Cedalo is an IoT startup in Germany with the aim to push digital transformation by providing solutions that enable fast and easy real-time data streaming. The goal is to empower organizations to successfully utilize real-time data and build powerful applications for IoT and data stream processing.

Following this mission, Cedalo sponsors and drives the development of two open-source products - Eclipse Streamsheets and Eclipse Mosquitto. Streamsheets enables users to analyze and react to data in real-time without writing any code.

The second product is the Eclipse Mosquitto MQTT broker which is currently the most popular MQTT broker in the world. Its performance is outstanding in terms of speed and ease of use. To complement the Mosquitto MQTT broker, Cedalo developed the Management Center for Mosquitto which provides a graphical user interface for monitoring and administration of brokers.

Around the Open Source core of Streamsheets, Cedalo offers the Cedalo Enterprise Platform for Eclipse Streamsheets with premium support, services, and product features for professional Streamsheets users. The same is true for the Cedalo Enterprise Platform for Eclipse Mosquitto where Cedalo provides premium extensions of the Mosquitto broker.

Streamsheets and Mosquitto are powerful individually but they also work well together. Get started with Streamsheets and Mosquitto here.
Streamsheets leverage No-Code spreadsheet logic and graphics

Streamsheets is No-Code, the goal is that more and more business users ("Citizen Developers") can directly implement their business process rules without complicated development processes involving internal or external programmers. Spreadsheet logic like VLookups help to handle larger sets of data.

Last but not least, Streamsheets is equipped with a full suite of diagrams and interactive elements like buttons and drop-down lists. User interaction can set up in forms ranging from simple data entry to complex interaction with dynamically appearing and vanishing elements based on user action. Results can be immediately visualized in dashboards with classical charts like pie or bar charts, but also more sophisticated diagrams like data representation on geographical maps.

All Streamsheets processes run on the server 24/7. Streamsheets are built in web browsers and once created, Streamsheet Apps can be shared by simple web links.
Real-Time Analytics

Streamsheets allows you to create and monitor real-time stream processing applications using spreadsheet logic. Agile companies are making the shift from batch processing to streaming analytics. Streamsheets enables companies to seamlessly and successfully make this shift.

Streaming analytics processing enables your data to be analyzed, transformed, and controlled data in real-time. As the adoption of IoT continues to grow, many IoT use cases will require stream processing. This allows for faster reaction time and makes certain business processes possible in the first place. Companies can continuously monitor operations, processes, changes in customer behaviors, and many more.

Using stream processing instead of batch processing increases companies’ ability to make timely and informed decisions. According to MARKETS AND MARKETS, the global streaming analytics market size is projected to increase from USD 12.5 billion in 2020 to USD 38.6 billion by 2025.

Streamsheets does not only provide the necessary processing mechanisms for real-time data, but also helps to store the flood of inpouring data in so-called timeseries databases (TSDB) like Timescale DB that is directly on board in the enterprise platform.
Connectivity and interoperability

Multiple data connectors like e.g. MQTT, OPC-UA, or Kafka are provided to quickly connect the Streamsheets to data sources and sinks: These can be machines, or sensors, but also ERPs, for MES, or financial systems. All kinds of REST or web services can be triggered by simple cell functions. Artificial intelligence (AI) engines can be provided with data (or also full pictures) from Streamsheets while results from such external analysis can then be retrieved in other cell ranges of the Streamsheet.

Enterprise Resource Planning (ERP) systems can be queried for upcoming operations to be executed on a shop floor or receive back results of the execution. Messaging systems can be triggered with flexible messaging based on cell results in the Streamsheet.

Streamsheets are extremely versatile to bridge across multiple networks and can help to pull together data from e.g. multiple companies of an enterprise in central dashboards.

Streamsheets also help to transform and provide data between different data providers and seekers in a very flexible way. Because in a lot of cases applications can only be connected interoperably if the data format is changed and certain logic is applied before providing the data to another application. Hence it represents the “interoperability glue” between the increasingly scattered parts of today's IT/OT landscapes in companies.

Use cases

You can use Streamsheets in many industries and all corporate functions. For example, in the financial sector, it can be used in fraud detection and for condition monitoring in the manufacturing sector.

Streamsheets offer generic functionality. However, typical use cases include:

Connectivity: Streamsheets enable seamless connectivity among devices, apps, enterprise software systems, and infrastructures. For instance, Streamsheets are used to transform sensor and machine telemetry data on-premises before sending it to private or public clouds.
Monitoring and continuous analysis: Another application type comprises the monitoring of machine conditions and production orders as well as continuously calculating and analyzing KPIs.

Real-time dashboards and visualizations: Thanks to the rich chart options, many of which are also available in the open-source edition, many users create real-time dashboards and individual visualizations.

Automation: The next step often entails automatically triggering actions which can be as simple as sending alerts while some users go even further and control whole workflows and processes.

Fraud detection: One way the financial sector can use stream processing for fraud detection, is in the case of ATM fraud. For example, if someone performed an ATM transaction in different countries within 2 minutes, the bank can easily be alerted and stop the transaction.

E-commerce: E-commerce companies can monitor customer purchasing behavior, observe patterns and changes in behaviors in real-time.
Mosquitto is one of the first and the most popular MQTT brokers in the world with over 9,000,000 docker downloads per month. The use of Mosquitto continues to grow as the use of MQTT for IoT communication increases.

**What is MQTT?**

MQTT is a lightweight IoT messaging protocol that uses the publish/subscribe model to connect and communicate with various devices and sensors. Apart from being lightweight which is one of the reasons that it is widely used, its scalability is another reason why it is the preferred IoT communication protocol. MQTT makes it possible to send messages to millions of devices.

**Overview of Mosquitto**

Eclipse Mosquitto is an open-source MQTT broker which enables devices and applications to communicate in real-time on the edge, in the cloud as well as across infrastructures. Thanks to the publish-subscribe communication pattern, individual setups and solutions are not only very scalable but also flexible and can be adapted to changing requirements quickly.

Mosquitto provides the digital nervous system for IoT systems. However, Mosquitto can also be used for hybrid stream processing apps that simultaneously process and connect technical and business data in real-time.

The graphical Management Center for Mosquitto monitors your broker(s) and most importantly regulates the IoT security of the connected brokers. Security policies and access rights for communication from and to the broker can be changed and set while the broker is running. Also, the dynamic security plugin is
much faster and comprehensive than previous 3rd party solutions since it comes natively with the broker.

Use cases

Mosquitto can be used in multiple industries from Automotive, Manufacturing, Transportation, Logistics, and many more.

The Mosquitto user base ranges from SMEs to major corporations, such as Siemens, Cisco, Dell, Tibco, and Deutsche Bahn AG.
For more information on Cedalo, Streamsheets, and Mosquitto:

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