



The salient answers on umati

EMO Hannover 2019: since 2017, umati has been on everyone's lips in the international machine tool industry. What at first was designated rather vaguely as an interface standard is now being meaningfully firmed up



Annedore Bose-Munde, specialist journalist from Erfurt

With application-tailored implementation of the umati interface for the machine tool sector, since 2017 clear contents and technical key data for translation into hands-on reality have been drawn up. What this means specifically, and what visitors can expect to see at the EMO Hannover, are explained by three experts: Götz Görisch is responsible at the VDW for the field of digitisation and Industry 4.0, and is Chairman of the umati Joint Working Group. Bernd Zapf is responsible for Development New Business & Technology at Gebr. Heller Maschinenfabrik GmbH in Nürtingen, while Andreas Wohlfeld is Lead Architect Smart Factory at Trumpf GmbH + Co. KG in Ditzingen, and heads the modelling group of the umati Joint Working Group.

Interview part 1

- Why did the companies and the VDW initiate umati?

Görisch: Following a workshop in the VDW themed around the issues of Industry 4.0, held in early 2017, it clearly emerged that things were definitely moving in terms of standardisation. After some market research, however, it also became clear that for the machine tool sector none of the proposals involved was usable. On occasion, standards had already been agreed between machine tool manufacturers and customers from the automotive industry, but only on a bilateral basis. This meant that very extensive resources in the companies were channelled into developing and maintaining the various customer implementations concerned. The intention is for the global interface umati to replace these, thus also creating capacities for developing new functions with customer benefits.

- Why has OPC UA been chosen as the communication standard?

Görisch: This question was very intensively discussed and examined

during the initial months of the project in 2017. In the past two to three years, OPC UA has been experiencing a veritable boom, and is tacitly acknowledged as the standard in industrial communication. OPC UA utilises internet technologies and protocols. Basically, it specifies how communication is handled. At the same time, sectorally specific expertise enables users to define, in what are called Companion specifications, the details of what is communicated. This means: the specifications provide a kind of sectorally specific dictionary.

- Why is standardisation not being performed at other organisations, like ISO or IEC?

Görisch: OPC UA, as a fundamental specification, is already an IEC Standard (IEC 62541), meaning a standard published by the International Electrotechnical Commission (IEC). The Companion specifications are at present still so development-intensive, and are so urgently required, that traditional standardisation procedures are not fit for purpose here. As

less and effortlessly connected to the customer's IT systems. For this purpose, we have published a simplified version of the umati Companion specification's draft, with the aim of reducing the amount of implementation work at the individual participants involved. The machines connect themselves to an aggregation server, which at companies is typically installed on the shop-floor level. On this server, the data from all machines are grouped together and made available to an OPC UA client in the destination application. Since we as the VDW cannot build a demosc of this kind for the fair all by ourselves, we are being assisted by T-Systems. At the same time,



soon as the Companion specifications have stabilised, the long-term aim is to adopt them in IEC/ISO Standards. The VDW is here already actively involved in the preparatory work in ISO/TC 184 – a body at the ISO (International Standardisation Organisation) that draws up standards in the field of Automation Systems and Integration. In the shape of OPC UA, the basic implementations with the corresponding tools are already available, whereas in a normal standardisation process lasting three to five years in the end you still don't have any implementations with the corresponding tools.

- How does the Showcase function?

Görisch: The Showcase at the EMO Hannover 2019 demonstrates that machines from different manufacturers featuring umati can be securely, seam-

lessly and effortlessly connected to the customer's IT systems. For this purpose, we have published a simplified version of the umati Companion specification's draft, with the aim of reducing the amount of implementation work at the individual participants involved. The machines connect themselves to an aggregation server, which at companies is typically installed on the shop-floor level. On this server, the data from all machines are grouped together and made available to an OPC UA client in the destination application. Since we as the VDW cannot build a demosc of this kind for the fair all by ourselves, we are being assisted by T-Systems. At the same time,

many clients (applications) will link up to this server, a special feature, since most participants also themselves possess a digital product for utilising the data. In addition, we have brought on board relevant added-value service providers like Adamos or Symmedia for participation.

- How extensive is the Showcase's data record?

Görisch: For the demonstration scenario, we took the draft version of the Companion specification, and defined a typical machine tool. This reduced the implementation work involved for the manufacturers concerned, and the scenario contains everything that has already been defined in the standardisation work. The data enable most of the ten use cases specified for the first version to be handled

— focused on the machine chosen for the Showcase.

- When is the standard scheduled for completion and publication?

Görisch: If it were up to me, before the end of this year. However, we still have a lot of consultation work ahead of us, and at the same time, after submitting the release candidate to the OPC Foundation we have deadlines to comply with for comments and objections. So a realistic date for publication is early 2020. Which doesn't mean that initial implementations can't already be deployed. Always against the background, however, that modifications can and must be made.

- When can actual products be anticipated?

Görisch: I am confident that the machine tool manufacturers will at the EMO Hannover be discussing with their development customers initial specific pilot implementations. The delivery times involved, however, will indubitably extend into next year. At the same time, the requisite testing and certification preconditions have to be put in place by the umati project team – with a view to dependable quality. And not least, the umati product for machine tools and software products has to be given its final description. Against this background, I would assume we'll be seeing the first products next year.

Interview part 2

How the machine tool manufacturers Trumpf and Heller are contributing to the umati Showcase in Hannover is explained by Bernd Zapf and Andreas Wohlfeld.

- What is your company's input for the Showcase at the EMO Hannover?

Zapf: Heller will at the fair be providing a total of four data suppliers featuring the EMO umati data model: one five-axis machine on the Heller stand, two training machines, of which one will be exhibited on the VDW's stand, and another five-axis machine that is installed at Heller's production facility in Nürtingen. These machines will provide the data for the Showcase. In addition, Heller is a member in the VDW's Core Group for designing and trialling the umati interface and for liaising with Siemens.

Wohlfeld: We shall be connecting individual machines to the data hub

as a showcase for the fair. Trumpf is, for instance, providing the VDW with a connected marking laser. Besides the machines in the Showcase, we are supporting the VDW's umati-themed events in our role as a member of the VDW's core group and the modelling group of the Joint Working Group. We are thus underlining our declared aspiration: it was important to the umati group to opt for a technology that offers maximised benefits for the new interface. Thanks to semantic self-description of the data in the information models, the data are not only structured, but provided with meanings, and thus significantly upgraded. And not least OPC UA is the standard chosen for communication in the framework architecture for industry 4.0 (RAMI4.0).

- What's the status of the standardisation work for your focus?

Zapf: The standardisation work is very elaborate, complex and time-consuming. Numerous opinions have to be obtained from different companies. Basically, what's needed is abundant willingness to compromise on the part of everyone involved. Furthermore, an up-to-the-future data record is being developed, which takes time and necessitates a lot of experience. From Heller's viewpoint, the current modelling status covers about 90 per cent of our requirements.

Wohlfeld: Trumpf has for several years now had its own in-house standard in terms of OPC UA. We see umati as the next logical step on the path leading to the cross-manufacturer smart factory. We're working hard on this. Approval of the companion specification by OPC Foundation Products is the next major objective. We should then also be able to put products on the market. Among the vendors, the standard will be successively disseminated. The tempo here essentially depends on how quickly they integrate the standard in their products.

- What specific pilot projects can be demonstrated at the EMO Hannover?

Zapf: Heller will be demonstrating at the EMO, with the machines connected, the entire EMO umati data record. In our estimation, this already covers about 40 per cent of the final data record. We supply this data record with MDA/PDA signals from our present MDA/PDA interface, and in addition have more sig-

nals available which we have so far not been able to deploy. These will be contributed by the umati interface. We will thus in future be creating a link from the present MDA/PDA interface at our machines to the new and future requirements. This can, for example, be the acquisition of machine status conditions.

Wohlfeld: At the EMO, we shall in the framework of the showcase be exhibiting a pilot with the Trumpf machine apps, which among other things visualises the machine status.



From 16 to 21 September 2019, international manufacturers of production technology will be spotlighting smart engineering at the EMO Hannover 2019. Under the motto of "Smart technologies driving tomorrow's production!", the world's premier trade fair for the metalworking industry will be showcasing the entire bandwidth of modern-day metalworking technology, which is the heart of every industrial production process. The fair will be presenting the latest machines, plus efficient technical solutions, product-supportive services, sustainability in the production process, and much, much more. The principal focus of the EMO Hannover is on metal-cutting and forming machine tools, production systems, high-precision tools, automated material flows, computer technology, industrial electronics and accessories. The trade visitors to the EMO come from all major sectors of industry, such as machinery and plant manufacturers, the automotive industry and its component suppliers, the aerospace sector, precision mechanics and optics, shipbuilding, medical technology, tool and die manufacture, steel and lightweight construction. The EMO Hannover is the world's most important international meeting point for production technology specialists from all over the planet. The EMO Hannover 2017 attracted almost 2,230 exhibitors from 44 different countries, and around 130,000 trade visitors from 160 nations. EMO is a registered trademark of the European Association of the Machine Tool Industries Cecimo.

MEMTEC at BIDECE-2019

The Middle East Military Technology Conference Examines the Importance of Tech Solutions for Defence



pecially in the West, as reflected in the volume of investment in this field. Technology not only enhances the capabilities of armed forces, but also significantly impacts the quality and effectiveness in preparation for national defence.

Preparations are now in full swing for Bahrain International Defence Exhibition & Conference (BIDECE) 2019, scheduled to be held from 28-30 October 2019.

H.H. Major General Shaikh Nasser bin Hamad Al Khalifa, Commander of Bahrain Royal Guard is the Chairman of the BIDECE 2019 Supreme Committee, with key support from the Bahrain Defence Force, National Guard and other government Ministries and Authorities.

The Middle East Military Technology Conference (MEMTEC) will be held alongside the upcoming Bahrain International Defence Exhibition & Conference (BIDECE), it was announced last month, during the period from 28-30 October 2019. Held under the patronage of His Majesty King Hamad bin Isa Al Khalifa, the Conference will contextualise the exhibition within the regional efforts to modernise capabilities. Once again, the Bahrain Center for Strategic, International and Energy Studies (DERASAT) is the Knowledge Partner for the Conference alongside BIDECE.

The Middle East Military Technology Conference (MEMTEC) will discuss matters including the current status and future of military technology, cyber defence strategies, the impact of artificial intelligence on the functions of armed forces, the use of military technology to develop simulation models of war, the impact of military technology on regional conflicts, and the future of military industries in Middle East. MEMTEC aims to showcase how global developments and advancements in the defence sector will reshape conflicts in the Middle East.

H.E. Dr Shaikh Abdulla bin Ahmed Al Khalifa, Chairman of MEMTEC and Chairman of

DERASAT, spoke about the importance of using technology to find solutions and create closer ties. 'Bahrain is a force for peace and global understanding. We have understood well the importance of military alliances to establish security and stability in the world in cooperation with friendly countries. The importance of military technology in the development of armed forces and in responding to threats to national security as well as its role in minimising post-conflict impact is undoubted. MEMTEC will examine the challenges facing this technology.'

During the last few decades, military technology has been a key focus for many countries, es-



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