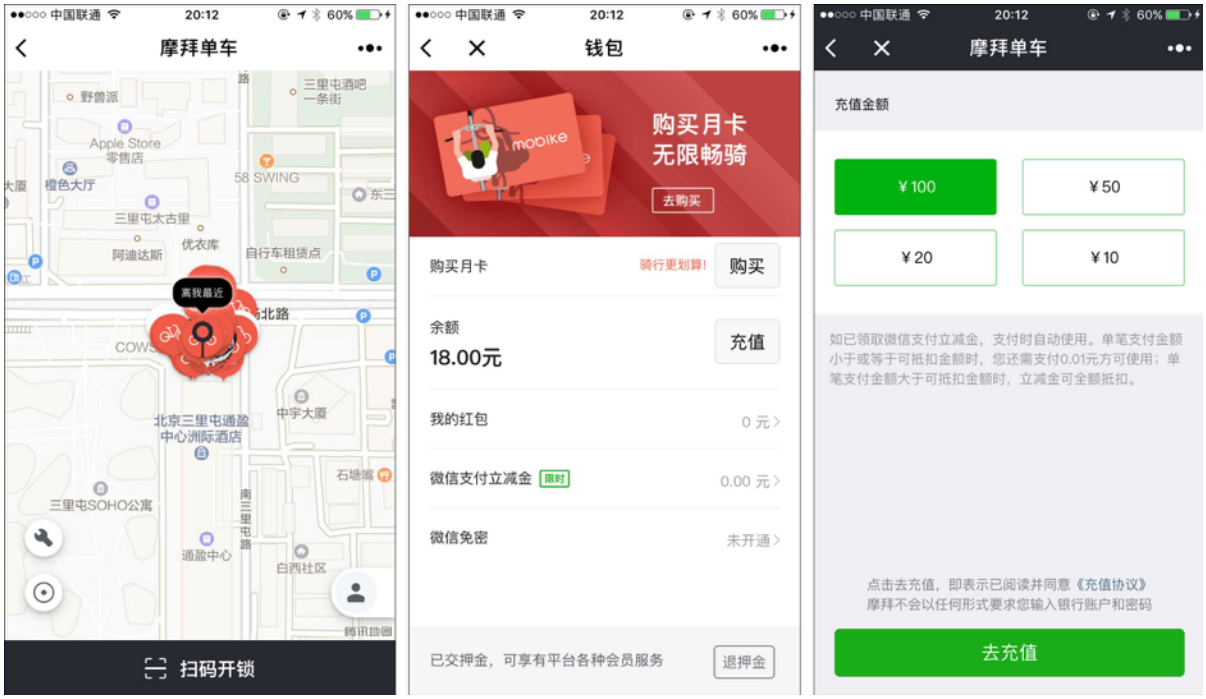

Figure 31. Mobike mini-program[75]

[74] In China, Mini-Programs Turning Super Apps Into App Stores? https://seekingalpha.com/article/4389259-in-china-mini-programs-turning-super-apps-app-stores
[75] What are WeChat Mini-Programs? A Simple Introduction https://walkthechat.com/wechat-mini-programs-simple-introduction/

Another example is Tesla's mini-program, it enables users to locate charging stations, schedule a test-drive and share their experiences about driving a Tesla car[76]:

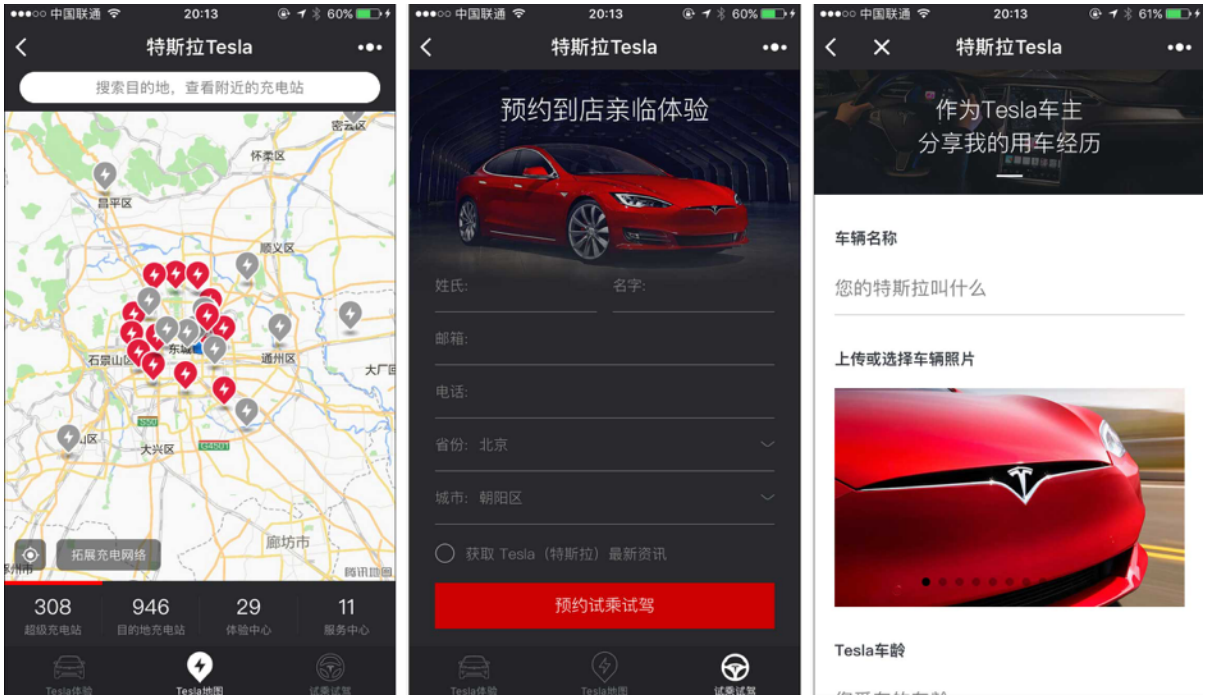

Figure 32. Tesla mini-program

The following graph shows WeChat's most popular mini-programs categories:

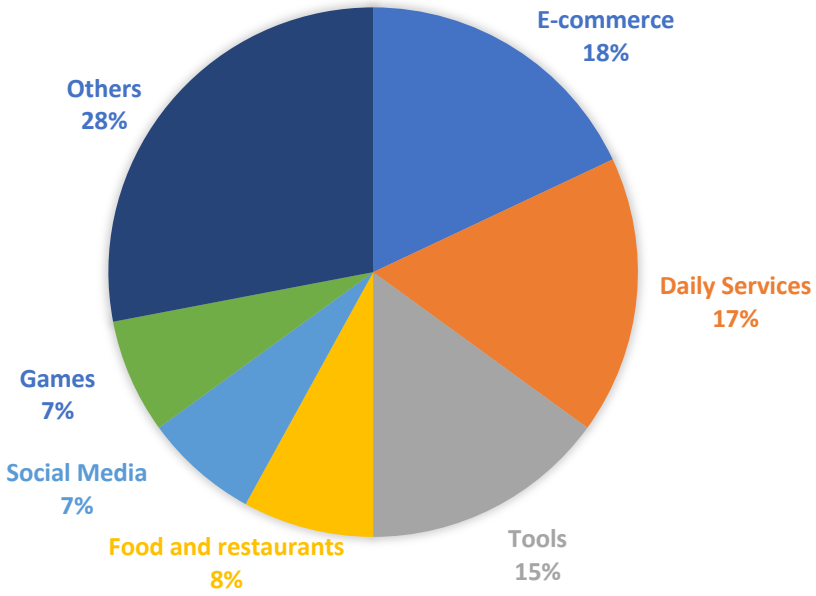

Figure 33. WeChat's most popular mini-programs categories

[76] What are WeChat Mini-Programs? A Simple Introduction https://walkthechat.com/wechat-mini-programs-simple-introduction/

For a company to publish a mini-app or mini-program inside WeChat, it needs to be a Chinese company or individual or have a Chinese entity. At this time, overseas companies and non-Chinese individuals can only open either a WeChat official service account or a subscription account, neither of which will allow them to develop mini-programs or games.

Mini-apps developers have access to the WeChat API & JS SDK documentation. WeChat mini-programs and games need to be reviewed by WeChat's team for approval, and the process usually takes from one to three days. The same laws and content restrictions that apply to native apps in China also apply to WeChat mini-programs and games[77].

Payments in mini-apps are completed within the hosted app. Alipay Mini-apps run on top of Alipay Native App, a hybrid solution of web and native. Alipay mini-program relies on web technologies as CSS and JavaScript, and integrates the functionalities of Alipay Native App as payment, credit service, face authentication, etc.[78]

Thanks to companies like sxl.cn is becoming easier for companies to create mini-apps inside super apps; they offer toolkits that allow users to create websites and mini-programs for WeChat, with no need for professional technical knowledge or design experience.

4.4. Usability and user experience

Creating the user experience of a super app brings more challenges than that of a single app. The super app seeks to reach a population segment greater than that of a single app, while a loan single-app seeks to reach SMEs and students, a super app tries to reach the entire population of the country with its varied offer of services.

Super apps try to reach out many demographic segments at once, people 16 and above, female and male, different income levels, bank, and unbanked population, different education levels, and people in different life stages. So, how to offer a unique user experience that works well for all segments? This is a hard question to answer. Indeed most super apps are just successful within the younger population.

It is important for super apps to reflect the culture of the society in which they operate. Each culture places different value on different design elements, they also absorb content in different ways, due to cultural perspectives. Interface design can be significantly affected by geographical and cultural factors. People from different cultures hold different assumptions

[77] How and Why To Develop A WeChat Mini-program or Game www.appinchina.co/services/wechat-miniprograms/
[78] MiniApp Standardization White Paper https://www.w3.org/TR/mini-app-white-paper/

and values, and they vary in their perceptions and cognitions. For example, U.S users tend to infer common features and rely on categorization, while Chinese users are much more responsive to relation and contexts[79].

Nequi, a Colombian neobank, uses everyday language to make its financial products easy to understand and intuitive for everyone. Traditional banks use financial terminology that is complex and non-intuitive, especially for millennials and the unbanked population. The financial app was started with a strong focus on young people and their relationship with money; over 80% of Nequi's customers are under 40 years old. The team's initial question was: What would be the new relationship of young people with money?. The team used design thinking methodologies to understand the user deeply and launched the Nequi app in 2015. The team found out that the traditional banking language was not easy to understand for most people. Hence, they created an easy to understand language that mimicked interaction with everyday objects.

Financial education is at the heart of Nequi, its simple language helps users feel more comfortable using the app financial services. Nequi's home screen is called "wardrobe", it is a place where a user can find everything; all the services and products available are displayed on this screen. The user can select the products and services from the wardrove and put them in his backpack, a customized screen with the most important products or services for each user. Users can also create pockets for the backpack; these separate the money for different expenses (rent, education, groceries, etc.). Finally, users can save money under the mattress, referring to saving money for future significant investments. The expression "under the mattress", is very common in Spanish-speaking countries, recalling an old and frequent practice caused by a lack of trust in banks. This friendly language is not just embedded in the design, but it is also part of their marketing strategy. One of the most popular blogs on their website suggests movies that help people to manage money, such as the pursuit of happiness and the godfather[80].

[79] Study on WeChat to improve user experience for Chinese older adults
https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=8901&context=etd
[80] https://metidasdeplata.nequi.com.co/2017/10/19/seis-lecciones-la-plata-nos-ensena-cine/

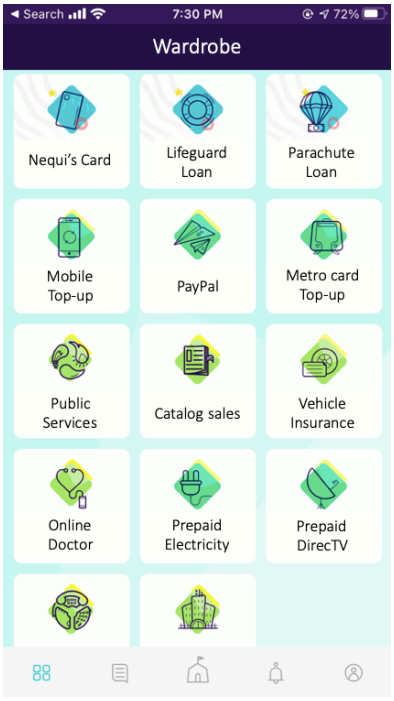

Figure 34. Nequi's User interface - Wardrobe (Home screen)

4.4.1. Mobile experience for travel

There are some activities that people prefer to do on their smartphones, and there are other activities that people like to do on their computers. According to Google's survey on traveling, a smartphone's most common travel activities include loyalty programs, digital ticket/boarding passes, check into a flight or accommodation, and check flight times[81]. However, the desktop is still the most used device for booking in all travel categories.

[81] Research Report: How People Use Their Phones for Travel https://www.thinkwithGoogle.com/marketing-strategies/app-and-mobile/app-marketing-travel-consumer-journey/

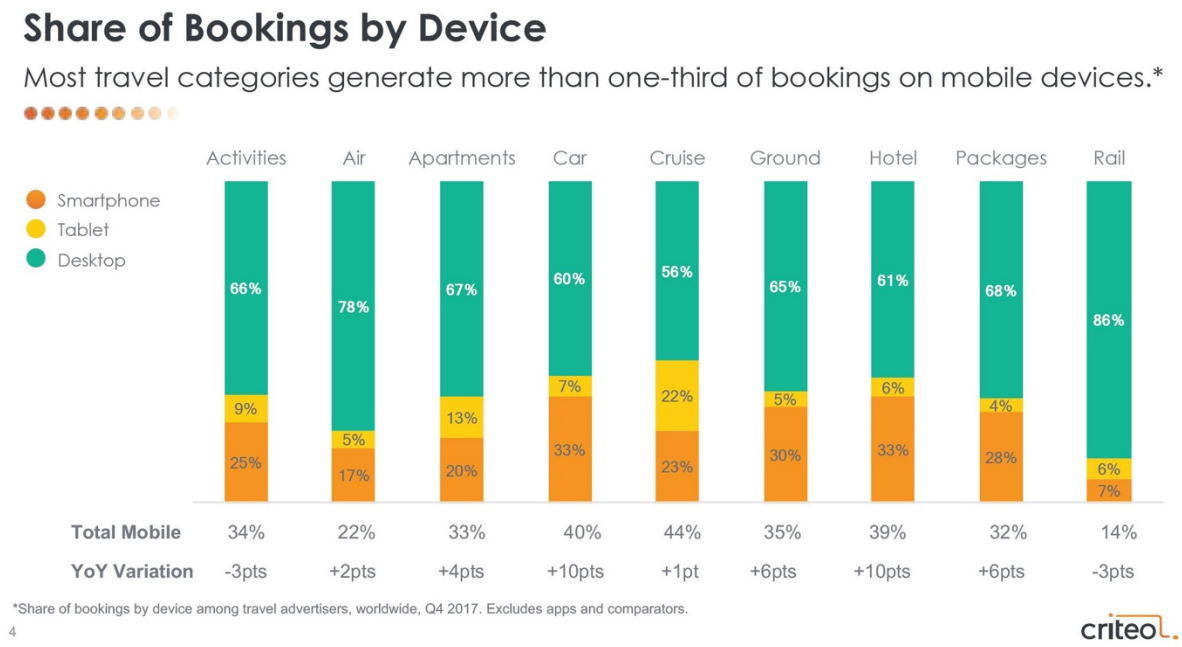

Figure 35. Almost all travel categories generate two-thirds of bookings on desktops[82]

A Google survey found that some of the most valuable attributes in travel apps for users were offering a wide range of features and storing preferences to make future activities easier. The following figure shows the user's preferences for traveling apps:

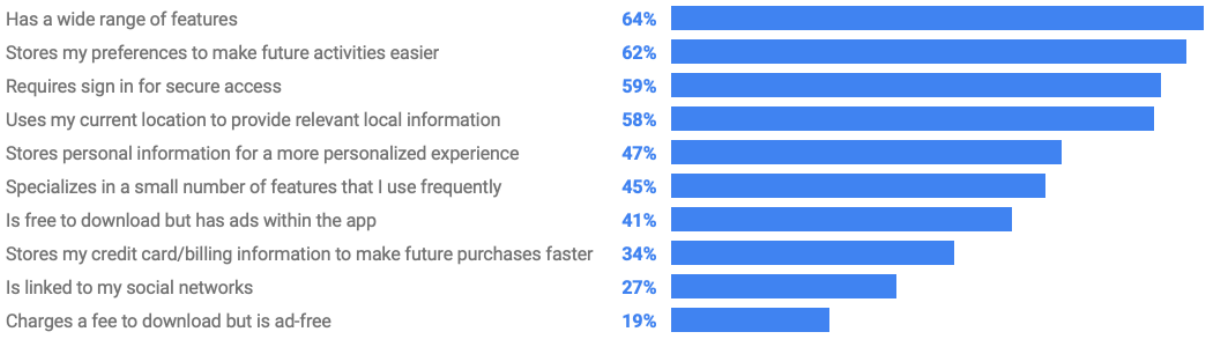

Figure 36. What users find most valuable about their favourite travel apps[83]

[82] The Current State of Travel Apps 2019 https://www.theneura.com/state-of-travel-apps-2018/
[83] Research Report: How People Use Their Phones for Travel https://www.thinkwithGoogle.com/marketing-strategies/app-and-mobile/app-marketing-travel-consumer-journey/

The following figure lists the main reasons why users abandon travel apps:

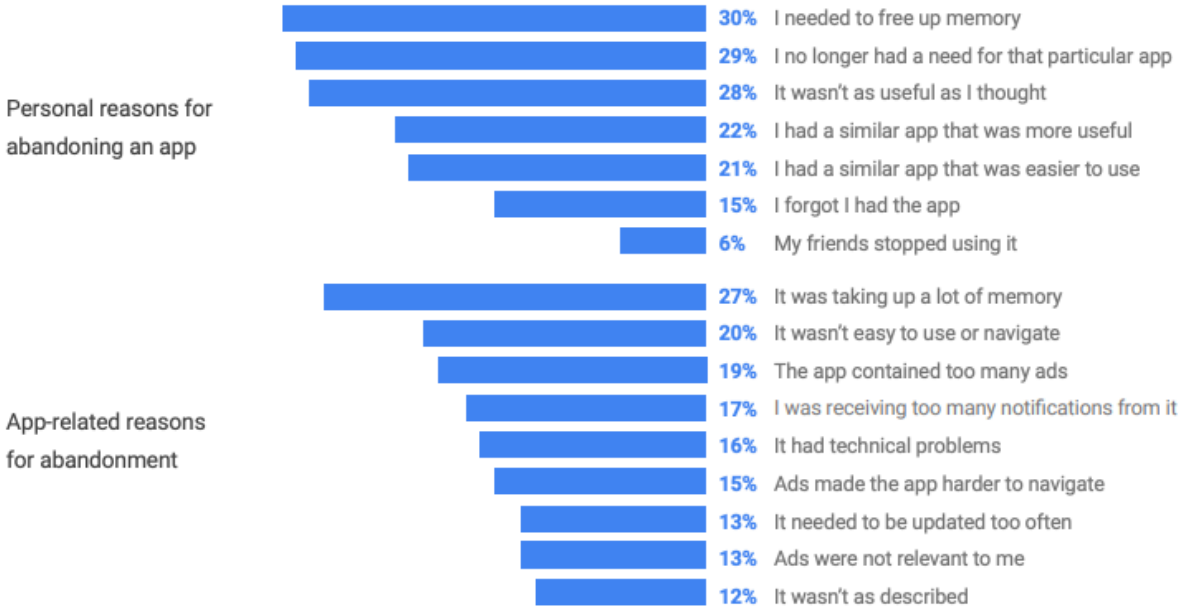

Figure 37. Reasons for users abandon travel apps[84]

Users are conscious of the storage capacity of their phones. That is why deleting an app due to the need to free up memory comes as the number one reason for abandoning a travel app. Other important reasons include hard to use or navigate, no longer needed, and had a similar app. Besides providing the most valuable attributes for users in travel apps, a super app could solve the abandonment issue with a lightweight and integrated experience.

The travel industry has one of the most siloed digital ecosystems. On average, users have 2.3 travel apps currently installed on their smartphones. The offering of standalone apps is very varied, and there are travel apps for each stage of the traveler's journey.

Stage	App
Travel inspiration	Travel guides (AFAR) Pocket-size guide for travel (SeeSaw) Discover luxury vacation experiences (Inspirato)
Language-learning	Language-learning (Duolingo)

[84] Research Report: How People Use Their Phones for Travel https://www.thinkwithGoogle.com/marketing-strategies/app-and-mobile/app-marketing-travel-consumer-journey/

Stage	App
Hotel Booking	Budget hotel networks (OYO) Vacation rental online marketplace (Airbnb) Customized holiday packaging (Trip factory) Hotel booking (Skyscanner, Booking, Agoda) Price predictor booking app (Hooper) Discount rates for travel-related purchases (priceline)
Flight Booking	Flight booking (Skyscanner, Booking, Agoda) Price predictor booking app (Hooper) Discount rates for travel-related purchases (Priceline)
Cruise Booking	Cruise booking (Skyscanner, Booking, Agoda)
Ground Transportation Booking	Inter-city bus (Greyhound) Inter-country bus (Omio) Inter-country train (Euro rail)
Travel planner	Personal trip organizer (Tripcase) Business trip organizer (Tripit)
Insurance	Travel insurance app (TravelSmart)
Packing	Packing list generator (Packpoint)
Airport	Boarding passes storage (Apple wallet)
On the airplane	Offline movies (Netflix) Offline music (Spotify)

Stage	App
Luggage management	Luggage storage (BagsAway) Storage with bag delivery (Baggage Nanny)
Hotel Check-in	Hotel self-check-in app (Marriott)
On property	Room assistant (roomassistant) Hotel Service and Maintenance Requests (SARA)
Car rental	Car rental (Skyscanner)
Tour guides	Audio tours (Detour) Historic photos of your current location (History pin) Book a tour (Airbnb, tripadvisor)
Tax reimbursement	Receipt and expense for taxes (Everlance) Tax assistance (IRS2Go)
Review	Trip review (tripadvisor)
Pet travel	Find the nearest vet (VetFinder) Emergency vet and hotel (Red Cross Pet First Aid)

Table 6. Travel single-purpose apps

The following are statistics included in Google's report[85]:

29% of travel app users reported abandoning apps when they were no longer needed.
71% of smartphone users who use their phones for travel do so at least weekly.
35% of travel app users discover apps by browsing app stores.
45% of travel app users said notifications containing trip status updates were most useful.
58% of travel apps are used at least monthly.
85 % Searches for apps related to learning a language have grown 85% year-over-year.

It could be concluded that a super app would be the right solution for the travel industry. Let's recap some of the super app benefits:

- One unique single sign-on.
- Share data between mini-apps.
- Offer a uniform and individual user experience.
- Save the memory storage on the user's device.
- Offer a variety of services.
- Pay less for customer acquisition.

4.4.1.1. Integrated user experience for travel

Years ago, physical travel agencies were replaced by travel website aggregators; people found the aggregators to be more convenient and cheaper than buying their flight tickets and hotel stays through a human agent who charges additional fees for his services. Nevertheless, somewhere between the transition from physical travel agencies to aggregators, other value-added services were forgotten. Travel aggregators do not offer visa application services, ground transportation, guided tours, and travel insurances; they just focus on flight tickets, hotel booking, and car rentals.

A super app could put together all these services from different vendors into one platform where they can complement each other. It could become the user's personal trip planner that offers the right services for the perfect vacation for all budgets. Imagine you are traveling to Italy. Preparing the trip would be easy with a travel super app that makes all the arrangements for you based on your preferences, interests, and previous trips. With just a few

[85] Travel app usage statistics https://www.thinkwithGoogle.com/marketing-strategies/app-and-mobile/travel-app-usage-statistics/

inputs such as budget, the number of days you are planning for the vacation, the dates, and the ages of the people in your group, a super app could suggest services and bundles that match the user's requirements.

A travel super app would be a one-industry super app. It could offer services from other industries like transportation (ridesharing), entertainment (off-line movies for long trips without internet access), insurance (travel and health insurance), and legal services (tax reimbursement). The travel super app company would not need to develop all the business from scratch, it can rely on partnerships and API integrations. There are many travel APIs already available that could help to develop the travel super app:

- Google translate API: Dynamically translate between languages
- Skyscanner flight search API: flight search and flight prices
- Amadeus trip purpose prediction API: predict travel itinerary
- Hotels.com API: hotel search data
- Tripadvisor API: all around travel data
- Booking API: hotel booking data
- Airports finder API: airport data
- IATA and ICAO codes API: airlines data
- Trailapi API: hiking and biking trails

A traveler's journey should start before the trip when the user is getting inspired by pictures and videos found on the internet. If the destination place language is unknown for the traveler, she might want to learn the basics before the trip, so language-learning courses become part of the trip preparation. After selecting the perfect vacation place, the traveler proceeds to purchase flight tickets and accommodations. The planning starts becoming more complex when new variables appear, such as weather, hours of operation of the places to visit, proper dress code for each activity, budget constraints, time constraints, etc. That is why the traveler needs a personal trip organizer that helps the traveler during the entire journey (pre-trip, trip, and post-trip).

Years ago, the role of the personal trip organizer was done by a human travel agent. Nowadays, the traveler/customer orchestrates her entire trip. A robust product recommendation algorithm helps users get the best deals while considering all their preferences. A super app

would not just offer this service but would take the role of the personal trip organizer that takes care of every single detail.

Previous to the flight, the super app could make movie recommendations for it to automatically download offline content for long and without internet journeys. The super app will have all the flight boarding passes and hotel booking reservations at hand. It could also become the medium of communication between the traveler and the hotel services. Users could request an iron, pizza, or massage to their room. The travel super app could also offer a vast variety of tours, from free (audio tours and free walking tours) to deluxe.

Finally, some post-trip activities could also be done through the platform, such as trip reviews and tax reimbursements.

Figure 38. Travel super app customer journey

The above customer journey could be seen as a high-level map of functionalities and mini-programs for a travel super app. These app would have the following characteristics:

- Pay less for customer acquisition.
- Share data between mini-programs or mini-apps.
- Provide one unique single sign-on.
- Offer a variety of services.
- Offer a uniform and individual user experience.
- Save the memory storage on the user's device

Customer journeys play an important role in one industry super apps; they cover every stage of the consumption process, including pre-purchase, consumption, and post-purchase. They help to identify the functionalities needed to fulfill all the customers' needs in that specific industry. The next two chapters will cover two one-industry super apps, elderly and healthcare. Both industries have siloed single apps ecosystems with complex user interfaces, presenting opportunities for the super apps in their domains.

5. Elderly

5.1. Background

Older people have special needs to meet. They are concerned about disability, loss of independence, and inaccessibility to social services. Adults want to feel integrated into society at all stages of life, and this implies the need to allow and facilitate them to adopt an active position.

Technology represents an ally but at the same time a challenge for them. The elderly struggle with technology because devices and applications are not designed for non-digital natives. It makes it difficult for the elderly to access information, online education, government subsidies, health services, government programs, and financial services. It is thus increasing social inequality through ageism, especially in the developing world.

By 2050, nearly 8 in 10 of the world's older population will live in the less developed regions. The highest regional growth rate of the 60-and-older population is occurring in Latin America (LAC). At these growth rates, the 60-and-older LAC population would double in fewer than 20 years, while a doubling of the under-60 LAC population would take about 115 years.

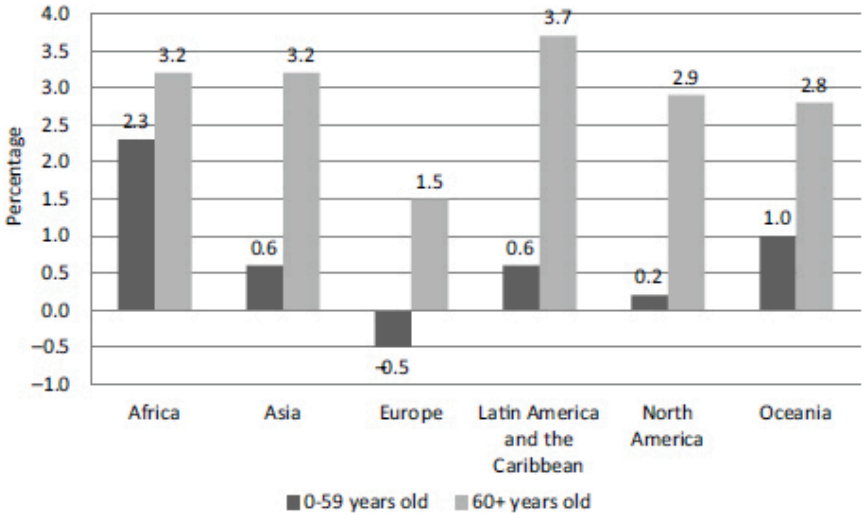

Figure 39. Regional growth rates of the 0-59 and 60-and-older populations, 2015-2020[86]

[86] Aging in Latin America and the Caribbean in Global Perspective https://www.nap.edu/read/21800/chapter/3

In Latin America and the Caribbean, there are an estimated 71 million people aged 60 and older, representing 11.2% of the population. The percentage 60+ is highest in the Caribbean (13.2%), compared with 11.7% in South America and 9.6% in Central America[87].

Globally, the older population in less developed regions is growing faster than in the more developed regions[88]. This is especially true for Asia and the Pacific, which comprises some of the wealthiest nations as well as some of the poorer countries.

Figure 40. Proportion aged 60 or over in 2016 and 2050 by subregion[89]

By 2050, one in four people in Asia and the Pacific will be over 60 years old. The population of older persons in the region will triple between 2010 and 2050, reaching close to 1.3 billion people[90]. Women constitute the majority (53 per cent) of the population aged 60 or older in the region, and their share rises to 60 per cent above age 80.

The world population aged 60 and older represents 895 million people, accounting for 12.2% of the world population. The number of people over age 60 is growing at a rate of 3% per year, while the population growth rate of people under age 60 is less than 1%.

[87] Aging in Latin America and the Caribbean in Global Perspective https://www.ncbi.nlm.nih.gov/books/NBK322002/
[88] World Population Ageing 2013 https://www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2013.pdf
[89] World Population Ageing https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017_Highlights.pdf
[90] Ageing in asia and the pacific https://mipaa.unescapsdd.org/files/documents/SDD%20Ageing%20Fact%20Sheet%20Overview.pdf

	Number of persons aged 60 years or older in 2017 (millions)	Number of persons aged 60 years or over in 2050 (millions)	Percentage change between 2017 and 2050	Distribution of older persons in 2017 (percentage)	Distribution of older persons in 2050 (percentage)
World	962.3	2080.5	116.2	100.0	100.0
Africa	68.7	225.8	228.5	7.1	10.9
Asia	549.2	1273.2	131.8	57.1	61.2
Europe	183.0	247.2	35.1	19.0	11.9
Northern America	78.4	122.8	56.7	8.1	5.9
Latin America and the Caribbean	76.0	198.2	160.7	7.9	9.5
Oceania	6.9	13.3	92.6	0.7	0.6

Data source: United Nations (2017). World Population Prospects: the 2017 Revision.

Figure 41. Number and distribution of persons aged 60 years or over by region, in 2017 and 2050[91]

The main key drivers of population ageing globally are declining fertility and increasing longevity. Lowest-income countries, most of which are located in sub-Saharan Africa, are projected to see its older population grow more than twofold between 2017 and 2050. And older populations of high-income countries the projected growth rates tend to be slower on average[92].

5.1.1. Barriers to technology adoption in the elderly

The definition of an older adult in this writing refers to anyone over the age of 60. However, there are substantial differences in technology adoption within the more senior population; a 62 years old person feels more comfortable with technology than a 90 years old person. Other factors that influence the technology adoption in the elderly besides their age are household income and educational attainment.

A report made by Pew Research Center states that seniors aged 65 to 69 are about twice as likely as those ages 80 and older to say they ever go online (82% vs. 44%) or have broadband at home (66% vs. 28%), and they are roughly four times as likely to say they own smartphones (59% vs. 17%)[93].

[91] World Population Ageing https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017_Highlights.pdf
[92] World population ageing 2017 https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017_Highlights.pdf
[93] Tech Adoption Climbs Among Older Adults https://www.pewresearch.org/internet/2017/05/17/tech-adoption-climbs-among-older-adults/

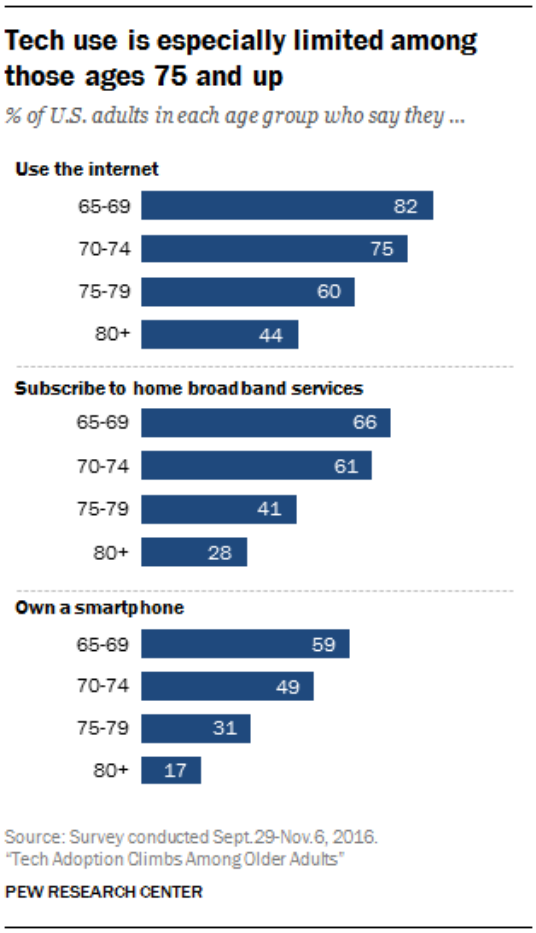

Figure 42. Technology use among seniors[94]

Seniors are moving towards more digitally connected lives, which is accompanied by many challenges that have to do with the decline of physical and cognitive functions. The barriers to technology adoption in the elderly include familiarity and access, need for assistance, trust, privacy issues, and design issues[95].

- Familiarity and access: Older seniors don't use the internet, mobile apps, or email because it doesn't seem relevant to them. Most people in this generation did not use technology during their productive years; thus, they believe it is not essential in their lives because they have been able to live comfortably without its use.

  Younger seniors transitioning out of the workplace into retirement are increasingly likely to have utilized technology in their professional lives. They feel comfortable using social media (especially Facebook), messaging apps, and email accounts.

[94] Technology use among seniors https://www.pewresearch.org/internet/2017/05/17/technology-use-among-seniors/
[95] Acceptance and Use of Health Information Technology By Community-Dwelling Elders https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4144164/

The constant evolution of technology and the birth of new startups and digital models make it very difficult for anyone to keep up to date. This is especially true for the elders; they are not considered in the development of new devices or mobile applications. In the United States, older people represent only 6% of Uber users; this happens not because they do not require a mobility service, but because the mobile application is not easy to use for people who are not digital natives.

- Need for assistance: In China, the proportion of elderly adults living alone has increased from 16.7% in 1993 to 27.9% in 2007 and will possibly rise to 90% by 2030[96].

  The annual report on the aging society from the Japanese central government shows a remarkable increase in the proportion of over 65 living alone in the past few decades. Over 65 women living alone nearly doubled from 11.2% in 1980 to 20.3% in 2010, and the proportion rose from 4.3% to 11.1% for over 65 men over the same period of time. Single-member elderly households are forecast to account for 17.7 percent of all households in 2040, up from 11.7 percent in 2015. Aside from the concern over who will assist them in their daily lives, the increase in the number of older adults living alone raises their risk of encountering economic problems in their advanced age. Today, roughly 90 percent of the elderly people on welfare are believed to live alone. Experts warn of an increase in the number of people who have no children or relatives to turn to for help in tough times.

  Older adults living alone are becoming more common globally; however, most countries do not have studies on this matter. Asian countries have the more detailed studies on this matter because it is already affecting their economy.

  Seniors living alone have no one to assist them. They need help on how to set up a device and how to use it, and this is not something that can be done with a single visit from a relative; most seniors require instructions to be repeated several times for them to be able to do it by themselves.

  The Pew Research Centre conducted a survey in the U.S. where most seniors say they need help using new electronic devices. In this study, 34% of older internet users say they have little to no confidence in their ability to use electronic devices to perform online tasks, while 48% of seniors say that this statement describes them very well:

[96] Health-related quality of life among elderly individuals living alone in an urban area of Shaanxi Province, China https://journals.sagepub.com/doi/10.1177/0300060520913146

"When I get a new electronic device, I usually need someone else to set it up or show me how to use it[97]."

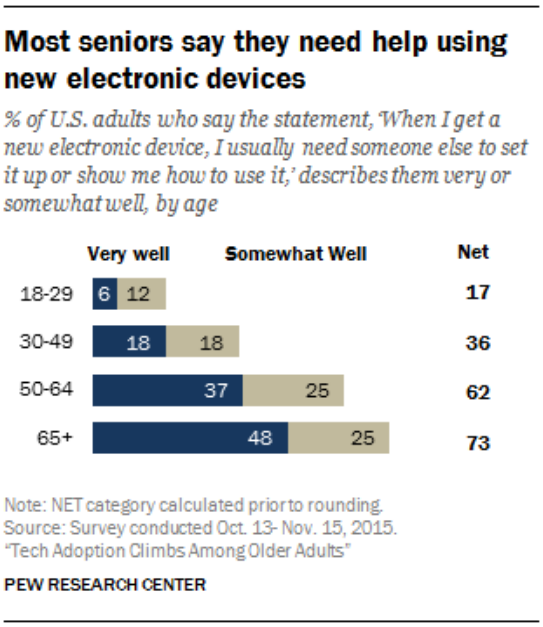

Figure 43. Electronics devices adoption in seniors

- Trust: The lack of trust includes whether people theoretically trust technology playing a role in their health as well as specifically trusting the accuracy and reliability of the content.

  The National Council on Aging lists health-related scams in their top 10 scams targeting seniors, including Medicare fraud, counterfeit prescription drugs, and fraudulent products. The elderly are also at high risk for financial scams ranging from buying items that are free to more extreme investment and mortgage scams.

- Privacy issues: A study investigating the attitudes of users living with in-home sensor monitoring technology showed that older adults would accept surveillance and share health information if it was of use to their physicians to preserve their autonomy and health. However, their concerns increased during the year of observation.

- Design Issues: Most current technologies were not designed with the elderly population in mind. Older adults are much more likely to be challenged by physical

[97] Tech Adoption Climbs Among Older Adults https://www.pewresearch.org/internet/2017/05/17/tech-adoption-climbs-among-older-adults/

and cognitive changes associated with aging. Limitations affecting their ability to use technology include decreased cognitive capacities, loss of memory and poor recall, decreased navigation skills, sight loss, hearing loss, decreased kinesthetic ability, and less experience with technology, as well as less confidence in these systems.

5.2. Current Market

5.2.1. Existing solutions

Different solutions are available for the elders to meet their needs, such as nursing homes, independent care-taker providers, relatives, smartphone apps and digital assistants. However, none of these solutions solve most of the elders needs, and the technology options are hard to use and set-up.

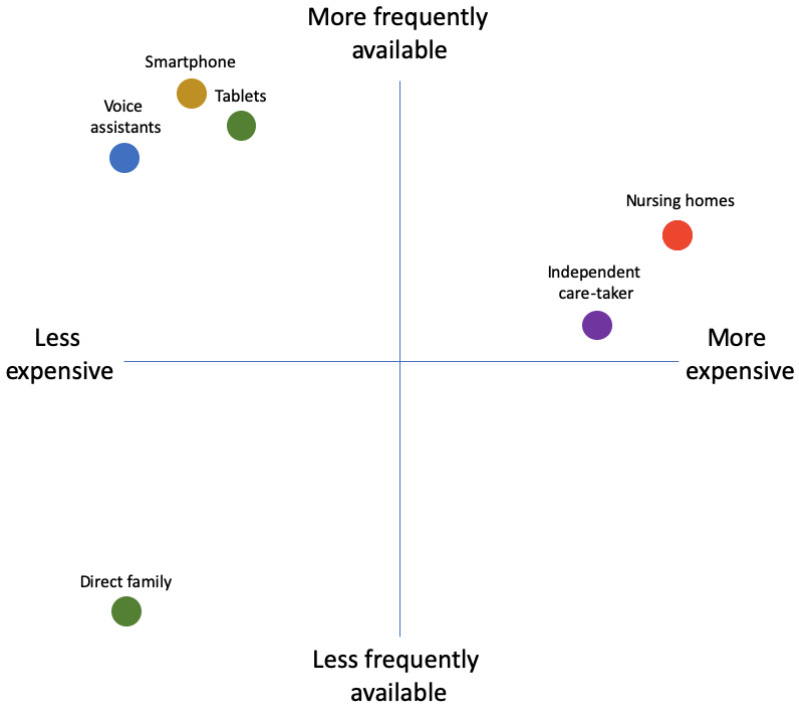

Figure 44. Existing solutions for elders

Direct family members are the preferred option by elders. But, the younger family members' busy life makes this option less frequently available to older adults. Nursing homes are expensive and can be depressing. They also represent a loss of freedom and independence, and there is potential for sub-quality care. Independent care-taker providers are also expensive and provide a higher quality service than nursing homes.

The least expensive and more available option for the elders are smartphone apps and digital assistants. Unfortunately, the current technology offered to elders is hard to use, it was not designed for them and cannot be set up without someone else's help.

5.2.2. Apps for seniors

There are numerous mobile applications on the market for the elderly, offering a wide range of functionalities from healthcare services to bills payment. These applications try to cover this population's primary needs and usually provide just one service through a single-app. It means that elders need to download many apps to fulfill all their needs.

These apps could be classified into six different categories: healthcare, adaptative, informational, entertaining, communication, and transactional.

- Healthcare apps include reminders for taking medications, symptom monitoring, telemedicine, etc.
- The adaptive apps help the elders to improve abilities that have been reduce because of their age, like magnifying glasses and hearing loss apps.
- Information apps that provide access to local news and weather information.
- Entertaining apps include memory games, movies and music streaming services.
- Communication apps help elders to contact their beloved ones in a virtual way.
- Transactional apps include apps that require a financial transaction such as shopping apps and bill payments apps.

The following table shows some of the most popular apps for the elderly in North America and Europe. Most of these apps have one functionality so they belong to just one of the categories listed above. Single-purpose apps tend to be free or have a monthly subscription of less than one dollar, and multi-purpose apps monthly subscription are on average USD 4.99 monthly.

An example of a multi-purpose app is "AARP Now", it offers access to daily news stories (information), local events (entertaining), and nearby member benefits (transactional). AARP (formerly called the American Association of Retired Persons) is a United States based interest group focusing on issues affecting those over the age of fifty. Their business model is

to sell memberships to elders for them to access benefits and discounts. The AARP Now app hopes to replace AARP benefits card.

Company	Healthcare	Magnifying glass	Communication	Music	Shopping	Discounts	Parking	Games	News	Events	Messages/ Dictation	Bills payment	Price
EyeReader by NetSoft		x											1.99
Life360			x										Insurance price
Blood Pressure Companion	x												Free
GoodRx					x								Free
iPharmacy Pill ID & Drug	x												Free
Moves Activity Diary	x												Free
Red Panic Button	x												4.99/month
ICE In Case of Emergency			x										0.99/month
Medisafe	x					x							4.99/month
Pandora				x									9.99/month
Pillboxie	x												1.99
Lumosity								x					Fremium
AARP Now						x			x	x			12.60/yr
Senior Discounts & Coupons						x							Free
WebMD	x					x							Free
Fall Detection	x												28.98
Clevermind	x			x				x	x				Free
Pocket Physio	x												Free
Park & Forget							x						Free
Dragon Dictation											x		15/month

Company	Healthcare	Magnifying glass	Communication	Music	Shopping	Discounts	Parking	Games	News	Events	Messages/ Dictation	Bills payment	Price
Pill Reminder Pro	x												0.99/month
MedCoach	x												Free
Crosswords Classic								x					13
Sudoku								x					Free
GreyMatters				x				x					4.99/month
MyTherapy	x												Free
HealthifyMe	x												10/month
Bills Reminder												x	Free
messagease											x		Free

Table 7. Existing apps for seniors

5.2.3. Launchers

Launchers are easy-to-use apps that replace the smartphone operating system. They focus on simplicity, offering few functionalities, including phone calls, text messages, camera, photo gallery, and emergency calls. They replace the wallpaper with a plain background and show each functionality as a big icon.

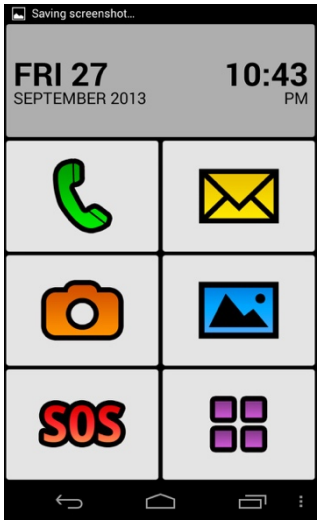

Figure 45. Big launcher interface[98]

[98] Big launcher www.biglauncher.com

Some launchers, like Oscar senior, include direct access to other apps such as the phone default internet browser and music streaming services. Although, these third-party apps are not senior-friendly.

Figure 46. Oscar senior interface[99]

Oscar senior works as an aggregator, and big launcher works as a super app. Big launcher has worldwide partnerships with mobile operators, mobile phone vendors, and home care service companies. They customize the app for the vendors, and the vendor can include the app as a pre-install app for the final user. For example, Vodafone offers a branded version of Big Launcher for Italian customers.

[99] Oscar senior https://www.oscarsenior.com/

These are some of the most popular launchers in the world and their prices:

Launcher	Price
Oscar Senior	4.99/month
Big Launcher	10.99
GrandCare	49/month
Tapestry	Free
Ohana	14.99/month
Senior Safety App	4.5/month
Simple Launcher	Free
Simple Mode	Free
Senior Safety Phone	0.99
Help Launcher Deluxe	Free

Table 8. Most popular launchers

5.2.3.1. Smartphone ownership in elders

Pew Research Center published a report about how smartphone ownership is growing rapidly worldwide, but not always equally. The report presents the percentage of adults who own smartphones in advanced and emerging economies.

Younger, better-educated more likely to own smartphones

% of adults who own a smartphone

		Age				Education			Gender		
	TOTAL	18-34	35-49	50+	Youngest-Oldest Diff	More education	Less education	Diff	Men	Women	Diff
	%	%	%	%		%	%		%	%	
Advanced economies											
South Korea	95	99	100	91	**+8**	99	90	**+9**	96	95	+1
Israel	88	91	94	80	**+11**	95	83	**+12**	88	89	-1
Netherlands	87	99	98	74	**+25**	95	82	**+13**	89	85	+4
Sweden	86	98	92	77	**+21**	91	83	**+8**	88	85	+3
Australia	81	97	89	68	**+29**	89	77	**+12**	80	82	-2
U.S.	81	95	92	67	**+28**	88	75	**+13**	82	80	+2
Spain	80	95	93	60	**+35**	94	75	**+19**	81	79	+2
Germany	78	98	90	64	**+34**	85	76	**+9**	81	75	+6
UK	76	93	90	60	**+33**	87	73	**+14**	81	71	**+10**
France	75	97	91	53	**+44**	88	63	**+25**	79	71	**+8**
Italy	71	98	91	48	**+50**	96	67	**+29**	75	68	+7
Argentina	68	84	77	42	**+42**	86	65	**+21**	67	68	-1
Canada	66	90	85	43	**+47**	74	55	**+19**	71	61	**+10**
Japan	66	96	93	44	**+52**	79	58	**+21**	69	63	+6
Hungary	64	92	84	35	**+57**	85	57	**+28**	69	59	**+10**
Poland	63	93	87	35	**+58**	82	57	**+25**	65	62	+3
Greece	59	95	83	29	**+66**	86	48	**+38**	59	58	+1
Russia	59	91	76	26	**+65**	72	39	**+33**	64	55	**+9**
Emerging economies											
Brazil	60	85	63	32	**+53**	86	37	**+49**	63	57	+6
South Africa	60	73	59	35	**+38**	77	47	**+30**	61	59	+2
Philippines	55	74	50	27	**+47**	70	29	**+41**	52	57	-5
Mexico	52	66	53	30	**+36**	79	35	**+44**	57	48	**+9**
Tunisia	45	75	35	18	**+57**	70	28	**+42**	48	42	+6
Indonesia	42	66	32	13	**+53**	72	27	**+45**	45	39	+6
Kenya	41	51	27	18	**+33**	71	24	**+47**	47	36	**+11**
Nigeria	39	48	31	20	**+28**	51	6	**+45**	47	31	**+16**
India	24	37	21	8	**+29**	55	11	**+44**	34	15	**+19**

Note: Statistically significant differences in **bold**.
Source: Spring 2018 Global Attitudes Survey. Q46.

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Table 9. Percentage of adults who own a smartphone[100]

As smartphone ownership has increased in both advanced and emerging economies, the growth has often been uneven. Age, gender, education levels, and income contribute to who owns a smartphone – though, often, age is the key factor associated with ownership.

[100] Smartphone ownership https://www.pewresearch.org/global/2019/02/05/in-emerging-economies-smartphone-adoption-has-grown-more-quickly-among-younger-generations/

In most countries, smartphone ownership in people over 50 years old is very low, regardless of whether it is an emerging economy or an advanced economy. For example, Russia and the Philippines have almost the same percentage of adults who own smartphones.

5.2.4. Digital voice assistants

The biggest tech companies have launched digital voice assistants to include them in all their devices (smartphones, TVs, remote controls, etc.) and complement their current offer. These devices can be beneficial for older adults who struggle with smartphones.

Digital Assistant	Price
Amazon Alexa	From 39.99, also available on Fire TV
Google Home	From 39.99, also available on the Google app for iOS and Android.
Apple Siri	Included in apple product (iPhone, iPad, Mac, Apple watch)
Microsoft Cortana	Included in Microsoft operating system

Table 10. Digital voice assistants

Other companies have launched their version of digital voice assistants, such as the Irish startup, CR Robotics; they created Mylo, a cat-faced voice-controlled robot to help people with Alzheimer's disease or dementia. Another example is Pria, a voice-activated robotic companion that combines an intelligent display and voice assistant with a pill dispenser built by Pillo Health and Stanley Black & Decker. And LifePod, a voice assistant that can begin conversations about health routines[101].

[101] Dutch Study Examines the Benefits of Voice Assistants for Older People
https://voicebot.ai/2020/02/26/dutch-study-examines-the-benefits-of-voice-assistants-for-older-people/

5.3. Opportunities

5.3.1. Better user interfaces

Senior adults need easy-to-use and intuitive user interfaces. The screen design should reduce current interfaces' complexity by removing layered windows that challenge elders' memory and motor functions by keeping a consistent format consistently throughout to minimize confusion.

Current Super apps have complex user interfaces that are very hard to navigate for non-digital natives. The two screenshots below correspond to the user interfaces of Grab and Rappi, respectively. Grab home screen has more than 24 touchpoints, and Rappi home screen has more than 22 touchpoints. The size of the icons, colors, and overall design made this user interfaces not suitable for elders.

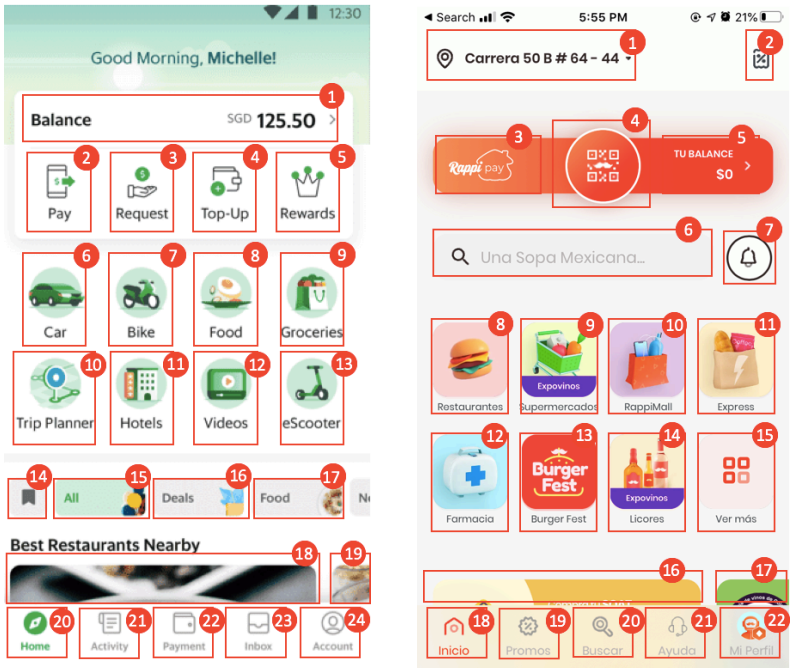

Figure 47. Grab and Rappi user interfaces

User interface designers should include geriatricians and the elders themselves as active participants so that they do not become simply receptors of technology[102].

[102] Acceptance and Use of Health Information Technology By Community-Dwelling Elders https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4144164/

Recommendations for UX design for seniors:

- Replace drag-and-drop features with keyboard functions
- Use of prisms to project images for people with macular degeneration
- Use tremor-stabilizing mouse controls
- Fonts should be a minimum of 16px
- Sans serif typefaces are often preferred for on-screen readability.
- Label the icons with text that is easily interpreted.
- Use appropriate lighting
- Include subtitles for video or audio content
- Remove all mobile gestures (i.e. tapping a phone screen, multi-finger gestures).
- Keep a minimalist design
- Ensure the attention is not being divided by multiple tasks or parts of the screen.
- Make sure the privacy and security settings are easy to manage, and transparent.
- Keep the return function and the home navigation easily accessible
- Provide training, potentially within websites, to aid users. Older users will likely read all instructions before clicking

5.3.2. Digital voice assistants designed for elders

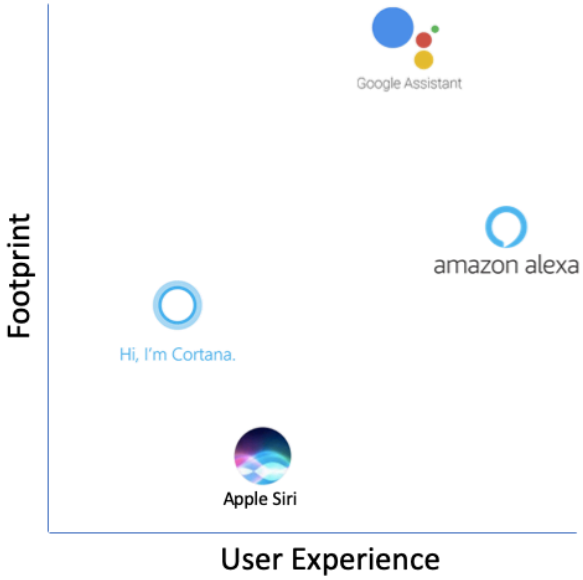

Figure 48. Footprint vs. User experience for user interfaces

Existing digital voice assistant solutions are insufficient in meeting the elders' user needs. The following list of features suggest improvements that could be added to existing digital voice assistants:

- Provide freedom to the user to name the device
- Recognize and process long sentences requests
- Train the algorithm to recognize long voice pauses in the sentences
- Train the algorithm to understand different accent in languages others than English
- Implement voice recognition as an authentication method for non-financial transactions
- Provide the user with a physical token for two-fact-authentication for financial transactions
- Provide information about local governments, subsidies, benefits, and social services.
- Allow registration to government programs
- Integrate with local companies. i.e. request a taxi from a local company using a voice command.
- Promote the creation of skill (apps) in local communities
- The device manufacturer should set up the Wi-Fi information (network name and password) and user details for the senior to be able to use without any initial setup (plug-and-play).
- Include the option to start conversations without voice command triggers
- Double-check security of integrations and do not share any data that is not strictly relevant
- Maintain minimal information accumulation
- Turn off voice interpreter while on standby.

5.4. Super App for the elderly

Technology needs to be more inclusive to the elderly and non-digital natives, and the solution could be a super app for the elderly. This multi-sided platform would connect the senior population to healthcare providers, restaurants, banks, retailers, government entities, IoT devices, and any existing company that offers senior citizens' products or services.

The users could access to third-party companies' services and offerings from different industries including:

- Transportation
- Restaurants
- Healthcare providers
- Communication
- Internet of things devices
- Government entities
- Travel agencies, banks
- Learning platforms
- Retail
- Payments

The super app could also include functionalities that are helpful for the elderly and do not require any third-party partnership or integration, some of these functionalities are:

- Calendar
- Medications alerts
- Memory games
- Mental health
- Exercise videos

Companies that want to offer their services through the super app could do so by using the industry template that belongs to the company industry. For example, any bank would use the banking template, this interface will help them to create a user interface that follows the global parameters of the super app. The bank would have to integrate its data through APIs.

The templates will be part of the SDK and will help the super app deliver the same user experience across all mini-apps. Templates will limit companies to saturate users with many functions, companies will be limited to the predefined functions available for their industry. These predefined functions correspond to the top three to five functions that are the most relevant to the elderly.

It could have 3 different monetization models:

- Subscription Model: This option would be offered to companies offering services through the platform, they will use the app and they will be charged by the number of API calls.

- Commission: This option would be offered to companies offering services through the platform. Companies will pay a commission per product or service sold on the super app. There would be different rates that would depend on the category of the product or service.

- Advertisement: A percentage of the main screen would show ads. The super app would charge companies who advertise.

The super app could also integrate the voice capabilities of Amazon Alexa, and it could offer an Alexa skill (voice assistant application) for Alexa users. It would help elders to have a physical and voice interface for them to access to information and services.

The following is an example of what an easy to use super app could look like:

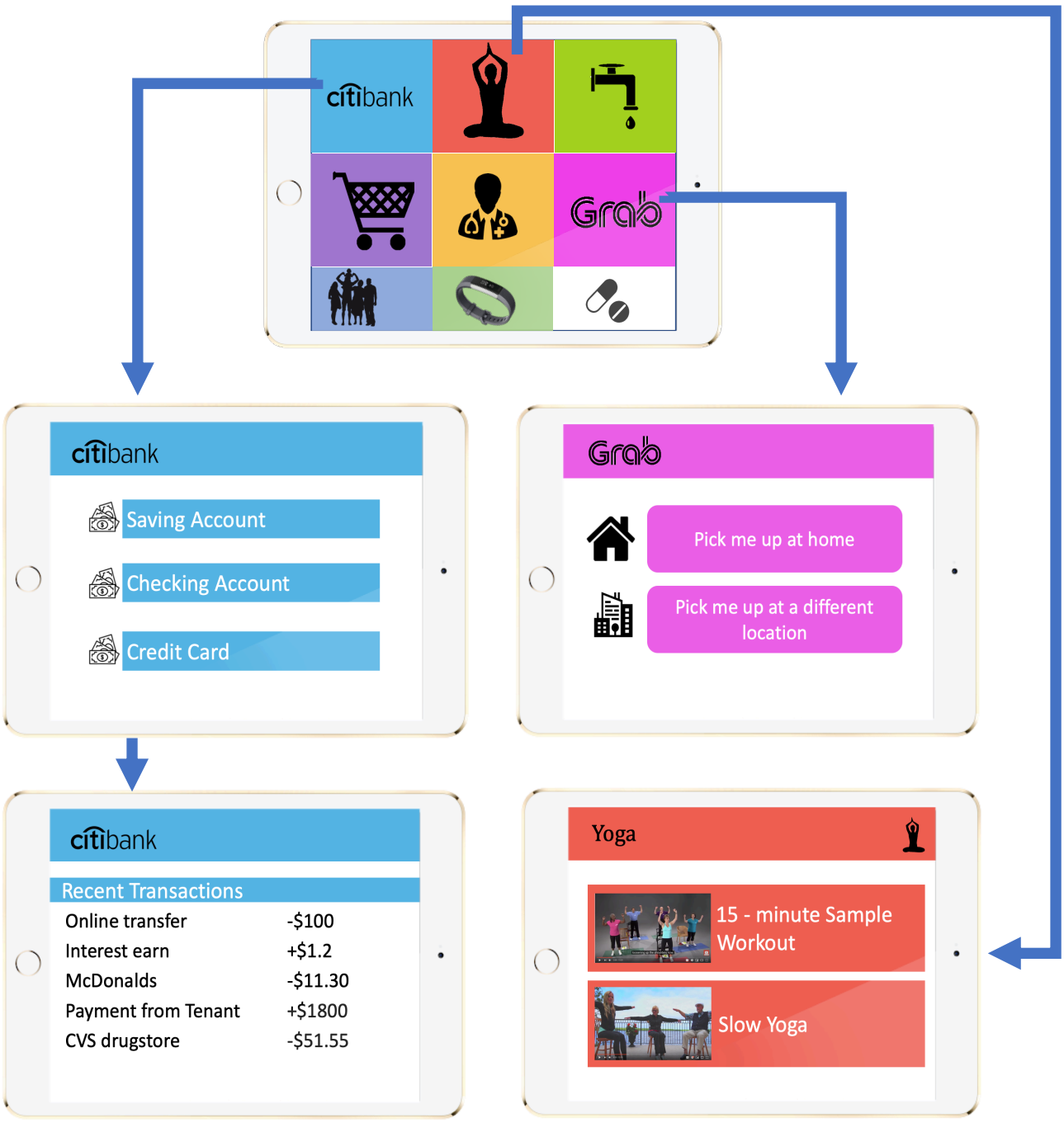

Figure 49. Example of what a super app for the elderly could be

6. Healthcare

6.1. Background

The COVID-19 pandemic exposed social inequalities in access to healthcare services. The virus placed an enormous strain on the global health care sector's workforce, infrastructure, and supply chain. Technology played an important role as an ally to fight the pandemic, with virtual care solutions, e-ICU, remote patient monitoring, and health information exchanges becoming a fundamental part of the patient-doctor interaction.

In these times where almost anything can be done on the internet, it is not a surprise that users expect end-to-end healthcare solutions that can be accessed from smartphones. That is why the global mobile medical apps market size is expected to be $11.2 billion by 2025.

6.2. Current Market:

6.2.1. Existing solutions

Technology has been the primary enabler of healthcare's new solutions and innovations. Mobile adoption, big data, and IoT have changed how we monitor our health and interact with our healthcare providers. There are many possible segmentations for the digital health industry, one of them is the segmentation by technology[103]:

- Mobile Health (mHealth): App services for professionals, consumers, mobile services, and mobile devices.
- Healthcare IT: Electronic health records, cloud data management, and patient portals.
- Wearables and devices: Hearth monitors, fitness devices, blood pressure, and diabetes monitors.
- Telemedicine: Tele-imaging, remote physician service, remote patient monitoring

[103] Disruptive Technologies in Digital Health https://cds-frost-com.libproxy.mit.edu/p/58319#!/ppt/c?id=D8B6-01-00-00-00&hq=digital%20health

Digitalization is part of every single aspect of our life, and healthcare is not the exception. From awareness to post-treatment monitoring, digital technologies help to improve the customer experience.

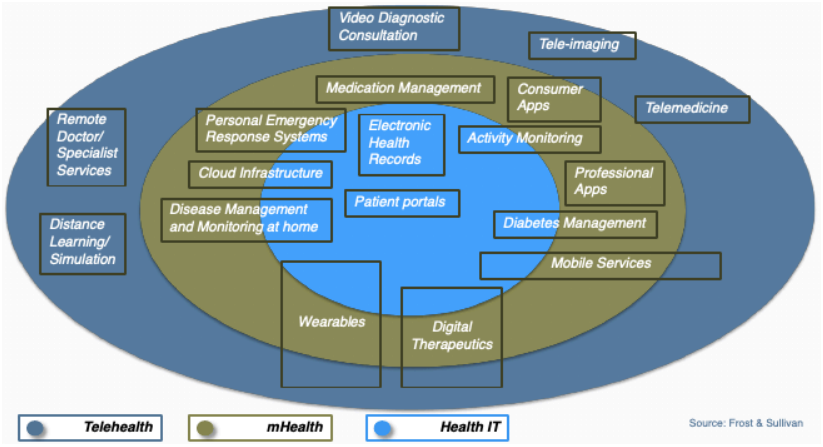

Figure 50. Novel platforms uniting multiple digital health technologies are emerging[104]

Surprisingly, with more than 350,000 mobile standalone apps for healthcare, there are not successful super apps in this space in the U.S market. Each app solves one or a few needs without ultimately fulfilling all the user needs. The most common use cases targeted by healthcare apps are:

- Find a doctor: users have access to the basic information from the doctor, such as name, address, and phone number.
- Book an appointment: users can book a time slot in the doctor's agenda.
- Symptom checker: users get asked a series of questions, most of the times it suggest contacting an specialist.
- Reminders: receive messages to remember about medications, consuming water, and exercising.
- Pharmacy: purchase prescription drugs, order refills, access to discount coupons.
- Wearables/IoT health trackers: Daily physical activity, steps, distance, burned calories.

The current siloed healthcare mobile app offering creates a fractured and inefficient healthcare ecosystem where information is not shared between the healthcare providers. Think of a diabetic patient using an Accu-Chek blood glucose meter and a Fitbit wristband wearable;

[104] Disruptive Technologies in Digital Health https://cds-frost-com.libproxy.mit.edu/p/58319#!/ppt/c?id=D8B6-01-00-00-00&hq=digital%20health

this user uploads his data to different apps that will never cross its data. The two apps do not inform any medical professional about the user readings, and the two apps are not complementing each other's readings with an on-time diagnostic.

The development of novel technologies and its adoption impacts the customer experience. The increasing number of healthcare wearables contributes to exponential growth in digital health data, creating opportunities for leveraging health information to deliver preventive and personalized healthcare services. However, opportunities are being missed due to a fragmented data ecosystem, even when users are willing to share their personal health data.

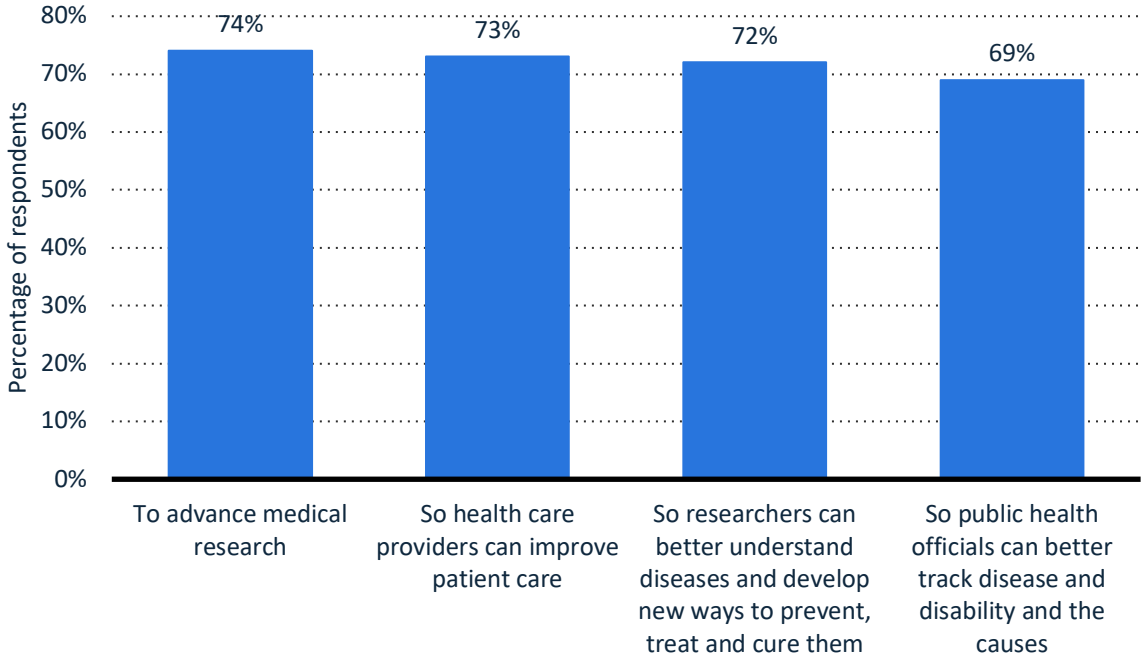

Figure 51. Percentage of patients willing to share health information by select reason as of 2018 and 2020 [105]

The willingness to share personal health data is associated with the user's age, education level, occupation, and technology adoption in his/her country[106]. As of 2020, 73 percent of patients were willing to share their personal data so that health care providers can improve patient care.

User's disposition to allow health care providers to access their health data creates many opportunities for startups in the healthcare space. 23andMe, a privately held personal genomics and biotechnology company based in California, provides its customers with ancestry and

[105] Percentage of patients willing to share health information by select reason as of 2018 and 2020 https://www.statista.com/statistics/417693/share-of-us-adults-willing-to-share-personal-health-data-for-research-and-health-care

[106] Connected Health User Willingness to Share Personal Health Data: Questionnaire Study https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6906622/

health reports. After receiving the reports, 23andMe customers can download the raw data and share it with other startups to get more insights and new reports from their DNA. This model and the user's willingness to share their DNA reports have led to the creation of many more startups in this industry. Such is the case of DNAFit, a popular personalized health and wellbeing company that uses raw data from 23andMe; it provides customized diet and fitness insights and counseling to 23andMe customers.

Healthcare startups have boomed over the past several years. This boom is driven by health reforms that are disrupting business models, such as an aging population that is demanding more and better care and the increasing adoption of technology (wearables and telehealth). The figure below shows the 150 digital health startups selected by the CBinsights research team; these startups were picked out of nearly 8,000. It is notable that the app/startup ecosystem it is still very siloed, mostly due to each software healthcare category processes' complexity.

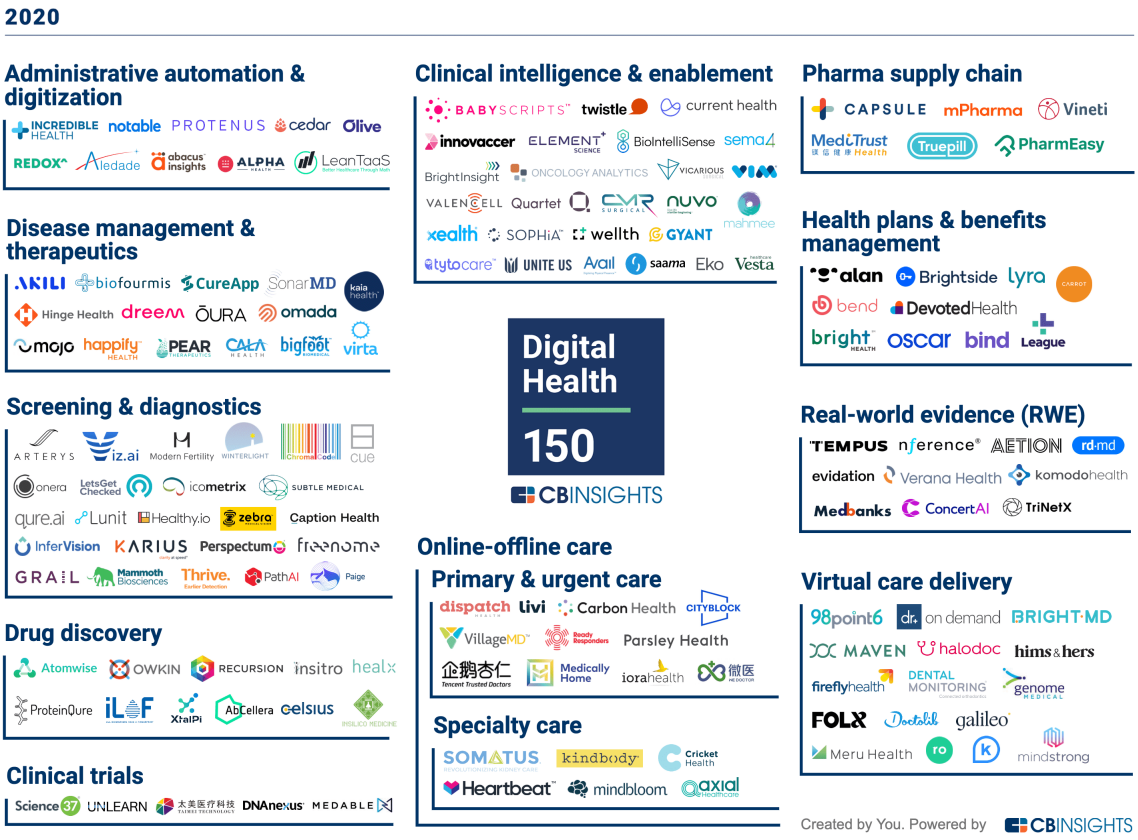

Figure 52. Digital Health 150: The Digital Health Startups Transforming The Future Of Healthcare[107]

[107] Digital Health 150: The Digital Health Startups Transforming The Future Of Healthcare https://www.cbinsights.com/research/report/digital-health-startups-redefining-healthcare/

Startups are trying to expand their offering, moving to other segments or categories. One unicorn on the list is Ro, a telehealth platform that provides remote care and medication delivery services raised a $200 million funding haul to expand the current offering. Other startups have formed partnerships with key industry players, as is the case of Happify Health, which partnered with the American Heart Association. They released a heart health-focused digital mental health program that sought to reduce stress and encourage healthy habits among plan members[108].

The healthcare sector is going through an accelerated transformation motivated by the pandemic and digitalization. Trying to offer a cohesive user experience, companies are already creating partnerships, acquiring other companies, and moving to new fields.

A super app would allow the user and health provider to have a centralized point of information, allowing better diagnostics, increase prevention measures, precise marketing campaigns, and most importantly, well-informed users. The pandemic has accelerated the adoption of technology; once we could no longer have on-premise visits, everything became possible. A super app in this space does not yet exist, but it would be an exciting proposal for this fragmented industry.

6.2.2. Healthcare apps

Mobile phone use and the adoption of health apps are rapidly proliferating. There are health apps for each stage of the user's healthcare journey. The following table lists the standalone apps available for each step of the user/patient journey.

Stage	App/Startup
Pre-visit	Patient monitors its health with wearables (Fitbit) Healthcare insurance services (bright health) Genomics tests (23andMe) Healthcare financial engagement platform (Cedar) Appointment scheduling (One medical) In-home, community-based, and virtual care (Cityblock)

[108] Digital Health 150: The Digital Health Startups Transforming The Future Of Healthcare https://www.cbinsights.com/research/report/digital-health-startups-redefining-healthcare/

Stage	App/Startup
Check-in	Electronic Health Record (Redox) Patient check-in (Phreesia)
Pre-MD Encounter	Procedure prep (Gamgee)
MD Encounter	Specialized care, kidney care (somatus)- Screening and diagnosis (Arterys) Telemedicine and health assistance (Teladoc)
Post Encounter	Get text-based primary care anywhere (98point6) Pharmacy delivery (Pill pack) Reminders for upcoming appointments checkups (Zocdoc)
Between Visits	Virtual medical visits (dr. on demand) Diabetes care (Virta)
Others	clinical trials management (Science 37) Reviews from verified patients (Zocdoc) Pill Tracking (MediSafe) Pregnancy Tracking (Ovia Health) Doctor Quality Indicators (BetterDoctor) Pregnancy care (Concepta) Fertility solutions (Univfy) Cancer care (Cyrcadia) Nursing care (Willow) Menopausal health (Madorra) Sexual health (Minerva) Sleep monitoring (beddit) Infant monitoring (mimo) Mental health (headspace) Remote monitoring (vitalconnect)

Table 11. Healthcare single-purpose apps

6.2.3. Wearables

A wearable is an electronic device that is used very close or in contact with the skin to detect, analyze and transmit information to the device's wearer. The most common wearable devices in the healthcare industry are glucose meters and fitness and health tracking devices.

Glucose meter: A sensor is inserted under the user's skill. It measures interstitial glucose level, which is the glucose found in the fluid between the cells. The sensor tests glucose every few minutes. A transmitter wirelessly sends the information to a monitor.

Vendor[109]	Details	Monetizing method
FreeStyle Libre by Abbott	14-day system that continuously monitors glucose levels.	Monthly payment from zero to $75 depending on their insurance.
Omnipod's DASH	It continuously delivers insulin at set and variable rates throughout the day to mimic the insulin release of a healthy pancreas.	The starer kit costs around $650 and a pack of 10 pods can cost over $350. Each small, waterproof Pod provides up to 72 hours of insulin delivery.
Eversense	It consists of a smart transmitter and a mobile app, provides real-time glucose monitoring every five minutes.	Prices for the long-term CGM start at $99 plus the cost of the sensor placement by your provider.
MiniMed 670G	Automated insulin delivery.	The full retail price is around $8,000.

Table 12. Glucose meter's business models

As you can see, glucose meters are not yet accessible to everyone due to their high prices. Providing more services around diabetes and patient care could add more value to their current offering, creating a more compelling reason to acquire the subscription.

Current glucose meter providers will have to face significant competition very soon because Samsung and Apple are adding the blood glucose measurement functionality to their

[109] The full retail price is around $8,000. https://www.usatoday.com/picture-gallery/tech/2019/06/05/6-wearable-devices-manage-diabetes/1275579001/

smartwatches. This is a game-changer; they are making this technology a bit more accessible to users. According to the American Diabetes Association, more than 10% of Americans have diabetes, and over 26 million of them are undiagnosed.

Fitness and health tracking devices: Electronic devices designed to collect the data of users' personal health and exercise.

Vendor	Details	Price
Fitbit watch and strap	Health Metrics & SpO2 ECG Stress Management 24/7 Heart Rate Sleep Tracking Active Zone Minutes Voice Assistants Fitbit Pay	From $80 to $500
Apple watch	Heart Rate ECG Fall Detection Apple Pay	From $200
Whoop strap	Focus on sleep, recovery and strain	Whoop strap 3.0 is free with a $30 membership

Table 13. Fitness and health tracking devices business models

Other healthcare devices: There are many more IoT wearable healthcare devices. However, just the smartwatches and glucose meter have gained notorious public adoption. Other devices include:

- Personal posture training
- Sleep sensors
- Hearing aids
- Blood pressure monitors
- Pulse oximeter
- Pedometers

6.3. Opportunities

6.3.1. Technology

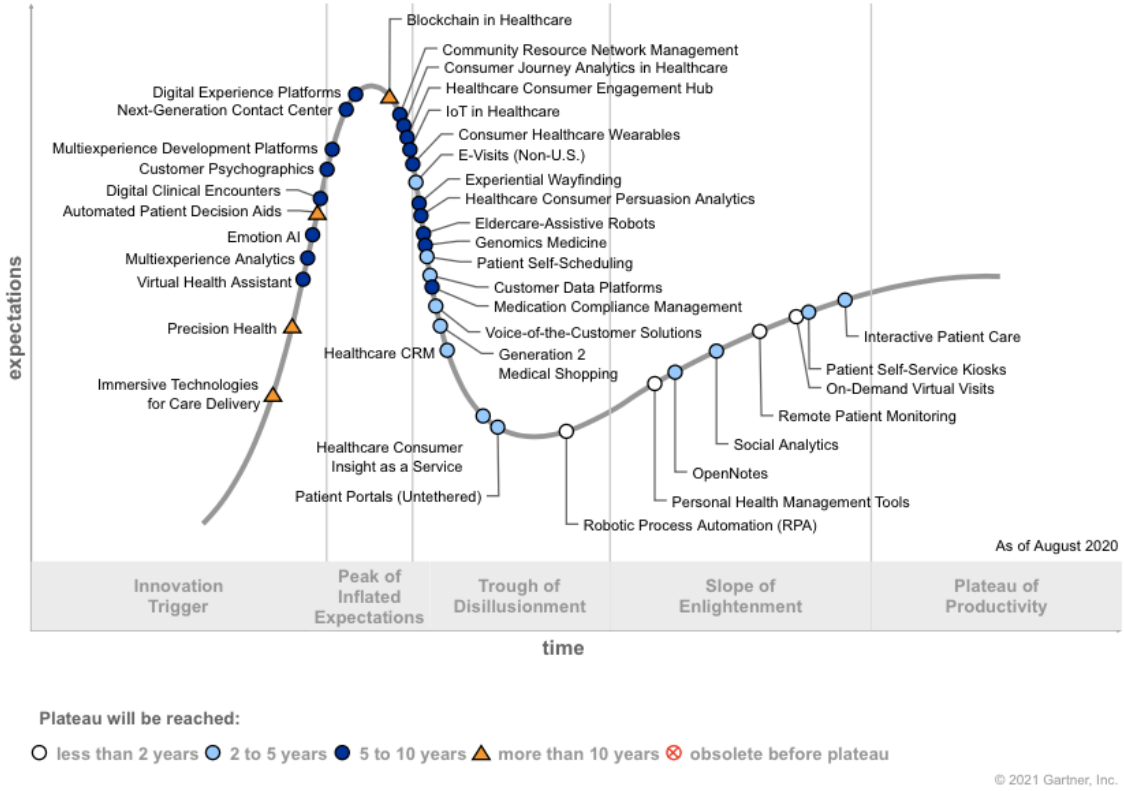

Figure 53. Hype Cycle for Consumer Engagement With Healthcare and Wellness[110]

Gartner's hype cycle for consumer engagement with healthcare and wellness exhibits the technologies used in the healthcare industry; some will reach the plateau sooner than others, while others might become obsolete before the plateau.

One of the most promising technologies is robotic process automation (RPA). This technology allows anyone to configure a bot to emulate and integrate human interactions with digital systems. They interpret, trigger responses, and communicate with other systems to perform various repetitive tasks[111]. RPA helps to increase satisfaction for both patients and providers, and these are some of its uses in the healthcare industry:

[110] Hype Cycle for Consumer Engagement With Healthcare and Wellness, 2020
https://www.gartner.com/document/3989052?ref=solrAll&refval=273518808

[111] Robotic Process Automation https://www.uipath.com/rpa/robotic-process-automation

- Simplifying claims processing: This process is often time-intensive and error-prone; a human mistake can cause a significant impact on cash flow. RPA streamlines the claims process by speeding up data processing and simultaneously reducing the number of errors.
- Improving the healthcare cycle: Providers collect vast amounts of data from their patients each day. RPA software can manipulate collected data to generate analytics that offers clinical staff valuable insights to help them make more accurate diagnoses and provide tailored treatments to patients.
- Scheduling new patient appointments: RPA robots can help scan the incoming data, build out a condensed report and direct the appointment request to the correct work queue based on its defining attributes such as location, diagnosis and insurance carrier [112].
- Optimizing regulatory compliance: RPA ensures that all process steps are tracked, traceable, and documented, as well as systematically organized in well-structured logs[113].

The pandemic helped the on-demand virtual visits to reach faster adoption. This service is appealing to time-pressured individuals, patients with mobility challenges, chronic disease sufferers, and patients who live in areas with shortages of clinicians. Also, interactive patient care systems could complement virtual visits by letting healthcare providers to engage, entertain, and educate patients across the care continuum via tablets, multimedia devices, in-room TVs, and online patient portals.

Patient portals will reach their plateau in two to five years. They enable a secure digital patient-provider communications channel that provides access to clinical, financial, administrative and educational information, and personal health maintenance tools.

Other technologies such as patient self-service kiosks and virtual health assistants (VHAs) enable digital encounters and release healthcare professional workload. Patient self-service kiosks offer opportunities to engage with patients and reduce patient wait times. These free-standing terminals enable patients to perform patient registration, check-in, wayfinding, and account payments.

[112] What Does Robotic Process Automation Look Like in Healthcare? https://healthtechmagazine.net/article/2020/01/what-does-robotic-process-automation-look-healthcare-perfcon
[113] 6 Real World Use Cases for Robotic Process Automation (RPA) in Healthcare https://www.cigen.com.au/cigenblog/6-real-world-use-cases-robotic-process-automation-rpa-healthcare

Virtual health assistants (VHAs) enable patients to have clinically relevant encounters using advanced AI capabilities. VHAs incorporate a broad range of use cases for specific digital encounters, including chronic condition management, medication compliance, and health and wellness routines.

The following figure shows how different AI technologies could be part of each of the stages of the patient journey:

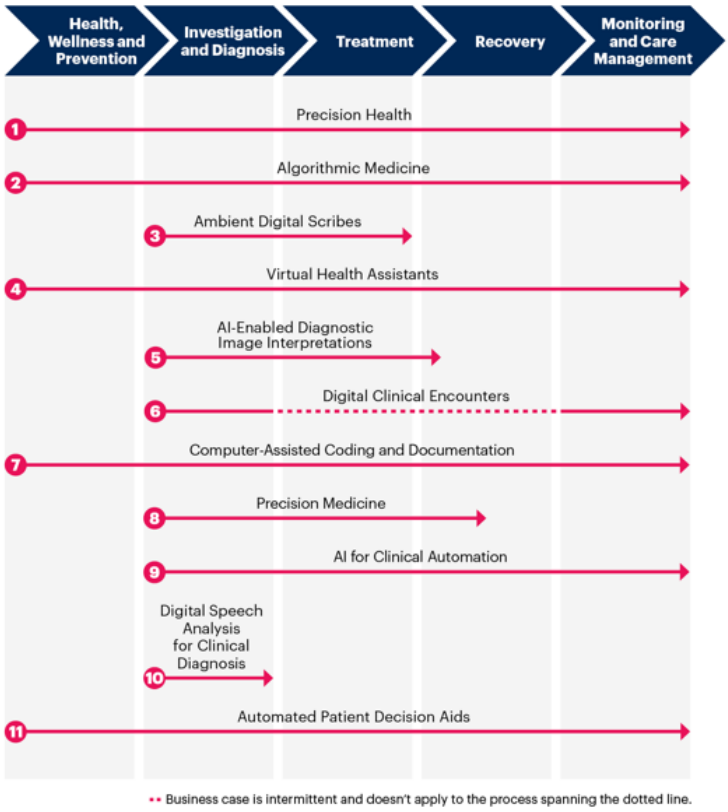

Figure 54. AI technology in healthcare[114]

Acceleration has been the pandemic's most notable impact on health systems' digital strategy. Before the pandemic virtual care was considered a nice-to-have, and during COVID it rapidly became a need-to-have. According to research carried out by the National Center for Health Statistics, 32% of people in the US with at least one chronic health condition had used telehealth in April, May or June. More specifically, 44% of diabetes patients, 37% of asthma patients and 33% of those with hypertension had accessed telehealth services[115].

[114] AI use case prism for healthcare provider industry – Gartner

[115] Rise of digital health during pandemic energises commitment and expectations of younger doctors https://www.healthcareitnews.com/news/emea/rise-digital-health-during-pandemic-energises-commitment-and-expectations-younger-doctors

6.4. Super app for healthcare

The healthcare industry has probably the most fragmented software ecosystem. How many times have you been to the doctor, and they have asked you the same questions: Do you have any allergies? What medical conditions run in your family? When was the last time you had a medical checkup?

Asking the same questions over and over is not just inefficient but also time-consuming. Wouldn't it be nice to go to the doctor and have your doctor telling you: based on your Fitbit readings from this year, I see that your heart rate has increased over the past 2 months, and due to your family history of hypertension, we should look at it closely. I have already formulated the drug prescription, and it should be delivered to your home by tomorrow evening. You will get a pop-up notification on your phone every day at the time you need to take the medication. Please book your next appointment on your healthcare super app, and do not forget to rate my services.

You might be thinking now, it does not sound like a healthcare service but as an Amazon customer service agent. And you are right. Amazon uses data to provide a better experience to its customers, so why not take the same concept to more critical areas such as healthcare.

A healthcare super app should cover every stage of the patient journey, including prevention, treatment, diagnosis, recovery, and monitoring. It needs to be intuitive, easy to use, and most importantly, it should offer everything a user needs for treating any sickness from seasonal flu to an advanced stage of cancer. A healthcare super app should offer many different user flows to cover all patient's needs. The following figure describes the journey for a user who was diagnosed with diabetes:

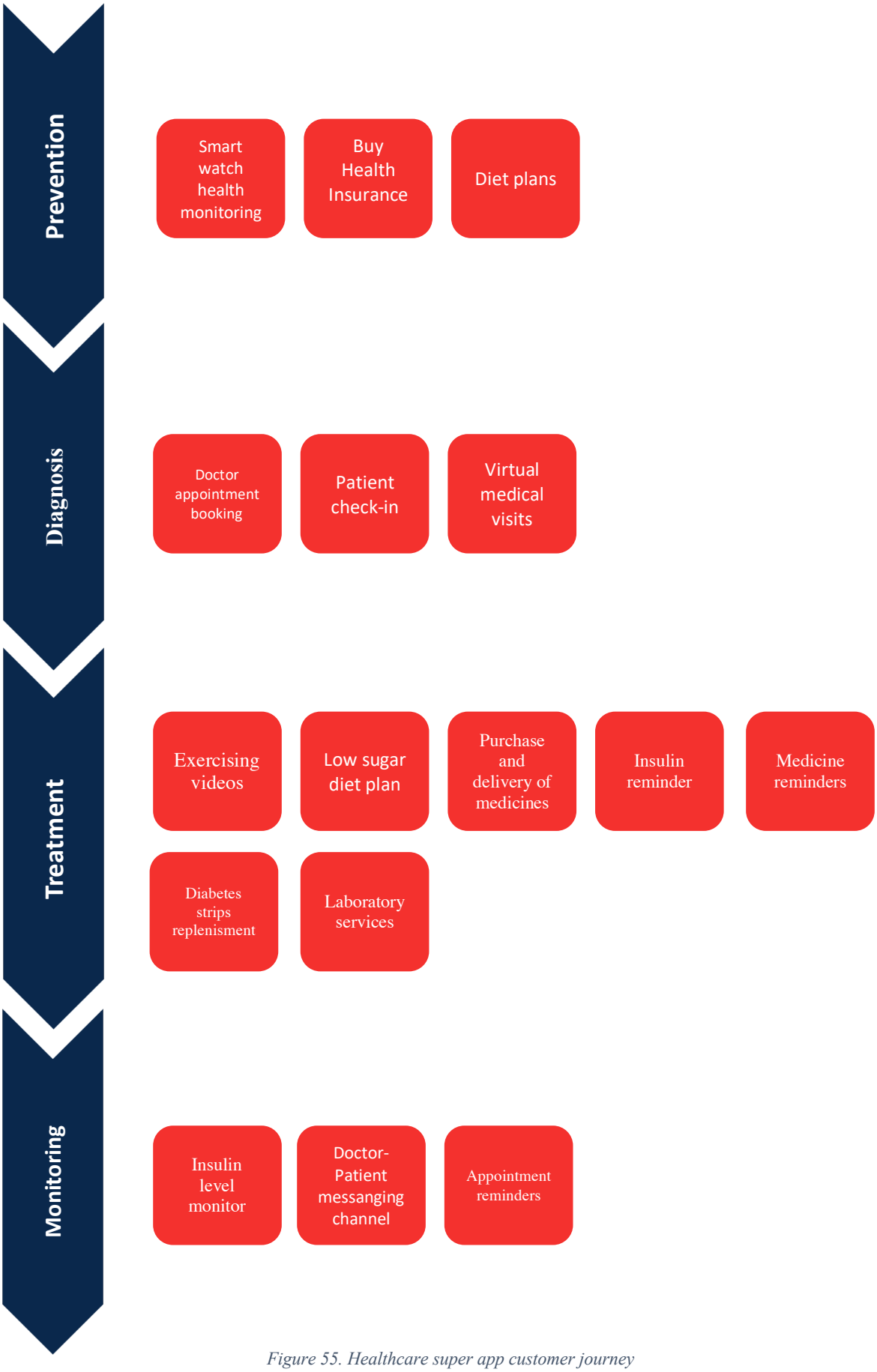

Figure 55. Healthcare super app customer journey

Women's health has been one of the growing needs in the healthcare space over the past years. It refers to the branch of medicine that focuses on the treatment and diagnosis of diseases and conditions that affect a woman's physical and emotional well-being.

The women's health market includes a wide range of technologies to address the specific health needs of women. There are already many apps in this space covering menstrual care, pregnancy care, fertility solutions, cancer care, general healthcare, sexual health, nursing care, fertility tracking, and menopausal health.

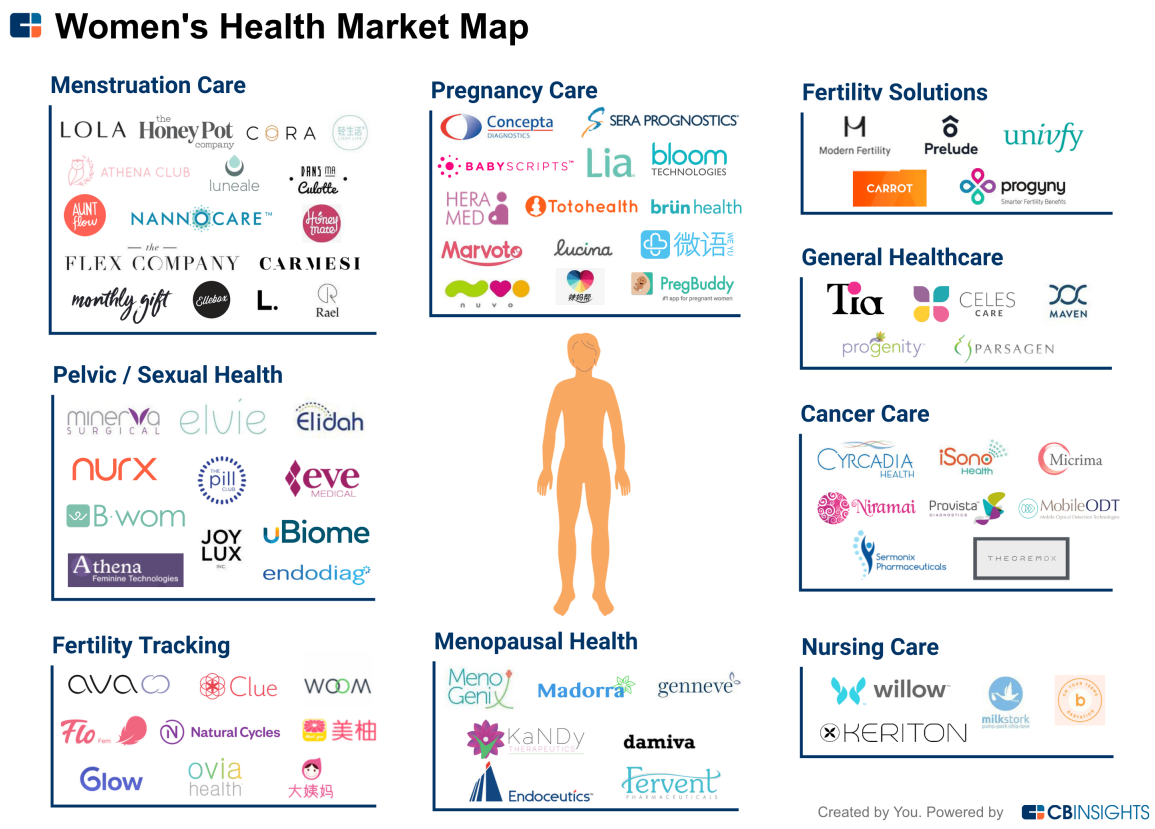

Figure 56. Women's health market map[116]

Women's health is still a relatively young industry. Nevertheless, the area is opening up new avenues for women to better understand their health, primarily via digital health apps and portable diagnostic tools. The women's health market is estimated to be worth over $50B by 2025 globally, with recent investment and regulatory activities showing a growing interest in the space.

[116] How Technology Is Transforming Women's Healthcare https://www.cbinsights.com/research/report/womens-health-technology-transforming/

Technological advances in the area of health allow constant monitoring in all stages of the patient's life. From the early childhood to elderly services, and from the prevention stage to the recovery and monitoring stage, one or more technologies will interact with the patient. For Women's health, the internet of things and artificial intelligence has become an increasingly prevalent technology.

The term "femtech" was first used by Ida Tin, CEO of Clue. Clue is a popular period-tracking mobile app. It refers to any technology that aims to improve women's health and lives. Most femtech apps enable women to track their menstrual cycle, ovulation period, track moods, overall body condition, and reminders to take birth control pills.

For each stage of women's life and medical service, there is a femtech app to fulfill one women's need. No integration, no information is shared, and no complete view of the patient—just a siloed ecosystem of multiple apps.

A femtech super app could have the following characteristics:

- One unique single sign-on.
- Share data between mini-apps.
- Use historical data for better diagnosis.
- Offer a uniform and individual user experience.
- Save the memory storage on the user’s device
- Offer a variety of services.
- Offer the right services to the user for each life stage
- Pay less for customer acquisition

The following figure shows a potential customer journey for a femtech super app. The functionalities of nine different single-use apps or femtech startups could be combined into one super app. This would improve diagnosis and the customer experience.

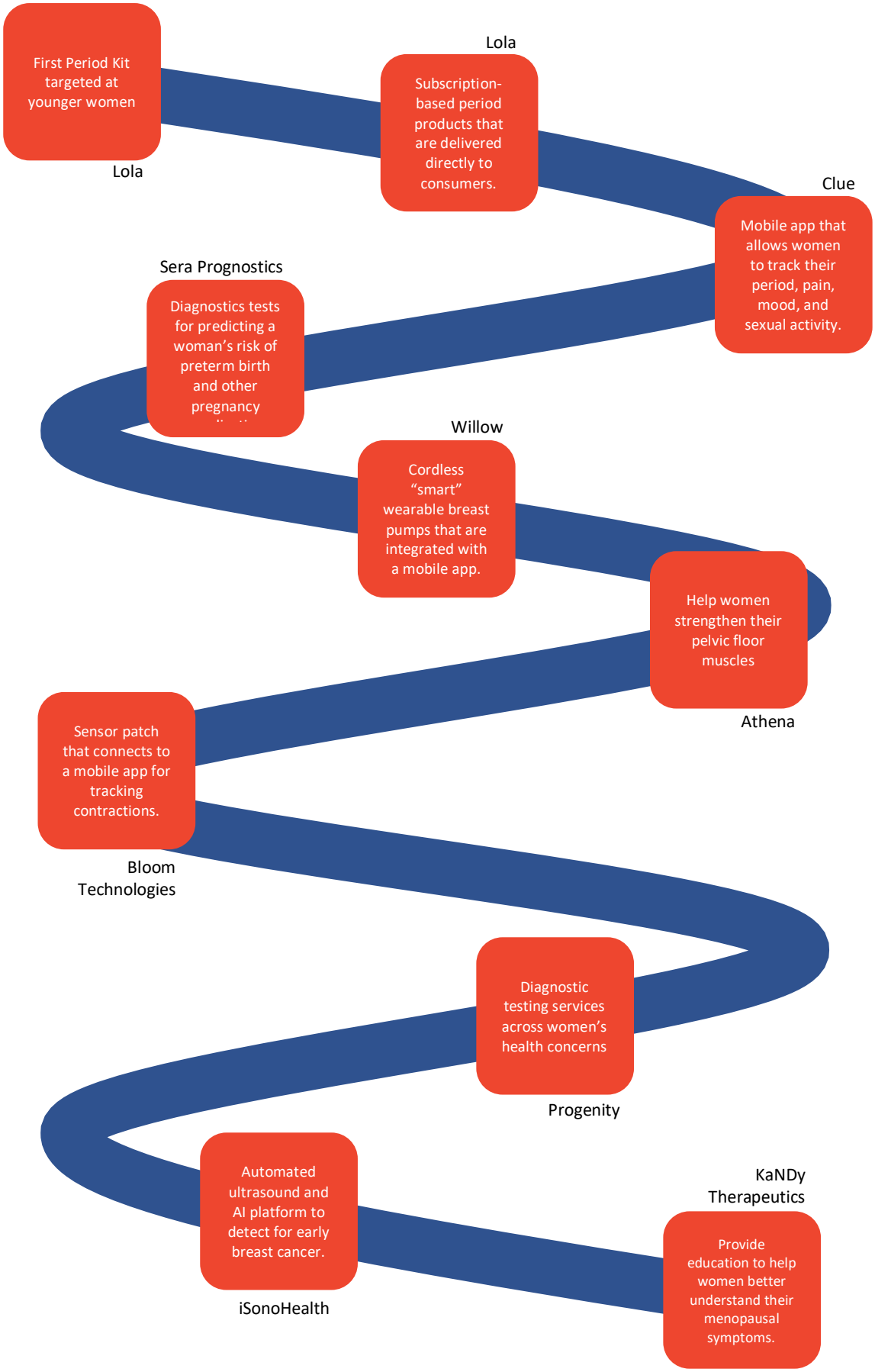

Figure 57. Femtech super app customer journey

7. Neobanks becoming Super Apps

In chapter 4.1.2. Scaling outside the core functionality, we discussed super apps wanting to offer financial services in their ecosystems. This chapter will discuss the current financial service apps landscape, the role of banks in the super apps ecosystem, and neobanks (digital banks without physical branches) wanting to become super apps.

7.1. Financial services apps

According to a report by Google, the average number of finance apps that smartphone users have installed on their phones is 2.5, and 63% of those apps are used weekly[117]. As of February 2021, there were 10,605 financial technology startups in the United States, each of which has at least one single-purpose mobile app solving one or a few user's needs in the financial sector. There are standalone apps for personal banking, retail investments, lending, cryptocurrency transactions, digital wallets, insurance, payments and transfers, and remittances.

Compared to other industries, the financial services industry is less fragmented than others. Nowadays, banks offer not only financial services but also non-financial services in the same app. Their flexibility and easiness of integrating financial services to almost any customer journey from any industry make this industry the most developed in the one-industry super app space.

7.2. Super Apps moving to the financial sector

Banks are no longer competing against other banks; financial and non-financial companies are competing with one another to provide their financial services to users. Banks in South East Asia are now competing with Grab, and soon they will be competing with more super apps that include financial services as part of their offering.

In 2018, Grab launched Grab Financial, a company's financial arm which offers payment, insurance, and financing services. In 2020, Grab was granted a digital bank license from Singapore together with Singtel as a consortium that would allow Grab-Singtel to expand

[117] The finance app in mobile banking https://www.thinkwithGoogle.com/marketing-strategies/app-and-mobile/app-marketing-mobile-banking/

their financial services offerings. And in January 2021, Grab Financial Group, the company's financial services unit, raised more than $300 million from South Korea's Hanwha Asset Management[118].

7.3. Partnership between super apps and traditional banks

Super apps represent a threat to banks[119]. Traditional financial institutions are being moved one step further away from their customers because super apps are disintermediating banks from their users. WeChat and Alipay offer a range of banking, savings and investment products to customers. Their financial products are originated and underwritten by traditional financial institutions. Still, the entire customer interaction is through the super apps.

Super apps variety of services gives them access to a vast amount of data, which they use to deliver better services and experiences to their users. They are using social media and transactional data to risk-assess loan applicants and leverage on data to better target financial products to customers at the exact time they need them.

Financial institutions are building their brand reputations in financial services through super apps partnerships. Banks are using the super app's brand reputation to access new customers and build trust in financial services. WeChat has WePay for payments and WeBank for banking products, while Alibaba has AliPay and Ant Financial.

In this digitalized era, super apps have an advantage over financial institutions, where traditional banks struggle to get a complete view of their customers. Like what happened in the insurance sector with aggregators, traditional financial institutions may quickly find they have been relegated to performing the regulated activities while the super apps retain the customer experience and relationship. Quoting Anna Mikhina, Head of Lifestyle Banking at Tinkoff, "those able to create a quality super-app, which customers can use for all of their daily needs, will remain in the game".

[118] Grab https://en.wikipedia.org/wiki/Grab_(company)
[119] Super app or super disruption? https://home.kpmg/xx/en/home/insights/2019/06/super-app-or-super-disruption.html

7.4. From neobank to super app

Not just super apps are becoming a threat to traditional banks, but also Neobanks. Neobanks are digital banks, they operate exclusively online without a traditional physical branch network. Some of them are created from scratch by startups, such as is the case for Nubank and Monzo. In contrast, others Neobanks have been created by traditional banks, such as is the case of Nequi from Bancolombia. No matter where they come from, they are successfully attracting younger generations of consumers.

Monzo, a neobank with headquarters in the United Kingdom, has more than 5 million customers, mostly millennials. Another financial app, KakaoBank, attracted more than 240,000 Korean customers within the first 24-hour-operation. It is very popular due to its simplicity, unique and intuitive UI and UX.

The following table lists some of the most popular neobanks and the services they offer:

Service	Nubank	Nequi	Sofi	Revolut	Ant Financial	N26	Pepper	Paytm	Aspire	Kakaobank	Monzo
Non-financial services		x			x			x			
Personal finance	x	x	x	x	x	x	x	x	x	x	x
Payments		x		x	x	x	x	x	x	x	x
Remittances					x			x		x	
Lending	x	x	x		x		x	x		x	x
Retail investment								x			x
Wealth management		x		x	x	x		x		x	x
Insurance	x	x	x	x	x			x			
International transfers				x				x			
Rewards	x			x		x	x	x	x	x	
Business account	x		x	x							x
Crypto-currency				x							
ATMs		x				x		x		x	

Table 14. Neobank's services

Bancolombia, is the largest commercial bank in Colombia and one of the largest in Latin America, providing a range of financial products and services to both individual and corporate customers. It created Nequi, the first Colombian neobank, as an internal attacker, their competitor. It was conceived at Bancolombia's innovation lab in 2014 as a separate entity from Bancolombia, and nowadays, it has now more than 6 million users. Nequi operates like a startup, and its success has been based on its user focus, reinvention capacity, and high resilience.

Nequi has three different revenue models: free services, pay per use, and open collaboration. Free services include everything that has to do with money transactions. Pay per use refers to third-party services offered in the main menu, such as phone and public transport top-up, bill payment, insurance purchase, and bike ridesharing service. Finally, open collaboration refers to how Nequi exposes its services in third-party businesses through APIs (invisible bank). Nequi is a neobank that offers financial and non-financial services and seeks to become a multi-industry super app.

Nequi's business model is different than that of a traditional bank. It relies heavily on commissions and APIs monetization. These commissions can be paid by the business partner or by the final user. There are currently 25 companies that consume their APIs, including parking meters, parking lots, electronic commerce, a food delivery app, and recycling machines (you put a plastic bottle and get money in exchange into the Nequi app).

In order to become attractive for business partners, Nequi's strategy is to strengthen the application heart (free services) and increase the customer base at a low customer acquisition cost. Nequi wants their customers to find everything they need in the app, so the money circulates within the ecosystem. They are creating alliances with other companies to offer their services in third parties' applications through APIs. Nequi created the first API portal in Colombia, and its most significant challenge has been the immaturity of the Colombian ecosystem regarding API integrations.

Like Nequi, Tinkoff is a Russian neobank expanding their offering from financial to non-financial services through partnership and an API strategy. Tinkoff moved from a bank app to a super app, the first banking super-app created by a financial institution in Europe. They serve over 11 million customers, with more than 20,000 Tinkoff Black cards issued daily[120]. Tinkoff has already made agreements with major players in each industry to offer Tinkoff customers access to a myriad of services at a discount or with a cashback offer.

[120] Tinkoff: Creating a banking super-app https://www.efma.com/article/detail/32263

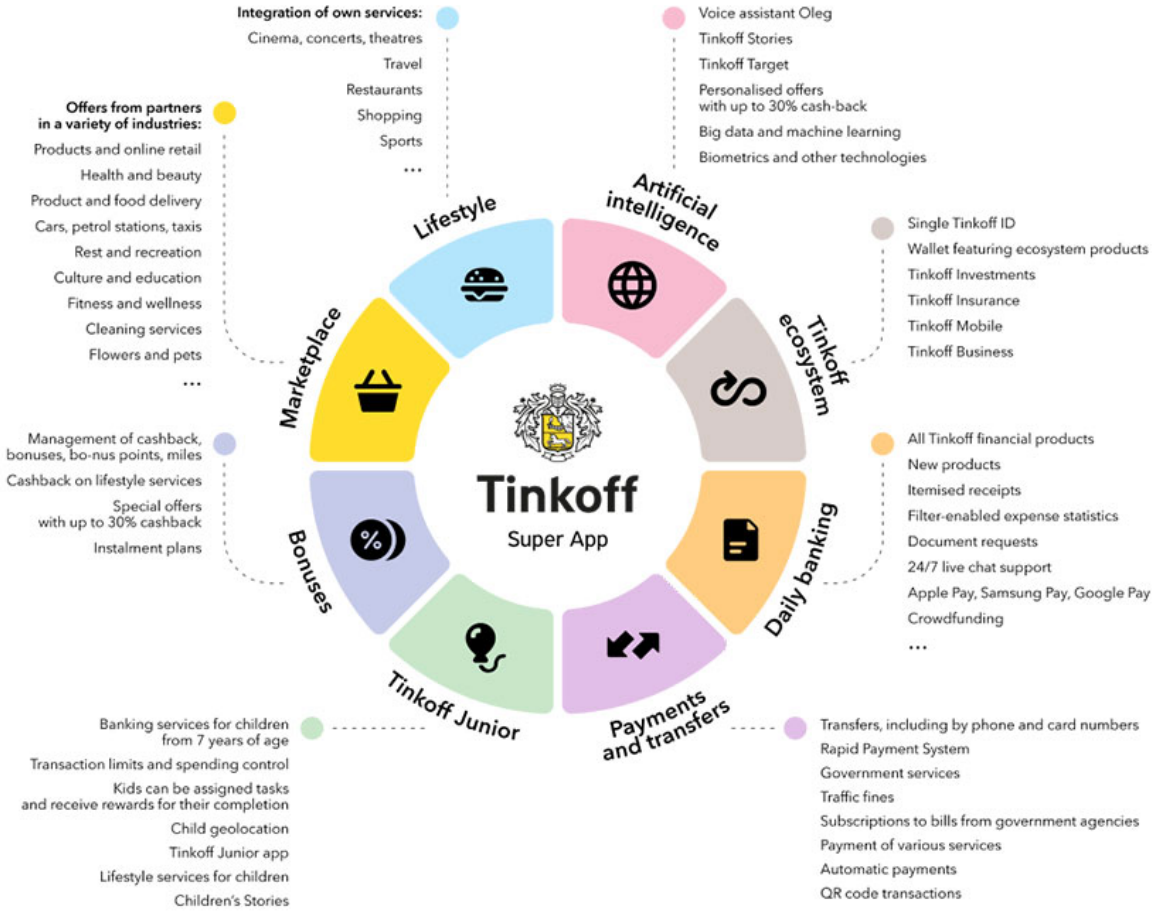

Figure 58. Tinkoff ecosystem[121]

Tinkoff's current offering to consumers includes lifestyle services such as movies, concerts, theaters, restaurants, travel, shopping, sporting events, and insurance services. The neobank super app key feature is its own marketplace. External partners can connect to it (via open APIs) using the app-in-app model to offer targeted products and services within the Tinkoff app.

The Russian super app started as a neobank, plans to expand its current offering to e-commerce, excursions, exhibitions, parties, master classes, fitness and wellness, food and flower delivery, car products and services, products and services for children, transport, logistics, and car-sharing, health and beauty, and cleaning services.

[121] Tinkoff ecosystem https://aika.substack.com/p/tinkoff

8. Are super apps the future?

Super apps in East Asia, Latin America, and Africa still have a long way to become the WeChat of their respective geographies. The successful mini-programs strategy and QR code payments have not been adopted by super apps outside China. China's technology readiness and tech-savvy population made possible the creation and adoption of more than 2.3 million mini-programs on WeChat. SMEs (small and medium enterprises) in Latin American still need to develop in-house technical capabilities and a digital mindset to create and execute an API strategy and developments outside their applications.

WhatsApp payment service could become a game-changer in Latin America and Africa in the coming years. While WeChat has 1,213 million monthly active users (MAU), WhatsApp has 2,200 million MAU. This is a huge opportunity for Facebook to start monetizing WhatsApp and access the unbanked population of many countries that are heavy users of the messaging app. It could change the way e-commerce operates in countries where people do not trust online payment platforms yet.

The messaging company could become the bravest competitor for Neobanks, which are trying to keep their clients' money circulating within their digital ecosystems with financial and non-financial services. Banks and Neobanks want to be part of every aspect of the lives of their customers, monetize data (open banking), and offer the right services at the right time. WhatsApp payments customer acquisition cost would be minimal and could bring enormous amounts of money to Mark Zuckerberg's digital ecosystem. However, it will not be easy for the messaging company to launch the payment service in many countries due to monopoly concerns.

Tech companies have faced increased scrutiny over their size and power in recent years. Google, Facebook, Apple, and Amazon have abused monopoly power. These firms run a marketplace while also competing in it, enabling them to write one set of rules for others while they play by another. The U.S. House Judiciary antitrust subcommittee released a report recommending making it tougher for tech giants to buy up smaller companies. They also suggested nondiscrimination requirements, which aim to stop platforms from prioritizing their own products over those of rivals. The subcommittee also called for the strengthening of antitrust laws and enforcement[122].

[122] Apple, Google, Facebook and Amazon abused monopoly power, House report says https://www.cnet.com/news/apple-google-facebook-and-amazon-abused-monopoly-power-house-report-says/

One might think it will not happen to super apps due their strategy focuses primarily on partnerships, gig economy, mini-programs, and more importantly, because they operate outside of Europe and the U.S., where regulations are not yet so strict. However, in February 2021, China's market regulator released new anti-monopoly guidelines that target Internet platforms. China has over 200 licensed payments providers, but Ant's Alipay and Tencent's Tenpay (WeChat) divide most of the non-bank online transactions between them. Chinese super apps offer customers free payments while trying to convince them to stash unused balances in an interest-yielding account.

Regulators want financial technology companies offering interest-bearing deposits to be supervised more like banks with capital adequacy requirements. Chinese monopoly rules threaten the super-app model, given that if the movement of funds from financial accounts to shopping accounts gets constricted or blocked, digital wallets become less profitable, and super-apps integrating investment and payments become unviable[123].

Another super app facing monopoly accusations is Grab. In 2018, Grab acquired Uber's Southeast Asia business. Complaints against Grab were mainly related to fare price increases since the merger. Uber's exit from the region gave Grab the monopoly categorization, the ride-sharing company has about 72% market share in the region.

Government regulations create additional challenges to super apps that already struggle to become profitable. Ride-hailing companies Gojek and Grab saw a significant drop in the passengers' orders in Indonesia as the government enforced a new tariff increase for app-based motorcycle taxis. The regulation factors in provisions such as the standard minimum fare of motorcycle taxis and customer protection and stipulates that the minimum tariff should consider a motorcycle taxi's operational cost.

Gig economy super apps face additional criticism due to their workers' misclassification and low wages. Migrants often make up a significant proportion of the gig economy. According to a World Bank report, Rappi has indirectly profited from the crisis that has brought 1.3 million Venezuelans to Colombia. The migrant's urgent need to get a job pushed wages down across the country. At a protest in October 2018, Colombian contractors claimed Rappi had reduced all couriers' wages per delivery as a direct result of the Venezuelans. The workers claimed that migrants did not know the previous rate and desperately needed money, agreed to work for less[124].

[123] Chinese monopoly rules threaten super-app model https://www.reuters.com/article/us-china-payment-cenbank-breakingviews/breakingviews-chinese-monopoly-rules-threaten-super-app-model-idUSKBN29Q0J1
[124] The gig economy is a double-edged sword for migrant workers https://www.bbc.com/worklife/article/20190701-the-gig-economy-is-a-double-edged-sword-for-migrant-workers

The days of food delivery and ride-sharing apps of profiting from ambiguity in employment law might come to an end in many countries over the next years. Companies that want to control their workers and guarantee a particular kind of service will in exchange have to provide them with sick pay, holiday pay, and the minimum wage, that will raise costs and reduce returns[125]. Gig economy workers misclassification is a discussion that is being held in every country that has a super app which core functionality is a gig economy service.

Super apps have many legal battles to fight yet. Their business model, user experience and strategy have had a great reception among millennials, which makes them prompt to become monopolies. Primarily because most of them operate in markets where regulations for digital products are not mature.

The deregulation of digital platforms in many countries in Latin America, Asia, and Africa will allow super apps to continue growing in the coming years. It is uncertain for how long they will have this advantage. WhatsApp payments expansion could accelerate the regularization in developing countries, where governments will protect their local financial ecosystem (bank and neobanks).

[125] Uber judgment is set to reshape the gig economy https://www.ft.com/content/fa86829e-1eb1-4cb2-b92f-482110a752cd

9. Appendix

9.1. Survey on technology adoption by older adults

Total responses: 162

Date Created: Saturday, August 15, 2020

Complete Responses: 162

Q1: How old is this older adult?

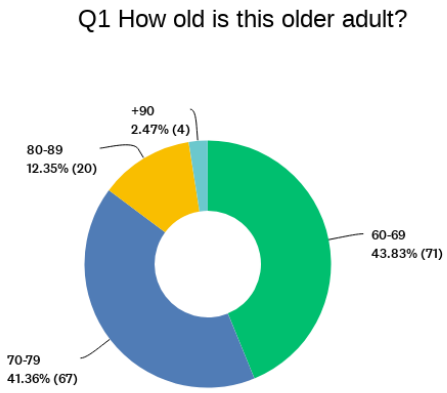

Figure 59. Older adult's survey - Age

Q2: What devices does this older adult have? (multiple choice question)

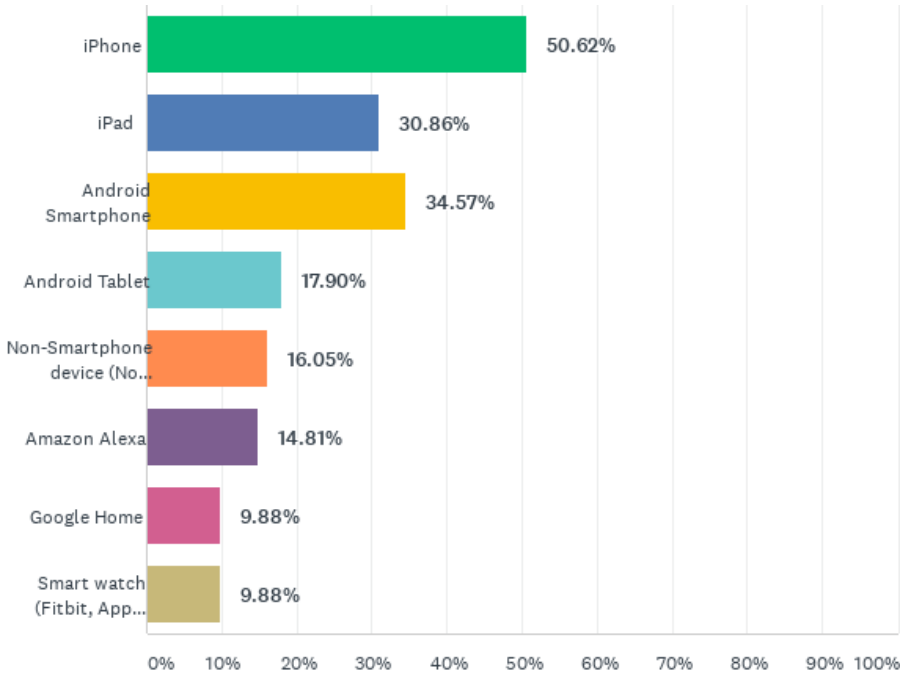

Figure 60. Older adult's survey - Devices

Q3: What can he/she do with his/her smartphone? (multiple choice question)

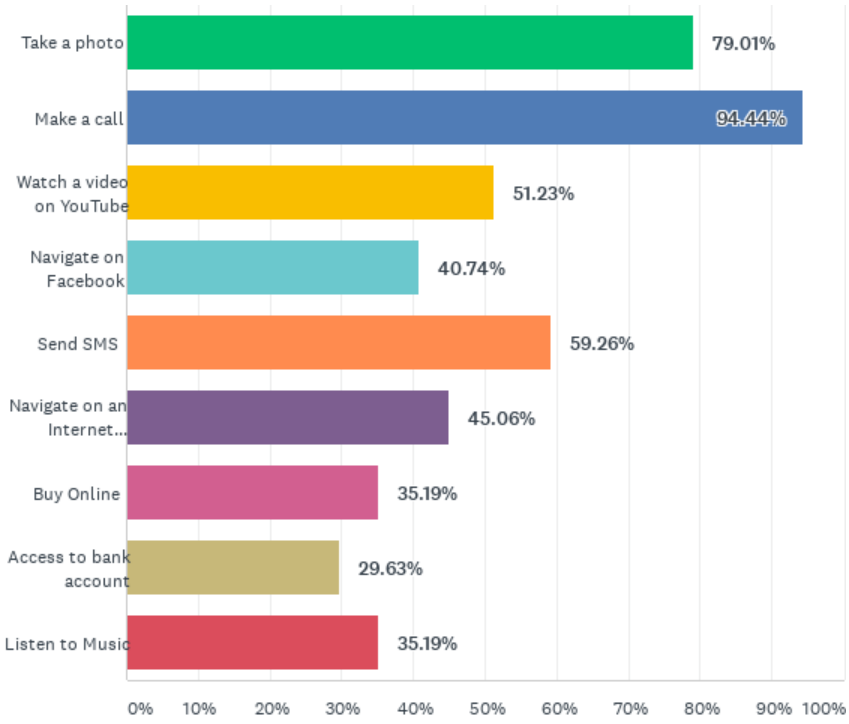

Figure 61. Older adult's survey - Smartphone activities

Q4: Select the applications this older adult currently uses:(multiple choice question)

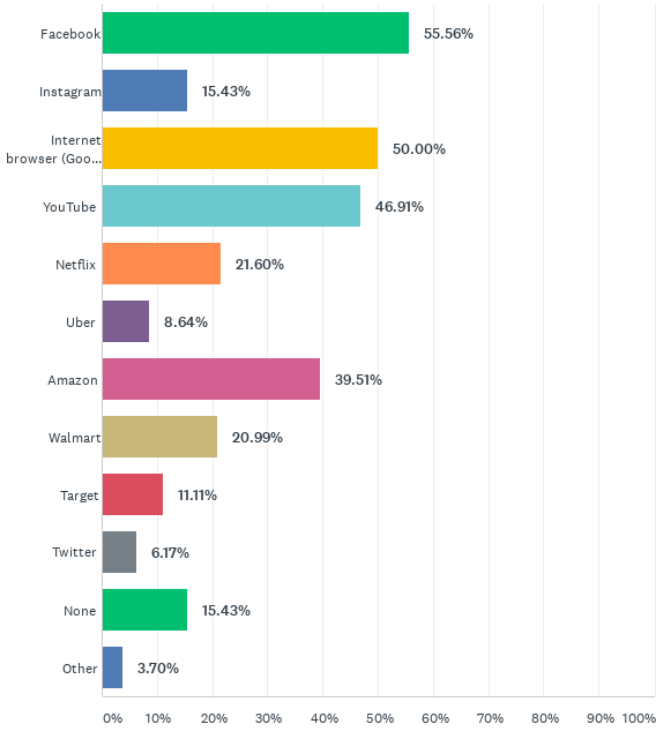

Figure 62. Older adult's survey - Applications

Q5: What are the reasons why this person finds it difficult to use mobile applications? (multiple choice question).

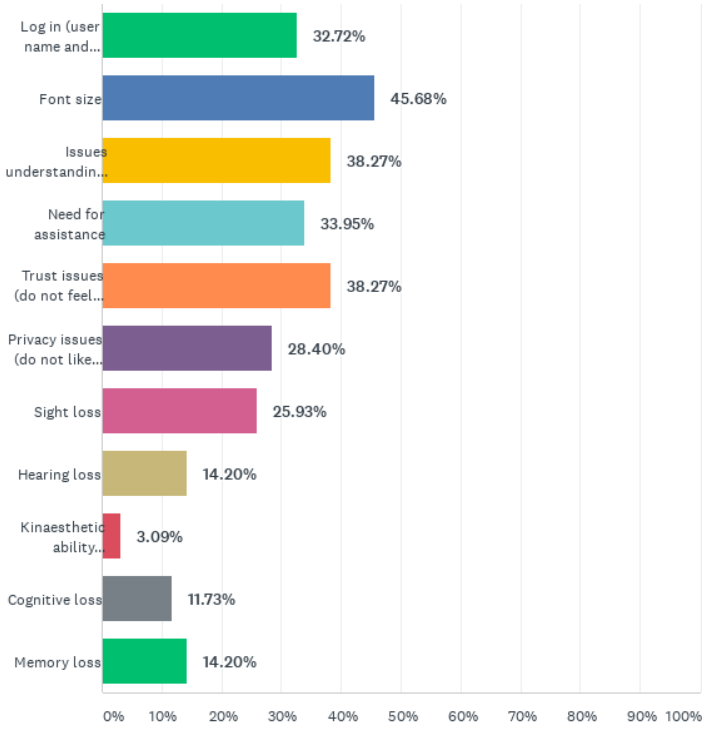

Figure 63. Older adult's survey - Reasons they find it difficult to use mobile applications

Q6: How many times do you have to explain how to use a mobile application to an older adult, for him/her to feel comfortable using it?

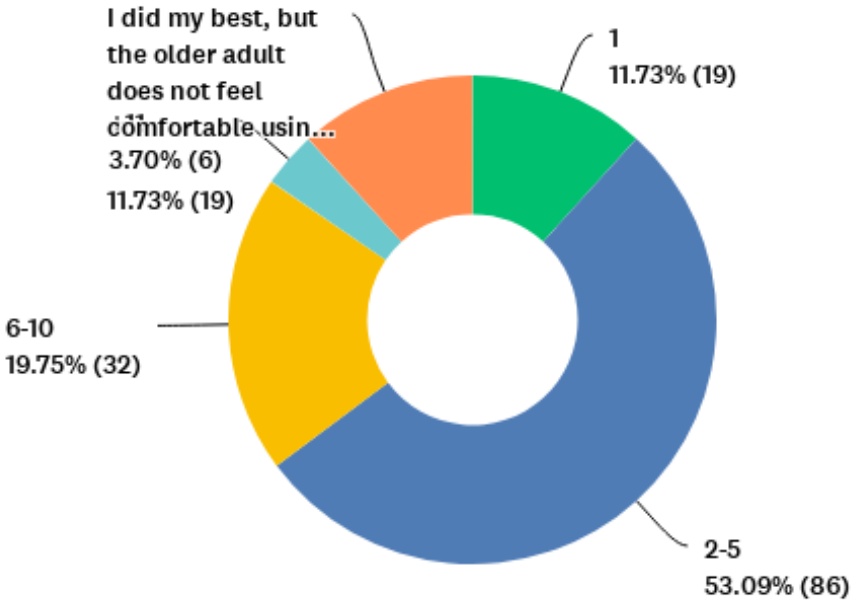

Figure 64. Older adult's survey - Number of times you exlained an older adult how to use a mobile application

Q7: Select all the devices/wearables that he/she uses:(multiple choice question)

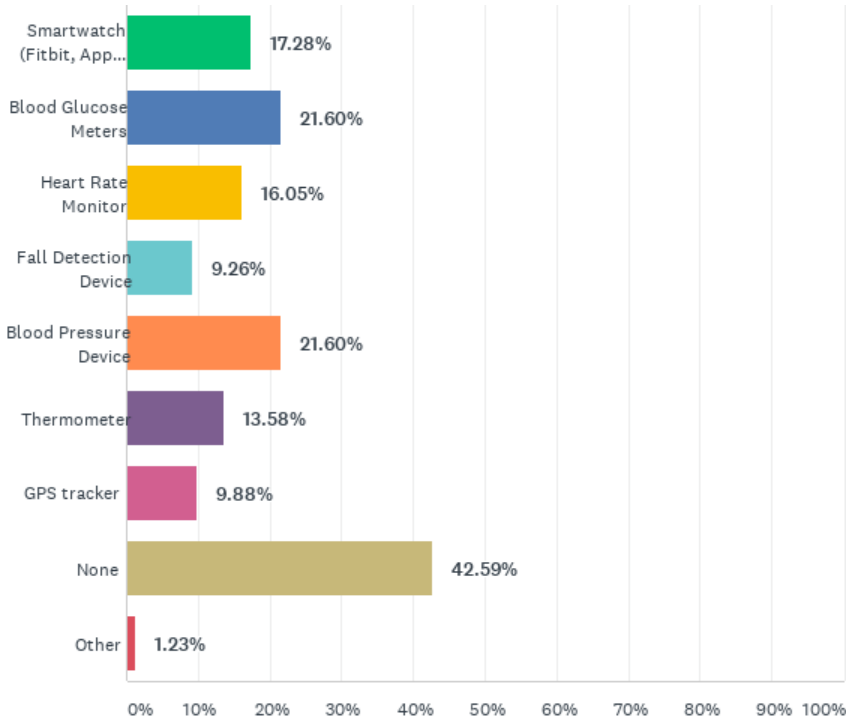

Figure 65. Older adult's survey - Devices/Wearables

Q8: During the COVID-19 confinement did he/she attend any virtual religious service?

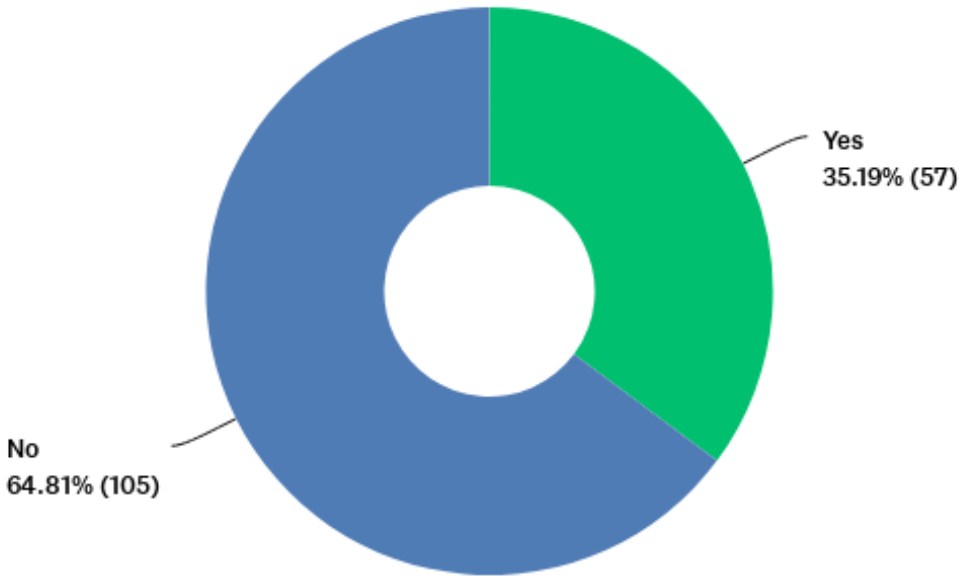

Figure 66. Older adult's survey - Virtual religious services

Q9: Does she/he currently use or have used an application designed exclusively for the elderly?

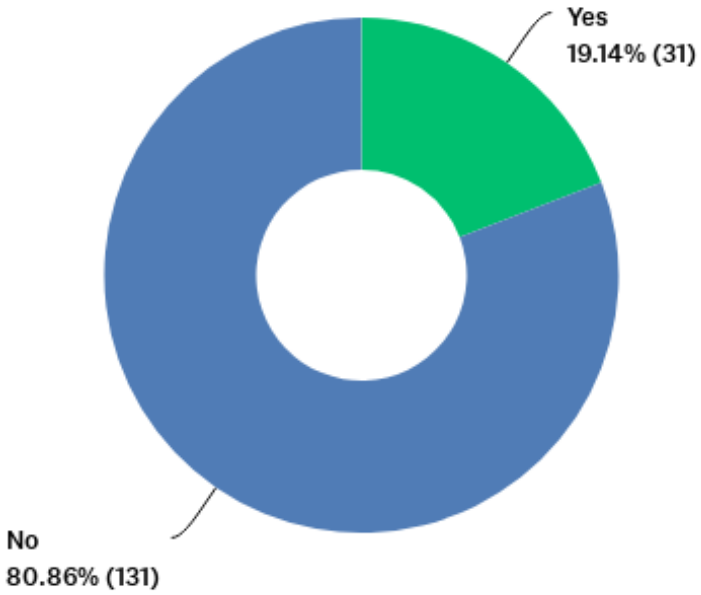

Figure 67. Older adult's survey - Applications designed for the elderly

Q10: Select the functionalities that you consider would be useful for the elder adult:

	WILL NOT USE (1)	COULD USE (2)	WILL DEFINITELY USE (3)	TOTAL	WEIGHTED AVERAGE
Access to the bank account	37.65% 61	47.53% 77	14.81% 24	162	1.77
Buy groceries on the internet	41.98% 68	38.89% 63	19.14% 31	162	1.77
Attend church online	37.04% 60	40.74% 66	22.22% 36	162	1.85
Request an uber	61.11% 99	32.10% 52	6.79% 11	162	1.46
Book a doctor appointment	24.69% 40	53.70% 87	21.60% 35	162	1.97
Video calls with relatives and friends	16.05% 26	43.21% 70	40.74% 66	162	2.25
Telemedicine/Telehealth	22.84% 37	58.02% 94	19.14% 31	162	1.96
Watch Physical Exercises Videos	53.09% 86	32.10% 52	14.81% 24	162	1.62
Watch Yoga Videos	66.67% 108	24.69% 40	8.64% 14	162	1.42
Manage Medication Alerts	27.16% 44	57.41% 93	15.43% 25	162	1.88
Take Handicraft Courses	62.35% 101	28.40% 46	9.26% 15	162	1.47
Play Memory Games	32.72% 53	46.91% 76	20.37% 33	162	1.88
Manage Calendar	37.04% 60	46.30% 75	16.67% 27	162	1.80
Pay taxes	62.96% 102	27.78% 45	9.26% 15	162	1.46
Request Government Subsidies	50.62% 82	42.59% 69	6.79% 11	162	1.56
Pay Bills	41.36% 67	43.21% 70	15.43% 25	162	1.74
Book a Vacation	53.70% 87	34.57% 56	11.73% 19	162	1.58

BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION
Access to the bank account	1.00	3.00	2.00	1.77	0.69
Buy groceries on the internet	1.00	3.00	2.00	1.77	0.75
Attend church online	1.00	3.00	2.00	1.85	0.76
Request an uber	1.00	3.00	1.00	1.46	0.62
Book a doctor appointment	1.00	3.00	2.00	1.97	0.68
Video calls with relatives and friends	1.00	3.00	2.00	2.25	0.71
Telemedicine/Telehealth	1.00	3.00	2.00	1.96	0.65
Watch Physical Exercises Videos	1.00	3.00	1.00	1.62	0.73
Watch Yoga Videos	1.00	3.00	1.00	1.42	0.65
Manage Medication Alerts	1.00	3.00	2.00	1.88	0.64
Take Handicraft Courses	1.00	3.00	1.00	1.47	0.66
Play Memory Games	1.00	3.00	2.00	1.88	0.72
Manage Calendar	1.00	3.00	2.00	1.80	0.70
Pay taxes	1.00	3.00	1.00	1.46	0.66
Request Government Subsidies	1.00	3.00	1.00	1.56	0.62
Pay Bills	1.00	3.00	2.00	1.74	0.71
Book a Vacation	1.00	3.00	1.00	1.58	0.69

Table 15. Older adult's survey - App functionalities

Q11: Region

ANSWER CHOICES	RESPONSES	
East North Central	19.38%	31
East South Central	5.00%	8
Middle Atlantic	9.38%	15
Mountain	4.38%	7
New England	3.75%	6
Pacific	14.37%	23
South Atlantic	24.38%	39
West North Central	3.75%	6
West South Central	15.63%	25
TOTAL		160

Table 16. Older adult's survey - Regions

Q12: Device Type

ANSWER CHOICES	RESPONSES	
iOS Phone / Tablet	56.79%	92
Android Phone / Tablet	37.65%	61
Other Phone / Tablet	0.00%	0
Windows Desktop / Laptop	2.47%	4
MacOS Desktop / Laptop	0.62%	1
Other	2.47%	4
TOTAL		162

Table 17. Older adult's survey - Device Type

Q13: Household Income

ANSWER CHOICES	RESPONSES	
$0-$9,999	5.56%	9
$10,000-$24,999	11.73%	19
$25,000-$49,999	29.01%	47
$50,000-$74,999	16.05%	26
$75,000-$99,999	16.67%	27
$100,000-$124,999	6.17%	10
$125,000-$149,999	2.47%	4
$150,000-$174,999	0.62%	1
$175,000-$199,999	1.85%	3
$200,000+	3.70%	6
Prefer not to answer	6.17%	10
TOTAL		162

Table 18. Older adult's survey - Household income

Q14: Responder's Age

ANSWER CHOICES	RESPONSES	
< 18	0.00%	0
18-29	29.63%	48
30-44	28.40%	46
45-60	33.33%	54
> 60	8.64%	14
TOTAL		162

Table 19. Older adult's survey - Responder's age

Q15: Gender

ANSWER CHOICES	RESPONSES	
Male	39.51%	64
Female	60.49%	98
TOTAL		162

Table 20. Older adult's survey - Gender

9.2. Prototypes

I decided to develop and launch an MVP of an app for the elderly in Colombia. This app proved that elders are willing to use an app if it provides them with helpful information and services that they could not access in-person due to the pandemic. The app included online religious services and a directory with family-owned grocery stores close to the user. The app uses geolocation to show the services by the nearest to the farthest.

Website: http://nonni.com.co/

Mobile app: https://play.google.com/store/apps/details?id=com.olalab.uxai.nonni&hl=en_SG&gl=SG

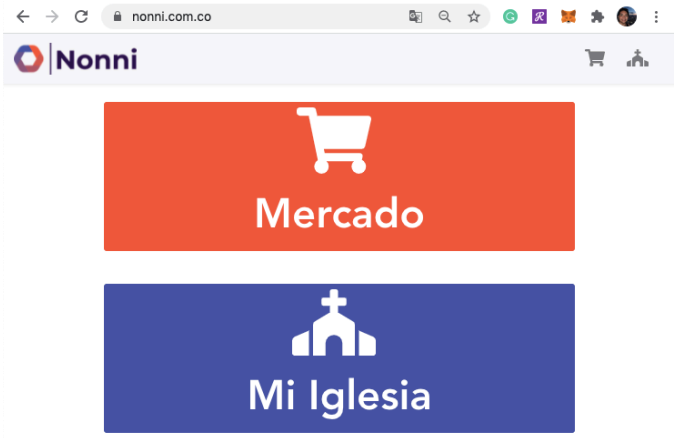

Figure 68. Nonni – homepage

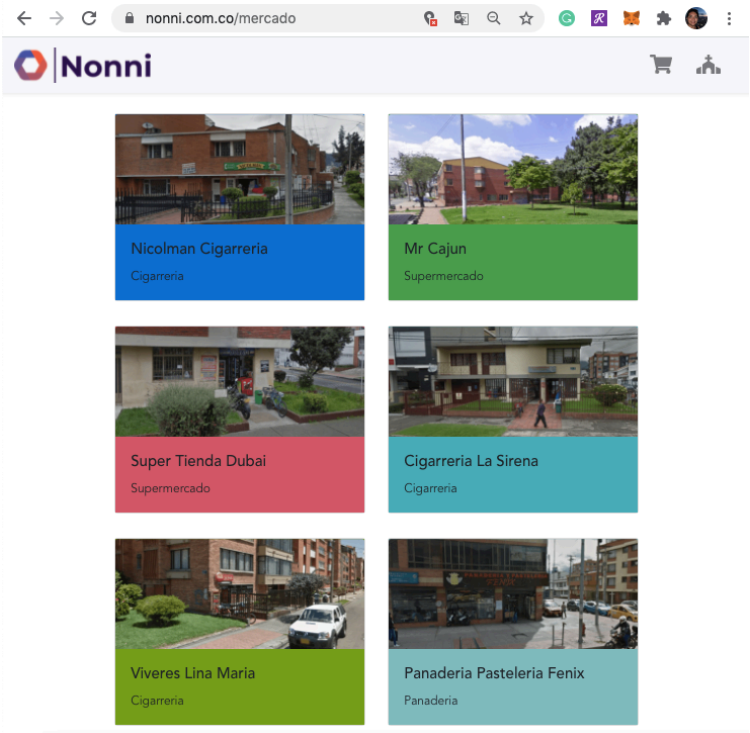

Figure 69. Nonni – Family-owned stores

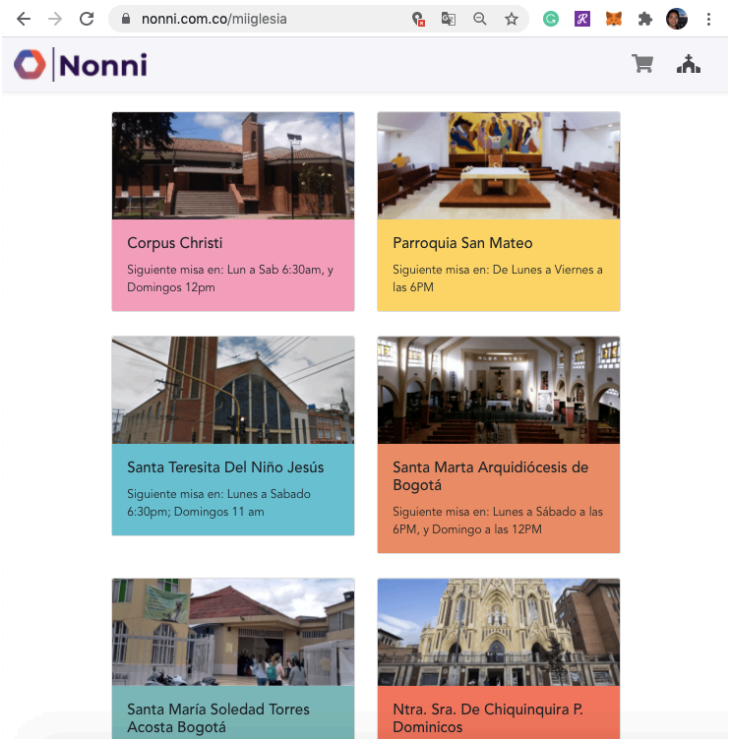

Figure 70. Nonni - Religious online services

9.3. Marketing campaigns

Local stores: 300

Facebook add campaign:

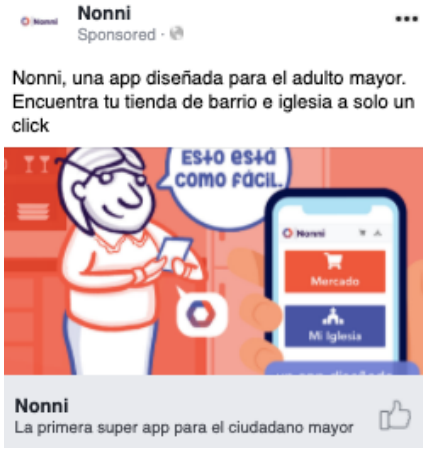

Figure 71. Nonni ads

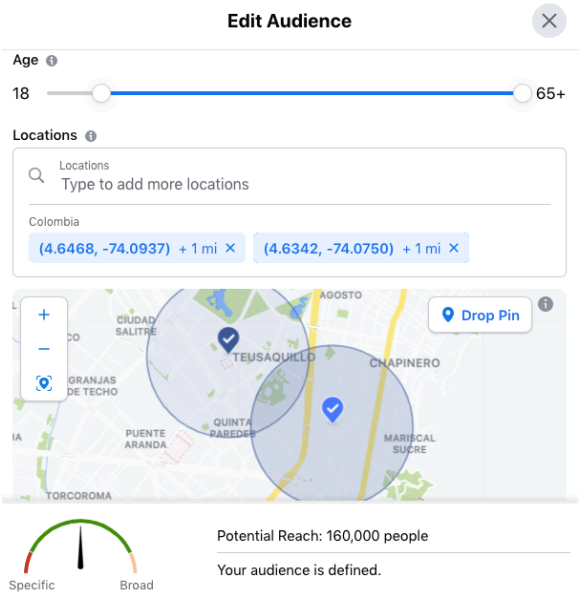

Figure 72. Nonni Facebook audience

Estimated daily results and budget

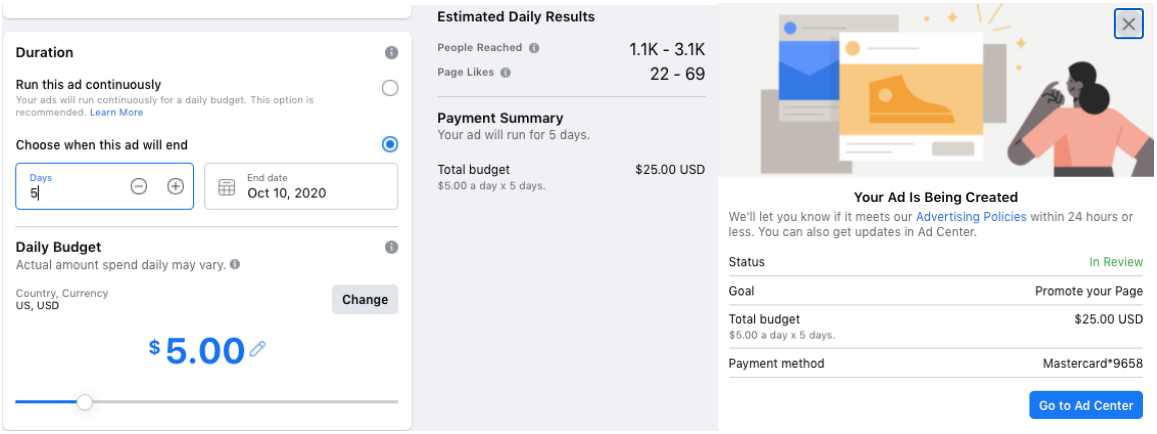

Figure 73. Nonni Facebook ad campaign