ZETA

SYMPOSIUM

March 11-13, 2024 // AUSTRIA

REVIEW

THE **ZETA SYMPOSIUM** 2024

Pioneering the Future of Pharma & Biotech with AI Innovation

The **ZETA Symposium 2024** took place at the picturesque Schloss Seggau in Southern Styria, where top executives from the biopharma and biotech manufacturing industry from around the globe convened to discuss forward-thinking topics with high-level technical experts and scientific partners.

The well-established event provided a platform for 160 participants to focus on artificial intelligence as a driving force for the industry's transformative journey and to highlight sustainable solutions.

The gathering revolved around some of the most discussed questions of our time: What impact is AI already having? What changes can we expect in the near future? Is the industry ready for the technology leap and its consequences?

1st Day

The event started with a casual gathering and wine tasting at the castle tavern.

For the following two days, the participants appreciated inspiring lectures given by renowned experts from industry and academia, debated approaches to tackle the challenges of the future in the Sponsor Forum and panel discussions, grasped the opportunity to network and learn about new scientific solutions and enjoyed the social get-together in a pleasant atmosphere.

2nd Day

With his opening words, focusing on the importance of innovation for a sustainable future, ZETA Managing Director **Andreas Marchler** set the tone for an inspiring event. He shared his strong believes with the audience: "We must innovate the entire production process, from development to disposal of waste. Can we manage that? Yes of course we can! But we must leave the known tracks." As a key enabler of success, he sees digitalization, and its sub-areas automation, simulation and AI, and predicts: "With these tools we will drive forward the necessary innovations in drug development and environmentally friendly production processes at a speed that we cannot yet understand in a full scope." In addition, Andreas Marchler announced ZETA's recent acquisitions in stakes and highly valued additional competencies: the Swiss planning specialist CB Consultancy, INOSIM Software GmbH, and the

automation specialist SIGMA Process & Automation GmbH. After expressing his thanks to the sponsors, supporters, speakers and organizers of the ZETA Symposium 2024, Andreas Marchler introduced **Oliver Spadiut**, University Professor and Head of Research Unit Biochemial Engineering, TU Wien, who took over the moderation of the multi-faceted presentations and discussions.

The keynote speaker, **Rex VanHorn**, is AI lead and technical architect at Boehringer Ingelheim, who, in his lecture, delved deep into the topic of artificial intelligence. He revealed that he didn´t like the term very much, but would rather think of AI as "application intelligence", his goal being to "inject intelligence into applications, to do things smarter today than we did yesterday." According to Rex, the most important recognition when wanting to implement AI properly is that there is not only one type of AI, but there is a graduation among four. Starting from the lowest level of assistive intelligence, where the machine helps a person by giving advice. On the other side of the spectrum there is autonomous intelligence: the machine working with little to no human oversight. The overall risk increases with the level of autonomy. Rex revealed one of Boehringer's secrets to the audience: "When we introduce AI, especially in the GXP frame, we are starting with assistive intelligence,

and we are gradually moving, where it makes sense, towards autonomous intelligence." This approach has been successful, as Rex proudly showed how his team introduced AI into Boehringer Ingelheim's quality landscape by the release of a fully validated, AI-enabled GXP application, which now serves as an important component of their major quality processes. After giving a detailed description of the application, Rex dived deep into the details of semantic search and how semantic similarities are used in LLMs. After giving some amazing use case examples involving pigs, honeybees, children's stories and license plates, Rex shared some big predictions with the audience: "The pace of technological change is so fast, that it has become impossible to follow everything. I believe very strongly that within the next five years it will be commonplace for organizations and even humans to have their own LLM dedicated and built for them."

At the start of their presentation on the rise of GenAI in healthcare and biopharma, **Tibor Mérey** and his Boston Consulting Group (BCG) colleague **Sultan Hochweiss** posed the question to the audience: "Who thinks that artificial intelligence can do your job better than you?", implying that we are entering an age where many of us will have to reconsider our answer. GenAI is a new type of artificial intelligence that can suddenly generate fully original content. It can search, summarize, and create content in the form of text, pictures, audio, video, and code. According to him, ChatGPT is just the top of the iceberg: "We see acceleration in the identification of novel drug candidates, and we see, especially in the software industry, tremendous efficiency gains." Sultan ex-plained what all that meant to biopharma, where the opportunities for GenAI range across the whole value chain. He illustrated it by giving an overview

on more than 150 GenAI use cases and described a GenAI project to make pharma supply chain planning more efficient. To accelerate the journey into AI and GenAI, Tibor recommended five things to do: starting with a responsible strategy, identifying priority use cases – he called them "pearls", building data systems and capabilities, investing in talent and training, and forging strategic partnerships.

The following speaker, **Krist Gernaey** from the Technical University of Denmark was introduced as "a true legend in the field of data science and biomanufacturing". He gave some fascinating insights into lab-, pilot- and full-scale process engineering, highlighting the potential benefits and challenges in utilizing digital twins for biomanufacturing. He emphasized the need for honesty when working with mathematical models: "When you work with lousy data then you cannot always expect that your model will solve all your problems for you." Krist discussed the two-way communication between the real-world facility and its virtual copy in a digital twin, the difference between

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a digital twin and a digital shadow, and the challenges of creating a fully operational model of a complex biomanufacturing facility. He presented a case study on validating a model using free-floating sensor devices and noted the limitations of data availability in fermentation.

Axel Lorenz, who is running the Siemens Business Unit Process Automation, is convinced that it is software that will make the difference in the next year, and that it is essential to move from the automation we have today to software-defined automation. Out of his long experience, Axel discussed how customers have changed their concerns and priorities over time and emphasizes on their rising need to increase flexibility and sustainability, and to deal with a shortage of skilled workers. The solution proposed by him is a revised digital twin that leverages the recent advances in AI and generative AI to provide "trustworthy" solutions. Axel shared his vision with the audience: "We have to build a framework where everything and all the technology we develop will be available to the people

who are doing the engineering, commissioning and servicing of plants. It will be a standardized automation that hundreds of thousands of people can use."

Derrik Daniel Lenzner presented a case study based on the unprecedented growth situation Novo Nordisk currently finds itself in, needing to ensure the global supply of diabetes 2 and obesity treatments to patients. To meet the huge demand for scaling up production capacity, the company needs partners capable of innovating at high speed and highly reliable suppliers of safe and innovative technologies. Derrik made an urgent appeal to the ZETA Symposium audience: "I would like you to see my presentation as an invitation to work together or to intensify our cooperation," and gave an impressive overview of the planned expansion of the supply network, particularly for the API production plant that is being built in the small Danish town of Kalundborg.

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The next speaker, **Michelangelo Canzoneri**, joined us live from Darmstadt, Germany, to discuss Merck's SMARTfacturing initiative. He opened his talk by addressing the industry's current challenges, particularly the lag in scaling pilot projects, which results in siloed efforts in digital solution development. Michelangelo shared his strategic vision for leveraging the untapped potential of data sets through the integration of advanced technologies such as process analytical technologies, robotics, automation, data analytics, and artificial intelligence. These technologies, he argued, are crucial for building agile, efficient, and highly adaptable manufacturing ecosystems.

Concluding his presentation, Michelangelo underscored the importance of resilience, collaborative innovation, and fostering a corporate culture oriented towards continuous learning and improvement as essential prerequisites for overcoming these challenges and achieving transformation.

The journey towards smart manufacturing was continued by **Jens Laucht**, who, as the global lead architect in execution systems at CSL Behring, explored the possibilities of their newly developed execution concept. If he were to describe the event- and recipe-driven execution concept in one word, it would be "standardization". This became especially

important as the company moved from local automation teams at their various sites to one global Execution Systems department, and it became necessary to create a toolbox including global standards, a common document landscape and a global library. "The goal was to design once and to apply everywhere, especially when expanding your product lines to another site. With the new concept, we are fit for the business needs", he explained and continued the talk by giving an overview on the concept, and described the resulting benefits, such as a significant reduction in cost of ownership.

The conference sessions of this day were concluded by a unique and entertaining speaker. The neuroscientist and German Science Slam champion, **Henning Beck** was skillfully addressing the major theme of the ZETA Symposium 2024 by asking "who was holding the upper hand – our brains or the best AI out there". He enlightened the audience by vividly showing the difference between self-learning algorithms and the brain – and explained which mindset will make the difference in future businesses. Everybody was left inspired when leaving the conference hall for the festive gala dinner which followed in the evening.

Panel Discussion

Another highlight of the Symposium was the **panel discussion** on Wednesday, which saw esteemed business partners **Bart Moors (Siemens), Olaf Ophoff (Turck), Matthias Fick (GEMÜ), Klaus Köhler (Endress+Hauser), and Andreas Juza (Cytiva)** engaging in an animated discussion.

The discussion tackled questions around AI and the significant advances it would generate for the pharmaceutical industry, as well as the impact it would have on companies, employees, and patients.

In automation, AI will, according to Olaf Ophoff, "increasingly and significantly improve the availability of systems – both in terms of predictive and optimized maintenance as well as when setting up systems." Klaus Köhler sees data as basic requirement and enabler for all activities and improvements.

Sponsor Forum

The **round table discussions** at the Sponsor Forum witnessed lively participation from the attendees.

The selected business partners – **Siemens, Cytiva, GEMÜ, Endress+Hauser and Turck**, had invited the audience to their round tables to provide special insights and lead discussions on specified topics. On Tuesday morning, the focus was on **AI tools that are already in operation or will soon be and what impacts the customers can expect from such developments.**

In the afternoon, discussions at the Sponsor Forum revolved around **strategies that ensure the resilience of companies and the sustainability of supply chains during global crises**.

Many thanks to our fantastic sponsors who helped to make the event such a success!
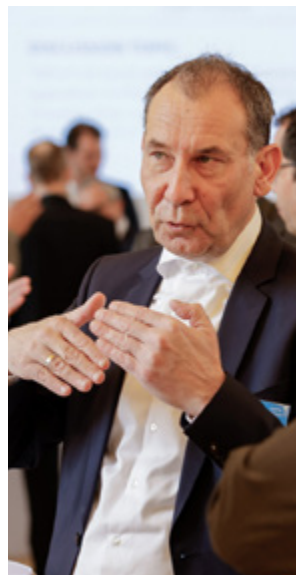
3rd Day

The Wednesday morning session threw light on how pharma projects usually are conducted in China. **Christian Bachofen** (CB Consultancy AG, Switzerland), who has been working as a consultant and university guest professor in China for 18 years, drew a comparison between European and Chinese projects. Regarding topics of digitalization and AI he expressed skepticism: "As for digitalization and AI, I don't see a guideline and a strategy at the moment on how to implement these topics in the Chinese pharma industry, I don´t believe that we will see a significant progress in the next decade." However, in his presentation Christian emphasized on the remarkably fast realization times of CAPEX projects in China. As a main driver for swift market readiness, he named the market competition, which he described as "brutal". He highlighted the distinctive phases of project development and provided a comprehensive overview on how Chinese companies speed up their projects, but also on the risks that come with the Chinese approach.

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Hunter Song, Vice President of Tianjushi Engineering Technology Group, delved even deeper into the topic and gave further enlightening insights. "We have the quickest response, we have the best service for the clients' requests, we have no weekends, we have no holidays, we cater to all client needs, and we have a large number of dedicated engineers", he brings the Chinese philosophy to the point. After giving an overview on several impressive fast-track EPC projects, Hunter concluded with an outlook for the market in China and on the new trains of technology that can be followed – including AI.

The following presentation was given by **Ravi Kalla** (Anthem Biosciences), who was live connected from India to discuss how users in pharma and life sciences can benefit from a unified automation architecture. Benefits in terms of CAPEX, OPEX, integration, data analytics and regulation were demonstrated to the audience. The lecture clearly showcased how Anthem Biosciences has benefited from the described architecture.

Session II on Wednesday dealt with one of the most important topics of our time: sustainability. As Sustainability Lead of Bayer Pharmaceuticals, **Thomas Gosmann** is responsible for climate targets and sustainability aspects, especially in the context of investment projects. In his presentation, he outlined the company's sustainability strategy in detail. He explained the most important steps in the implementation of this strategy, which began in 2019 with the definition of sustainability targets. The decision to use geothermal energy, the introduction of a tracking tool to control the numerous Bayer sites and the installation of heat pumps are just a few examples of what has been achieved in the last four years. "We look at every single project. What can we do, what are our green options," explained the speaker,

proudly showing the new production plant in Leverkusen, which was inaugurated last year and is powered by geothermal energy. Thomas also reported on the various systems that have been developed for internal and external reporting.

Sustainability is a top priority also at Roche, where carbon dioxide reduction measures have been implemented for many years. **William McNamara**, leading global projects in Roche Pharma Technical Operations, showed his passion about delivering facilities that minimize resource usage and champi -on best practices from a design and construction perspective. In his talk he focused on Roche's approach to achieve carbon reduction targets in emissions of Scopes 1 and 2, and on how they are

extending their reduction strategy to Scope 3, which covers the indirect activities through the supply chain. However, obtaining accurate and digitized data on emissions performance remains a challenge for the industry. William demonstrated how digitalization enables Roche to achieve these targets and gave an overview of the project key performance indicators for sustainable construction that they are using and plan to develop – including utilization of BIM (Building Information Modelling) and digital collaboration among project stakeholders.

Patrick Ratheiser concluded the conference sessions at Schloss Seggau with an engaging presentation on the practical implementation of AI. As the CEO of Leftshift One, he supports companies in using AI in production, and he shared insights on how generative AI will revolutionize workplaces in the coming years - using an image of Darth Vader to emphasize on the transformative impact it is going to have. When discussing how companies approach AI, Patrick drew an interesting comparison, stating:

AI is like teenage sex, everyone talks about it, but nobody does it.

"AI is like teenage sex, everyone talks about it, but nobody does it." He noted that many companies are interested in AI but are unsure about its potential or how to start a project, emphasizing that they often lack the necessary courage to do so. To leverage the power of AI, he explained that companies must firstly identify use cases. They should look for manual repetitive activities within their processes, as these are the areas where applications can be created with a positive return on investment. Patrick then shared use cases to illustrate the possibilities of Large Language Models and text analysis. A particularly interesting example for the ZETA Symposium audience was a pharma industry use case centered around the documentation of a production line. Through incident prediction, categorization, and analysis, AI can support the workflow, providing a more efficient process with fewer errors.

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INNOVATION PATH

Following the conference, a major part of the participants seized the opportunity to "**walk the ZETA Innovation Path**" and to have a face-to-face exchange with the experts **at ZETA headquarters**, in Lieboch, Austria. The various stations of the Innovation Path provided **multi-faceted insights into innovation fields**. Participants were able to learn about a newly developed inline-conditioning system, to experience the advantages of the SES platform, of process simulations based on INOSIM and INOSIM Foresight, and of integrated paperless testing and hear more about the hot topics that are driving ZETA's customers.

In conclusion, the ZETA Symposium was a resounding success and participants appreciated the opportunities the event provided in bringing experts and potential business partners together to share their knowledge and discuss opportunities for future cooperation.

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