

SIDAT

AUTOMATION —
— INFORMATICS

INTEGRATION PROJECTS AND INDUSTRY 4.0

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

INTEGRATION PROJECTS AND INDUSTRY 4.0

INTEGRATION PROJECTS AND INDUSTRY 4.0 viewed in the light of the entire hierarchy of the automation and informatics tasks in a production company

Today we usually find the automation and production informatics tasks in a hierarchical and mostly vertical structure:

LEVEL 1 (AUT/OP) – Automation of the production and technological processes and their local control incl. installation of the corresponding electrical, measuring and action components and incl. visualization on operation panels.

LEVEL 2 (HMI/SCADA) – Visualization of the production and technological processes enabling their control from the technology layer.

LEVEL 3A (MIS - Management Information System) – Production information system based on the acquisition of data from diverse sources and its conversion to information.

LEVEL 3B (MES - Management Execution System) – Production information system in the environment with completely digitalized processes. In the continual production types mainly, the acquired data is further used, applying the optimization algorithms, for the subsequent close-loop control.

LEVEL 4 (DT/industry 4.0) – Production information system in the environment with completely digitalized processes. The application of the digital twin as a faithful digital model of the physical production/logistic system for the real-time simulation and optimization of the manufacturing processes, in discrete production types mainly.

The level 4 integrated with the completely digitalized environment of the levels 1, 2 and 3A/3B can be then taken as a base for Industry 4.0 applications.

INTEGRATION PROJECTS

The set of supplies and services in this area includes:

- ▶ elaboration of a proposal of the entire automation and informatics solution, conform with the Industry 4.0 principles
- ▶ supply of components, systems and engineering services aiming to the creation of a digitalized production structure
- ▶ supply of computer HW and real-time database for the physical, status and operational data management
- ▶ supply of the information interface to the LEVEL 4 (DT/INDUSTRY 4.0)
- ▶ step-wise commissioning of the digitalized production structure and its putting into operation under running production conditions (for the implementation of the needed adaptation, migration and modernisation steps a repeated discontinuation of the production might be necessary)
- ▶ qualification training of the manufacturing management and operator/maintenance staff
- ▶ expert support of the investor/future production operator, concerning the existing contracts related to the manufacturing/logistics system (after-sale warranty, service contracts, limitation due to the author's law etc.) which could, in connection with the introduction of the digitalized structure, represent serious legal problems.

*More in detail of this issue is to be found in a brochure **SIDAT: SIDAT Modernise and digitalize your automated production – Application of the Industry 4.0 strategy in a production factory**, published in Prague 2019.*

(At the time being in the Czech language only)

INDUSTRY 4.0

The focus of activities in this area is the creation of a trustworthy digital model of the physical production/logistics system – so called digital twin (DT).

Digital twin must behave in the same way as the physical production system with which an integrated environment is expected to communicate. When creating digital copy, we collaborate with the customer and deal with following activities mainly:

- ▶ revision of the data set transferred from the existing physical production/logistics system
- ▶ creation of the first and follow-on digital twin versions
- ▶ verification of the digital twin usability and reliability using iterative simulation methods for the generation of particular production sequence cases

Verifying the digital twin usability and reliability, e. g. in line productions, on machining centres, island operation places or in cases of the storehouse logistics, we usually confront its behaviour with the real production sequence cases, mainly by:

- ▶ generating the occurrence of the non-standard and fault conditions, which could take place in the real production, aiming to their prediction and elimination
- ▶ simulating the manufacturing resources load from the point of view of their operational efficiency increase

The debugged digital twin, when accepted by the customer, might take advantage of solutions as e.g.:

- ▶ detailed production process and needed maintenance planning
- ▶ production and utilities unit costs reduction
- ▶ but also in design phases associated with the preparation and design of modernisation or technological adjustments/conversions in the production base

ADVISORY AND CONSULTING

Due to its integration character preparation and implementation of projects in the field of comprehensive automation, production informatics and Industry 4.0 represents, in many cases, the most professionally demanding and complex activity in automation at all.

The seriousness excels mainly at those projects, where the customer is going to modernise and digitalize his production and then completely integrate into the plant infrastructure. The way to reach such a goal leads via an application of migration and virtualization methods, implementation of advanced communication architectures based on internet technologies and via state-of-the-art data management. The separate issue is the creation and verification of the digital twin incl. its interconnection with control and information levels of the physical production/logistics systems. Without repeated inevitable discontinuation of the running production the realization might be hardly possible.

Based on our experience all these topics often exceed the knowledge and professional competence of the investor or, rather, the future operator of the modernisation project. Thus, to the customers we offer an expert support – a set of competent design, investment and realization advisory and consulting.

In the preparation phase of such projects we focus our services on:

- ▶ feasibility study elaboration
- ▶ investment goal formulation
- ▶ elaboration of documents related to HW and engineering services tenders
- ▶ support of supplier contracts preparation (especially in the field of technical part particulars)
- ▶ creation of a scenario for necessary user staff training

REFERENCES

Having carried out more than 3000 automation and production informatics projects we acquired huge knowledge and experience in many production eras.

We implement our own products which enable to streamline the industrial production and secure the operational efficiency increase (find more in the brochure *SIDAT PRODUCTION INFORMATICS*).

Based on modular programme we offer a versatile support to our customers in the fields of HW supplies, comprehensive service, both in warranty and after-sale periods, in personnel training, advisory and consulting (find more in the brochure *SIDAT CUSTOMER CARE*).

We performed our first projects focused on the physical and digital technologies integration. Moreover, we recently launched further projects of this category (find more in the brochure *SIDAT DIGITAL COMPANY PROFILE*).

We are very proud by the fact that we could prepare and carry out some significant integration and Industry 4.0 projects at noted companies, as e.g.:

SECOP
Viscofan
Autoneum
Synthesia
Pižeňský Prazdroj/ASAHI

Modernise and digitalize your automated production. SIDAT is ready to guide you on this journey.

SIDAT

AUTOMATION —
— INFORMATICS

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