MQTT-Spreadsheets allow Code-free Modeling and Visualization of IoT and Digital Factory Processes

German based Cedalo AG enables the business end user to model IoT and digital factory projects by leveraging spreadsheet technology for message queue processing

KIRCHZARTEN, GERMANY, April 20, 2017 /EINPresswire.com/ -- At the Hanover Industrial Fair 2017 German based Cedalo AG presents a new approach for modelling and operating software-based networks of sensors, actuators and machines in the Internet of Things (IoT) and the Digital Factory (Smart Factory). Instead of relying on classic software development environments for Java, JavaScript, C, or other programming languages, Cedalo AG introduces "Process Sheets". Process Sheets are novel, cloud-based spreadsheets that enable code-free modeling of digital processes and support the increasingly popular IoT communication protocol MQTT.

The MQTT-capable spreadsheets empower non-programming business users, who are familiar with the spreadsheet concept of Microsoft Excel or Google spreadsheets, to actively participate in digitization projects. Both, simple and complex process flows in IoT as well as entire Industry 4.0 scenarios can be visually and interactively modeled in a short time. With the help of cloud-based technology these models are converted into a secure business mode providing 24-hour real-time operations at the touch of a button.

Cedalo´s modelling concept relies on message queues and supports many different types of processes. Besides serial and hierarchically organized processes, it is possible to implement process architectures with distributed, asynchronous and autonomous elements. In design and test phases missing hardware components or even complete systems can be simulated virtually by using Process Sheets.

For this reason, the newly developed, browser-based Process-Sheet-technology offers, in addition to classic spreadsheet functions, a set of new functions especially designed to visualize processes. In this way, not only data and message flows can be visually displayed but also physical operations, such as machine or transportation movements.

The real-time communication between hardware and software takes place using MQTT. MQTT is a lightweight and highly flexible messaging protocol for use on top of the TCP/IP protocol. Its concept is easily understandable for everyone and is based on the very powerful message queue and publish-subscribe principle. MQTT is the only IoT protocol which is supported by the majority of large IoT cloud providers. In addition, MQTT broker as well as the corresponding client SDKs are open source.

At the Hanover Fair, Cedalo AG will present the link between an OXID eCommerce platform and a logistics robot. The robot picks the items automatically only seconds after they have been ordered in the OXID eShop web portal. The technical and business logic of this process is modeled by two Cedalo Process Sheets and controlled by MQTT via the Amazon Cloud.

Another demonstration shows the link between a smartphone and a robot arm. Via MQTT the GPS,

position and acceleration sensors of an Apple iPhone are connected to Cedalo Process Sheets. Thanks to these connections and the implemented formulas in the Process Sheets, the robot arm is moved 3-dimensionally according to real-time changes in the position of the iPhone.

Moreover, Cedalo provides numerous interfaces for devices that use other industry protocols. For example, at the Hanover Fair, an industry type distance sensor is connected to Cedalo Process Sheets via an IO LINK-MQTT bridge. The measured distance values of the sensor arrive in intervals of milliseconds at the Process Sheets. Based on these values the sizes of workpieces are calculated which after that lead to the corresponding positioning commands of the connected actuators.

Further MQTT bridges, such as REST API, OPC UA or Profinet, are available or under development. Cedalo´s goal is to offer a simple end-to-end alternative to the many communication processes in the industry which rely on complex protocol architectures.

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