Team #100

Nile Technologies

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Nile is a blockchain-based platform that helps all participants in a trade finance transaction coordinate, communicate, and receive financing.

Executive Summary

Despite the importance of the global trade finance industry in facilitating international commerce, trade finance currently relies on relatively archaic practices. The widespread use of physical bills of lading and contracts, lack of a centralized 'source of truth' for all parties, and lack of a platform to source competitive financing rates compromise the efficiency, transparency, security, and profitability of transactions. These issues are partly responsible for what the International Chamber of Commerce and Asian Development Bank estimate is a $1.7 trillion financing shortfall.[1] This financing gap disproportionately affects small and medium-sized enterprises who often find it difficult to access the financial resources and relationships required to engage in global trade, especially with new counterparties. With recent legislative advances supporting the market's digitization and the inherent complexity associated with coordinating transactions between multiple parties remaining unsolved, we believe that there is an opportunity for a new platform that streamlines trade finance for this crucial segment of the market.

Nile, our blockchain-based trade finance platform, addresses these key frictions faced by SMEs, financial institutions, and other stakeholders throughout the lifecycle of a deal. Nile offers a secure, transparent, and efficient platform to streamline the accounts receivable financing process, reduce financing risks, and lower the time and capital costs associated with accessing capital. For SMEs, the platform provides easy visibility into cash flows, profiling on counterparties, and transaction milestones, helping ensure liquidity and offering access to early payment financing options through our investor matching feature. To trade finance investors, our system offers increased transparency and risk reductions when lending funds to SMEs, unlocking an area of the market that previously required extensive manual due-diligence that rendered most transactions unprofitable. The private blockchain that our solution is built off of addresses the most prevalent form of fraud in trade finance, ensuring that borrowers are unable to collateralize the same assets across multiple disjoint lenders. Automated smart contracts also enable investors to work under predefined criteria to approve loans, making the investment process more straightforward. In short, we aim to be an integrated solution that altogether addresses the most critical pain points felt by businesses engaging in trade finance and the institutions lending to them.

The market opportunity for the Nile platform is substantial. The estimated serviceable addressable market for A/R financing amounts to $3.6 trillion[2]. We propose a balanced revenue model that comprises of transaction fees, investor match fees, and smart contract usage fees. These fees allow us to adjust to the different willingness to pay by different stakeholders. We believe that Nile can earn attractive unit margins while still providing great value to stakeholders.

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[1] [McKinsey & Company](#)
[2] [Straits Research](#)

The Problem

Background

At its core, trade finance revolves around a business transaction between a buyer and a seller, often across borders. Broadly, trade financing agreements help facilitate the payment by guaranteeing payments between parties and accelerating payments to a recipient. While there are numerous complex financial instruments and agreement types, we focus on letters of credit (a guarantee of payment by a financing institution conditional upon certain delivery checkpoints), promissory notes and bills of exchange (a promise to pay the seller or exporter an amount at a specific time written by the buyer), as well as traditional invoices. Aside from letters of credit, financial institutions provide invoice discount finance (accelerating all or part of a seller's receivables) and variations thereof such as pre-export financing (paying the seller prior to shipment). The recipient then repays the financing institution similar to a traditional loan. By introducing third party financing, buyers and suppliers mitigate payment and supply risk in an efficient manner that ensures enough liquidity to keep global trade running.

Much of the complexity of trade finance stems from the numerous parties involved – such as an exporting agency, freight broker, and inspectors that check the condition of goods during transit – throughout the lengthy transaction process. Financial intermediaries often struggle to underwrite transactions without a transparent overview of the entire transaction.

Furthermore, this process is transacted primarily through physical documents resulting in extreme susceptibility to document based fraud including the forgery, alteration, destruction and withholding of documents. The International Chamber of Commerce estimates that even with fraud rates as low as 1%, $50 billion per year is lost to fraudulent transactions.[3] On top of this, the requirements of working with physical bills of lading incur significant time and transaction costs, requiring trade financing cycles to take many months and often over a year to execute.[4] However, recent regulatory changes have approved the digitization of bills of lading,[5] creating an extremely valuable opportunity for fraud reduction and efficiency improvements.

Stakeholders

Suppliers

Suppliers in trade finance run the risk of sending out goods and never being paid on time. While financial instruments such as letters of credit help mitigate this risk, suppliers are still susceptible to not being paid in cases where initial trade agreements are altered, withheld, or destroyed, preventing trades from being executed as agreed upon. Suppliers must also coordinate with many parties, often playing the role of an exporter helping connect producers and customers and resulting in operational difficulties managing documents and communication channels. Nile addresses these stakeholder concerns by ensuring document authenticity and centralizing communication in a way that ensures efficient execution of agreements.

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[3] Bloomberg.com
[4] International Trade Administration
[5] Digital Container Shipping Association (DCSA)

Purchasers

Purchasers face similar risks as suppliers regarding payment without receiving goods. Again, letters of credit are designed to mitigate this risk but are still susceptible to document fraud that can make settlement more difficult. Purchasers also face similar communication and coordination challenges as they may not be the final purchaser of goods. However, Nile addresses these issues with the same value proposition as it has to suppliers.

Financers

Financers in trade finance play the role of providing credit, often secured by the goods involved. In addition to the risks previously posed by physical documents, financiers are also susceptible to credit risks inflamed by the inability to perform adequate KYC checks. Nile's platform addresses these physical document concerns in addition to centralizing the relevant data needed to securely inform financiers of the credit risk they are taking on. Not only is this particularly helpful when working with new clients, Nile also enables financers to easily discover new clients, further increasing the efficiency of trade finance.

Market Opportunity

The global trade finance ecosystem is approximately $5.2 trillion in size[6] – the category as a whole is incredibly broad. While the aforementioned issues faced by the different types of participants are generalizable across different niches, it is simply unfeasible to attempt to overhaul the world's trade ecosystem with a single tool. In our research, we discovered that there is a subset of firms for whom trade finance is working far less well than it could be – micro, small, and medium sized businesses. Worldwide, there are estimated to be up to 65mm of these businesses. SMEs tend to be severely credit constrained, limiting their ability to effectively exercise their crucial role in global trade; These types of businesses face rejection rates of over 40%.

The burden that the status quo 'trade finance process' has on an organization is very dependent on its size. Multinational corporations have dedicated procurement/sales/finance teams, access to proprietary/closed digital networks and tools, and benefit from established relationships with commercial banks. Their size, easily identifiable and verifiable creditworthiness, and their large notional transaction sizes make them a very profitable and attractive borrower for financial institutions.

SMEs, on the other hand, are simply not as well resourced to deal with the bureaucracy involved. There is significant manual work involved in managing trade finance transactions. SMEs tend to not have sufficient collateral and their size makes them inherently riskier than larger firms. Moreover, their lack of financial history with the financial institutions providing these types of financing makes them harder to approve for a loan. While they stand to be helped by slowly increasing digitization in the trade finance space, their fragmented nature and small notional transaction amounts makes them far less lucrative.

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[6] McKinsey & Company

The head of trade finance investing at a large asset manager that we spoke with expressed it quite plainly – "lending is a volume game." While we believe that investors generally would be interested in exposure to a large basket of smaller businesses, in practice it is often not feasible to set these investments up. There are some levels of fixed costs involved in bare-bones diligence, and the spread on a small loan is not enough to compensate investors for the risk once these costs have been dealt with.

These problems are connected to a large extent. The complexity involved in arranging and monitoring transactions is overwhelming to SMEs, and makes it harder to quickly diligence and approve them for a loan. Investors hence charge higher rates, restricting access to credit necessary for these firms to engage in more business/expand their operations. While several-sided marketplaces/tools are generally regarded as extremely difficult startups to pursue, we see a two-pronged approach as essential to any acceptable solution to these issues.

This section of the market has favorable tailwinds. The 'trade finance gap' in availability for SMEs is estimated to further expand (currently at 10% of global trade). As more proprietary point-solution systems are rolled out (McKinsey refers to these as 'digital islands'), the disconnect between both larger competing private systems and the large segment of small, under-resourced players is poised to grow even further.

Our Solution

The Nile platform is at its core an organizational tool that helps the numerous transacting parties coordinate their deliverables, track their responsibilities, and be discovered by trade finance investors while providing those investors with the necessary due-diligence.

Within a transaction, any participant that is on the receiving end of a scheduled payment can solicit for bids from an investor. This then makes the transaction – and certain details of the transaction and the counterparties – visible to investors who are scanning for investments in the 'Investment Search' view. Note that transactions are entirely private to the parties involved until the point at which a member requests for an advance (at which point the information is needed for due diligence). The payment recipient can then review the bids received and accept one, accelerating a portion of their payment and giving them access to valuable cashflow sooner rather than later. That firm's counterparties are not told the details of who the investor is, only that the party has gotten an advance.
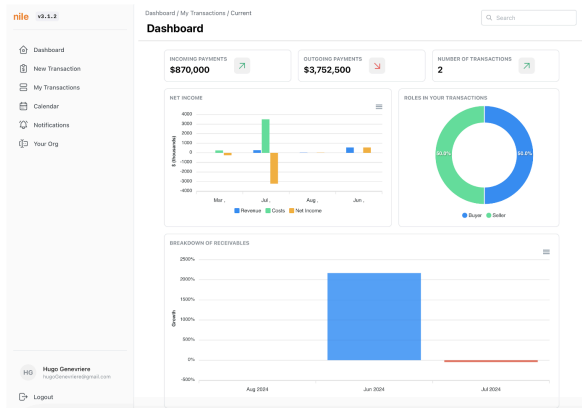
Everything centers around agreement – whenever a participant marks an assigned task as 'complete', the other counterparties are notified and might need to approve/validate that the task is done. At any point in time, a user can see on the timeline who has done what, who has approved what, and what remains left to be done to bring the transaction across the finish line. Individuals need to 'opt-in' to transactions. Altogether, these features ensure that a transaction is what it says it is, making it harder to commit fraud.

As part of the onboarding process, each organization makes a publicly visible (to others on the platform) page where they can list key points of contact, firm information, and upload non-transaction specific files that are still relevant to counterparties and investors. This might consist of licensure documents, certificates of good standing, financial documentation (the latter with more restrictive visibility settings). This helps investors or counterparties quickly ascertain

the firms and people involved and access the transaction/counterparty's legitimacy, all without needing to constantly ask/find/re-share/mail every time they are seeking financing.

Our system backs up onto our private blockchain. In theory, different investors and larger firms can hook into this blockchain, hosting their own nodes, and building their own functionality/systems on top of our open protocol. As currently implemented, transactions are stored on-chain as a universal 'source of truth'. In the event that our traditional NoSQL backend were to be tampered with, an altered transaction would be identifiable. Were this blockchain solution (not necessarily the Nile organizing app) to be widely adopted, this would also be able prevent a common form of fraud in trade finance – pledging the same collateral to multiple lenders/arrangements without the other parties knowing.

A core part of what makes the status quo inefficient is the reliance on different paper and PDF agreements that are emailed or physically mailed back and forth. Our platform makes it quick and easy to onboard a transaction through the use of an AI assistant. Users simply upload their documents, and the assistant pre-fills out information about the transaction.

From left to right and top to bottom: the main dashboard where companies see their cumulative cash flow for each week/month; part of the individual transaction view where parties in a transaction have a master timeline of deliverables, a 'todo list' of their deliverables, information about the various parties, and access pertinent transaction documents; page element where payment recipient who has matched with investor and accepted an offer sees the summary of their advance; sample of a payment deliverable in the 'My Todos' section.

Competitive Landscape

Given the high switching costs for businesses when choosing a supply chain finance platform, the trade finance platforms sector is presently dominated by only a handful of companies. These companies are focused on either enhancing the financing processes, assisting with organization, communication, and counterparty discovery or on security and fraud prevention. It is extremely important to note that no platform presently provides solutions for both transaction efficiency and security. The firms we have identified as industry leaders are as follows:

Demica is a supply chain finance platform focused on the cost financing aspects of transactions. The platform provides advanced analytics and automations geared towards helping businesses finance their transactions at the lowest costs. The platform has over 250 banks and non-bank financial institutions that leverage the platform's data to provide working capital solutions for businesses. However, this platform's security offerings fall short of the anonymized ledger provided by Nile's private blockchain.

Parafin provides a similar solution to Demica but with a greater degree of focus on setting up supply chains for SMEs. While Nile plans to follow a similar strategy in terms of targeting SMEs and helping them gain access to capital financing solutions, Parafin also has the same shortcomings as Demica in terms of security, fraud prevention, and remediation protocols.

SAP's Taulia is the largest player in this space, offering a platform with cash flow financing solutions across all areas of trade finance. While Taulia is the primary platform for many large trading partners, the platform faces the same fraud and security concerns as Parafin and Demica, as well as also lacking some of the automation efficiencies provided by Nile.

Accenture and TradeIX's Marco Polo Network takes a bit of a different approach from these other firms. Instead of focusing on security and implementing a private blockchain for similar purposes as Nile. However, one key point of differentiation Nile has is that the Marco Polo Network is optimized for large scale supplier financing. This makes the Marco Polo Network useless for many SMEs as unlike Nile, the Marco Polo Network does not provide the same company profiling and counterparty discovery benefits as Nile.

Thus, while the competitive landscape for trade financing is very much mature, Nile is positioned in such a way to provide new security capabilities as well as secure and increased data and counterparty discovery, allowing Nile's value proposition to penetrate the market for both small and large scale transactors.

Cost

Like many B2B SaaS businesses, the product unit costs are extremely profitable – the financial viability of the platform hinges on keeping our customer acquisition costs and customer support in check.

Direct Product Costs

Our webapp itself is very cheap to host as there is little expensive computation needed; organizing and fetching standard NoSQL queries is not algorithmically expensive. While the product involves a non-trivial number of file uploads for transactions, these are luckily static files. PDFs/Excel/Word documents with relatively little downloads/and uploads per day are negligible compared to high definition photos or videos that most webapps host. Our Node.js could be hosted on a straightforward serverless backend. We currently use Firebase for file hosting, and would likely remain around the $0.026/GB pricing tier. Given that each organization is not expected to have anywhere close to 100GB in contracts, we expect per organization file hosting to remain well under 75 cents per month inclusive of data ingress/egress charges. Even under extremely heavy usage, we do not anticipate all-in hosting costs exceeding $2 per user, per month.

The primary cost drivers of our app are the AI transaction creation assistant and the blockchain backup components. OpenAI charges $30 per million sampled tokens (each token is ~75% of a word)[7]. Very aggressively estimating 500 words on each page of a contract that gets uploaded, and ~100-200 pages in total per transaction, we would estimate incurring approximately $1.50-$2.50 for each large batch file analysis task that we execute in the transaction creation process. Regarding the blockchain component, with Ethereum hosting via GCP priced at 2.75$ an hour, we can allocate roughly $10,000 a month across all users to host several nodes in our private blockchain.[8]

Indirect Product Costs

Any direct costs associated with the product are negligible in comparison to the large sales/marketing and customer support costs that a roll-out of Nile would require. To get meaningful uptake at launch, let us assume that we would need 4 experienced sales managers (~$250k total annual expense on payroll and benefits each). Adding in 2 marketing personnel ($150k annually, each), a marketing budget of $2mm, and 5 developers to keep the platform running and add crucial integrations ($250k each, annually), we are already reaching an annual burn rate approaching $5mm for a 'small' rollout, before considering things like compliance costs and customer support.

The crux of the cost issue that Nile faces is that there is no feasible way to keep indirect spend initially low. The mission critical nature of a platform like this is akin to that of an ERP — no firm considers switching ERPs on a whim, much less to one that is not absolutely 'feature-complete'. To be seriously considered, even by small trade finance firms in the space,

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[7] Open AI
[8] Google

Nile must be completely polished both in terms of product and in terms of enterprise-level sales and support functions. Hence, Nile would need substantial pre-seed backing.

To put our estimates into context, a recent survey of B2B SaaS firms with 3-5mm ARR depicts the following average cost breakdown in terms of revenue: [9]
- 5% on Hosting,
- 5% on DevOps,
- 2% on COGS.
- 10% on Customer Support/Success.
- 15% on General and Administrative.

In short, Nile needs substantial adoption to begin to break even with the aforementioned (relatively fixed) indirect costs.

Revenue Model

In its full form, Nile will generate revenue via multiple streams. The first of these fees will be a transaction fee, where Nile will take a flat fee for each transaction managed through the platform. This flat fee structure ensures that the platform is both triable and scalable for small and large businesses, especially for smaller businesses that may not have enough volume for other platforms to be worth their costs. Having a base transaction cost will also ensure that counterparties only receive serious A/R invoices.

On top of this, Nile will also charge a loan origination fee to lenders for providing the counterparty discovery, historical data, and risk profiling of prospective borrowers. This fee will be a competitive 2% of the loan's value, which not only aligns with typical placement agency costs but also presents an attractive opportunity for these high APY loans.[10]

Finally, Nile will achieve additional revenue via subscription packages for add-on features. This ensures that the platform remains useful and accessible for smaller businesses, as well as profitable for larger players by offering increased efficiencies for their larger operations. Examples of this include having a package for investors that provides advanced analytics on prospective borrowers or a package for transactors that offers detailed analysis of their working capital flows. As an additional incentive to purchase these subscription packages and unlock more features, these packages would also include a fixed limit of free transactions.

[9] SaaS Capital
[10] 3E Management

Appendix: Feasibility Concerns Following Customer Conversations

After speaking with more experts in the space, we discovered roughly halfway the school year the answer to a question that had been lingering for some time: why is there no major existing solution targeting SMEs? While we do believe that a product similar to this is in some sense 'inevitable' – SMEs serve too great a function to global trade to be under-financed and relegated to paper-based bureaucratic processes forever – we were told that there is implicitly a glass ceiling preventing major adoption of a platform like Nile in the short term.

A due-diligence provider we spoke to phrased the issue as "big conglomerates don't want to play ball". Many SMEs' trade finance deals are with large multinationals who are not properly incentivised to participate in even relatively straightforward processes that would make SMEs' operations far simpler. The example he provided was that when Walmart gets approached by an investor doing diligence on financing for an SME that sells to Walmart, Walmart will generally refuse to give information to validate the existence of their business relationship. A simple verification that this SMEs invoice to Walmart is legitimate would enable the SME to get financing, improve their business with extra flexibility, etc, yet they are not in a position to make Walmart 'play ball'. The benefits of a platform like Nile are only fully realized when the vast majority of a business's transactions can be centralized on it. Yet, the power imbalance in many trade finance deals is simply not conducive to rapid adoption.

The status quo of major trade finance players developing 'digital islands' and advanced internal supply chain transparency tools while a large segment of SMEs remains under-resourced is not sustainable in the long term. A recent report by McKinsey comes to the same conclusion we came up with – there is a need for an open protocol/network that provides transparency while letting firms connect in the manner/to the extent that they choose. A blockchain based approach does offer possibility, but unfortunately the above has resulted in us shelving this project for the time being due to the amount of time and difficulty it would take to establish an open protocol/network being infeasible for us.