TJ Thinakaran

How Interoperability Created an $800 Million Acquisition

Twilio, ZipWhip & Text Messaging

TJ Thinakaran

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" Unless you're a legislator or a regulator, rare are the times you will win a staring contest with a carrier.

They own the infrastructure, the access to the wireless device, and the treasured relationship with the subscriber.

Yet Twilio built a multi-billion dollar business on providing unfettered access to the networks and the mobile devices attached to it. "

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01   # Know Whose Party You're Crashing

Know Whose Party You're Crashing

A startup is a lonely endeavor that never works alone. It works with a dominant player, whether in an app store like a marketplace or building on an existing platform like a wireless or a card payment network. Interoperability—the ability to plug into the dominant platform—is a core requirement for its existence. How the startup manages this interoperability determines its success.

If the platform is a party the dominant player is hosting, interoperability is how you get in. The quality of the invite depends on the type of interoperability you practice.

The Three Flavors

Interoperability has three flavors: **indifferent, cooperative, and adversarial.** The kind of interoperability your startup needs determines the execution risk.

Indifferent Interoperability

Most startups fall into this category. The dominant platform provider does not care what you do as long as you follow the rules they set. App Stores, Marketplaces like Shopify, SalesForce, and HubSpot, fall into this category.

The price of admission is small, and it's up to you to author your success. You are a party guest about whom no one knows or cares. How you become the life of the party depends entirely on you.

As long as you don't break anything or offend anyone, you get to enjoy certain privileges.

Cooperative Interoperability

Less common, cooperative interoperability is when the provider of the dominant service works with your startup to build standards that allow for interconnectivity. Unlike the App Store, where the provider takes a hands-off approach and lets you battle for market share, here, the dominant provider is invested in your success.

At this party, the host actively connects you with other guests and ensures you're having a good time because your success is their success.

Adversarial Interoperability

...The Aero Story

The riskiest form, adversarial interoperability allows for using an existing network in a way that the maker of the network did not intend. This usage pushes the boundaries of what the network does without necessarily breaking its rules of engagement. While such startups are unorthodox, perhaps even unwanted, they are not illegal.

This is the party you snuck into, found your way to their wine cellar, and opened a rare vintage. Not only that, you're actively stealing their guests and encouraging them to go to a party you're hosting. It's all fun and games until the host finds out.

While adversarial interoperability is a great business model for startups, it is perilous. You are fighting a powerful and well-funded incumbent. The owner of the dominant service has deep pockets and will use everything at their disposal if they think you're about the eat their lunch.

Aereo is a cautionary tale.

The Aero Story

Streaming TV Startup Aereo aspired to give everyone the ability to watch free-to-air TV on demand. To enable this, they provided a cloud-based DVR and rent-an-antenna service that allowed you to store your programs and stream them anytime. It checked every box on the interoperability checklist.

The existing service was free-to-air. In other words, the viewer had access to

the programming via a local antenna and a personal DVR. Aereo merely managed their setup and let them access it anywhere on the Internet. Having a farm of tiny antennas storing programming to individual DVRs is not what the network programmers had in mind when they started broadcasting. Nevertheless, Aereo did so and got early traction. The service got rave reviews from The Wall Street Journal and, at its peak, had 80,000 users.

Almost instantaneously, Aereo was taken to court. It didn't matter that they took something free and made it more accessible. It was a nonstandard use of the network, and the networks argued that it was illegal based on copyright laws. The case made it to the US Supreme Court, and the provider of the dominant network (CBS, NBC, ABC, and Fox) won. Despite backing from Barry Diller's IAC, Aereo filed for Chapter 11 Bankruptcy and sold its assets to Tivo. Sometimes, a business model doesn't fit neatly into an interoperability framework.

WhatsApp is a good example.

The Whatsapp Example

When you install WhatsApp, it uses the phone numbers in your contact list to find other WhatsApp users you may know. It rides on your data plan and, unrestrained from most regulations, can offer rich messaging, including media, group chat, delivery confirmation, and read receipts.

Let's walk through that again.

WhatsApp uses phone numbers—a userid it does not own or create—on a network it doesn't own or operate, to build a messaging platform that, in most countries, beats SMS as the dominant form of messaging.

In so much that WhatsApp is freely available on app stores, it is a textbook case of indifferent interoperability. Over 400 million users actively used it before Meta (Facebook) bought it for $19 Billion. Yet, it destroyed SMS and MMS in many countries, thereby robbing the carriers of SMS revenue. That would make it look adversarial.

In the end, everyone in the ecosystem benefitted from WhatsApp. Not only the founders, investors, and employees of WhatsApp, but also the carriers who benefited from the increased data usage that WhatsApp generates with all the videos and images that are shared and re-shared multiple times over.

While the Carriers didn't expect WhatsApp to become the dominant messaging medium, they didn't shut it down as everyone benefitted in expanding the wireless network usage.

Finally

Not all interoperability is a zero-sum game. Even if the startup and the incumbent are adversaries, everyone can succeed if both are rewarded handsomely.

The key is for the user of the service to get a better deal because of the interoperability.

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02 How
Interoperability
Made Texting
a Big Deal

How Interoperability Made Texting a Big Deal

US customers sent 2.2 trillion text messages in 2020. In other words, the wireless operators have created a big party—one which application developers, marketers, and soft ware companies are vying to gain access.

SMS messaging is the textbook example of interoperability. Every wireless carrier commits to support SMS. Thanks to this commitment, all devices on every network globally can send and receive text messages. This is true for cell phones that are part of your handheld, in your car, or the millions of internet-enabled devices around the world.

In **Know Whose Party You're Crashing**, we saw how startups often need to work with the platform of the dominant player. If the player were hosting a party, we discussed how important it was to know the rules. This week we continue that journey and discuss SMS in that context.

A Non-Technical Discussion

The simple description can cover most of the landscape but not describe it entirely. Yet, too many details can unnecessarily clutter the picture and obfuscate the big idea. I learned this first-hand as I tried to explain to multiple M&A clients the economics of messaging.

What follows is a top-down, big-picture description of how SMS works. The goal is to share enough about how SMS works to have a meaningful conversation about why it is a big deal.

SMS, MMS, Text Messaging, Texting, and Messaging are used interchangeably. And while any technical topic is acronym heavy, here they are used when there is either no simpler way to describe the concept or when knowing the acronym is necessary for understanding.

Defining P2P & A2P

In SMS there are two networks. One that enables one person to send a text message to another person. Enabled by cooperative interoperability between carriers and with device manufacturers, this is Person-to-Person or P2P messaging.

The second is a blend of cooperative and indifferent interoperability that allows applications to send text messages on the network to people. In the purest sense, this is Application To Person (A2P).

The distinction between P2P/A2P works well to describe messaging in the EU and the rest of the world. The North American market has a slightly different take on the distinction wherein if an application behaves like a person in terms of messaging frequency, it is still considered a P2P participant. More on this in a future post when we discuss Twilio and how it transformed the A2P market.

The critical relationship to remember is that A2P rests on top of P2P. It derives all its power from the utility-like predictability that P2P text messaging enjoys. A2P is the invite to the P2P party. To understand how the invite works, we need to know how text messaging works.

The P2P Message Flow

There are two types of P2P messages. On-net communication is when both users are on the same network or have the same wireless provider. Off-net communication is when both are on different networks.

Managing a network is a thankless job. Thanks to the universal interoperability requirements, dropped calls and undelivered messages plague even the most sophisticated network operations. This, combined with sovereignty laws around roaming and antitrust, means a text message takes a longer route to reach the destination than one might think.

When a destination is not on its network, the carrier outsources delivery to an Inter Carrier Vendor (ICV). These ICVs take over message delivery. Like the Swiss clearinghouse of messaging, they ensure timely delivery and billing and charge a small fee. No more than fractions of pennies per message, it quickly adds up to a big, profitable business for the ICV.

P2P messaging is a high-quality network. It's extensive, expansive, and has been operational for at least two decades. This marvel of interoperability has allowed SMS to become the genuinely cross-platform, cross-device, pan-geo, and cross-generational medium.

The A2P Message Flow

Using SMS to deliver your message is extremely attractive compared to the noisy world of push notifications and email. Application developers wanted in on the action and were willing to jump through the hoops carriers set for them.

There are two ways to send A2P messages. One via 5-6 digit short codes, and the other is via regular long codes.

Shortcode messaging, or sending messages in bulk, is accomplished via aggregators. Aggregators exist because if the carriers connected with every application that wanted to send a message, they'd have an unmanageable network. So theydelegated this effort to the aggregators. In an example of cooperative interoperability, the carriers made the aggregator the one-stop shop for all application traffic.

The origin story for long-code based messaging isn't well documented or well known. Perhaps it was a one-off use case or the ICV's desire to add revenue, but they decided to offer selective connectivity to the P2P network. In an example of indifferent interoperability, the carriers were aware of it but didn't explicitly sanction it. As long as the ICV ensured legitimate use, the carriers didn't mind the traffic.

The A2P Operational Burden

A2P interoperability brings additional stresses to the P2P network. First, given that it is an application at one end of the conversation, it is effortless to flood the network with unwanted messages. This can cause customers to complain and leave.

In P2P networks, both sender and receiver are vetted by the same KYC (Know Your Customer) process. In A2P, each application has its KYC process. Combined with the proliferation of use cases, the carriers find it increasingly challenging to control unwanted messages.

For example, in the US, TextNow and TextPlus won endorsements from carriers because of the network effects these innovators created for them. On the other hand, GroupMe (now Skype) was different enough that the carriers had to make exceptions to function.

Soon carriers found themselves policing content instead of connections, use cases instead of content. This increased the operational burden for a part of their business that has become little more than a cost center.

The Wireless Operator's Challenge

Text messaging does not make any meaningful money for the carriers, given the overall size of the subscriber business. It hasn't for a decade or more and shows in endless Unlimited Texting plans they offer.

Every carrier has tried to be more than just the wireless signal provider and failed. AT&T with DirectTV, Verizon with AOL, and Yahoo are recent reminders of audacious moves and spectacular failures. These days their main revenue growth streams are device sales and data plans.

Carriers are constantly fighting the tyranny of low switching costs. Most devices, plans, and services are similar. It is therefore straightforward to switch providers. As such, their best hope to keep a customer (outside of contractual lockdowns and deep device discounts) is to deliver high Quality of Service (QoS).

This means spending the money to upgrade networks (I haven't heard of startups lining up to build 5G radio towers) and ensuring a pristine voice & text experience. As a wireless operator, you do everything to ensure complaints about unwanted texting don't inundate your customer service teams.

As such, the wireless operator has a tough job. They'd rather not give anyone access to their P2P network because there's little money in it for them, and they have to do all the policing of the networks. Yet, they can't take away access because of the vocal blowback by businesses like health care

providers, schools, and package delivery companies. Regulatory oversight usually follows when you shut down wholesome use cases that customers want.

In their minds, they worked hard to win the customer relationship and build a product that the customer wanted. And everyone (i.e., A2P developers) wants to ride that relationship to develop their businesses.

The A2P developers are also aware of the absolute control carriers have on their distribution channels. There is only one way to get to an SMS inbox—through the carrier to which the device is connected. If Verizon decides to block an A2P message, there is no way to deliver the message via AT&T or T-Mobile. You have to work with Verizon.

Finally

The A2P/P2P interoperability is the crossroads where the conflicts and opportunities in text messaging meet. Not only do you have adversarial goals, but you have multiple high-growth markets colliding. This crossroads is where entrepreneurship meets opportunity.

It was Marconi who said, "when wagering on the future of new wireless technology, always bet on the optimists—eventually, they're going to be right." Next, we'll discuss the two companies founded by optimists and how they changed the course of the texting industry.

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03 # How Twilio leveraged Indifferent Interoperability

Twilio and The Hidden Value of Indifference

Twilio paid $800 Million to acquire ZipWhip. At 10x revenue, the valuation was high for the asset. As deals go, it wasn't the biggest in Software but one of the biggest in the Messaging industry. While surprised by the price tag, industry insiders knew why Twilio had to buy ZipWhip.

Interoperability and The Direct Bind

Connectivity is at the core of interoperability. In messaging, this connection is 'the bind.' A technical term for the point in message flow where both networks connect, a bind is the single most irreplaceable asset in messaging.

An example of cooperative interoperability, the direct bind is reserved for the ICVs and the aggregators who charge their fees for being intermediaries. In messaging, you can't get rid of the ICV or the aggregator unless the carriers approve. Everyone else has to go through them to send their messages. Carriers' fees reflect this reality with no volume discounts in the pricing model. Any hope for deals comes from squeezing the aggregator or the ICV, which also has its limits.

There comes a time when it pays to get rid of the intermediary. When you're Twilio doing over 12 billion messages a month, the intermediary can add substantial costs to your bottom line.

Twilio by the Numbers

Twilio is a growth engine. Since 2013, it has grown at least 40% YoY. It has never gone below 48% in gross margins and never sequentially grown less than 4.8% each quarter.

It has high revenue, high margins, and high growth making it not only a standard-bearer in the messaging space but also in the software industry.

What Makes Twilio Special

It's not like what Twilio offered in 2007 didn't exist before. Bandwidth.com was Twilio before Twilio was Twilio. CallFire was founded a year before Twilio and had more significant revenues. When it came to SMS messaging and number provisioning, Bandwidth.com had perhaps the best API. I attested to this as Bandwidth's IPO reference client.

What made Twilio stand out was its relentlessness. Jeff Lawson's vision is to make messaging simple for the software developer. A developer himself, he had first-hand experience of the obfuscation of access that the carriers create when providing gateways to out-of-network communication.

Twilio promises quick network access regardless of whether you are a developer in Sydney, Shanghai, or San Francisco and regardless of message destination.
Its mission is to make access to the telecom network fast, easy, simple.

Serving this relentless vision is the ruthless pursuit of operational leverage. Not only did Twilio have an excellent product for the developer, but they also made their pricing competitive and straightforward.
Any developer could start an app by paying pennies on the dollar. There were no plans to commit. You just paid as you went.
Not only that, you didn't need to give a work email address to sign up. Twilio is unwavering in this promise.

The operational leverage that the scale brought you meant you could provide products at the lowest prices. Pricing that you would not have unless you were an insider or a wholesaler that knew the movers and shakers in the world and the secret handshakes they used.

So, when trying to figure out what Twilio's up to, understand that it is driven by one thing alone: Building messaging solutions that the developer will love.

Finally

The developer is notoriously impatient. They're too busy building what they're building to be bothered with the complexities of the always-on dial tone network that everyone has come to expect.

In the face of this expectation, Short Codes were inaccessible to the everyday developer with its uncertain and vague approval process. So Twilio went for long code-first development via tier-1 ICVs like Syniverse and SAP and used them to get access to messaging quickly and at scale. When these developers got successful, many messages went from Long Codes via ICVs.

As the developers got more successful, the volume of these Long Code based messages snowballed, fueled by the many new apps they were building.

When Carriers caught on to this, Twilio, flush with cash, emboldened by scale, and a loyal and large customer base, used its influence to push the Carriers onto the back foot.

Next →

In the next installment, we'll see how Twilio went from practicing indifferent interoperability to outright adversarial even though it never wanted to be a Carrier.

We'll see how this shift laid the groundwork for its ZipWhip acquisition.

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**04 The Twilio
Effect**

The Twilio Effect

In 2016—the year it went IPO—Twilio had 36,000 customers paying it $270M to transmit messages. This was an eight-fold increase in revenue and a three-fold increase in customers in just five years. None of this would help it win the treasured direct connection to the carrier.

The Viral Effect Twilio Created

Twilio's success showed a new breed of innovators that high revenue, high margins, and high growth could exist in the messaging industry. Before then, you could have two of the three but rarely have them all.

Thanks to Twilio, everyone started courting the developer, vying for their business, and vouching for their application.

▶ This increased the A2P traffic that carriers were getting and the many use cases these developer tools spawned. The carriers themselves couldn't handle the volume of requests for provisioning and exceptions.

Shortcodes continued to be inaccessible to the everyday developer with their uncertain and vague approval process and high costs. A shortcode for example, costs $500/month, whereas developers could get a long code for pennies. Most developers went for the false certainty of long code first development. When those developers got successful, SMS messages flooded the long code channel.

With the high volume of good messages came many unwanted messages. And this brought on blocking, throttling, and prioritization by the wireless carriers. Unknown traffic was tagged as unwanted and routinely blocked without warning. Issues like Remind Me getting blocked without escalation were becoming more common.

Twilio and others were selling a product that the carriers were not offering. This broke every cooperative and indifferent interoperability role and made everyone offering such functionality adversarial to the carrier that owned the network.

The Limits of Size

SMS is an asymmetric market. More volume doesn't get you better rates because the carrier decides the floor. They have absolute control over pricing, access to their customer, device, and network.

Any semblance of operational leverage comes from the many intermediaries between you and the wireless provider. In other words, how close are you to the radio tower?

There comes a time when you exhaust all possible ways to get the best deal from the intermediary. In Twilio's case, it was either the Aggregator or the ICV. Yet, even with Twilio being the largest sender of messages over long codes, the carriers still refused to connect. Unhappy with the way Twilio had pushed the interoperability boundaries around traditional A2P, the carriers would never grant it a direct connection.

Poking 800 lb Gorillas

Unless you're a legislator or a regulator, rare are the times you will win a staring contest with a carrier. They own the infrastructure, the access to the wireless device, and the treasured relationship with the subscriber.

Yet Twilio built a multi-billion dollar business on providing unfettered access to the networks and the mobile devices attached to it.

In a world of campaigns requiring Word documents and weeks to provision, it used the indifferent approach that carriers took to A2P messages coming over the P2P channels to make real-time provisioning available.

Before Twilio, no one had tested the A2P channel at scale. It brought more use cases to the A2P channels, which pushed the carriers' processes around provisioning and policing. As such, identification and escalation of issues that seemed OK just a few years before were no longer tenable.

Unable to capitalize on their growing size to build better relationships, Twilio found themselves faltering on their promise to the developer. This was when Twilio went from being indifferent to adversarial. They decided to bring in the regulator.

The Title II Fight

In the US, FCC regulates communication. They get this power from the Telecommunications Act of 1934. It has eight sections or titles that deal with all aspects of communication. Title I defines a telecommunications service. Title II deals with broadcast services (also called common carriage). Titles III through VII deal with multiple matters, from not using radio waves for obscenity, violence, or sedition to how cable internet should work.

Voice is considered a utility and hence a Title II service. A Title II service is immune from blocking, throttling, or prioritization by the carriers for commercial reasons. A Title I service is an information service offered by the carrier, who can then decide rules for pricing and access. SMS is a Title I service.

Unable to get a direct bind, Twilio petitioned the FCC for SMS to be classified as a Title II service. If they couldn't have a fruitful conversation with the carriers, they would ask the regulator to change the rules for interoperability. Full disclosure, as COO, I led EZ Texting's efforts to grant the petition. While not as big a player as Twilio, we too were seeing the effects of the blocking. There is nothing new to say that's not already been said. However, I will talk a little about political advocacy.

Advocacy is a knife fight where the moderate opinion is the first casualty. This is true for any polarizing topic. Brilliant people on either side make well-reasoned arguments and ruthlessly drive their point. If the petitioner asks for more, less, or no regulation, question why.

For the carriers, the downside of being handed a de-facto monopoly over wireless networks is that regulators will always be poking under the hood to ensure equitable access and fair business practices. They always want less regulation or at least no change.

Startups are notoriously averse to dealing with law and regulators. The question is, what was inherently broken that forced Twilio to go to the regulators?

Filing the Title II petition was like punching an 800 lb gorilla in the face. While the carriers planned a response, for good and bad, Twilio became untouchable. It used this detente to grow even faster, wherein they became too big to shut down.

Twilio put itself in a win-win position. If its traffic got blocked, it had an example for the FCC. If no traffic got blocked, they had satisfied customers. The business didn't care about the regulatory treatment of SMS. It just wanted messaging to function.

The carriers cared much more about avoiding the regulation than blocking the traffic. They could showcase Twilio's success as the reason why the regulation wasn't needed. Soon it wouldn't matter which way the FCC would rule on the petition.

Twilio procured better relationships with the carriers in the years following, but this is an industry that doesn't forget. The carriers never forgot (or forgave) what Twilio did and refused the gold prize of direct binds.

The Network Consolidation Flywheel

Consolidation provides the clean-up of the mess that innovation creates. The pandemic accelerated this consolidation. Twilio's competitors felt the same pressures and acted more aggressively than Twilio. Sinch acquired SAP, one of the two tier-1 ICVs. Infobip acquired OpenMarket, one of the three Short Code providers directly connected to all carriers (AT&T, T-Mobile, and Verizon).

In a market rife with channel conflicts, your competitors not only had instant access to your book of business, they could also squeeze your operating margins.
This is not a place to make your bed.

Finally

Twilio's success is as much an interoperability story as it is a product story. They started in the indifferent interoperability camp. The carriers didn't care until they did, and when they did, the situation became adversarial. This even though Twilio never wanted to erect radio towers or sell iPhones.

The collective capacity of Twilio's customers to innovate outpaced the carriers' ability to keep up. In the same vein, Twilio failed to build meaningful relationships that would allow it to work more cooperatively with the carriers. It would take the threat of regulation for all parties to finally talk.

Next →

Next, we'll talk about ZipWhip, and how it managed to leverage cooperative interoperability from the carriers to disrupt SMS distribution channels. And how that made it the only way Twilio could get its direct connection.

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05 How ZipWhip leveraged Cooperative Interoperability

Zipwhip and the benefits of Cooperative Interoperability

In the payments industry, your leverage is your proximity to the payment providers: Visa, MasterCard, and American Express. In the messaging industry, your leverage is your proximity to the wireless carriers. In the US, you do that by using Sinch & OpenMarket for shortcode messaging and SAP (now Sinch) & Syniverse for long code messaging.

Fast forward to 2021, a lot had changed.

Twilio's focus on building products for the developer would come at the cost of not watching its flank.
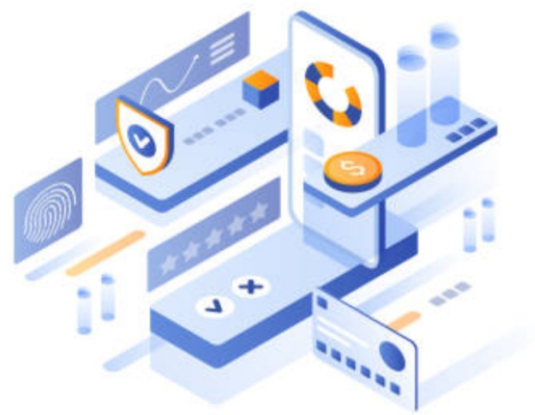
The Syniverse Play

If OpenMarket, Sinch, SAP, and Syniverse were the only A2P connections to the wireless carriers, Twilio's competitors owned three of them. InfoBip owned OpenMarket; Sinch owned SAP. This left only Syniverse. Twilio had no other option but to make a move on Syniverse.

What About ZipWhip

If there were a dive bar where all the messaging industry veterans converged, a coffee shop where they gathered, or a running group where they met, few topics would be as loud and gossipy as ZipWhip. There is no use in rehashing them here.

But from a Founder's perspective, like Jeff Lawson, John Lauer had displayed both a zealot's focus on the prize and a renegade's disdain for the status quo. Like Jeff, the market would reward John well for his spunk.

▶

New Ways to Connect

In the US, toll-free lines typically start with an eight (888, 800, etc.), where the caller pays nothing for calling, and the owning business bears all the costs.

ZipWhip was essentially two businesses. One was its Text-to-Landline (TTL) business, wherein it text-enabled any landline and allowed companies to use traditional voice-only lines for texting. The other was Toll-Free Texting.

Like Twilio, ZipWhip came to be because it commercialized established technology at scale. Toll-free and landline texting had existed before but in selective niches. **HeyWire** (acquired by Salesforce), for example, had been doing toll-free messaging long before ZipWhip.

In a masterstroke of negotiation, John convinced the carriers to give him exclusive rights to the arbitrage of every toll-free message in the US. This ensured that if you wanted to send a message to or from a toll-free number, it had to go through ZipWhip.

Zipwhip executed the perfect cooperative interoperability play. It convinced the platform providers (the Wireless operators) to make it the sole arbitrator for the medium. If toll-free was a highway fast lane, ZipWhip was the only toll booth.

Changing Rules of Interoperability

Twilio's exploitation of the messaging backdoor created by Syniverse and SAP did not go unnoticed by the carriers. Longcode messaging had exploded.

Burned as they were by blocking what turned out to be legitimate traffic, the carriers decided to bless these routes as accepted A2P messaging.

The end solution is still very much under construction. Some brilliant, hardworking brains are creating a solution that everyone can support. However, all the change as to "what's next" has created a lot of uncertainty. And with this uncertainty has come the loss of speed in provisioning phone numbers and the ability of the developer to build.

While 10-digit texting is still under construction, toll-free messaging is alive and well. It is the only carrier-sanctioned way to do messaging without the need for a lengthy vetting process or the fear of being shut down without notice. Outside of shortcode, toll-free messaging is the only way to ensure predictability to deliverability. And that road takes you to only one player—ZipWhip.

On The Valuation

This is where Twilio's acquisition of ZipWhip and the price they paid for it makes sense. It's not because Twilio decided to go after the SMB or mid-market. Twilio doesn't want to build the next SMB solution—it wants you to make it but use its platform. As long as Lawson's in charge, its sole goal will be to let developers build on their platform.

In the new world that came to be in no small part because of Twilio, that promise to the developers is getting hard to keep. Instead of real-time provisioning by writing code, the first step is to submit documentation? Its customer would never stand for that. Jeff would never stand for that.

From 2013 to 2022, Twilio grew over sixfold to $2.8B in revenue. Twilio bought out ZipWhip, paying $800M today, to help ensure $16B in 2027.

Finally

Twilio's acquisition of ZipWhip unearthed How Interoperability Created an $800 Million Acquisitionis a driving force in the market. In part I, we saw how Twilio pushed the boundaries of indifferent interoperability to scale quickly.

In Part II, we got to know how that interoperability became adversarial. Finally, we saw how ZipWhip used cooperative Interoperability to build a market monopoly and why Twilio had to buy it. Next, we discuss How Interoperability is disruption's secret weapon.

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**06 Why We Need
Interoperability
and How to
Protect It**

Why We Need Interoperability and How to Protect It

Wireless networks are universal, pervasive, and heterogeneous. They are a fertile testbed for interoperability-driven innovation. Text messaging is but one example of how complex event sequences enable interoperability.

So far, we've seen how interoperability made SMS the most common global messaging app. We analyzed interoperability's role in the success of Twilio and ZipWhip and its role in Twilio's subsequent acquisition of ZipWhip. But the story of messaging and interoperability is much older than that.

A very brief history of Messaging

Gugliemo Marconi built and controlled the first transatlantic texting network. This control made Morse code the world's first instant messenger. Fixed radio transmitters on either side of the Atlantic transmitted radio signals in minutes. It also created a monopoly.

In 1912, Marconi could charge a penny a word (29 cents/word today). In today's dollars, transmitting this sentence would have cost you $3.19.

Nine years later, the Marconi Telegraph Company became the Radio Corporation of America (RCA). The rate had increased to 25 cents per word ($4.02/word in today's dollars). The same sentence now cost you $44.22—a fourteen-fold increase!

Today, thanks to interoperability, the open Internet, and our limitless desire to connect, the same message is free. Yet, messaging is a bigger industry today than a century ago.

None of this was automatic. An expanding customer base, a competitive business environment, and an active regulator worked (often adversarially) to create an open, interconnected system. This allowed for interoperability, enabling the wealth of competitive solutions we continue to see today.

While wireless networks have benefitted from interoperability, their lessons can apply to any industry.

The Startup and the Incumbent

The startup and the incumbent are alike. Both are competitors vying for complete domination. For one to succeed, the other has to fail. It is brutal industrial warfare oft en waged in secrecy.

To win, a startup has to do the usual activities: create a crisp product, have a tight narrative, and build an efficient distribution model. But it must also have a plan when the incumbent finds that the startup has been using its platform in unsanctioned ways.

Twilio, for example, found itself in an adversarial position when it filed its Title II petition with the FCC. Its size and large customer base became its defense. A lesser player would have been driven out of business or forced into mediocrity. Aereo, on the other hand, bet it all on court litigation. When that didn't play out, their efforts to make peace with the cable providers came too late.

For the incumbent, monitoring unexpected use of its platform is a competitive necessity. Not all non-compliant use needs to be squashed. If one upstart breaks the rules, there will be others. Given enough time, one of them will succeed in extending the platform in valuable ways. The incumbent has to decide whether to buy or copy the startup.

The User

In the gladiator fight between the incumbent and the startup, the user decides who wins. The incumbent is big because the user made it so. If the startup offers a lousy product, it wouldn't survive.

When Twilio went head-to-head with the carriers, the most vocal group in its camp was its users, who even petitioned the FCC. Aereo, on the other hand, while a high-quality product, didn't have a user base that couldn't do without its service. If Aereo didn't exist, they'd go back to TiVo or just the actual antenna over their house. In Aereo's case, the user was silent.

If the dominant provider shuts down the disruptor, the user must get vocal. It is the loudest voice the regulator will hear. For this, the user has to do nothing more than demand better products from the competitors and better protection of their choice from the regulator.

The Regulator

The regulator's role in protecting interoperability cannot be overstated. If interoperability is about starting on the ground floor, the regulator ensures that the ground floor exists. The regulator's job is to ensure the playing field is equitable and benefits the user. While the marketplace participants try to outsmart each other and win at all costs, the regulator watches out for everyone. This includes the kid in the garage disrupting the old ways of doing things.

Hailed by Peter Drucker as "the most effective decision maker in US business history," AT&T President Theodore Newton Vail saw the critical role of the regulator.

Commercial enterprises, he reasoned, are driven by one goal: to become big. When they become too big to fail, the government overreacts and either takes over their management or creates a state-sponsored competitor. This is an unnatural state for a government and therefore untenable.

Instead, Vail recommended a common-sense regulation framework. A regulator that uses "intelligent review" to ensure the "conservation and protection of the interests of all." This regulator operates like a company board but with a broader public mandate. In fact, Vail believed that principled public regulation was vital to the preservation of his company.

Yet, the regulator doesn't always get it right. On March 14, 2002, the FCC decided that the cable companies didn't have to share their lines with other Internet providers. Twenty one years later, America is still paying the price. Large swaths of the country continue to have only one internet provider. The argument was that it was the early days, and the best ways to deliver connectivity weren't decided yet. So there was no reason to require cable companies to interoperate with anyone. The FCC called it wrong. Twelve years after that decision Chairman Michael Powell admitted to as much.

The regulator's job is bound to get more complicated. Zero-Knowledge proofs will require the regulator's forbearance with free market dynamics and active protection of such self-sovereign technologies from big tech's money firewall. Most of all, it will require that they understand before they regulate.

Protecting the Adversary

I started on this journey of understanding interoperability when I chanced upon Cory Doctorow's polemics for the Electronic Frontier Foundation. Doctorow unequivocally attacks all big tech. This is tough to endorse completely.

Competition is about competence, and if big tech remains big tech because they're the most competent, so be it. It's not Mark Zuckerberg's or Jeff Bezos' job to think about being equitable. They are in the game to win, like everyone else.

I agree with Doctorow that adversarial interoperability needs to be protected. The ability for new services to plug into existing ones "without permission or cooperation from the operators of the

dominant service" is under threat.

This despite, as he points out, almost every big tech story has an adversarial interoperability story behind it.

The way to regulate Facebook is not to police it but to make it easy to build new social networks. Creating a new social network that still allows users to keep in touch with their Facebook friends without logging in. Very much like Facebook did with MySpace.

This is Personal

This is also personal. My cohort is not only my CallFire (EZ Texting) cofounders but also Jeff Lawson, Ben Chestnut, and John Lauer (to name a few). We all started our companies around the same time, piggybacking on the same technological innovation that was coming of age.

The carrier networks were open thanks to Asterisk, OpenSIPS, and SMPP specs. I doubt the carriers knew this, but they were laying the groundwork for a new phase of interoperability. While the outcomes of our ventures follow a Normal distribution, we all benefitted from the interoperability that the early 2000s unleashed. Therefore, it is incumbent upon us that the new generation of leaders continue to benefit from equitable access.

Finally

Interoperability is the gateway to disruption. First, you connect to the existing system. Then, you change it. The method and speed of change depend on the interoperability you practice.
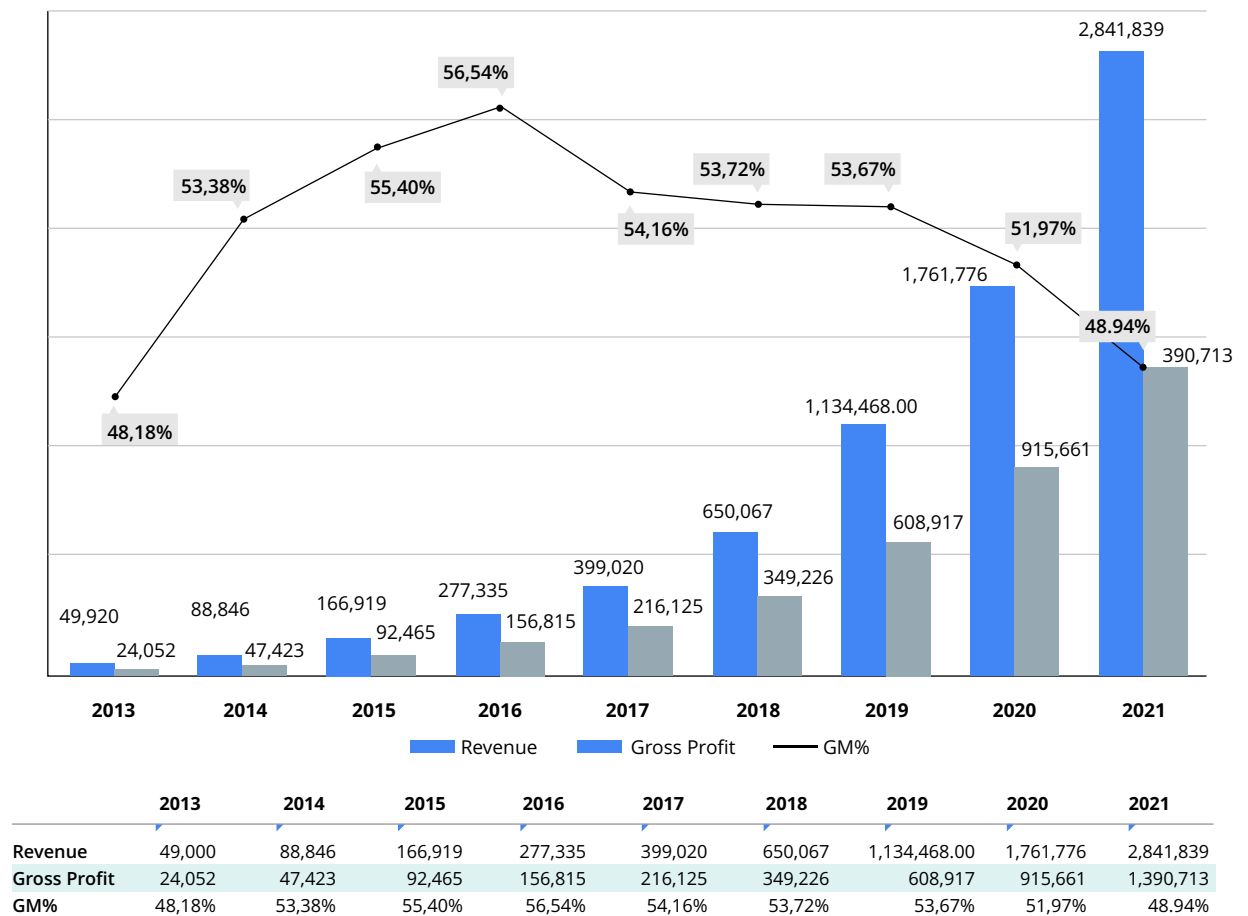
Free markets work when one participant focuses on equitable access. So while everyone has a role in enabling interoperability, the regulator has the singular job of protecting it.

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How Interoperability
Created an $800 Million
Acquisition

07 **Appendix**

Revenue and Gross Profit

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Revenue	49,000	88,846	166,919	277,335	399,020	650,067	1,134,468.00	1,761,776	2,841,839
Gross Profit	24,052	47,423	92,465	156,815	216,125	349,226	608,917	915,661	1,390,713
GM%	48,18%	53,38%	55,40%	56,54%	54,16%	53,72%	53,67%	51,97%	48.94%

Revenue and Revenue YoY Profit

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Revenue YoY Growth	0	77.98%	87.87%	66.15%	43.88%	62.92%	74,52%	55.30%	61.31%
Revenue	49,920	88,846	166,919	277,335	399,020	650,067	1,134,468.00	1,761,776	2,841,839
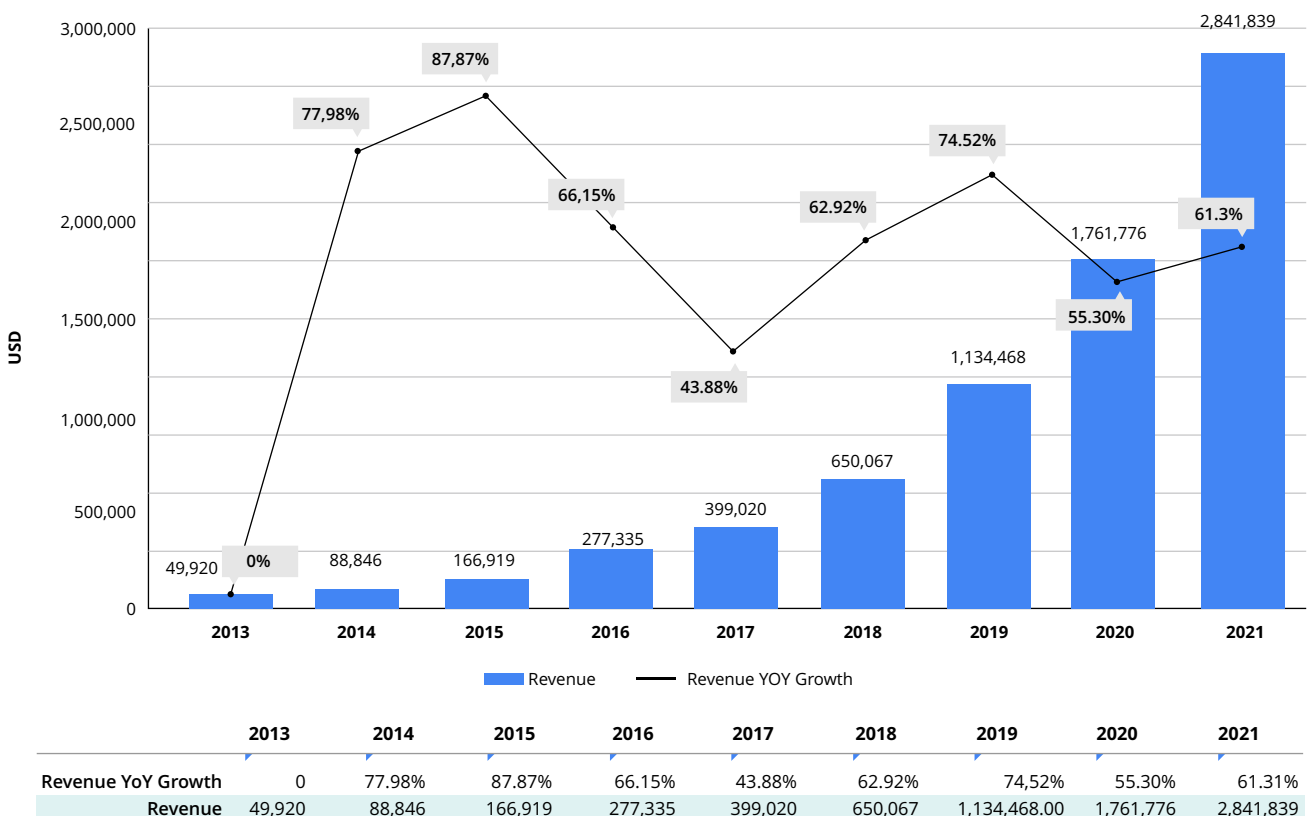
Active Customer Account and Revenue
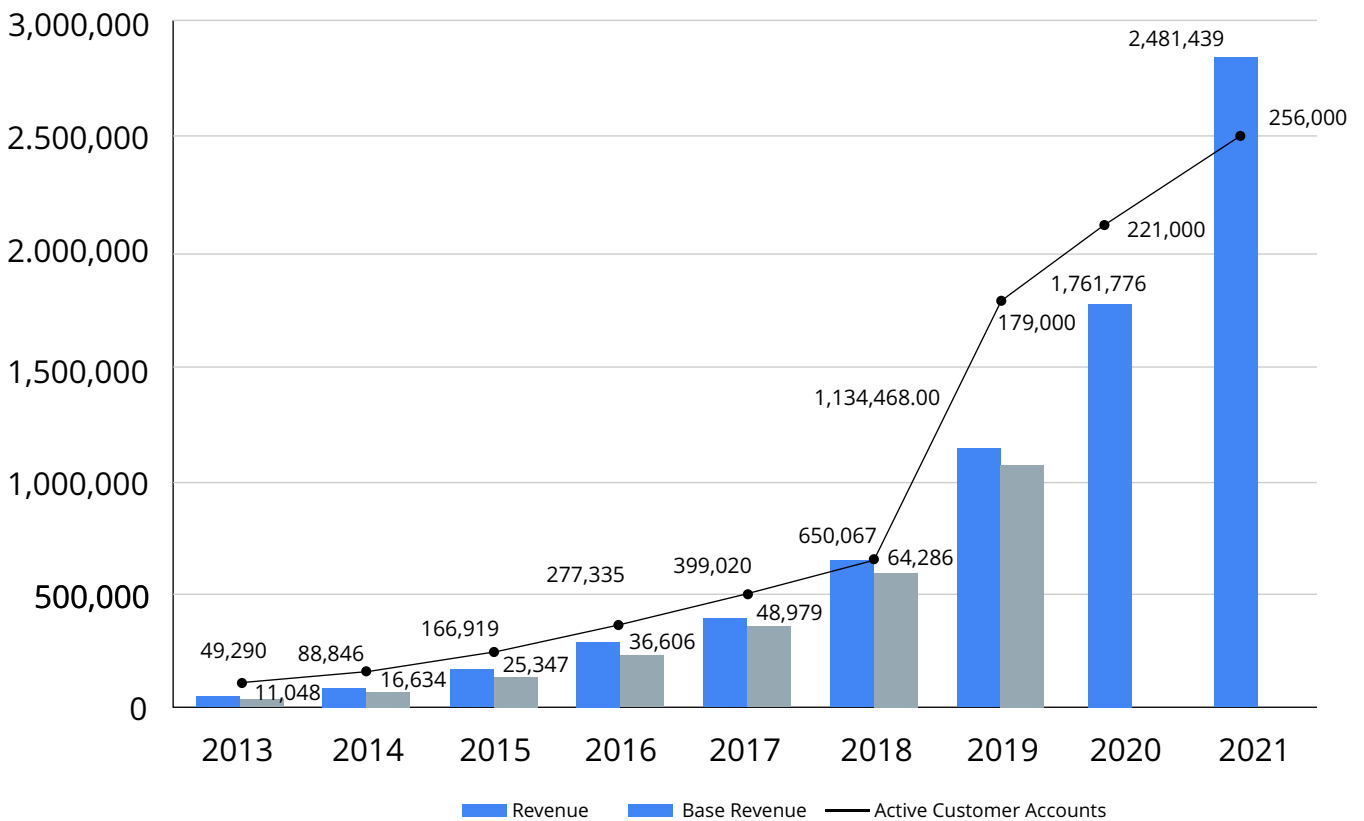
	2013	2014	2015	2016	2017	2018	2019	2020	2021
Revenue	49,920	88,846	166,919	277,335	399,020	650,067	1,134,468	1,761,776	2,841,839
Base Revenue	41,751	75,697	136,851	245,548	365,490	593,017	1,059,808.00	0	0
Active Customer	11,048	16,631	25,347	36,606	48,979	64,286	179,000	221,000	256,000

Business Metrics

Base Revenue — **Active Customer Account**

Base Revenue — **Dollar Based Net Expansion Rate**
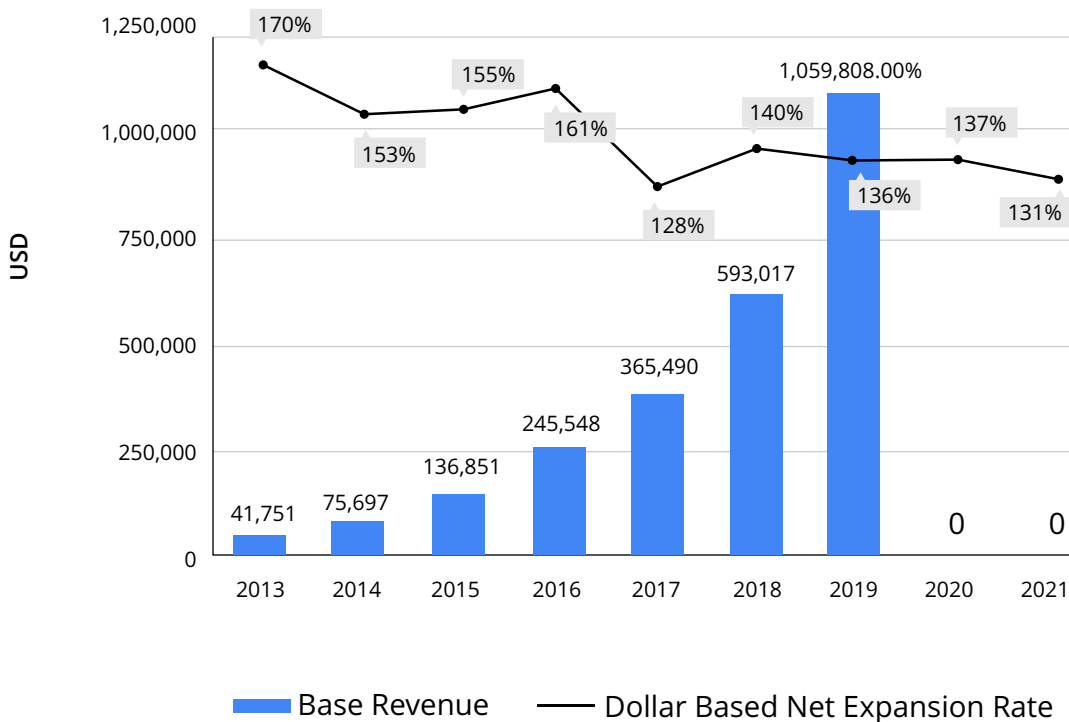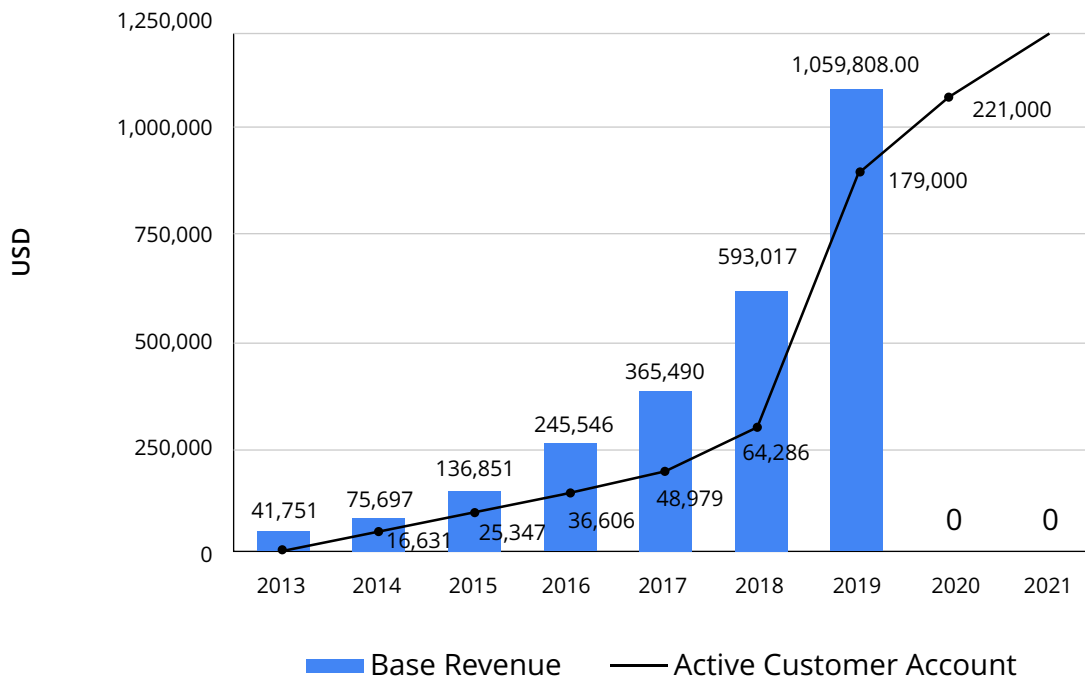
	2013	2014	2015	2016	2017	2018	2019	2020	2021
Dollar-Based Net Expansion Rate	170%	153%	155%	161%	128%	140%	136%	137%	131%
Base Revenue	41,751	75,697	136,851	245,548	365,490	593,017	1,059,808.00	0	0
Active Customer	11,048	16,631	25,347	36,606	48,979	64,286	179,000	221,000	256,000

Operating Expenses, yearly
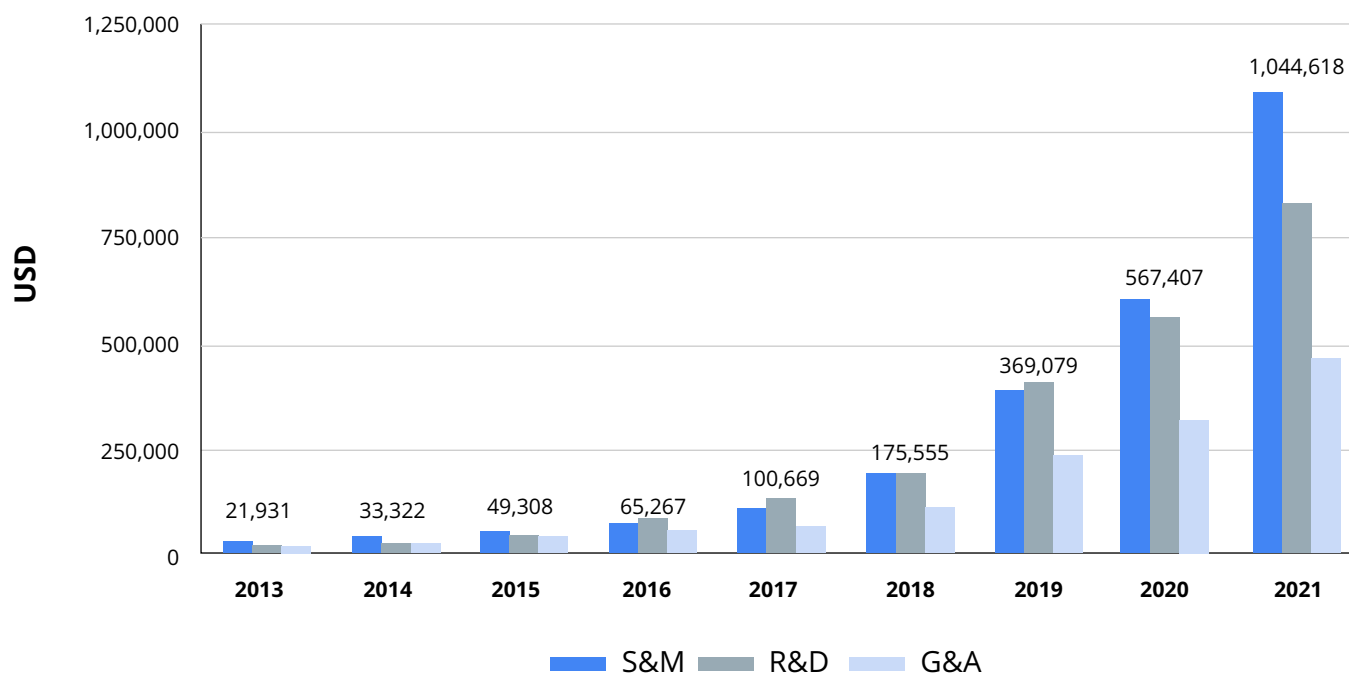
	2013	2014	2015	2016	2017	2018	2019	2020	2021
S&M YOY Growth	0	51,94%	47,97%	32,37%	54,24%	74,39%	110,24%	53,74%	84,10%
S&M	21,931	33,322	49,308	65,267	100,669	175,555	369,079	567,407	1,044,618
R&D YOY Growth	0	56,34%	95,01%	83,10%	54,94%	41,92%	128,38%	35,57%	48,76%
R&D	13,959	21,824	42,559	77,926	120,739	171,358	391,355	530,548	789,219
G&A YOY Growth	0	26,30%	89,83%	41,92%	16,72%	85,22%	97,66%	33,60%	51,33%
G&A	15,012	18,960	35,991	51,077	59,619	110,427	218,268	291,614	441,291

Sales & Marketing Expenses, Yearly
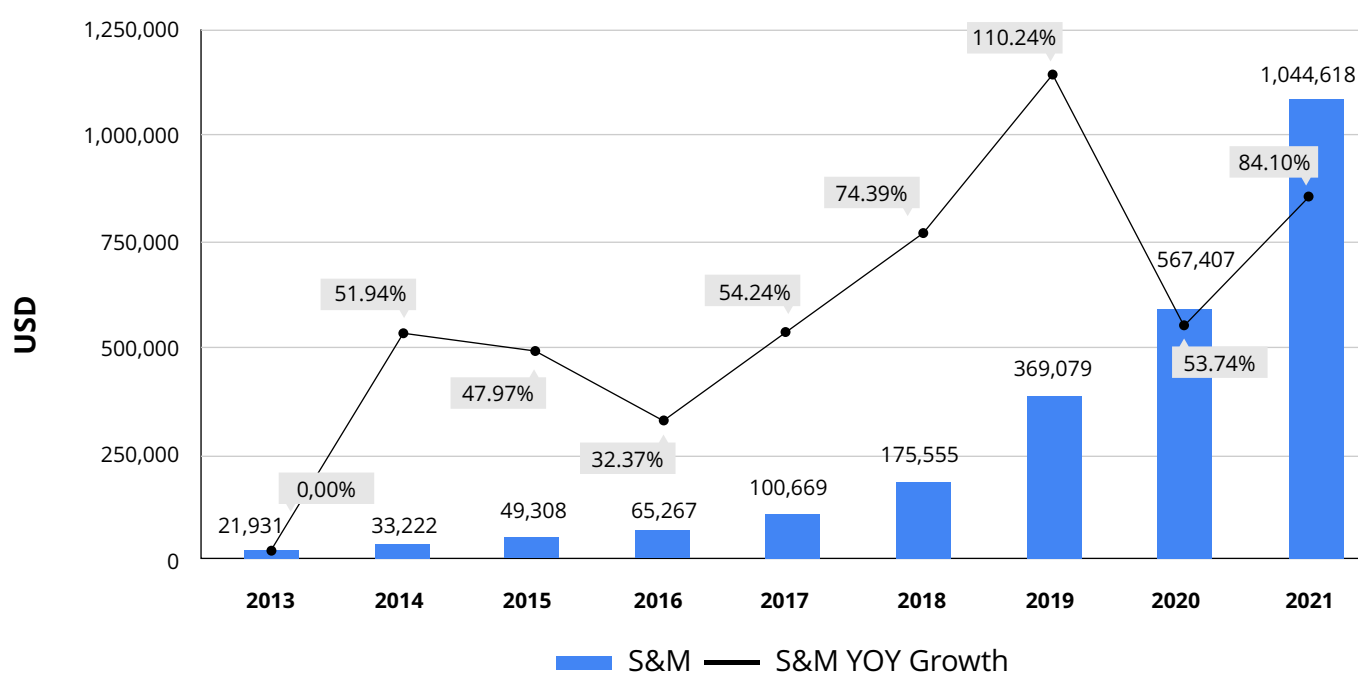
Research & Developement Expenses, yearly

R&D — R&D YOY Growth
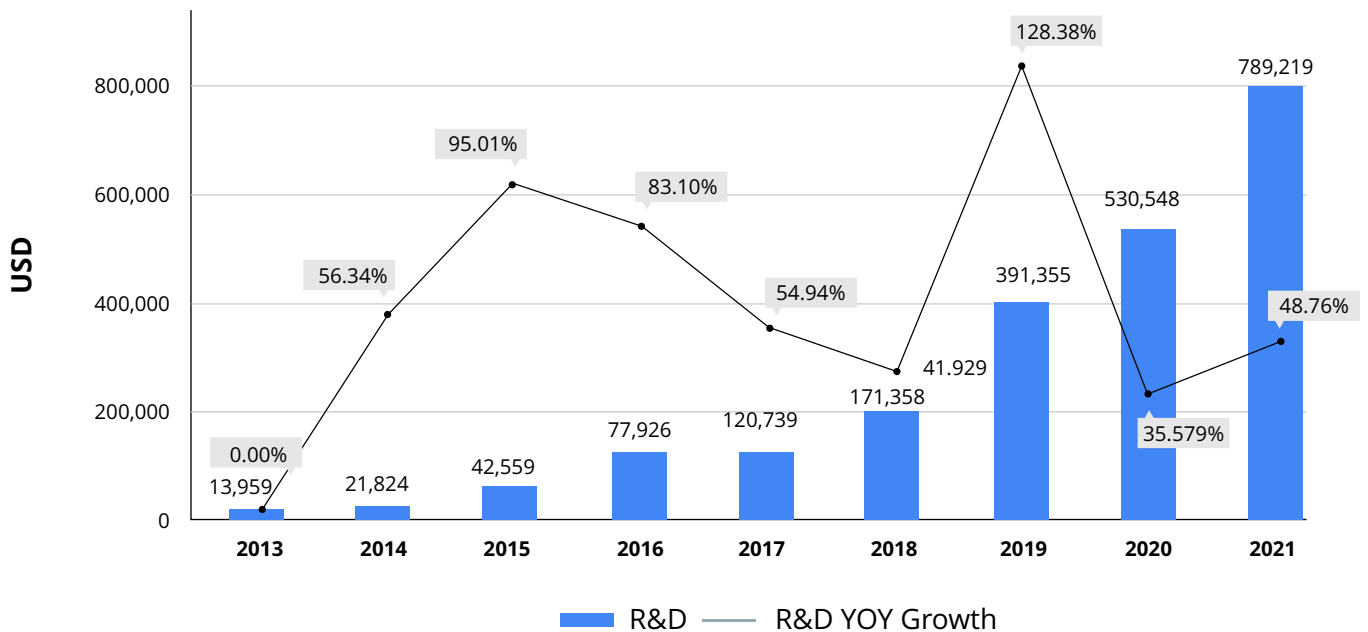
General & Adminstrative Expenses, yearly

General & Adminstrative Expenses, yearly

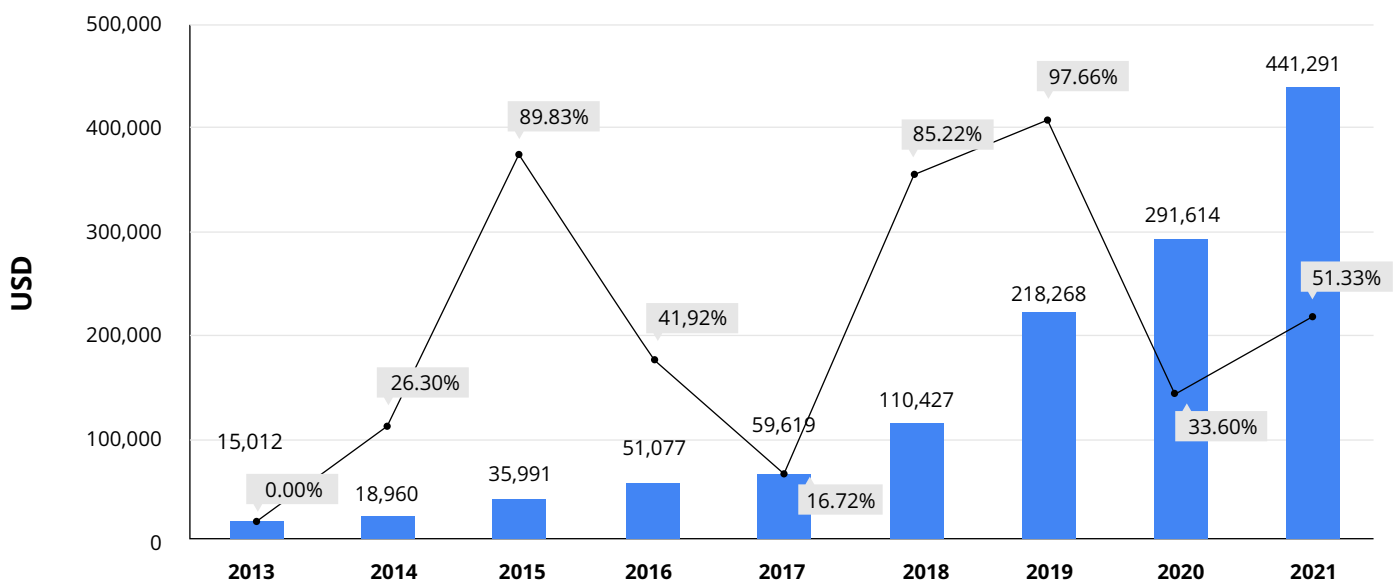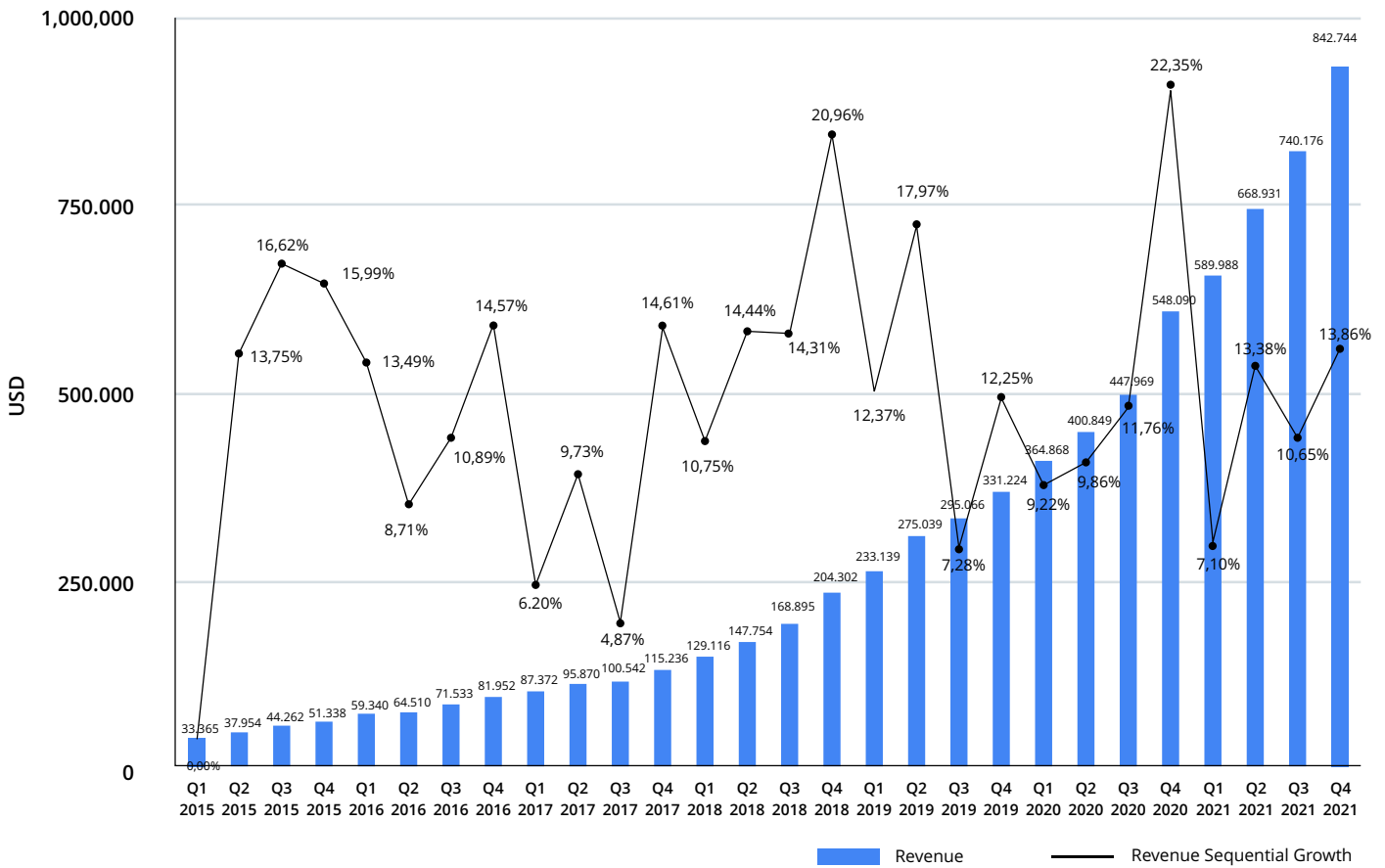|	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017
Revenue Sequential Growth	0,00%	13,75%	16,62%	15,99%	13,49%	8,71%	10,89%	14,57%	6,20%	9,73%
Revenue	33.365	37.954	44.262	51.338	59.340	64.510	71.533	81.952	87.372	95.870
Gross Profit	17.820	21.127	24.660	28.858	32.513	36.307	40.248	47.747	50.086	53.537
GM%	53,41%	55,66%	55,71%	56,21%	54,79%	56,28%	56,26%	58,26%	57,33%	55,84%
Dollar-Based	145%	149%	156%	172%	170%	164%	155%	155%	141%	131%
Base Revenue Growth Rate	70%	75%	77%	97%	92%	84%	75%	73%	62%	55%
Base Revenue	25.931	30.694	36.729	43.497	49.834	56.370	64.099	75.245	80.643	87.583
Active Customer Accounts	19.340	21.226	23.822	25.347	28.648	30.780	34.457	36.606	40.696	43.431

	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019
Revenue Sequential Growth	4,87%	14,61%	10,75%	14,44%	14,31%	20,96%	12,37%	17,97%	7,28%	12,25%
Revenue	100.542	115.236	129.116	147.754	168.895	204.302	233.139	275.039	295.066	331.224
Gross Profit	52.288	60.214	69.534	79.814	91.864	108.014	126.050	150.015	158.162	174.690
GM%	52,01%	52,25%	53,85%	54,02%	54,39%	52,87%	54,07%	54,54%	53,60%	52,74%
Dollar-Based	122%	118%	132%	137%	145%	147%	146%	140%	132%	124%
Base Revenue Growth Rate	43%	40%	46%	54%	68%	77%	88%	90%	79%	65%
Base Revenue	91.965	105.299	117.507	135.004	154.348	186.158	220.885	256.737	275.548	306.638
Active Customer Accounts	46.489	48.979	53.985	57.350	61.153	64.286	154.797	161.869	172.092	179.000

	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021
Revenue Sequential Growth	9,22%	9,86%	11,76%	22,35%	7,10%	13,38%	10,65%	13,86%
Revenue	364.868	400.849	447.969	548.090	589.988	668.931	740.176	842.744
Gross Profit	193.535	209.131	230.874	282.121	298.304	331.247	364.615	396.547
GM%	53,04%	52,17%	51,54%	51,47%	50,56%	49,52%	49,26%	47,05%
Dollar-Based	143%	132%	137%	137%	133%	135%	131%	131%
Base Revenue Growth Rate	57%	46%	52%	65%	62%	67%	65%	54%
Base Revenue	0	0	0	0	0	0	0	0
Active Customer Accounts	190.000	200.000	208.000	221.000	235.000	240.000	250.000	256.000

Revenue, quarterly

Legend: Revenue ▮ | Revenue Sequential Growth —

Revenue & Gross Profit, quarterly

Legend: Revenue ▮ | Gross Profit ▮ | GM% —

Business Metrics, quarterly

Legend: Revenue — Gross Profit — GM%

Revenue values (Q1 2015 – Q4 2019):
25.931, 30.694, 36.729, 43.497, 49.834, 56.370, 64.099, 75.245, 80.643, 87.583, 91.965, 105.299, 117.507, 135.004, 154.348, 186.158, 220.885, 256.737, 275.548, 306.638

GM% values:
145,00%, 149,00%, 156,00%, 172,00%, 170,00%, 164,00%, 155,00%, 155,00%, 141,00%, 131,00%, 122,00%, 118,00%, 132,00%, 137,00%, 145,00%, 147,00%, 146,00%, 140,00%, 132,00%, 124,00%, 143,00%, 132,00%, 137,00%, 137,00%, 133,00%, 135,00%, 131,00%, 131,00%

Legend: Base Revenue — Revenue — Active Customer Accounts

Active Customer Accounts values:
19.340, 21.226, 23.822, 25.347, 28.648, 30.780, 34.457, 36.606, 40.696, 43.431, 46.489, 48.979, 53.985, 57.350, 61.153, 64.286, 154.797, 161.869, 172.092, 179.000, 190.000, 200.000, 208.000, 221.000, 235.000, 240.000, 250.000, 256.000

Business Metrics, quarterly

	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017
S&M Sequential Growth	0,00%	43.52%	-14.81%	9.46%	1.59%	35.27%	-12.57%	12.24%	15.63%
S&M	9,869	14,164	12,067	13,208	13,422	18,156	15,873	17,816	21,116
R&D Sequential Growth	0.00%	10.71%	23.58%	12.82%	11.94%	16.85%	21.52%	16.49%	7.30%
R&D	8,480	9,388	11,602	13,089	14,864	17,369	21,106	24,587	26,522
G&A Sequential Growth	0.00%	-14.88%	41.22%	8.26%	-1.54%	9.84%	25.01%	-1.66%	16.85%
G&A	8,265	7,035	9,935	10,756	10,593	11,635	14,545	14,304	17,203

	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019
S&M Sequential Growth	23.85%	-1.43%	7.15%	15.84%	15.01%	21.72%	28.48%	17.56%	26.27%
S&M	26,153	25,778	27,622	32,822	37,749	45,949	59,035	71,607	90,421
R&D Sequential Growth	12.04%	6.60%	3.65%	12.63%	5.95%	6.35%	21.94%	33.68%	26.88%
R&D	29,714	31,674	32,829	37,576	39,811	42,340	51,631	77,855	98,783
G&A Sequential Growth	-72.45%	298.04%	-0.31%	19.60%	3.50%	17.43%	20.95%	46.41%	-15.01%
G&A	4,740	18,867	18,809	23,393	24,212	28,433	34,389	64,176	54,543

	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021
S&M Sequential Growth	11.32%	5.70%	8.85%	11.22%	8.51%	27.76%	14.53%	13.04%	11.13%	25.28%
S&M	100,657	106,394	116,722	129,823	140,875	179,987	210,590	238,058	264,548	331,422
R&D Sequential Growth	5.77%	5.51%	3.59%	5.56%	13.22%	16.25%	9.12%	3.71%	15.78%	6.36%
R&D	104,481	110,236	114,339	120,701	136,652	158,856	174,800	181,280	209,890	223,249
G&A Sequential Growth	-12.56%	8.74%	1.16%	9.17%	4.51%	103.82%	-20.98%	6.49%	6.28%	4.19%
G&A	47,690	51,859	52,469	57,279	59,860	122,006	100,848	107,394	114,133	118,916

Operating Expenses, quarterly

Legend: S&M · R&D · G&A

Sales & Marketing Expenses, quarterly

Legend: Revenue · Revenue Sequential Growth
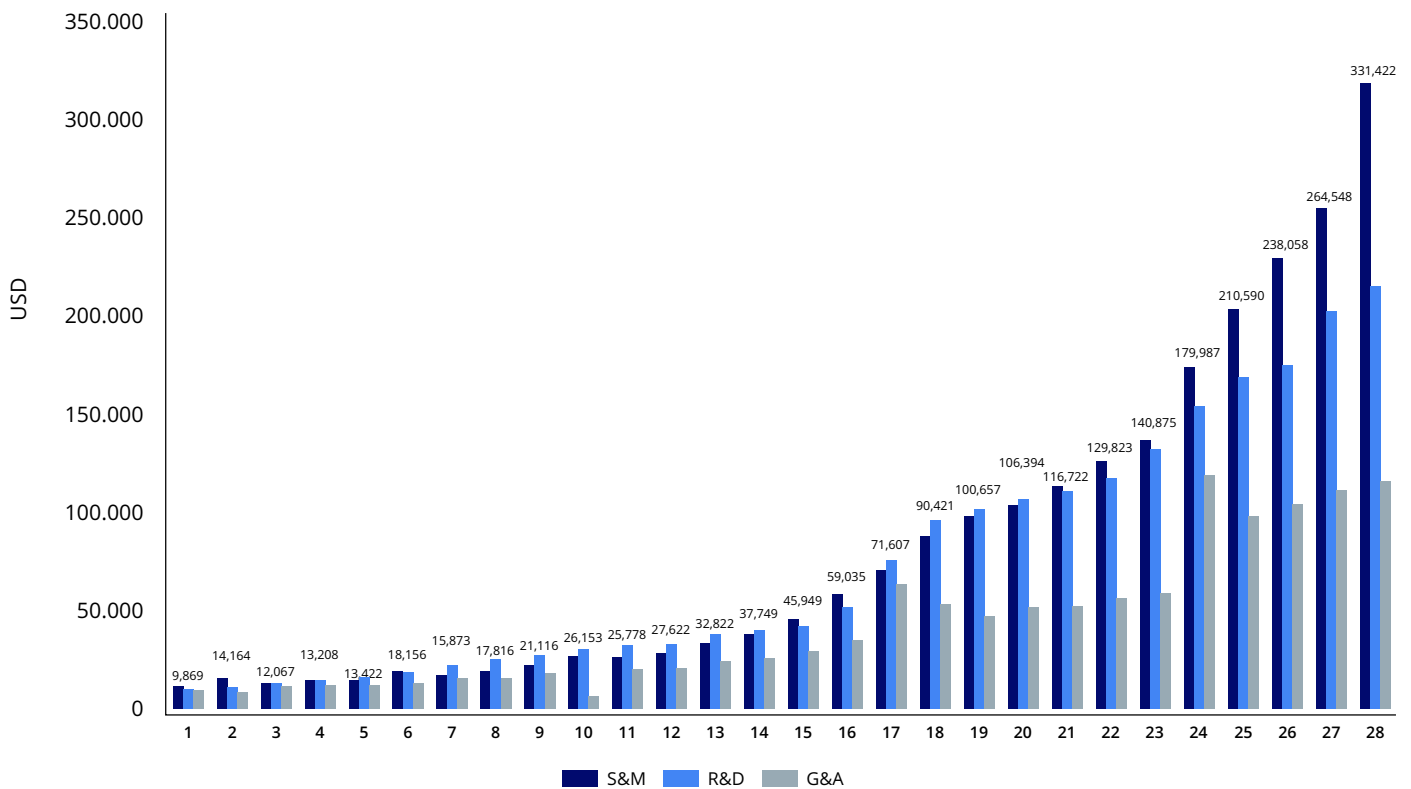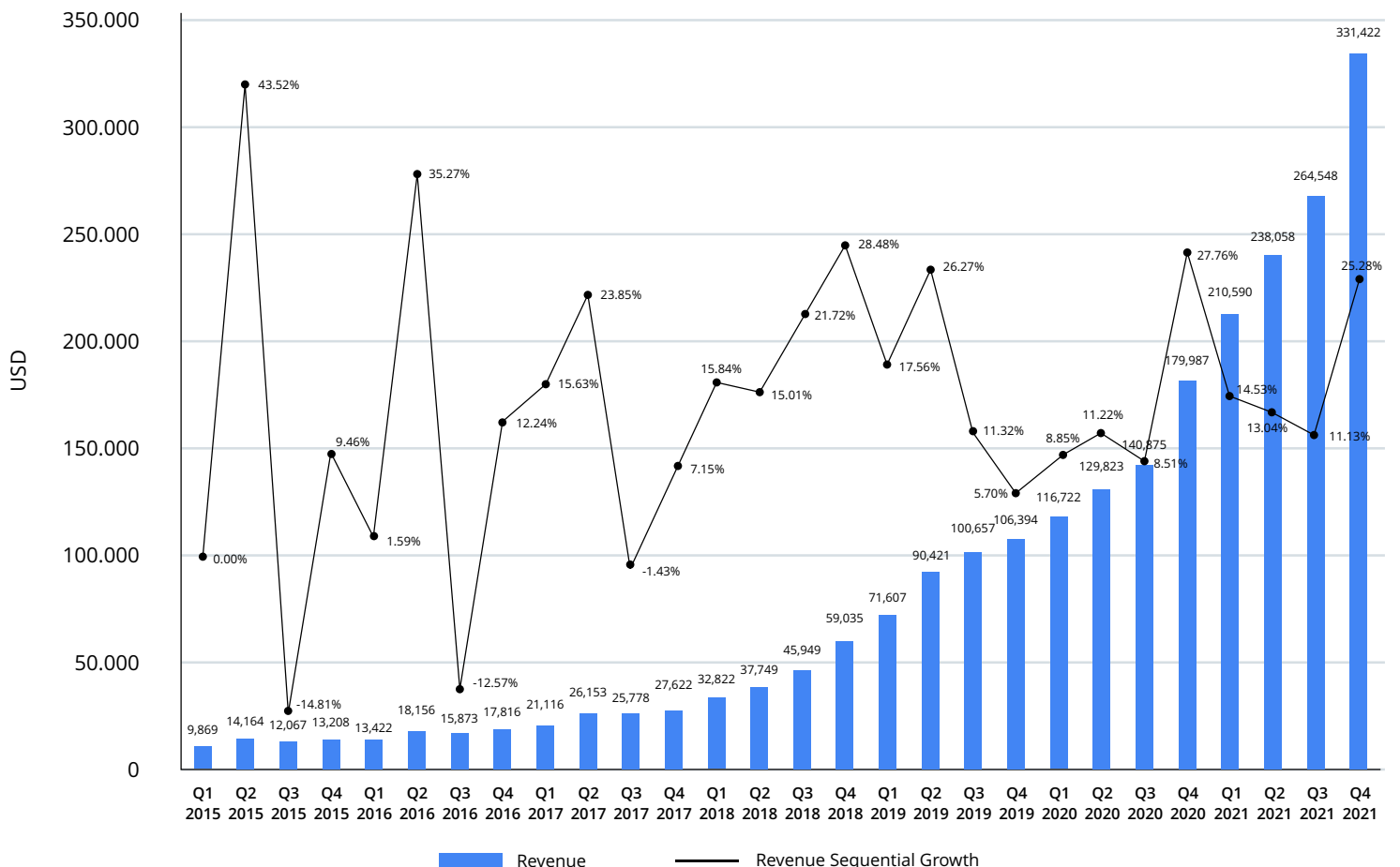
Research & Development Expenses, quarterly
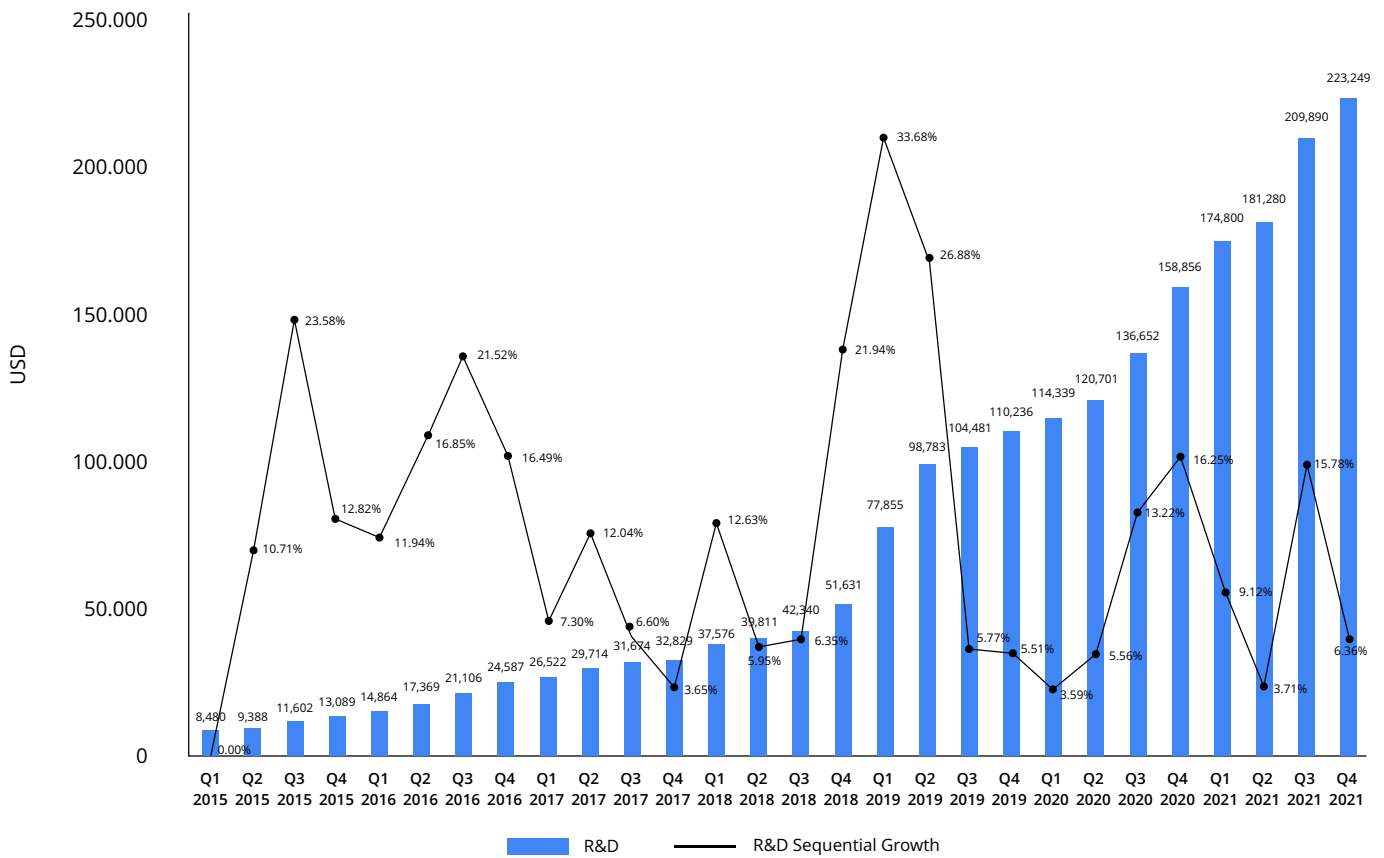
General & Administrative expenses, quarterly

Legend: G&A (bar) — G&A Sequential Growth (line)

th USD	2013 FY	2014 FY	2015 FY	2016 FY	2017 FY	2018 FY	2019 FY	2020 FY	2021 FY
Financial Metrics									
Revenue	49.920	88.846	166.919	277.335	399.020	650.067	1.134.468,00	1.761.776	2.841.839
Revenue Sequential Growth									
Revenue YOY Growth	0	77,98%	87,87%	66,15%	43,88%	62,92%	74,52%	55,30%	61,31%
Cost of Revenue	25.868	41.423	74.454	120.520	182.895	300.841	525.551	846.115	1.451.126
Gross Profit	24.052	47.423	92.465	156.815	216.125	349.226	608.917	915.661	1.390.713
GM%	48,18%	53,38%	55,40%	56,54%	54,16%	53,72%	53,67%	51,97%	48,94%
OpEX									
R&D	13.959	21.824	42.559	77.926	120.739	171.358	391.355	530.548	789.219
R&D Sequential Growth									
R&D YOY Growth	0	56,34%	95,01%	83,10%	54,94&	41,92%	128,38%	35,57%	48,76%
S&M	21.931	33.322	49.308	65.267	100.669	175.555	369.079	567.407	1.044.618
S&M Sequential Growth									
S&M YOY Growth	0	51,94%	47,97%	32,37%	54,24%	74,39%	110,24%	53,74%	84,10%
G&A	15.012	18.960	35.991	51.077	59.619	110.427	218.268	291.614	441.291
G&A Sequential Growth									
G&A YOY Growth	0	26,30%	89,83%	41,92%	16,72%	85,22%	97,66%	33,60%	51,33%
Charitable Contribution	0	0	0	3.860	1.172	7.121	0	18.993	31.169
Net Profit	-26.850	-26.683	-35.393	-41.315	-66.074	-115.235	-369.785	-492.901	-915.584
Business Metrics									
Active Customer Accounts	11.048	16.631	25.437	36.606	48.979	64.286	179.000	221.000	256.000
Base Revenue	41.751	75.697	136.851	245.548	365.490	593.017	1.059.808,00	0	0
Base Revenue Growth Rate	111%	81%	81%	79%	49%	62%	79%	55%	61%
Dollar-Based Net Expansion	170%	153%	155%	161%	128%	140%	136%	137%	131%
Free Cash Flow	0	-22.700	-31.141	-32.334	-49.581	-47.246	69.507	-360.070	-369.735
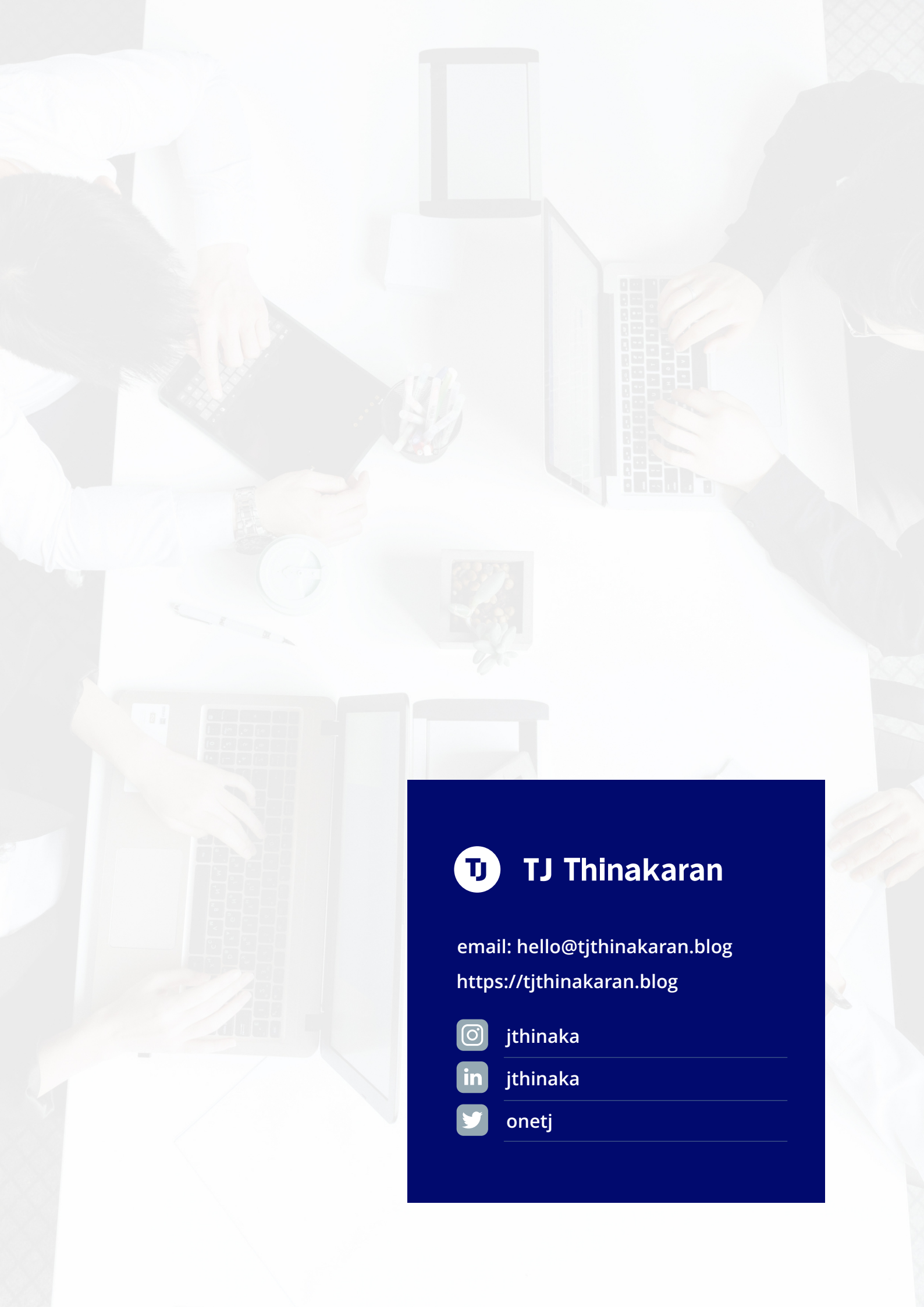
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