SIDAT

AUTOMATION
INFORMATICS

PRODUCTION INFORMATICS

COMPREHENSIVE AUTOMATION

PRODUCTION INFORMATICS

INTEGRATION PROJECTS
AND INDUSTRY 4.0

CUSTOMER CARE

SIDAT spol. s r.o. (Ltd.) was established in the spring of 1990. To this day, it is fully owned by Czech nationals. **In 2020**, the company commemorates **30 years of its existence**. It employs almost 100 people and reaches a turnover of a quarter billion Czech crowns.

Over the past **3 decades**, we automated processes and supplied informatics projects for production technologies exceeding **CZK 30 billion** in the Czech Republic alone. Today we have **300 current customers** and the total number of implemented projects **exceeds 3,000**.

Many of these projects represent top achievements in terms of the desired effects, scope or speed of implementation and represent **the best in the given field**, even at the **international level**.

Branches in **Prague** and **Brno** currently provide services and deliveries in four main areas, which are mutually interconnected:

COMPREHENSIVE AUTOMATION

PRODUCTION INFORMATICS

INTEGRATION PROJECTS AND INDUSTRY 4.0

CUSTOMER CARE

PRODUCTION INFORMATICS

The focus of activities in this area is mainly on the food and processing industries.

Our projects in the field of production informatics comprise solutions from simple data acquisition with visualization and reporting to complex **MIS/MES** solutions. These projects represent digitalization of the production environment, i. e. a completion and modification of the communication and database architecture, which is then used for the production data transfer and archiving, implementation of algorithms for aggregated data calculation and interface creation for the data handling resulting from the manufacturing and/or company management needs.

Our solutions dealing with production informatics projects include a wide range of supplies and services:

- virtualisation of control architectures
- computer and automation hardware supplies
- assembly and installation works
- acquisition of various data groups and their archiving
- application software delivery incl. the user interface and interface to the control system of the manufacturing technology
- training of end user staff
- 24/7 after-sale service and further support within our CUSTOMER CARE programme
- advisory, consulting, and management of the entire project

In the following text we briefly present characteristics of some solutions subdivided according to their use in serial and piece productions.

DATA ACQUISITION AND VISUALISATION OF MANUFACTURING TECHNOLOGY (RTDB + SIDAS® RT)

The base of every production informatics project is the data acquisition from the manufacturing technology. We need either the continuous data (produced by various measurements of physical values) or discrete data (which define the technology position or status).

When solving such a topic in a long term basis, we have been using proven solutions – the real-time databases IP 21 from the **AspenTech** company and **iHistorian** from GE. Both platforms utilize the data compression technology. By the **OPC Gateway** we normally provide the interface to the control system of the manufacturing technology. In this manner the fail-safe data transfer from the environment with heterogeneous industrial communication standards (**S7, MODBUS TCP, CAN, PROFINET, etc.**) can be reliably secured.

The data which is stored in the real-time database we subsequently present in a graphical form. In doing so, the products delivered together with the database **(e. g. AspenTech ProcessExplorer WEB)** or our own product **SIDAT SIDAS® RT** can be used.

The **SIDAS® RT** solution enables to integrate diverse databases and other data sources, to perform various calculations and data aggregations required by the customer and to approach them via the www browser either in the form of classical data or dynamic curves and technological screens.

MONITORING OF SERIAL PRODUCTION (SIDAS® OEE)

In cases where the manufacturing technology is composed of a huge amount of automatic or semi-automatic machines, which produce hundreds and thousands of products, we have to monitor other indicators. Among these the most significant are number of pieces, number of scraps, downtime, stand-still reasons, the total effectiveness, etc. For the extraction of such indicators from complex built manufacturing technologies the SIDAT product SIDAT SIDAS® OEE is dedicated.

The automatically read data is mostly acquired directly from machine control systems or from piece counters located at individual machines. For manually gained data or for modification of the data acquired automatically serve also the panels installed in the production system directly.

The automatically acquired status data is stored in the real-time SQL database. Over it an application based on the **SIDAS® OEE** product is created.

In a real-time way a status of the manufacturing technology as well as the snap-shots of particular events and production outputs in the periods passed can be displayed. At the same time the important indicators (as e. g. OEE, OPI, etc.) are on-line calculated.

Such an image enables to control the production in the real-time mode. The reporting part is also an integral segment of this application. According to the customer requirements there are generated reports, which describe the production process incl. the cross-connection to the production plan.

MONITORING OF PRODUCTION MACHINES (SIDAS® CNC)

The important indicators, as e. g. production time and downtime, cutting times, number of produced pieces, etc. are necessary to monitor also in technologies, which consist of a smaller number of sophisticated manually served manufacturing machines.

All data is again stored in the real-time database. However, the data acquisition from the control systems requires a specific know-how. This requirement is executed by using the **SIDAT SIDAS® CNC**, which is tied together with real-time SQL database. SIDAS CNC integrates our knowledge related to machine tool control systems, PLC's and data acquisition by means of signals from simple machines. By incorporating the panels with scanners makes it possible to file the scheduled production plan as well as the worker's attendance at the workplace.

By utilizing all this data, it is subsequently not only possible to display the actual status of the technology but also the historical production statuses and production outputs in the periods passed (Gant diagrams). At the same time the important indicators (as e. g. OEE, OPI, etc.) are on-line calculated. The other possibility is to file the production process in a structured form according to the individual product. The integral feature of the application is furthermore the reporting part. Reflecting the customer requirements, it provides simple or sophisticated reports, which describe the entire production process and its conformity with the production plan.

MAINTENANCE MONITORING (SIDAS® MNT)

Every machinery, no matter what simple or complicated, principally requires regular maintenance or service inspections. On a regular basis the cycle is defined either by operational hours or by time passed from the moment when the equipment was put into operation.

To keep the overview of the necessary service actions and their scheduled dates might be rather complicated, especially in large technologies.

In the application **SIDAT SIDAS® MNT** we follow the time passed, the number of operational hours, or the number of machinery on/off switches. This data is acquired or subsequently derived from the data obtained from the technology.

Consecutively to the technology operation it becomes in an easy way possible to create a list of the needed service actions related to each machinery. Moreover, to each machinery a service period and service instruction will be assigned. When the running time is over or the predefined number of operational hours fulfilled, the system lets the customer know automatically about the service action necessity and delivers him relevant service instructions.

All service requirements including those, which were already performed, can be reported. Based on that it is possible to transparently illustrate all the service actions.

ENERGY MONITORING (SIDAS® IEM)

The integral part of the effectiveness monitoring in each production process is also a monitoring of its energy demandingness. We need to take into account not only electrical energy and water, but often also gas, steam, compressed air, carbon dioxide, waste water and other fluid and liquid media.

The monitoring and evaluation of those media consumption and its assignment to particular manufacturing cost centres or to individual production unit (product, set, batch, etc.) makes possible an application based on **SIDAT SIDAS® IEM**.

As inputs serve the automatically read or manually entered data from measuring instruments and sensors, which are situated in the respective energy flow branches.

As outputs serve the on-line energy consumption and flow rate image accessible on an energy portal and a complex inquiry – daily, weekly, monthly and annual reports in a structured way related to the individual measuring instruments, calculated or aggregated consumption values and costs per technological unit. In **SIDAS® IEM** there is also included an option to control the consumption according to consumption diagrams and quarter-hour demands incl. a consumption prediction for the defined period.

This very attractive solution of consumption monitoring we supply including the installation of measurement instruments, their interface to acquisition modules and the IT infrastructure and www portal.

SIDAS® iLOM – COMPLEX SOLUTION IN THE PRODUCTION INFORMATICS FIELD

In this solution with the trade name SIDAS iLOM single SIDAS® components (RT, OEE, MNT a IEM) are put into effect for the monitoring of quarries and crushing plants operation.

The system **SIDAS®** is connected to the quarry and crushing mill control system (PLC). This provides operational data (machinery status), technological values (material level in silos, etc.) and the data from the weighing system (material, amount, truck's license plate, etc.), which is then archived in an **RT** database. The customer can follow the technology state of the art on the www portal. Also the visualisation of the operational statuses in the form of Gant diagrams incl. identification of dead-time reasons is available. Using these resources, the operational reports and reports describing the production are generated and sent to the corporate servers.

From the maintenance point of view, the **MNT** helps the machinery operators by delivering a notice about service and maintenance requirements related to every element of the machinery, which is in the **MNT** module involved.

The effectiveness of the entire facility is supervised by the **IEM** module. By means of this the consumption monitoring and its reporting to the responsible people is possible.

The integral part of the solution is also the alarm system which on the main survey screen displays the pertinent invasion into the particular safety zones.

COMPLEX MES ON THE SIEMENS OPCENTER EXECUTION PLATFORM

The previous examples utilising the SIDAS platform represent situations, which are connected to the typical tasks in the production environment. This concerns solutions where the amount of administered and processed data, the requirements related to the integration of the entire treatment into the production company infrastructure and the provision of an interactive management convenient interface does not exceed the demandingness of middle-sized projects.

For MES solutions in bigger projects, both in discrete and process manufacturing technologies, we offer solutions based on the product platform **Opcenter Execution** provided by **Siemens**. This product enables the customers to apply the latest principles in the field of production digitalization, from the product development, across orders entry and production process supervision and control, after as much as the complex reporting and manager dashboards.

The **Opcenter Execution** features a big process flexibility and effectiveness and integrates the quality requirements with acceptable operational and maintenance costs. The aim of its use is to identify those areas, where within the product design phase and consecutive production processes the execution of needed changes is necessary.

An integral part of the **Opcenter** product family is the planning system **APS** and an integration feasibility with other **PLM** products, as e. g. the data and project administration **Teamcenter**, digital modelling **Tecnomatix**, etc.

REMARKABLE PROJECTS AND CUSTOMERS

MolsonCoors (Staropramen, Ostravar) – SIDAS® OEE+IEM (RTDB GE)

Heineken (Krušovice, Starobrno) – SIDAS® OEE+IEM (RTDB GE)

Schreiber Foods (ex. Danone) – SIDAS® OEE+IEM (RTDB InSQL)

Plzeňský prazdroj (Prazdroj, Gambrinus, Popovice, Nošovice) – SIDAS® RT+IEM (RTDB IP21)

Synthesia – SIDAS® RT (RTDB IP21)

DZD Dražice – SIDAS® OEE+IEM (RTDB GE)

Autoneum – SIDAS® OEE (RTDB GE)

PSP/Metrostav – SIDAS® RT+OEE+MNT (RTDB GE)

CocaCola – SIDAS® IEM (RTDB GE) + SIMATIC IT

Honeywell – SIMATIC IT Discrete

Unipetrol – SIMATIC IT/UNILAB

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