Trusted Digital Ecosystems for Sensitive Goods

Powered by
IoT Sensing, Blockchain and AI

modum

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Mission + Vision

Modum is committed to be the measure of all things in transforming global supply chains into transparent, trusted and efficient digital ecosystems. We reliably provide and create trusted supply chain data to monitor, automate and optimize supply chains, increasing quality while minimizing waste and inefficiencies. Our overarching values: reliability and quality, customer enablement, trusted relationships, and agility and innovation, allow us to benefit our customers, partners, and team.

History

modum.io AG is a Zurich-based start-up founded in 2016 by a group of entrepreneurs with backgrounds in information technology and pharmaceutical manufacturing. In 2017, Modum held a token sale to fund the development of its first award-winning product, MODsense One, which entered the market in 2018. Modum collaborates with a range of well-known business and technology partners and has close ties to academia.

How Modum Helps

Creating innovative digital solutions for today's supply chain challenges

The complexity of global supply chains is increasing in today's digital world. Innovative solutions are needed for large-scale data collection, secure information exchange, and business model and operational process optimization. Modum helps tackle these challenges today.

A trusted link to real-world evidence

Trusted data at scale — Modum's monitoring solutions provide accurate measurements with end-to-end hardware and software encryption. We create a trusted "digital twin" of the physical sensor using blockchain technology, ensuring an immutable link between measured data, quality requirements, shipment and article

Trusted information for process automation

No more delays with accessing information — our monitoring solutions provide automated data read-outs and validation of quality parameters in our dashboard. Detected quality-related events can be shared within a supply chain ecosystem enabling blockchain-based process automation beween several parties.

Simple + intuitive user experience

Ease of use is our main design principle — we create a smooth user experience from setting up monitoring devices and sending shipments, to managing measured data. Introducing our solutions into an organization can be done step-by-step, starting with a simple evaluation kit and leading to full integration into enterprise management systems.

Valuable insights for automated decision-making

Data is the currency of the digital age — we support insights gained from data with the use of advanced analytics and machine learning techniques. Quality assessments of measured shipment data, root-cause analysis of shipment events, and prediction-driven process recommendations allow us to support automated decision-making in supply chains.

Strong + global partnerships

Teaming up with industry partners allows us to offer our customers solutions that work across internal or external system boundaries. We collaborate with well-known technology leaders to ensure true interoperability and deeper enterprise system integration. Our business partners provide additional insight into customer processes.

Lean, cost-effective solutions

We aim to keep costs at a minimum by designing solutions that are fit-for-purpose, reducing both the implementation effort and the operational effort of the supply chain processes. These cost reductions coupled with a competitive service-oriented pricing model, enables us to provide a commercially attractive offering for any type of organization.

Why Work with Modum

**Become a supply chain superhero with a strong partner**

Eager and passionate, we want to help you succeed on your digital supply chain journey. Leverage our understanding of supply chain digitalization, our tech expertise and our drive to succeed.

We understand supply chain digitalization
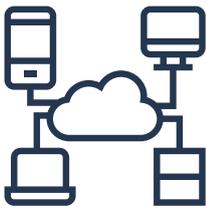
We have successfully completed various digitalization projects with customers in various industries by adopting a process-focused approach to solving supply chain challenges and leveraging our own industry expertise as well as our connections to industry associations and academia. We build solutions that link the physical world of goods distribution with the digital world of shipment information and financial transactions, applying the latest technologies where it makes sense.

We live and breathe the latest technologies
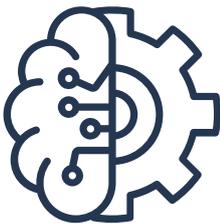
We have excellent and proven capabilities for realizing solutions using the latest technologies on both hardware and software levels – whether it is developing Internet of Things (IoT) data loggers, distributed ledger technology (DLT) ecosystems or applying machine learning for predictive analytics or pattern recognition. We ensure a seamless interaction between all modules and an enticing user experience to bring technology to life.

We get things done fast and with high quality

Our track record of achieving high quality results in record time is a key asset when it comes to customer satisfaction and time-to-market: our first Pharma qualified and WHO PQS authorized temperature monitoring solution was delivered in one and a half years, we received ISO certification within two years of company founding and our carrier integration Swiss Post was completed in a single year.

Industry Applications

Modum provides process-driven answers to supply chain digitalization for a wide range of industries.

Pharmaceuticals

As temperature-sensitive pharmaceutical products travel to the patient, external conditions, specifically temperatures, can reduce their efficacy and quality. Temperature-controlled packaging can maintain the desired temperature ranges. However, in order to fulfil Good Distribution Practice (GDP), World Health Organization (WHO) standards and other regulatory requirements, a monitoring solution is required. Our precision and customizable monitoring solutions are developed according to pharma standards and take product stability criteria and article-level monitoring into account.

Medical devices

Medical devices are subject to regulatory requirements to ensure quality from production to the end user. In the EU, the Medical Devices Regulation (MDR) requires quality control on a single unit level. During a shipment, these devices are particularly prone to damage from shock and tilt due to incorrect handling or insufficient protective packaging. Our solutions can monitor shock or other acceleration related events and can handle closed-loop shipments, such as hospitals shipping and returning bone cement to be placed back on the market.

Perishable foods

According to a UN study, approximately a third of the food produced for human consumption, around 1.3b tons, is wasted due to supply chain issues, in particular deviations from the required environmental conditions during transit. In addition, functional food, which is often categorized neither as a drug nor a dietary supplement, can be subject to unique quality control and reporting requirements. We have both temperature and humidity sensing capabilities and our seamless monitoring approach supports you in keeping your cold chain under control until the produce reaches its destination.

Construction materials

In construction, malleable materials, such as thermoset polymer foams, are often used due their unique ability to change their physical properties depending on temperature, light or pressure. These products are often used for sealing or insulation purposes. This requires controlling and monitoring the environmental conditions during transport, in order to ensure that the physical properties remain within the quality limits determined by the product's intended use. Our solutions measure the conditions of each individual reactive chemical component separately with its own condition profile.

Further industry applications

Cosmetics   Electronics   Oil + Gas   Art + Valuables

Supply Chain Applications

Modum addresses challenges for the distribution of sensitive goods, from finished products to the end consumer.

Primary distribution

Shipping in bulk from production sites to regional hubs typically involves a variety of transportation means and comes with its own challenges. On the one hand, high value shipments distributing goods in bulk need to be protected. On the other hand, logger shipment durations usually involve multiple 3rd parties and areas with little control over environmental conditions, for example foreign airports or harbors. We suggest a risk-based approach: real-time solutions for transport segments with higher risk and stationary gateways for selective data read-out at specific points.

Last Mile

Currently somewhat of a blind-spot, regulatory scrutiny is increasing with monitoring quality during transport in the final stages of goods distribution. Delivery density, ad-hoc changes in routing, unpredictability during transit, diversity of consumer needs, cost sensitivity as well as varying carrier capabilities to control transport quality are just some of the challenges in this last stage. Our award-winning temperature monitoring solution MODsense One was designed with the Last Mile in mind, providing a simple and scalable way of keeping goods safe while still being cost effective.

Clinical trials

Clinical trials have reached a global level, where kits are sent over large distances to participating patients. As clinical trials are both costly and time-sensitive, ensuring the quality of the transported goods on kit level is crucial. The growing trend of patients administering treatments at home requires them to indepently conduct quality checks prior to consumption. With data loggers that fit into most kits, we generate measurement sets which provide valuable insights for root-cause analysis. Our solution is simple and robust enough to be used by consumers, ensuring quality control right up to consumption.

Personalized medicine

Personalized medicine market size is expected to double in the next 5 years reaching USD 3.2 trillion in 2025. Its impact on logistics is huge – the high value of individual treatments will drive the need for even more visibility, goods sensitivity to environmental conditions will increase, retrieving bio samples from patients will add a new stage to the logistics process and time-to-patient will need to decrease significantly. We address this with solutions that track conditions on an article level along the entire chain, documenting important events on the blockchain, thereby creating a trusted layer for information sharing and process automation.

Further supply chain applications

| Anti-Counterfeit | Provenance | Closed-Loop | Intra-Logistics |

MODsense

Flexible, easy-to-use and future-proof monitoring solutions for demanding supply chains.

- Adaptive solution modules to cater to every stage in the supply chain and keep costs at a minimum

- Extract valuable supply chain data with minimal effort for business process automation and optimization

- Manage deviations on shipment and article level effectively and efficiently

- Access information from anywhere at any time on both desktop and mobile devices

- Data integrity by design ensured by storing data fingerprints and events blockchain

- Minimize the handling time of each shipment for all involved stakeholders, from sender to receiver

- Integrate easily and step-by-step into existing logistics processes and IT systems

Solution modules

A monitoring toolbox for every stage of the supply chain

Software Modules	User Management	Device Management	Shipment Management	Article Management	Deviation Management
	User Analytics	Device Analytics	Shipment Analytics	Article Analytics	Deviation Analytics
Integration	Blockchain-based Data Management	ERP Integration	Logistics Integration	Serialization Integration	QMS Integration

Sensing Devices	Real-Time, Multiplatform		Point-to-Point, Single/Dual Platform		Indicator, Single Platform	
Communication Options	Autonomous via TelCo Networks		Stationary Gateways	Mobile Carrier Scanning Devices	Personal Mobile Devices	

Not every solution matches every stage in the distribution of sensitive goods and flexibility is key in order to meet tacking and monitoring requirements, while keeping costs in check.

That is why we offer a wide range of solution modules on a software and sensing device level, as well as individual integration options. In addition, we support a variety of data communication options to ensure you have access to insights at any point in time.

As part of a workshop, we support you in tailoring the best set-up for your tracking and monitoring needs, assessing together with you what modules are best for the challenge at hand.
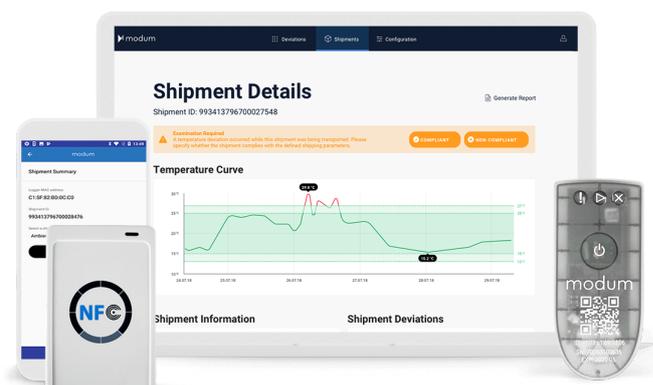

MODsense One - Temperature monitoring made easy

Modum's award-winning solution for trusted and scalable temperature monitoring

MODsense One is designed for cold-chain applications and comes with unprecedented ease-of-handling. MODsense One is fully qualified to pharma standards and is WHO Performance, Quality and Safety (PQS) authorized.

Monitor high volumes of shipments with MODsense One and benefit from immediate and automated validation of quality requirements. Data on the blockchain is immutable, managed securely and easily accessible.

MODsense One is ideal for last-stage logistics, closed-loop shipments and clinical trials.

MODlink

MODlink uses blockchain technology to enable the sharing of trusted events within a supply chain ecosystem; it connects the independent data silos of stakeholders without exposing private data. MODlink bridges data access gaps between enterprises, allowing process automation; it provides access to blockchain-secured data pools in compliance with regulatory requirements; and it assures quality, integrity, and efficiency within the supply chain for all involved parties.
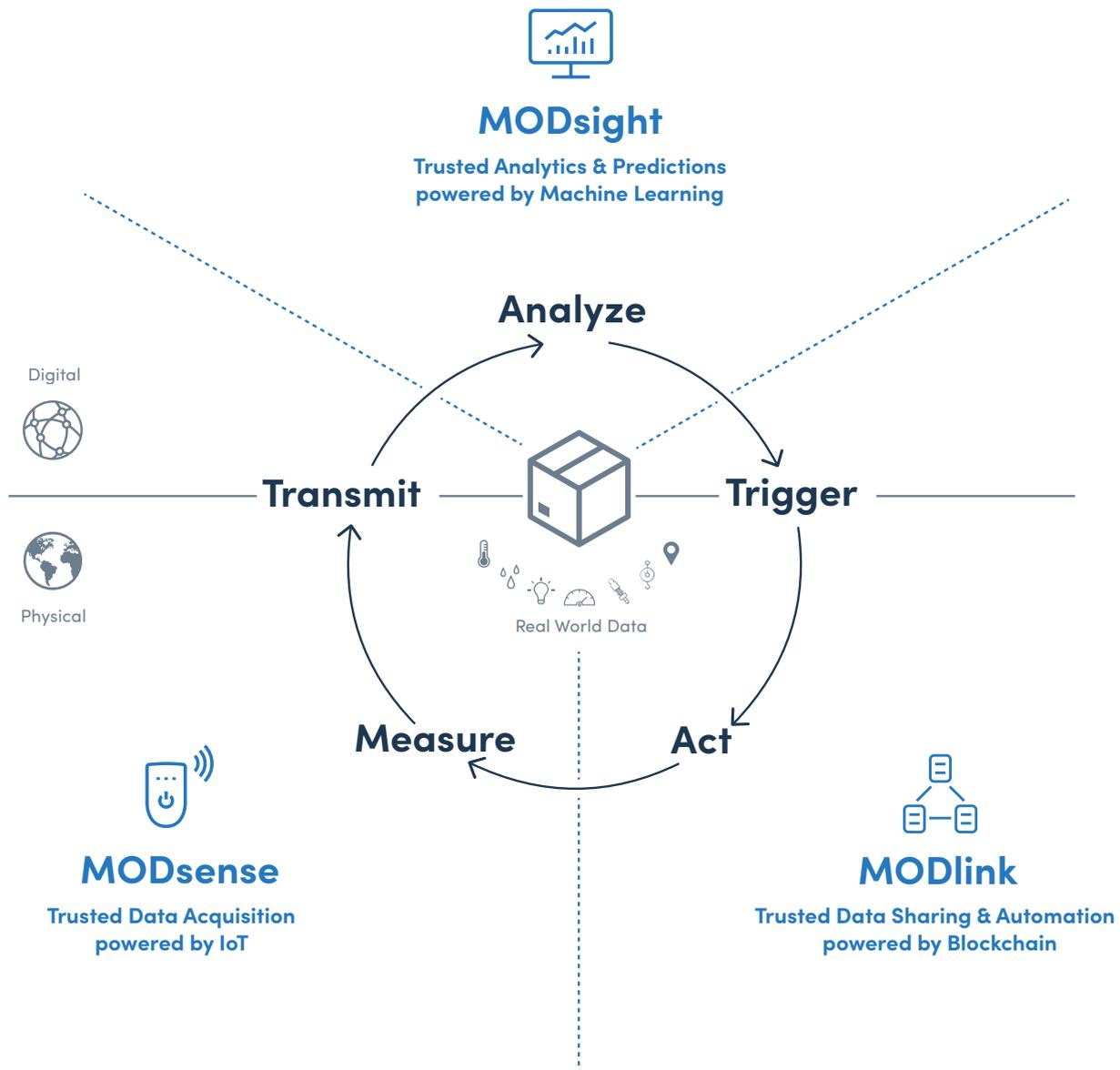
MODsight

Using acquired data, MODsight provides aggregated insights through advanced analytics and predictions.
Scenario analysis is used to understand the root-cause of trusted events and predictive models help to improve the value chain, reduce costs, and optimize risk management. MODsight runs on leading cloud platforms to facilitate integration into your IT ecosystem.

Connecting the physical world to the digital world

MODsight

**Trusted Analytics & Predictions
powered by Machine Learning**

Analyze

Digital

Physical

Transmit   **Trigger**

Real World Data

Measure   **Act**

MODsense

**Trusted Data Acquisition
powered by IoT**

MODlink

**Trusted Data Sharing & Automation
powered by Blockchain**

How we use technology

IoT Devices

- Smart sensing for a wide range of environmental conditions
- The latest connectivity options enable seamless process integration and notifications
- Cryptographically secure hardware ensures data authenticity and that data cannot be manipulated

Blockchain

- Monitored data is verified on the blockchain
- Temperature parameters create a unique record to the smart contract for each shipment, it is verified at readout to ensure data authenticity
- Data integrity is ensured as datasets stored on the blockchain are immutable

AI

- Self-learning models replace the manual modelling of shipment scenarios with a large variety of feature sets
- Machine Learning facilitates high accuracy predictions and pattern recognition
- Easily retrainable models adapt to changes in business scenarios

Technology Partners

SAP aws VARIOSYSTEMS

Business Partners

Deloitte. GS1 Switzerland

Academic Partners

University of St.Gallen Universität Zürich UZH

Awards

Gartner COOL VENDOR 2019 DIGITAL ECONOMY AWARD PostEurop Innovation Award

Certifications & Compliance

ISO 9001 SYSTEM CERTIFICATION SGS TÜV SUD EN 12830 Gamp

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