IMT 589

Current State Analysis-

Remitly

- Vanshika Srivastava

Remitly's Technology bucket analysis entails -

➢ **High-level architecture**
  ○ Technology platform
  ○ User Experience
  ○ Transaction lifecycle
➢ **Tech speed to market**
  ○ Updates and feature release dependency
  ○ Remitly's feature release strategy
➢ **Stack health analysis**

  ○ Technology stack
  ○ Costs and expenses
➢ **Emerging technologies at Remitly**
  ○ Range of technologies to deliver services
  ○ Associated tech risks
  ○ Risk prevention strategies

Remitly's core technology architecture -

Technology platform -

Remitly's technology platform was purpose-built to power its mobile-centric suite of products, connect their global network, localize marketing, products and experiences, and drive their data-driven approach.

Given the scale of the business and complexity of digital cross-border payments, their technology platform has broad and complex capabilities and, together with the data, gives a unique advantage in understanding the customers. Its technology platform is comprised of the following:

- **Marketing technology** stack that enables their marketing team to efficiently operate and improve the quality of customer experiences by supporting their localization strategies and efficiently capturing and analyzing data to ensure maximum long-term return on their marketing investments;
- **Core transaction engine** that underpins the entire transaction lifecycle from pricing and FX, to funding, processing, and, ultimately, to disbursement;
- **Customer experience engine** with corridor-specific user journeys and multilingual self-service or real-time support;
- **Disbursement system** for partner integrations that support a diverse set of delivery methods in over 115 countries; and
- **Multi-layered machine learning and data-driven fraud and risk management** capabilities (KYC, anti-money laundering, etc.), in compliance with highly complex and continuously evolving global and local regulations.

User experience -

Remitly strives to make every interaction on their mobile app intuitive. They optimize for the entire customer experience by reducing friction from a customer's first transaction on the platform to their most recent as a loyal Remitly customer.

New customers who have their information at hand can initiate a transaction in just minutes after setting up their account and adding their recipient's information. Below are the key steps of a transaction from account log-in to transaction confirmation.

Account set-up and log-in | **Choose recipient** | **Speed of delivery** | **Delivery method** | **Transaction confirmation**
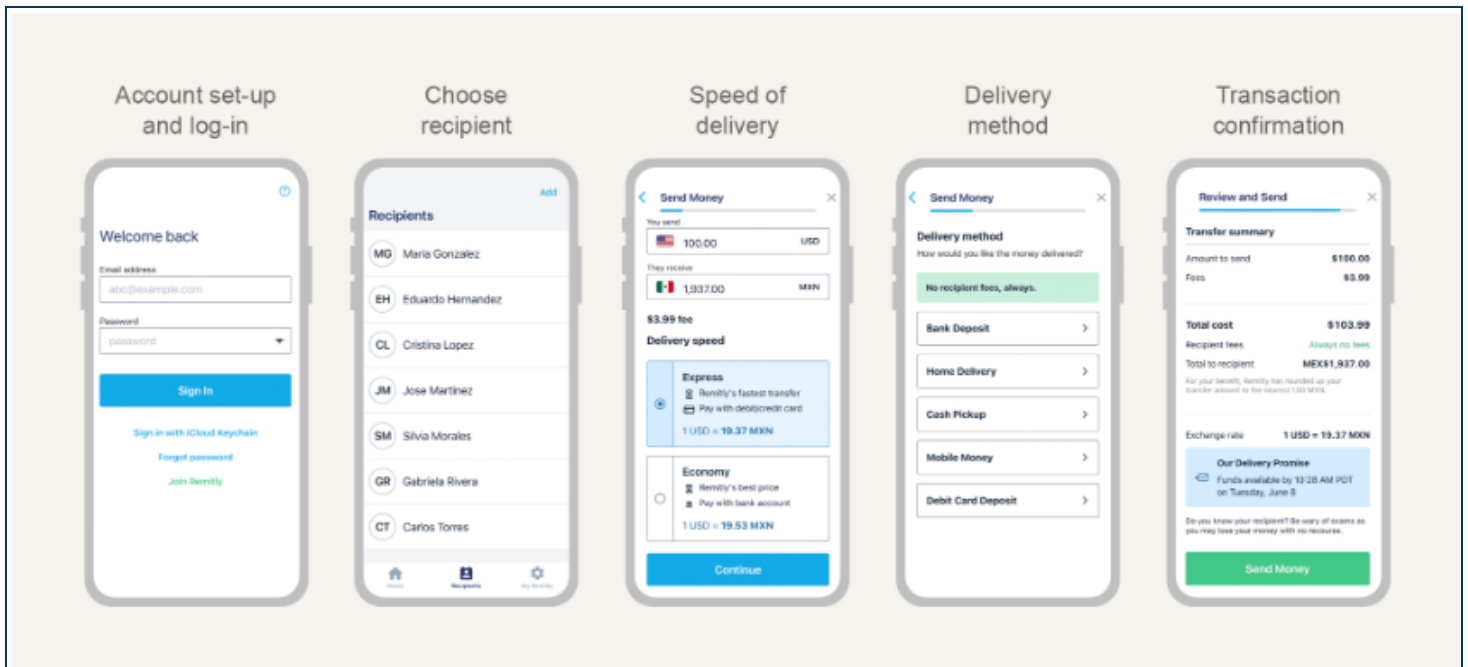
- **Account set-up and log-in.**
    - Customers can quickly set up an account on the Remitly app by entering their relevant personal information and documentation in a way that is designed to be secure.
    - They then link their choice of payment methods including their bank account, credit card or debit card, and certain alternative payment methods.
    - There is biometric login to reduce ongoing password friction for customers to enjoy faster and secure way to transactions.
- **Choose the recipient.**
    - Customers can send to an unlimited number of recipients, and adding new ones is easy. To add a new recipient, the customer simply fills in the key information necessary for them to receive funds.
    - The recipient's details only need to be entered one time making repeat transactions quick and easy.
- **Speed of delivery.**
    - In the vast majority of customers' transactions, after selecting their recipient, they have the flexibility to select the delivery speed, send amount, and payment method within the product.
- **Delivery method.**
    - Remitly's global network of partners allows them to offer a rich selection of digital delivery methods, including bank deposits and mobile wallets as well as traditional delivery methods such as cash pickup, where a recipient can

conveniently collect the money sent at a nearby location using a picture ID and a transaction reference number.

- They also offer the convenience of home delivery in certain markets to further extend the accessibility of customers' recipients.

- **Transaction confirmation.**
    - Remitly provides peace of mind with its *Perfect Delivery Promise* which includes a projection of the exact date and time for delivery of funds.
    - In addition, it provides a money back guarantee on timely delivery, a feature we are incredibly proud to stand behind. Both customer and the recipient receive notifications at key stages of the transaction process including initiation, completion, and a transparent breakdown of their transaction costs.

Transaction lifecycle -
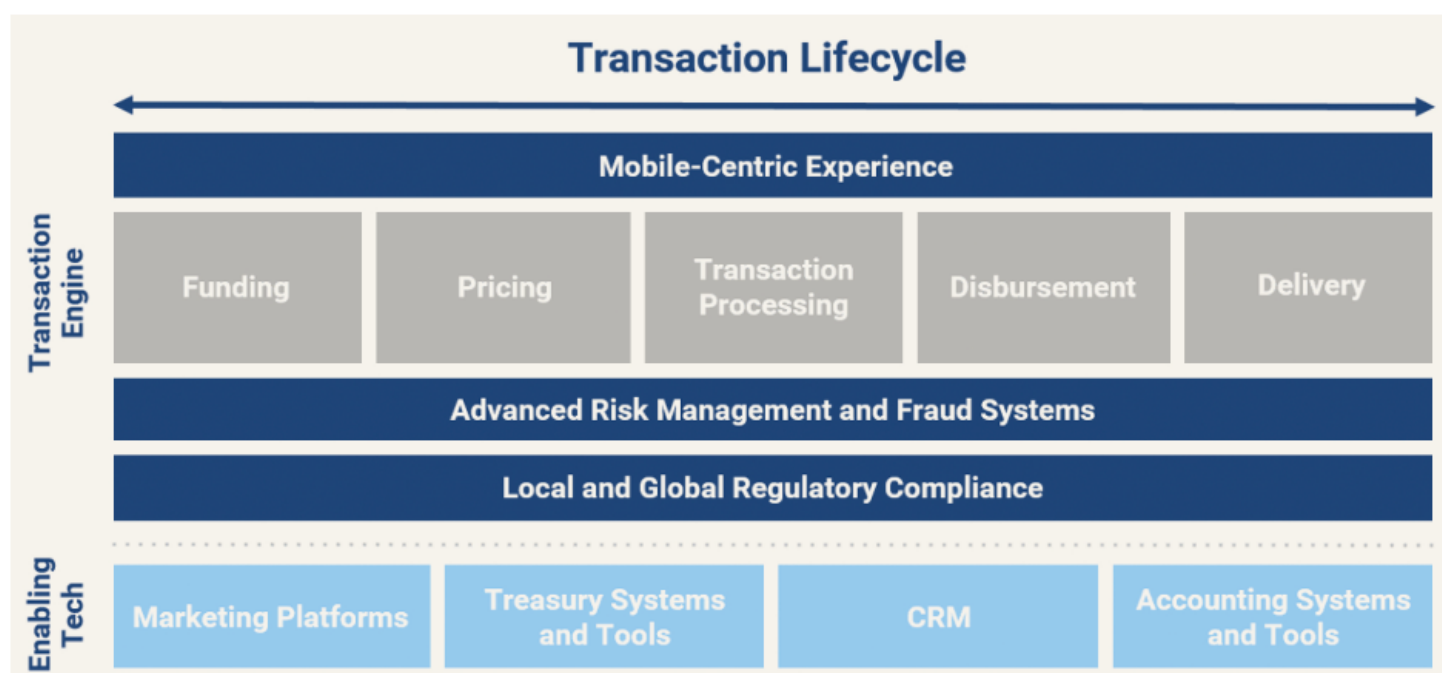
Remitly's technology unites critical front- and back-end functions into a single, vertically integrated stack which allows to provide a low-friction customer experience, efficiently operate the business, and maintain control over product development.

They utilize a **cloud-hosted infrastructure** which gives them cost and scale advantages. Everything is built with flexibility and configurability in mind, enabling solutions to be dynamic as they continue to grow and expand into new geographies.

They also employ a **Services Oriented Architecture** to support fully decentralized, autonomous and high velocity engineering teams.

Enables Localization at Scale. From customer acquisition through the disbursement of funds, many corridors display unique behaviors to which Remitly tailors its technology. For example:

- ☐ It enables marketing strategies to be executed with high efficiency and quality. Remitly can intelligently tailor over 3,900 mobile-optimized landing pages by location, language, and promotion.
- ☐ Remitly uses a turnkey A/B experimentation system to test different packaging, pricing, merchandising and user experiences, which enables them to learn from customer behavior and iterate.
- ☐ Remitly can dynamically respond to a rapidly changing environment. Through its sophisticated marketing technology stack, they can set up new experimental channels in less than one week and launch new languages in less than one month.
- ☐ Once onboarded, customers interact with Remitly's mobile app and website which are built to flexibly overlay 14 local languages through automated and scalable translations.

Highly Integrated Across the Transaction Lifecycle. Remitly delivers simplicity for customers through a robust, scalable and flexible transaction engine that seamlessly integrates various functions across the transaction lifecycle.

The highly integrated platform enables interoperability of strategic partners' multiple technology systems, functions and services through the entire remittance transaction from pay-in to pay-out.

Key capabilities include:

- ☐ **Funding**. Acquires funding via batch, instant and push payment methods.
- ☐ **Pricing.** Using revenue optimization machine learning models and analysis, presents the exchange rate, fees, and promotional merchandising across the transaction lifecycle, from upper funnel marketing pages through the send experience.
- ☐ **Transaction processing.** Orchestrates all system processes and functions into a single end-to-end payment flow.
- ☐ **Disbursement**. Distributes funds through a diverse set of disbursement methods including bank deposit, mobile wallet, cash pickup, and home delivery. This system supports numerous integration approaches from traditional data file exchange and batch processing, to real-time push and pull APIs, all with the goal of creating a consistent and seamless customer experience regardless of disbursement method or partner integration approach.
- ☐ **Perfect Delivery Promise.** Calculates the date and time of when the funds will be available to the recipient, a complex calculation done in real-time and made available to both customers

and their recipients. It also provides a money back guarantee on timely delivery, a feature that Remitly is incredibly proud to stand behind.

- ☐ **Enabling technology.** Tightly integrates business operations processes across the customer journey to yield the best customer experience. Custom-built CRM solutions have use case specific workflows that are integrated with product delivery for seamless support at any stage of the transaction.

  Its treasury decision support system, supported by machine learning models, enables treasury operators to fund over 100 markets at scale ensuring a customer's money is delivered reliably and on-time.

  There is a custom-built ledger system that enables fast and scalable reporting, including automated tracking and creation of ledger lines, losses, chargebacks / disputes, and financial-related transaction events.

Data-Driven Approach. All of the technology systems at Remitly collect and manage data. This data is leveraged to continuously test and iterate to optimize the customer experience and drive various machine learning models.

- ☐ **Marketing.** Remitly synthesizes third-party analytics with the website customer behavior to support channel-level spend optimization.
- ☐ **Pricing and product.** They use both internal and third-party licensed data to build and optimize the machine learning-based pricing models at scale across thousands of corridors. Using proprietary A/B experimentation system, they execute, test, learn, and iterate cycles to improve their product offering, merchandising and customer experience.
- ☐ **Fraud.** They use internal data to build and optimize fraud machine learning models to detect fraudulent and illegitimate transactions. These models work in tandem with advanced user experience techniques including third-party step-up verification technologies and internally developed in-product mitigations to reduce friction while enhancing outcomes, identification and exclusion of illegitimate activity and fraud control.
- ☐ **Treasury.** They manage their FX inventory and risk across the globe on a daily basis through proprietary treasury decision support software that uses machine learning models that forecast demand and an integrated account management system bringing together hundreds of currency accounts.

Tech speed to market -

Updates and feature release dependency -

- If Remitly does not innovate, improve existing products, and develop new products that achieve market acceptance, its growth, business, operating results, financial condition and future prospects could be materially and adversely affected.
- Remitly operates in a highly competitive and evolving market and may be unable to compete successfully against existing and future competitors which employ a variety of existing business models and technologies or new innovations.
- If Remitly does not or cannot maintain the compatibility of its platform with the most popular mobile devices, desktop browsers, and tablet devices, its revenue and growth prospects may decline.

Remitly's feature release strategy -

- Remitly invests heavily in technology research and development, and has a dedicated team of engineers and developers working to continuously improve its services and stay ahead of the competition.
- Remitly actively seeks customer feedback and uses this information to prioritize and make improvements to its services.
- It checks for customer satisfaction by their average appstore ratings of 4.9/5 and playstore ratings of 4.8/5 and prioritize feature releases on a weekly rolling basis.

Remitly's Stack health -

Technology Solutions-

➔ **CloudZero solutions**
- ◆ Like most software-driven companies, a key contributor to Remitly's costs is their AWS bill. In 2019, Peter Samaan — who leads the infrastructure team responsible for running the Remitly platform — was focused on improving their cloud cost visibility.
- ◆ Their first step was to build a custom cost data pipeline and dashboards — a process that took him and two engineers a quarter to complete and covered about 60% of their total costs. So while they had invested significant work, they still didn't have the visibility they needed.
- ◆ Peter and his team then turned to CloudZero, a cloud cost intelligence platform that connects cloud costs with software products and the engineers who build them.
- ◆ **CloudZero** is a solution that lets Remitly account for all of their AWS costs without much effort and proactively notifies them of changes.
- ◆ Without manual tagging effort, they were immediately able to improve allocated resources from 60% to 90% coverage compared to their homegrown tool. Then, with CloudZero's machine learning-driven context mapping, they divided costs into products, features, and development teams. They also no longer required their engineers to maintain a custom solution.
- ◆ With CloudZero, Remitly now has a way for their nearly 150 engineers to easily understand their costs and how they relate to their products. They receive regular product-specific updates and cost anomalies in Slack, then can quickly drill down into any cost to understand the source of it.

➔ **CrowdStrike Falcon® LogScale**
- ◆ Remitly uses CrowdStrike Falcon® LogScale to ingest and examine massive volumes of streaming log data from a variety of different sources at scale. Falcon LogScale improves DevOps and SecOps observability, helping the financial services firm increase insights and make faster, better-informed decisions while reducing TCO.
- ◆ Remitly wanted to ingest logs from all of its IT equipment and services. The incumbent open-source solution was too costly and complicated to handle this scale of data ingestion. The company wanted a commercial solution to simplify operations, increase adoption and keep pace with change.

◆ With Falcon LogScale, Remitly is able to transform about 40% of its raw data into meaningful information that delivers value to the business as quoted by Brandon Helms, Security Engineering Manager, Remitly.

➔ **Amazon Web Services**
   ◆ Remitly uses Amazon Web Services (AWS) to power its platform, leveraging various AWS services to build and run their application infrastructure.
   ◆ This includes using Amazon EC2 for computing resources, Amazon S3 for storage, Amazon RDS for database management, and AWS Lambda for running their serverless functions.
   ◆ Additionally, Remitly uses AWS services such as Amazon SNS for messaging and Amazon CloudFront for content delivery. By using AWS, Remitly benefits from the scalability, security, and cost-effectiveness that AWS provides, allowing them to efficiently deliver their services to customers around the world.

Costs and expenses -

Technology and Development. Technology and development expenses consist primarily of personnel-related expenses for employees involved in the research, design, development, and maintenance of both new and existing products and services, including salaries, benefits, and stock-based compensation.

Technology and development expenses also include professional services fees and costs for software subscription services dedicated for use by our technology and development teams.

Technology and Development							
		Year Ended December 31,			Change		
		2019		2020		Amount	Percent
				(dollars in thousands)			
Technology and development	$	32,008	$	40,777	$	8,769	27 %
Percentage of revenue		25 %		16 %			

Technology and development expenses increased by $8.8 million, or 27%, for 2020, compared to 2019. This increase was driven by a $7.3 million increase in personnel-related expenses, including stock-based compensation expense, resulting from a 27% year-over-year increase in technology and development headcount, partially offset by a $2.0 million decrease in compensation expense related to a tender offer that occurred in 2019.

The increase in technology and development expenses was also driven by $3.5 million in software costs for employee tools and cloud services due to growth in both headcount and the volume of transactions.

Emergence of technologies at Remitly -

→ Range of technologies to deliver services

❖ **Web development frameworks** - Remitly's website is built using web development frameworks, such as Ruby on Rails, Django, or AngularJS.

❖ **Content Management Systems (CMS)** - Remitly uses a CMS, such as WordPress or Drupal, to manage the content on its website.

❖ **Cloud computing** - Remitly leverages cloud computing services, such as Amazon Web Services (AWS) to host and manage its website, ensuring high availability and scalability.

❖ **HTML, CSS, and JavaScript** - Remitly's website is built using HTML, CSS, and JavaScript to create a visually appealing and interactive user experience.

❖ **Analytics and tracking technologies** - Remitly uses technologies such as Google Analytics to track and analyze visitor behavior and improve the performance of its website.

❖ **Marketing automation tools** - Remitly uses marketing automation tools, such as Marketo or Pardot, to manage and automate its marketing campaigns.

❖ **E-commerce technologies** - Remitly's website also includes e-commerce capabilities, such as payment processing and order management.

→ Associated tech risks

● Cyberattacks or data security breaches could result in serious harm to Remitly's business, reputation and financial condition.

   ❖ Remitly is subject to privacy and cybersecurity laws across multiple jurisdictions which are highly complex, overlapping and frequently changing and create compliance challenges that may expose it to substantial costs, liabilities or loss of customer trust. Remitly's actual or perceived failure to comply with these laws could harm their business.

   ❖ Any significant interruption or failure of their system availability, including failure to successfully implement upgrades or new technologies to mobile app or website, could adversely affect their business, financial, and operating results.

● Remitly partners with third parties to support fulfillment of services which exposes them to risks outside their direct control.

   ❖ They integrate third-party technologies into proprietary KYC and risk management systems and information security program and also partner with an extensive network

of third parties to deliver payment processing for customers and disbursement of funds to recipients.

- ❖ Any failure or disruption to the services provided by these third parties could cause disruption or delay the delivery of services and negatively impact customer experience. For example, any natural disaster that affects the ability of the payment processors to process funds could cause delays to disbursement process and thereby negatively impact customer experience and cause express or economy delivery guarantees to fail.
- ❖ Additionally, if a payment processor experiences a service outage or service interruption that results in being unable to collect funds from customers, their liquidity could be harmed and they may not be able to meet their capital requirements.

- Use of social media, endorsers, emails, and text messages may adversely impact Remitly's reputation or subject them to fines or other penalties.
  - ❖ Remitly uses social media, emails, and text messages as part of its approach to marketing. As social media rules and policies, and laws and regulations rapidly evolve to govern the use of these channels, any failure by the company, its employees or third parties acting at its direction to abide by applicable rules, policies, laws, and regulations in the use of these channels could adversely affect its reputation or subject them to fines, contractual damages, or other penalties.
  - ❖ Its customers may engage with them online through social media platforms, including Facebook, Instagram, and Twitter, by providing feedback and public commentary about all aspects of their business. Information concerning them, whether accurate or not, may be posted on social media platforms at any time and may have a disproportionately adverse impact on their brand, reputation, or business. The harm may be immediate without affording them an opportunity for redress or correction and could have a material adverse effect on business, operating results, financial condition, and prospects.

- Interruptions or delays in the services provided by critical data centers or internet service providers could impair the delivery of our platform and our business could suffer.
  - ❖ Remitly is heavily reliant on the cloud services provided by AWS. AWS provides them with computing and storage capacity pursuant to an agreement that continues until terminated by either party. They may not be able to easily switch their AWS operations to another cloud or other data center provider if there are disruptions or interference with their use of or relationship with AWS, and, even if they do switch their operations, other cloud and data center providers are subject to the same risks.

➔ Risk prevention strategies

Low-Friction Risk Mitigation.

- **Advanced risk management system.** The nature of Remitly's business subjects them to the ongoing risk of fraud and other illegitimate transactions, including, money laundering, scams and transactions subject to sanctions.
    - To address these risks, Remitly has advanced risk management and identity verification systems that both efficiently manage KYC and other compliance obligations and identify potential fraudulent transactions. Because of the efficiency of these systems they are able to maintain compliance while delivering a low-friction customer experience with low transaction loss rates.
    - Utilizing proprietary machine-learning algorithms and trusted third-party vendor software, their technology platform applies dynamic risk management measures by corridor that enable them to stay ahead of fraud and other types of unwanted activity.
    - Additionally, they deliver a low-touch, risk-based KYC process including automated document upload and digital proof of account ownership. The ongoing monitoring capability leverages multiple security layers, including third-party identity verification technologies and multi-factor authentication.
    - Remitly systems are scalable to meet future growth and are flexible and agile, which enable them to promptly respond to emerging fraud scenarios and changes in regulatory requirements. For example, with respect to new fraud risks, early warning systems trigger alarms when anomalous behavior appears, allowing them to shut down fraud attempts before they have an opportunity to scale.
    - Alternatively, in the case of changing regulatory requirements, their policy engine allows them to dynamically configure KYC requirements. They continue to invest in risk management capabilities including 24x7 expert human oversight to monitor transaction traffic and to spot evolving risks.
- **Local and global regulatory compliance.** Remitly has a technology platform to operate efficiently in a highly complex and changing regulatory environment.
    - Remitly's technology and compliance expertise allows for a consistently low-friction customer experience, which new market entrants would likely find difficult to replicate.
    - As they launch services into new markets, they ensure that they have rigorously considered and tested compliance with local experts and regulators.

- In addition, they have high standards and apply a robust diligence process in selecting global distribution partners, which allows them to leverage their local regulatory expertise.
- Acquiring the U.S. federal, state and international regulatory approvals necessary to operate as a money transmitter is a time-consuming and capital-intensive process. Remitly has developed disciplined controls and systems, powered by technology, to comply with the requirements of handling cross-border remittances. As a result, they are able to monitor money movement at every step of the process to both support reporting obligations and keep their customers well informed of their transaction status, but also as a benefit to them.

References -

★ Samaan, P. (n.d.). *How Remitly Built a Cost-Aware Engineering Culture With CloudZero*. CloudZero. Retrieved February 3, 2023, from https://www.cloudzero.com/customers/remitly

★ *Remitly Case Study*. (n.d.). CrowdStrike. Retrieved February 3, 2023, from https://www.crowdstrike.com/resources/case-studies/remitly/

★ *Remitly Company Insights, Tech Stack, and Competitors*. (n.d.). Slintel. Retrieved February 3, 2023, from https://www.slintel.com/company/remitly/5b89162d7c866675e51090c9

★ *Document*. (n.d.). Document. Retrieved February 3, 2023, from https://www.sec.gov/Archives/edgar/data/1782170/000162828021018524/remitlyglobalinc-sx1a1.htm

★ *Remitly Transaction and Account Security : United States*. (n.d.). Remitly. Retrieved February 3, 2023, from https://www.remitly.com/us/en/home/security

★ *Passbook by Remitly Launches Suite of New Features | Remitly Global, Inc*. (n.d.). Investor Relations | Remitly Global, Inc. Retrieved February 3, 2023, from https://ir.remitly.com/news-releases/news-release-details/passbook-remitly-launches-suite-new-features