MORPHEUS.NETWORK

BLACK PAPER
According to the World Economic Forum’s report, “Enabling Trade: Valuing Growth Opportunities”, reducing supply chain inefficiency could increase worldwide GDP by almost 5 percent and total trade volume by 15 percent. This equates to a global economic boost of up to $2 trillion USD.

Morpheus.Network was established by industry veterans to address global supply chain inefficiencies by utilizing emerging technologies, resulting in a full-service, global, automated, supply chain platform for the global trade industry. We optimize and automate supply chains to eliminate inefficiencies and provide shipment and item visibility for safe and secure supply chains, saving companies time and money.

We launched our revolutionary platform, called Blue, in March 2019. With the evolution of our platform and the addition of over 100 new features, we have reached a new milestone in the company’s development.

WE PROUDLY INTRODUCE THE NEXT GENERATION OF OUR GLOBAL PLATFORM WHICH WE LIKE TO CALL:

MORPHEUS.NETWORK BLACK
Winner of the Gulftainer "Future of Ports" 2021 competition from over 2,000 entries across 6 continents and over 200 cities!
“This technology couldn’t have come at a better time as tedious compliance documentation and the absence of real-time tracking were hindering our operational efficiency. We’re definitely impressed on how easily the platform eased those pain points.” — Kevin Brock, Brock Air Products

“Morpheus.Network has allowed us to move past the traditional hurdles that many US companies face when importing and exporting goods. By enabling greater transparency in the supply chain, we’re able to process shipments faster and more efficiently than ever before.” — Blake Childers, Marketing Manager of Hoosier Feeder.

Working with Morpheus.Network has resulted in an efficient throughput of our supplier document management and validation processes. Next up we are looking at the overall visibility of our supply chain from suppliers to FCL warehouses. The transparency provided by Morpheus.Network’s technical solutions fits well with our own co-operative ethos of driving integrity from start to finish.” — Raymond Gareau Supply Chain Manager, Federated Co-operatives Limited.

“We attached the QR codes to a variety of welding equipment to give visibility to our clients as to the handling points of the equipment we manufactured. The QR code is also being used to store the shipping documents for the client, which I’ve been explained, in an unchangeable fashion. This technology is very exciting and revolutionary but also extremely easy to implement.” — Lisa Li, Export Manager at Ji’nan North

“I have enjoyed working with the Morpheus.Network team these past few years. They have such a great product, their track and trace and export documentation fits perfectly delivering downstream supply chain capability complementing our Dimitra Technology platform which delivers the upstream Agriculture components.” — Jon Trask CEO & Founder | Dimitra Ag Tech

“As simple to use an Amazon tracking number, Morpheus.Network has provided our team of supply chain managers with a trusted Digital Footprint to track and trace each step of the process.” — Alejandro Marcos, CIO, Vitalcan

“We look forward to using the Morpheus.Network Platform to simplify compliance with its automated document generation features. Dan and the team have been very helpful in assisting us with integrating this into our process.” — Peter Terranova, President of Century-Tech.

“Our focus is to grow volume and achieve market leadership. We chose Morpheus.Network because they are committed to innovation and have helped us develop supply chain strategy and drive execution.” — Eric Gomez, CEO, Maxianet.

“With an end goal to improve the coordination of our products and merchandise traveling through China, we have picked Morpheus.Network to furnish us with the transparency we need to trace our global shipments and establish a great relationship with our customers” — Lulu Liu, Head of Exportation at Jiangsu APEC Machinery.
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INTRODUCTION

With the dawn of globalization, supply chains have become incredibly complex. A typical supply chain involves a tangle of stakeholders in different parts of the world, each subject to different regulations, languages, currencies, and more. Not only are there co-dependencies across the entire chain, but there are also a multitude of intermediaries involved in the physical movement of goods.

Today, the backbone of supply chain networks involves many different IT systems and platforms which need to communicate with each other. This includes different enterprise resource planning (ERP) platforms, warehouse management systems (WMS), legacy databases, order processing tools, logistics tools, documentation management and payment layers, just to name a few. Information is mostly stored in inefficient data silos with inhibited data sharing and collaboration.

Efficient supply chain management is one of the key pillars to a profitable business and has evolved from a business support role to a value generator that became a business model of its own. The COVID-19 pandemic has further highlighted the need for robust and resilient supply chains. Efficient supply chain management not only allows companies to mitigate unforeseen challenges, but more importantly can create competitive advantages and new revenue streams.

Morpheus.Network is a software solution catered to the needs of supply chain managers. It brings all data into the same platform, makes information exchangeable and allows managers to automate and digitize previously manual processes end-to-end, resulting in higher efficiency and cost-savings. The platform allows customers to easily integrate new technologies like Blockchain, IoT, Artificial Intelligence, Optical Character Recognition, Machine Learning, Data Analytics, and much more into their existing infrastructure.
This is where digitalization and new technologies can support to create optimization and automation. The supply chain management software market size is poised to grow by $9.56 Billion USD from 2020-2024.

Imagine a world where supply chains can be automated end-to-end, including the handovers between multiple parties and back office processes. Not only would this increase speed and reduce costs, but ultimately would allow for a better customer experience. Technological advancements in IoT, Blockchain, Machine Learning and Big Data now support the realization of this vision.

The World Economic Forum has declared removing supply chain inefficiencies as the number one problem to solve in order to stimulate global economic growth, increasing global GDP by over $2 Trillion USD.

Morpheus.Network is intensely focused on helping companies and Government organizations remove supply chain inefficiencies to optimize the global supply chain.

**A NEW DAWN**

In March 2019, Morpheus.Network launched the first version of their platform which was called Morpheus.Network Blue. This release brought innovative features such as automated workflows, IoT integration, IPFS document storage, QR code triggers, and more.

Since then, global adoption has propelled the growth and maturity of the platform to an entirely new level. Our team has implemented 100+ new features, capabilities and improvements in close collaboration with our clients and partners. The updates are so significant and numerous that we decided to release a whole new version which we are calling Morpheus.Network Black.

Our new platform release comes following Morpheus.Network being named a winner of the Gulftainer ‘Future of Ports’ competition from over 2,000 entries across 6 continents and over 200 cities!

Morpheus.Network was recently recognized as Best Growth Venture at the Romania Blockchain Summit and won the Disruptor Daily Use Case Awards, honouring best-in-class blockchain in supply chain management initiatives.
Morpheus.Network has been deeply involved with the SAP ecosystem, including joining their SAP PartnerEdge Open Ecosystem and later being accepted into their Co-Innovated With SAP Program where we are working to expand parts of our platform to run on SAP software.

We have a technology partnership with IBM and were recently one of 22 companies (out of 500) accepted into the Supply Chain Innovation Program at the legendary Plug and Play Tech Centre in Silicon Valley (2019) and recently accepted into the Supply Chain Innovation Platform at Plug and Play Toronto (2021).

We are members of organizations such as the Blockchain in Transport Alliance, Trusted IoT Alliance, Florida Blockchain Foundation and the International Association for Trusted Blockchain Applications helping to define and promote new industry standards and best practices.
HOW IT WORKS

In a typical supply chain, there are over 40 points of contact between different entities. Something as simple as sending a bulk shipment of flowers internationally can generate over 200 physical documents from dozens of sources. Each handling point is susceptible to human error: misfiling, late documentation, lost packages, slow payments, etc., all with the potential of delaying or halting the entire shipment.

Within sensitive supply chains involving the transport of food, medication or disaster relief—successful mitigation of these errors could be the difference between life or death.

The Morpheus.Network Platform is uniquely positioned as a “middleware” solution - basically a binding glue between various IT systems and solutions. The platform can connect to multiple separated systems and trigger actions in an event-based workflow that resembles an automated digital clone of the existing manual processes.

Learn how Morpheus.Network’s blockchain-powered supply chain platform is revolutionizing the industry: https://www.youtube.com/watch?v=4jbPwmyk8nA
The platform renders manual, error-prone processes into an automated and streamlined digital workflow. It creates a digital twin of supply chain processes, allowing all systems and data to be connected and normalized. The result is enhanced control, higher efficiency and the ability to easily monitor process performance and implement preemptive measures before errors occur.

With a simple drag-and-drop interface, automating the most complex global supply chains requires no technical expertise. The platform transforms the most advanced technologies into basic modules that can be deployed in minutes.

Morpheus.Network Black offers 100+ preset modules that represent the most used technologies in global trade today, as well as emerging technologies like Blockchain or Machine Learning that the industry has embraced as the future.

Among others, these modules include:
- SAP robotics automation, IPFS document generation and storage, government compliance systems for imports and exports, shipment alerts (temperature/shock/humidity), email notifications, continuous QR code scans, global fiat/cryptocurrency payments, etc. The new platform also gives clients the option to create new modules from scratch with the support of our developer team.

Once all workflows are set up and operational, the platform supports the optimization of the supply chain network by analyzing all data that is created in the process execution. It gives users the possibility to monitor performance in real-time with integrated dashboards and uses data analytics to suggest improvements of the process by altering the process flow or integrating new technologies (e.g., automated digital document transfer instead of a manual process). In terms of new technologies, the platform enables users to easily tap into new technologies such as IoT devices or telematics without having to repurpose the existing IT infrastructure or exchange legacy systems.

Picture a supply chain on autopilot, each completed process triggering the next, until the package lands safely where it was intended. Morpheus.Network applies this logic to the platform as well as conditions for when things do not go as intended. Process steps are automated by creating customizable, predefined workflows, driving the
supply chain with predetermined events, such as handovers, document creation or payments. Catching mistakes as they happen with automated corrections is a key feature of the platform. Interacting with the network by revising or adding workflow objectives in your supply chain is designed to be intuitive and easy to navigate.

With its blockchain-agnostic architecture, it can ensure that confidential information remains in permissioned networks, while other data can be openly shared between partners and suppliers. With a fully digitized data-driven workflow, the required basis for leveraging other technologies like Machine Learning or Data Analytics is established.

Various technology stacks can be layered in as part of the workflow such as SAP, Microsoft Dynamics ERP systems, UPS Package Tracking or SWIFT international wire payments to over 1600 banks worldwide. The backend layer of the platform is built on a distributed ledger (blockchain) architecture which also enables cryptocurrency payments (Bitcoin, Litecoin, etc.) if preferred by the user.

Morpheus.Network Black removes existing barriers between stakeholders by creating a mutual trust layer without imposing all parties to use the same backend stacks or legacy systems. Thus, it creates a trustless system for information and data exchange. Value and competitive advantage stay in the customer-facing service layer and the established ecosystem of each party. By bringing the previously segregated layers of payments, physical goods and auxiliary services into one architecture, the platform allows companies to save money and develop new data-driven services.

As an example, the digital identity assigned to products (e.g., via barcode or QR scans) allows companies and consumers to determine the origin of a product. In return, digital certificates for fair trade standards or loyalty schemes for purchases can be implemented at the point of purchase. These services can give sellers an edge over the competition without having to pay middlemen to handle the data streams or hand out supply chain data to an external entity.
Morpheus.Network currently integrates with 100+ industry-leading technologies and service providers such as DHL, UPS, FedEx, SAP, and Salesforce, as well as various IoT devices from leading companies such as Geotab, Hanhaa and Digital Matter.

As a middleware solution, it is agnostic of a specific protocol or legacy system and is able to integrate different data sources to create value for the user. Data is stored in a trustless architecture based on distributed ledger technologies.

For international payments, our platform integrates with the international SWIFT banking payment protocol which connects our platform to 1600 banks worldwide. Morpheus.Network enables suppliers, manufacturers and exporters from around the world to receive their local currency in over 200 countries globally. Additionally, purchasing importers can send their own country’s currency to finance purchases in other countries. Our platform also enables fast and secure crypto-to-crypto payments through an AML-compliant, Know-Your-Customer (KYC) verification process.
As a middleware platform, we do not seek to replace existing systems and services, but rather augment and enhance them. This means that our clients do not need to throw out their established technology infrastructure but can utilize our platform to optimize and automate their current workflows in conjunction with existing IT infrastructure. This approach minimizes adoption costs for companies and allows parties to maintain their own customer experience through established ecosystems and networks.

This is also the reason why we decided to move the Blockchain layer into the backend and focus on providing an intuitive user interface. Instead of requiring companies to overhaul their entire software stack and set up Blockchain networks themselves from scratch, Morpheus.Network does the heavy lifting in the background. Our platform is web-based, which means there is no costly software and hardware to install or maintain and companies can adopt and benefit from the platform within days instead of months.

By connecting to all internal and external data streams for supply chain operations and bringing them into the same place, previously separated layers of physical distribution, documentation and services, as well as payment streams, are connected.

This creates the base for holistic analytics, automation and process improvements by receiving in-depth insights into all datasets created along operations.
OUR ADVANTAGES

1. Web-based software. No hardware or software to install and the platform is accessible anywhere.

2. As middleware we connect to your existing systems. No need to rip out and replace your current IT infrastructure.

3. Highly customizable features and user interface with custom-tailored modules and APIs.

4. Data is highly portable and exportable. No vendor lock-in.

5. Predictable, pay-as-you-go pricing.

6. Connect fragmented and fragmented systems into a common machine-readable platform to allow for effective data exchange and automation.

7. Automating your previously manual and error-prone processes to save time and money.

8. Flexible user permissions so different users only have access to the information and capabilities they need.

9. Blockchain-agnostic, Cloud-agnostic and IoT-agnostic, providing you with tremendous freedom to work with your preferred vendors.

10. Morpheus Network Training and Support Team always available to assist with your supply chain digitalization and automation journey.
FEATURE HIGHLIGHTS

Our middleware platform seamlessly integrates legacy as well as emerging technologies. This enables organizations to take advantage of technological advancements in IoT, Blockchain, Artificial intelligence, Machine Learning and Big Data without lengthy and cumbersome implementation projects. To give our users a better understanding of what this means, we have compiled a breakdown of some highlights that have been developed and integrated into the new release.

IPFS DOCUMENT STORAGE

IPFS, a revolutionary new way to store and access documents, has been built into our platform. For shipping of goods across borders, it is critical — both functionally and legally — to have verifiable and accessible documentation regarding every shipment.

Morpheus.Network uses a private network of IPFS document storage nodes, combined with event logging on the Ethereum blockchain, to ensure that shippers, authorities, and recipients can retrieve shipment data, and to be assured that documents used in shipping transactions are verified, tamper-free originals. Since all goods shipped using Morpheus.Network’s platform can be easily associated with the proper documentation, users can move shipments across borders with less friction and greater speed.

And because all documentation is stored using IPFS, there is no central data clearinghouse holding sensitive shipping details, including financial information or other personally identifiable information.

This provides two layers of assurance: apart from the access control afforded by

“It’s about trust. One of the reasons why the international supply chain industry is so inefficient is because you have organizations who need to work together, but don’t necessarily want to share their data because there’s not a lot of trust amongst all these organizations. There have been a lot of solutions attempted over the years, but all of those solutions required a central entity in the middle. Our supply chain platform, which takes a more decentralized approach through technologies such as IPFS, enables more organizations to collaborate.”

https://docs.ipfs.io/concepts/case-study-morpheus/
encryption. IPFS’ use of, “content addressing” offers inherent tamper protection, solving a too-real problem in the global shipping industry.

Every party involved with a shipment can now be completely assured the documents they work with are unmodified originals. Paired with our document generation features, the complete process of creating, transmitting, validating and signing documents is digitized and automated, removing a previously manual and error-prone chain of processes.

DOCUMENT GENERATION

Morpheus.Network has developed a Document Handling System to enable immutable documentation of production, processing, and all subsequent handling stages in digital format. Through a partnership with Customs Direct – a U.S. Customs Broker – our platform can generate, digitize and store custom documentation to facilitate cross-border shipments. All documentation can be generated and attached directly to the workflow and easily exchanged between all parties.

For a fully digitized document flow, the platform offers integrated OCR scanning tools and intelligent data extraction to translates documents into machine-readable information. This can reduce manual intervention and allow the automation of processes, resulting in higher efficiency and reduced risk of errors. Leveraging the modular workflow design, the platform can be adapted to any supply chain and feature specific documents like BoL (Bill of Lading), customs declaration, or official certificates needed in the food industry like FDA approvals.

Read the Morpheus.Network Case study on the official IPFS site: https://docs.ipfs.io/concepts/case-study-morpheus/
BEST-IN-CLASS IoT

We work with IoT devices from best-in-class companies such as Geotab, Hanhaa and Digital Matter. Through our IoT partnerships, we are able to enhance our platform by automating the collection of data such as temperature, humidity, shock, tampering, theft, irregular movement and make them actionable. All collected data is stored on an immutable blockchain.

“Integrating Geotab with Morpheus.Network’s middleware unlocks great potential for their end users. By tapping into our telematics capabilities, Morpheus.Network’s supply chain automation platform produces endless possibilities of automation and emerging technology integrations.” Michael Branch, Vice President Data & Analytics at Geotab

Geotab is one of the largest telematics outfits in the world. Geotab focuses on fleet management, aiming to improve safety, fleet optimization, compliance, scalability, and more. Geotab hardware trackers integrate directly with the Morpheus.Network Platform providing exceptional fleet-tracking capability to our customers. Our IoT partnerships have allowed us to expand our product offerings, including a Brexit ready solution to target the European Agri-Food sector and a USMCA cross-border solution for shipments travelling from Mexico to the USA.

Request a copy of our Hanhaa and Vitalcan IoT case study here: https://connect.morpheus.network/vitalcan.html
BIG DATA AND MACHINE LEARNING

Bringing all supply chain related datasets into one architecture and format gives our platform the chance to create a holistic monitoring interface for supply chain performance and deploy efficient algorithms for optimization.

The platform features an in-built dashboard to track the flow of single SKUs from production to end-user across all handovers and touchpoints. It also integrates proactive Email, SMS and browser notifications in case of unexpected deviations or delays in shipments to immediately inform supply chain managers of potential problems with their shipments.
However, our ultimate goal is to not only provide reactive alerts but to design proactive measures that allow action-taking before a disturbance becomes a problem. We achieve this by feeding all datasets into analytics tools and building algorithms with our customers that constantly optimize the performance of workflows. This is where the strength of our platform to bring all relevant datasets into a uniform machine-readable format is leveraged, as it guarantees that AI, ML or RPA algorithms are built on trusted and uniform datasets, ultimately improving the result of deployment.

To illustrate this with an example: The Morpheus.Network Platform is generating data on precise timestamps of handovers, optimal shipping routes, busy traffic intersections and port delays. These datasets can be used to plan and route container shipping ports in advance based on global traffic, port delays, weather, as well as many other factors and data sources. Also, if there is a statistical accumulation of delays at a certain handover point within the Supply Chain, our platform can provide recommendations to the Supply Chain manager on how to improve the associated worksteps.

**DIGITAL ID AND FRAUD PREVENTION**

According to Boston Consulting Group “The amount of total counterfeiting globally will reach $1.82 Trillion USD by the year 2020. Businesses’ could reduce the number of fraudulent sales by 60% to recoup an average of 3.9% in associated revenues.”

Morpheus.Network helps vendors to establish full transparency within their supply chain. Products are equipped with unique digital identifiers at production level using a QR code - or any other preferred scanning technology like RFID, Barcodes or NFC - as the identifier. By combining this identifier with unique product data from other data sources like the ERP system, our platform creates digital identities of products. In outbound logistics, distributors and retailers can scan the product upon receipt and at the point of sale, while connecting information to the unique identity of the product. By storing all information immutably on blockchain, an effective protection mechanism is created against plagiarism.

As a side effect, the platform can use the created data to optimize stock levels and automate reordering or payment processes by providing timestamped information along every action within the Supply Chain. It gives the chance to identify buying patterns, optimize shelf times to find the right balance between waste and availability and can be used to streamline production and warehousing. By using QR codes, which can be scanned using any modern smartphone, transparency is extended to the end consumer, thereby increasing brand confidence and loyalty.
We joined the “Co-Innovated with SAP” program to certify our Fraud Prevention Protocol (FPP) running SAP infrastructure. The program provides access to resources, services, certification and GTM benefits. SAP domain experts were particularly interested in bringing this product to market.

**MULTILINGUAL МНОГОЯЗЫЧНЫЙ 多種語言 רב לשוני**

Supply chains are international and so is our platform. You can transact with partners and suppliers across the world as easily as across the street. The Morpheus.Network Black Platform includes Internationalization (i18n) with support from multiple languages, local timezones and date formats to better support our global audience.

**HIGHLY EXTENSIBLE (SDK)**

Together with our new platform release, we will also offer a new Software Development Kit (SDK). This allows third-party developers to build modules on our platform (of course falling under the same quality standards as native solutions). Our goal is to make the platform highly extendable to ensure that features and functions can be easily adapted to all use cases. Our SDK is already in use by developers in Argentina as part of our collaboration for SENASA.

This opens up new opportunities and collaboration potential and takes our platform to a whole new level of compatibility, customization and extensibility. It also gives our clients the chance to earn revenue through our platform by offering their own custom-build modules to third parties. Imagine it as a supply chain-catered ecosystem.
similar to the Google Play store or the Apple App Store, where companies that use Morpheus.Network have the chance to monetize their own development efforts by offering the module to other platform users.

In addition to the standard modules developed by Morpheus.Network, partners, developers and community members may create their own solutions to solve new use cases faster and with a better user experience. In the first phase of the partner program, we intend to distribute a percentage of the global net revenue collected by custom modules directly to the developers of those modules. In the future, we plan to launch a third party marketplace to incentivize solution providers.

Our new Software Development Kit which allows third-party developers to build custom modules for our platform!
SECURITY & DATA PORTABILITY

We take security very seriously. Aside from utilizing defence-in-depth principals across our technology and organization, we partnered with HackenProof, a decentralized bug bounty platform that provides a preventative, rather than reactive, approach to cybersecurity. HackenProof connects Morpheus.Network with thousands of highly skilled security researchers from around the world to ensure that our code meets the highest standards of security. Read more about our cybersecurity partnership.

We utilize external code audits and constant, proactive vulnerability testing services as an additional layer of security on top of our own rigorous security standards which substantially improves our ability to identify threats ahead of time.

By company policy and practice, we use multi-signature hardware wallets for all roles with elevated privileges. This is in accordance with best security practices and helps to eliminate the risk of a single rogue actor conducting unauthorized transactions. Our m-of-n backup setup ensures that a loss or compromise of a single private key doesn’t result in the loss of a wallet. Our platform uses secure authentication methods including support for Single Sign-On (SSO) and Two Factor Authentication (2FA).

It is your data, so it should not be locked into a proprietary system. All data generated and handled within the platform are always accessible to clients and can be exported to CSV or systems such as Microsoft Power BI for further analysis at any time.
DIGITAL FOOTPRINT

For every shipment, the platform generates a Digital Footprint. This transparent audit trail provides supply chain managers with exceptionally detailed, real-time visibility into their global supply chain operations.

Multiple stakeholders such as Brokers, 3rd Party Logistic, Freight Forwarders, etc., can add compliance and shipping documentation at key handling points across the entire supply chain. IoT triggers enrich the Digital Footprint with real-time telematics (E.g., geolocation, temperature, humidity, shock, light, etc).

The digital identity assigned to products (e.g. via barcode or QR scans) allows companies and consumers to ascertain the origin of a product. In return, use cases like certificates for organic food or fair trade standards or loyalty schemes for purchases can be implemented. These services can give sellers an edge over competition without having to pay middlemen to handle the data streams or handing out Supply Chain data to an external entity.

All the data collected is stored on an immutable blockchain providing a highly trusted record of events. Each Digital Footprint includes a map to help quickly identify any issues with a particulate shipment which requires attention.

Digital Footprints can remain private to your organization or shared with select third party suppliers and partners, allowing compliance with data privacy and company specific requirements.
WHY BLOCKCHAIN?

A blockchain is a distributed, decentralized ledger—a digital system for recording events and transactions among multiple parties in a verifiable, tamperproof way. We recognize blockchain as a technology to be leveraged across supply chains to see breakthroughs in automation, optimization, security, visibility, and forecasting. Using a blockchain backend layer provides several key advantages for the platform:

- **Data is stored in a trustless environment to facilitate secure exchange between multiple parties.**

- **Datasets are notarized, normalized and fed into one pipeline, which creates an efficient backbone to deploy machine learning or artificial intelligence algorithms for process automation and predictions, as these technologies require trusted datasets to work with.**

- **Smart contracts are used for event triggers, i.e., automated process steps. By using a smart contract architecture, conditional actions can be triggered (e.g., if a temperature sensor measures a breach in the cooling chain, an alert is automatically sent to the forwarder and the event is reported to the insurance company).**

- **Once data has been written to a blockchain, no one can change it. This creates a secure, immutable audit trail of all documents and transactions to ensure compliance with local regulations.**
With a fully digitized data-driven workflow, the required basis for leveraging other data-based technologies like Artificial Intelligence, Machine Learning or Data Analytics is established. Our blockchain layer normalizes all data streams into a “common machine-readable language,” with Morpheus.Network acting as the translating agent. Normalized and validated datasets are a key success-factor to deploy efficient algorithms. Given the nature of distributed ledger architecture, the need for middlemen for data storage or data clearance is removed, allowing for a more cost-efficient data exchange between actors.

For illustration, an important part of supply chains can be utilized: Document creation and exchange (e.g., customs, shipping or certification documents). Documents are digitized within Morpheus.Network, recorded on the blockchain and can be accessed only by authorized participants; this can be all participants or only those who need a particular portion of the data. Document ownership and access can be anonymous yet securely identified between partners who require verification. In short, it can be widely shared and protected at the same time.

MORPHEUS.NETWORK ADDRESSES SHORTCOMINGS OF BLOCKCHAIN TECHNOLOGY

While many existing supply chain solutions rely on proprietary blockchains, thereby ensuring vendor lock-in and scalability limitations, our platform was fully designed to be blockchain-agnostic. We are currently integrated with Ethereum, EOS and Hyperledger and have more on the way. We are also cloud-agnostic and currently run on Amazon AWS, Microsoft Azure and Google Cloud. This allows the user to choose the right blockchain solution and platform based on their requirements, giving them full flexibility regarding IT infrastructure and setup.

Trying to force all actors within a supply chain network to utilize the same legacy system and/or IT infrastructure has proven to be a large hurdle to blockchain adoption, as it presents massive switching costs for implementation. With our platform, partners within the network are not forced to use the same blockchain.
Our blockchain-agnostic approach was also chosen to tackle the most prevalent shortcomings associated with distributed ledger networks:

In public, permissionless blockchains, all information is publicly available at any time. While this endorses transparency and trust, it poses a great challenge for mission-critical and sensitive datasets. Morpheus. Network solves this problem by allowing users to switch between permissioned (private), permissionless (public) and hybrid networks for data transmission. The platform features permission settings that establish which data, documents or workflow objectives are kept private, and which ones are visible and shareable with your shipping agents, customs brokers and freight forwarders. This ensures that confidential information remains in permissioned networks, while other data can be openly shared between partners and suppliers, allowing compliance with data privacy and company-specific requirements.

Another common criticism associated with blockchain is scalability for high-throughput applications. Using blockchain for data notarization in high-frequency applications can become expensive with high volume datasets such as IoT geolocation, tracking data or document handovers. For a single company executing on an average of 20-25 workflows in a day, the calculated number of intermediate transactions easily ends up at around 7500 transactions per day.

Every time a transaction is notarized on a public blockchain, a transaction fee is incurred. This results in uneconomical costs at scale and a backlog of transactions that cannot be processed due to network congestion. One possible solution would be to use a highly scalable blockchain network. However, this contradicts with our approach of interoperability and not forcing all users into one blockchain network. Also, when validating all transactions on the public blockchain, dependency is increased and controlling the privacy of sensitive data becomes more difficult.

Morpheus.Network Black tackles this issue with a side-chain architecture. We have developed a layered platform that allows the abstraction of different blockchain protocols. It enables users to benefit from the inherent strengths of different protocols and systems for leveraging the required transaction data in one, single place – without compromising on flexibility, security or scalability. For detailed information on our approach, please refer to this Medium article: Token Functionality and Scaling Morpheus.Network.

To drive the evolution of distributed ledger technologies for corporate use, we are actively engaged in the Ethereum for Enterprise network. We are a sponsor and Governing Board Member of the Ethereum OASIS Open Project and Governing Board Member of the Baseline Protocol. The Baseline Protocol defines a series of steps to
privately and securely synchronize data and business logic between multiple independent systems of record, using the Ethereum Mainnet as an auditable common frame of reference. This protocol implements best practices around data consistency and compartmentalization, and leverages public Ethereum for verifying execution of private transactions, contracts and tokens on the Mainnet using zero-knowledge proofs.

**MRPH TOKEN**

In our pursuit to provide a unified communication layer between different systems and blockchain protocols, Morpheus.Network grants an abstraction layer that leverages multiple distinct and disparate platforms in one place. The MRPH tokens are the currency used to cover the costs associated with operating the platform for data storage, notarization and exchange.

From a user standpoint, MRPH tokens are used to “pay” for two key functions of the platform: firstly, automating processes that had to be done manually before, thereby saving time and money; secondly, notarizing all transactions/datasets in an immutable ledger for all parties to create a single source of truth and converting information into a common machine-readable data format.

Clients utilizing Morpheus.Network’s automated Workflow Builder and Process Orchestration Engine pay a standardized SaaS fee. A percentage of the SaaS fee is used on the backend of the platform for notarizing the completed modules on the Ethereum Mainnet and another percentage is converted into MRPH and used to hash critical supply chain data to the Ethereum blockchain, thus creating an immutable audit trail of all the completed events that occurred throughout the supply chain lifecycle.

MRPH tokens will be used by the platform to compensate participants in the Morpheus.Network ecosystem, including Morpheus.Network Solution Providers, Module Developers and those involved in helping to secure and optimize the network including Masternode operators.
Ethereum was chosen based on its native ability to process smart contracts and the fact that it is one of the most secure and widely recognized decentralized networks. However, there exists a need to address specific Ethereum-based issues. Some of the significant problems include a limited volume of transactions processed per second and thus the critical need for interoperability.

Currently, the Ethereum mainnet can only handle approximately 15 transactions per second. To resolve this issue, the Morpheus.Network Platform will be able to leverage masternodes, which are capable of performing instantaneous transactions in high volumes utilizing interoperable sidechains.

As we will be integrating a side-chain architecture for private networks and scalability, clients can become a functional part of the network by operating validator nodes if they wish to do so. Lastly, we are currently working on offering our customers a marketplace for custom-built modules. In other words, our clients will be able to monetize the development efforts they put into creating new modules. Within our module store, MPRH tokens will become an integral part for managing the ecosystem (similar to an App-Store).

MRPH tokens give users full access to all functions of the platform. We are convinced that distributed ledger technologies offer great opportunities for digitizing supply chains. However, we also understand that the process of acquiring, storing and using tokens represents a hurdle for most enterprises - at least as of now. That is why Morpheus.Network does the heavy-lifting associated with using Blockchain and tokens in the background to give our clients a frictionless and easy user experience:
• We offer our clients to pay for our services in their established and preferred payment methods (most commonly fiat currencies) and automatically convert into MPRH tokens on-the-fly at the time required. Thereby we eliminate volatility risks of coin holdings.

• Token exchanges, setting up wallets and storing cryptocurrencies is all handled backend by Morpheus. Network, hence removing the hassles associated with it for companies (e.g. managing wallets, risk of losing private keys, going through exchanges).

• Network setup and “plugging into” Blockchain protocols is done in the backend, making it easier for companies to interact with Distributed Ledger technologies.

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ENTERPRISE-PROVEN

Our secure, highly-robust platform is already in use by small exporters as well as large, multinational corporations around the world. Our philosophy always will be to develop our platform in close cooperation with users to make sure that solutions meet their expectations. Everything we design has ease of use and easy integration into existing software stacks as well as legacy systems in mind.

We are proudly working with Vitalcan which manages thousands of shipments a month including inbound for raw materials and packaging, outbound shipments to Argentina and international shipments by land and sea.

We also work with Federated Co-operatives Limited (FCL) to manage its complex supplier document management system. FCL is a co-operative federation providing procurement and distribution to member co-operatives in Western Canada. They are one of the largest companies in Canada with $9.2 Billion in revenue (2019) and over 150 suppliers.
Max Interamericas, which serves more than 25 countries, best known for solving market challenges for brands like Maruchan (ramen noodles) and Stone Brewing (craft beer), has adopted our platform to adopt best-in-class compliance workflows.

COMMON USE CASES

FOOD SAFETY REGULATORY COMPLIANCE @ FEDERATED CO-OPERATIVES LIMITED (FCL)

FCL uses Morpheus.Network to run its complex supplier document management system across Canada, linking hundreds of suppliers. This replaces a largely manual process where thousands of regulatory certifications and documents from more than 150 suppliers are collected and managed by FCL, all needing to be scanned, validated, processed and tracked. The new solution automates the management of documents from each supplier and provides a self-service portal for suppliers in the integrated document handling system.

The solution was developed for food safety managers to effectively manage Food Compliance processes. It enables simple communication and collaboration between various stakeholders within Food Supply Chains and third parties (suppliers, producers, vendors, distributors, etc.). Supplier self-management saves time and money and integrates automatic verifications of documents and membership numbers. Most prominent features include dashboard reporting to quickly identify
non-compliant suppliers, proactive notices and alerts before certification expiration, AI-driven OCR to identify important data and information within documents, third party API integration with certificate organizations (where available) and digital footprints for each supplier showing current and historical compliance status.

**TRUSTED DIGITAL FOOTPRINT @ VITALCAN**

Vitalcan uses the Morpheus.Network workflow builder for automating inbound and outbound workflows of nutritional solutions, falling under the regulatory framework for Agri-Food compliance. The platform allows them to track and trace each step of the process and includes setting up a unique QR code for each shipment, enabling key stakeholders to add digitized documents and data to shipments in real-time.
AGRO FOOD CERTIFICATION PORTAL @ SENASA

SENASA, the National Food Safety and Quality Service of the Argentine government, has agreed to implement the Morpheus.Network solution for animal management and certification using blockchain and IoT technologies.

SENASA has headed the government of Argentina’s surveillance, regulation, and certification of animal and plant origin products and also deals with the prevention, eradication, and control of diseases and plagues affecting these plant and animal species.

In its venture within the agro sector, Morpheus.Network promises to integrate data and analytical support in securing conformity, traceability, automation as well as cost-efficiency.

COMPLIANCE FOR COLD CHAIN APPLICATIONS @ MAX INTERAMERICANAS

Max InterAmericas, best known for solving market challenges for brands like Maruchan (ramen noodles) and Stone Brewing (craft beer), has continuously evolved by forming strategic partnerships and leveraging the latest supply chain technologies. The platform is used to seamlessly track processes by activity, document, and event.

Our workflow builder and process orchestration engine are deployed to develop outbound workflows and integrate with other technology providers for merchandising and automation of shipping transactions.

It is also in use with maxiaNET’s proprietary cold-chain FreshTech program, including real-time IoT integration for their growing roster of chilled and frozen products.

The tracking portal enables them to analyze shipping delays, SLA costs, and logistics cycles and gives them the freedom to work with a wider range of categories without compromising compliance across 25+ markets.

PHARMA APPLICATIONS

Pharma supply chains are a sensitive area of application, as they follow strict regulations and disruptions in the supply network ultimately puts patients at risk.

Morpheus.Network has created a solution to provide total pharmacovigilance by using data to monitor the safety of medicines from source to consumer. This provides transparency in the distribution process.
Our solution encompasses testing/approval, production and distribution of regulated substances, giving clients a one-stop shop architecture for their supply chain needs.

To add to this, we have developed management tools for hospitals, that include load balancing and maintenance of DME (Durable Medical Equipment). Our goal is to assist clinic operators with ensuring that their equipment is properly maintained and reduce sunk costs from unused equipment with a novel intra-hospital lending solution.

**BANKING AND TRADE FINANCE APPLICATIONS**

About 80-90% of world trade relies on Trade Finance (TradeFi) which includes trade credit and guarantees, but the coverage of trade finance is not uniform by geography or company size. A lack of TradeFi to developing countries is a clear non-tariff barrier to entry. Exporters and importers from the least-developed countries tend to pay very high fees, which increase their costs of trade.

Morpheus.Network provides a solution to address major inefficiencies with typical receipt, acceptance, matching and payment processes by providing a transparent and trusted “Digital Ready” Supply Chain. We have designed modules to solve the underlying issues, including Digital Documentation processes, automated real-time inventory and reports of product damage and receipt management of acceptable product using ePOD.

Our platform offers significant efficiency gains and savings on the execution of TradeFi credit to bolster working capital: 24/7 availability ensures documents, data and events are captured in real-time and sent to Banks, Financial Institutions and Software platforms for immediate action. Precise and Timely Information from SME and Sub IG Sellers and Buyers creates new credit opportunities while mitigating higher lender risk.
GLOBAL MNSP ALLIANCE

We have amassed a global network of Morpheus.Network Service Providers (MNSP). Our MNSP are an instrumental part of our strategy of expanding our client base worldwide. They help to market our platform in their respective territories and to their existing client base.

Our current MNSPs include:
- **BlockchainGuru** (Toronto),
- **Polaris.Network** (Argentina), **LIS Solucione** (Mexico), **Supply Chain Precision** (United Kingdom), Hanhaa (United Kingdom) and **Demand Management Systems** (Australia).

Interested in working with us as a MNSP? [Let's discuss!](#)

EDUCATION

We believe in education to support the adoption of new technologies, which is why we take pride in actively endorsing educational initiatives.

We are a partner of the ISCEA (International Supply Chain Education Alliance). Hear from Karl McDermott thoughts from the ISCEA Supply Chain Blockchain Summit Certification Workshop at University of Arlington, Texas: [https://www.youtube.com/watch?v=HK3Y2efYm9E&t=43s](https://www.youtube.com/watch?v=HK3Y2efYm9E&t=43s)

Co-Founders Dan Weinberger and Noam Eppel are on the [George Brown College Program Advisory Committee for Artificial Intelligence and Machine Learning](#). Noam is
also an adjunct Professor of the George Brown College Blockchain Development course.

We're also developed a course on supply chain and digital transformations with emerging technologies for Ivan on Tech Blockchain Academy. The Academy was named Digital Educator of the Year in 2019 by Consid Awards and has educated over 30,000 students in blockchain technologies.

The Co-Founders are also in-demand conference speakers, and have recently spoken at conferences around the world including:

- Cold Chain Forum, Toronto, Canada.
- Logistic Summit, Mexico City, Mexico.
- Blockland Cleveland, Cleveland, USA.
- UN/CEFACT Forum, Hangzhou, China.
- Malta Blockchain Summit, Msida, Malta.
- Cold Chain Global Forum Spring, San Diego, USD.
- American Chamber of Commerce, Taipei, Taiwan.
- Mexico Business Review’s Networking Cocktail, Mexico City, Mexico.
- Supply Chain Technology Conference and Expo (SCTech), Paris, France.
- ISCEA Supply Chain Blockchain Summit & CBSCP Workshop, University of Texas.
GETTING STARTED

We are very flexible in how we work and happily adapt to our clients’ needs. However, from working with many companies and organizations, this is the approach we have found to be the most effective for an initial setup and starting a specific use case or Proof of Concept:

1. The first call is normally a Discovery/Brainstorming session where we dive into your current operations, how you work, what technical systems you have in place today, and so on;

2. During the call, we also show you a demo of our platform and some custom operational solutions we have put together for our clients, all for you to get a solid understanding of the features, capabilities and value of our platform;

3. We take the collected information and produce a mockup of what a solution could look like for your company. At this stage, we will have a general idea of costs, timeline and potential open points to discuss;

4. From there we run a focused pilot which typically lasts about 1 to 3 months. We establish metrics to evaluate the success of the pilot together;

5. Once we can demonstrate value to your company, we set up a project plan for a scaling implementation and expansion of the pilot across more product lines, geographical areas or use cases.
Morpheus.Network can set up a low-risk pilot project with your company to demonstrate how we can save your business valuable time and money while providing you with much greater visibility into your global supply chain and reduce costly manual errors. Please request a personalized demo of the platform here:

https://morpheus.network/request-a-demo/

We love hearing from you! Please feel free to reach out directly to the founders with any questions, comments or feedback:

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BLOCKCHAIN POWERED GLOBAL SUPPLY CHAIN

The Supply Chain platform seamlessly integrating legacy and emerging technologies. We optimize and automate supply chains and provide shipment and item visibility for safe and secure supply chains, saving companies time and money.

01 Web-based software. No hardware or software to install and the platform is accessible anywhere.

02 As middleware we connect to your existing systems. No need to rip out and replace your current IT infrastructure.

03 Highly customizable features and user interface with custom-tailored modules and APIs.

04 Data is highly portable and exportable. No vendor lock-in.

05 Predictable, pay-as-you-go pricing.

06 Connect disjointed and fragmented systems into a common machine-readable platform to allow for effective data exchange and automation.

07 Automating your previously manual and error-prone processes to save time and money.

08 Flexible user permissions so different users only have access to the information and capabilities they need.

09 Blockchain-agnostic, Cloud-agnostic and IoT-agnostic provides you with tremendous freedom to work with your preferred vendors.

10 Morpheus.Network Training and Support Team always available to assist with your supply chain digitalization and automation journey!

Learn how our platform can optimize and automate your supply chain! Get in touch info@morpheus.network