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“Hacking” for IoT and Industry 4.0
Explorative approach, great progress: at the “Connected Manufacturing” Hack Challenge, around 50 programmers developed new applications and business models, supported by Bosch Rexroth.

- Participants implement concrete project ideas in just two days
- Connection of automation, smart devices and Cloud services
- Open Core Interface and WebConnector as the basic technologies

The “Connected Manufacturing” Hack Challenge was one of four Hackathons offered at the Bosch ConnectedExperience organized in Berlin, whose purpose was to develop concrete applications and business models for the Internet of Things (IoT).

Develop a concrete application for the Internet of Things (IoT) or Industry 4.0 and implement it within 48 hours – that was the challenge faced by the 50 participants of the “Connected Manufacturing” Hack Challenge, which took place March 8 and 9 at the Bosch ConnectedExperience (#BCX16) at Café Moskau in Berlin. The equipment for networking automation, modern IT and cloud-based data analysis was delivered by Bosch in a demo case.

Once they had been divided into different project groups, the Hackathon participants used various software solutions from the engineering framework Open Core Engineering from Rexroth, as well as intelligent control and drive
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technology. The WebConnector played a central role as “universal translator” for the integration of smart devices and web technologies, such as condition monitoring. The “Cloud2PLC” project showed how Cloud services can be carried out directly on the IndraMotion MLC control system to integrate data analysis directly into a manufacturing line and visualize it at locations that have no Internet access. The WebConnector thereby enables a data exchange between Cloud services, the drive system from Bosch Rexroth and an XDK sensor node from Bosch, and can also be calibrated in the Cloud if required. The definition of the connections simply takes place via the visual programming tool Node RED.

In the model-based engineering sector, the “Smart Pendulum” project furthered the development of a demo example brought along by Bosch Rexroth. The task: a smartphone that is balanced on the linear slide of the demo case using its location information is moved from left to right based on the movement of a Smartwatch. This was possible due to an extended fuzzy logic approach, which is used to take uncertainties into account in mathematical models and with two overlaid control loops. For the practical implementation, the team used the interface technology Open Core Interface, developed by Bosch Rexroth for MATLAB und Simulink. This way, the modelling solutions of Partner Mathworks can directly access the control. With the help of the Open Core Interface, a team of test engineers developed a commissioning wizard for the LabVIEW partner solution from National Instruments, which guides the user step-by-step through the drive configuration. The set-up of the Rexroth control took place in advance automatically through a newly programmed Virtual Instrument (VI).

“The event was a complete success and excellent proof of the direct applicability and potential of Open Core Engineering,” said “Hack MC” Janette Kothe from the Technical Sales Support for Industry 4.0 at Bosch Rexroth, describing the result of the “Connected Manufacturing” Hack Challenge. “I’m delighted with what the teams achieved in such a short time, often with no prior knowledge of our solutions.”

This opinion is also shared by Hack Coach Guido Burger, Global Client Advisor at Oracle Deutschland, one of the strategic partners of Bosch Rexroth in the IoT sector: “The Hackathon was well-organized and the interdisciplinary approach made it exciting for participants from the most diverse sectors. The curiosity and enjoyment surrounding experimentation with automation tools and IoT technology was palpable in the room from the very beginning. We are looking forward to supporting Bosch Rexroth in using...
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the results of the workshop and to integrating IoT more strongly into day-to-day business.”

The programming competition coincided with three other Hackathons in the run-up to the Bosch ConnectedWorld IoT conference. Here, more than 1,000 participants took part in an event aimed at programmers, control engineers and test engineers. The broad range of participants, which included end users, machine builders, start-ups, researchers and students, came from nine different countries.

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