



prostep ivip

1993–2023

years of  
excellence



A warm welcome to a  
journey through 30 years  
in the METAVERSE of  
PROCESS EXCELLENCE

## How to read this booklet

Happy birthday prostep ivip! If you want to understand the future, you have to know about its past. We take this dictum from former German Chancellor Helmut Kohl as an opportunity to start with the future. The managing director of the prostep ivip Association first undertakes strategic foresight, which is followed by an interview with the association's board members.

Then – following the mission of this booklet – a timeline of important milestones in the productive life of the association over the last 30 years welcomes the reader. After that, we let some of the association's prominent companions have their say. An entertaining picture gallery over the next pages makes many faces of the association that are still familiar to us today look surprisingly young and fresh. We conclude with profiles of the women who ultimately form the organizational backbone of association.

Enjoy inspiring your day-to-day business!

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## Envisioning our future direction



**Dr. Alain Pfouga**

General Manager, prostep ivip Association, Darmstadt

We are working with executives and experts from our community to shape the next strategic steps for the prostep ivip Association. Our goal is to create a more innovative environment for accelerated transformation, deliver value to our members and keep up with the times, reflecting the current needs of industrial digital transformation.

Engineers are increasingly confronted with societal challenges such as climate change and food security. Sustainability, often a legal requirement, has become one of the most important market and customer demands. At the same time, customers are becoming more selective. They want personalization even in mass-produced products, leading to an increasing number of variants. Many manufacturers are trying to accommodate this variability by using software, which can be developed and modified more quickly than mechanical components. The growing propor-

tion of software in products and the service offerings based on it require not only interdisciplinary engineering, but also closer collaboration between engineering, manufacturing, supply chain, operations and service.

The industry is facing the next wave of innovation in a network of systems, creating new and more complex systems. Sustainability requirements, future market and customer needs, digitalization itself as well as people and technological innovation are driving this process of change. These megatrends, some of which are mutually reinforcing, are driving new business models. The impact on traditional industrial value chains calls for new approaches to the development of sustainable products and services. There is a need for a paradigm shift to cope with the increasing complexity of the operational system-of-systems environment.



## **How global and urban trends are shaping markets and customers**

Global and urban trends have an impact on markets and customers. Companies need to adapt to different local contexts as they expand globally. The future of mobility may depend more on what happens in the United States of America or China than in Germany or Europe. It is unclear how Latin America and Africa – continents with rapidly growing populations – will contribute to the global economy in this century. Increasing urbanization will have a greater impact than population growth on how people move and consume in many countries. We will shift from buying more products to buying more services or using products as services. This will change value chains and networks.

## **How digitalization changes every-thing**

Digitalization is a driver of change in several ways. Firstly, IT in the form of software is finding its way into products and taking control of more and more functions, some of which are safety critical. Value creation will move from hardware to software, through product/service/systems and products as platforms, involving new actors in the value chain. This is why automotive OEMs for instance have identified software as a strategic domain and are developing their own capabilities. In the future, companies will need guidance to find their optimal place in the changing value chain. This is a new opportunity for the prosthetic Association. It is only a small step from embedded software to connected devices. IoT platforms will become the common hub for analyzing the data collected by these devices.

Homes and cities are becoming networked worlds with a multitude of systems-of-systems communicating and exchanging data. The development of these networked systems, as well as their production and operation, places new demands on the way companies position themselves holistically.

## What are the dynamics of change?

The main drivers of change identified by the board of the association are interrelated and cannot be considered separately. Therefore, we need to consider how to apply and assess the impact of action strategies for the specific situation. Of course, we need to consider the factors within the company's overall system. For example, when developing a new, smart, networked product/service/system, we need to ask whether the company and its business architecture, from the organization and processes to the data and applications and the technical infrastructure, are suitable for such an integrated product concept. For example, the latest battery-electric vehicles from BMW, Volkswagen, Mazda, Mercedes, or Hyundai are not just pieces of hardware, but 'driving IoT devices' that can be functionally changed by software updates. This means that even after the vehicle is delivered to the customer, the engineering department can still offer additional features that extend the capabilities and lifecycle of these vehicles.

In the world of system-of-systems and product platforms, however, it is not enough to look at the traditional enterprise architecture. Manufacturers must also rethink and, where necessary, reorganize their value chains and partnerships. In other words, system boundaries extend beyond corporate boundaries. At some point, appliance manufacturers may need to integrate their products into a broader smart home platform and allow third-party software to access their devices so that

the appliances can use weather data or trigger ordering processes. In extreme cases, value chains will be reversed, with premium carmakers reduced to mere hardware suppliers, providing interchangeable components of a broader mobility service.

In product-service systems, the responsibility and the liability claims are shifted to the manufacturer or to the operator. This means more verification work in system development. Companies may need new skills depending on their future role in the value chain. For example, they may need to learn how to master model-based systems engineering (MBSE) or how to develop software. They will also need to ensure digital traceability of development steps and results. They will need to combine different development approaches, such as the V-model or DevOps. The composition of the value chain and the positioning of the partner chain are critical to achieving development goals. These goals can vary from case to case. The success of development goals can be measured based on a global approach. The overall maturity of the system is more important than the maturity of individual components. This avoids missing synchronization points and late changes that can be costly. This requires different processes, such as model-based coordination for design reviews. New drive systems are not enough to improve the environmental footprint of products in a sustainable way. Traceability is also required to always meet regulatory requirements

## **Vision of the prostep ivip Association**

Based on the key drivers of change, it is important to develop a vision for the future work of the association. In any case, this vision must consider our 30-year track record as a pre-competitive collaboration platform for standardization.

The prostep ivip Association is a global, independent network of industry, IT and research dedicated to the digital transformation of product creation and production. It identifies and consolidates the needs of manufacturers and suppliers in the manufacturing industry, sets standards and interfaces, provides forums for IT vendors to improve interoperability, and conducts impartial benchmarks. Our members value the opportunity to collaborate on a comprehensive technical program and to network with other members to increase their influence with user groups, vendors or regulators. They recognize the general importance of interaction between different member groups to keep abreast of the latest technologies without always being active in the field. This practiced neutrality is a key differentiator of the association and makes it a unique trusted network in the industry.

The future orientation of our technical work should reflect our strategy. We need to create work groups or establish new elements on topics that are relevant and not yet covered. The association supports sustainability through its recommendations in a multi-partner value chain. It does not deal with individual issues, but each member company benefits from the collective intel-

ligence. Competitive advantage comes from rapid adaptation. The goal is for members to apply and implement the results of the technical program in their own organizations as soon as possible.

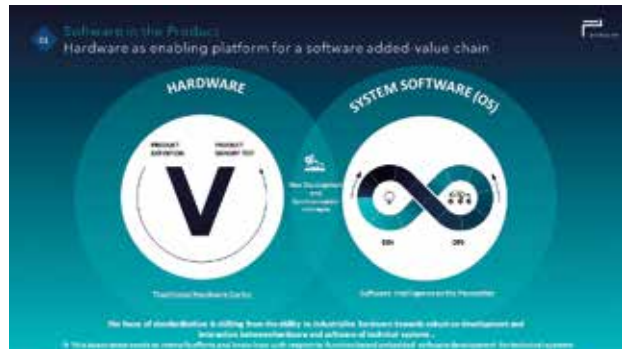
## **Board recommendations for realizing the future vision**

Our vision for the future requires us to do things differently. We may need to adapt our technical program more than we expected to add value through openness, transparency and quality in times of industrial digital transformation. We may need to create project teams capable of handling the new digital processes in development, production, and service, with member organizations willing to share knowledge unconditionally. The very identity of our association will have to change. This will require the cooperation and active leadership of all our members in an unprecedented effort. Let's all agree that it will be worth it!

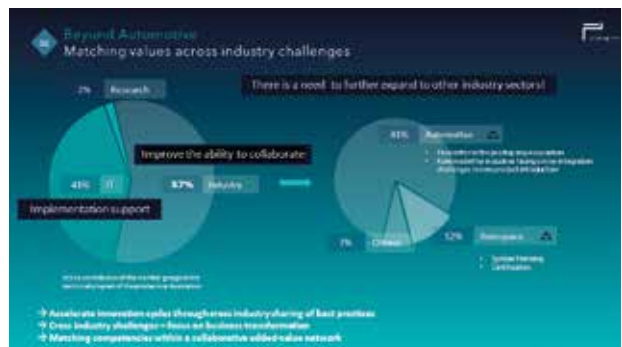
**Integrating the in-product software view.** Software is the key to a product's functionality and intelligence. This requires a new approach in our traditionally hardware-driven world. We believe that software development and engineering systems development need to be more integrated and intelligent in the development process. The current tools and methods for software development (CASE) and PLM are not compatible. We need new information elements to better describe in-product software, based on artefact groups from model-based systems engineering (MBSE). Without such a description, we cannot digitally and com-



prehensively test software as the primary source of functionality and intelligence. The association should provide platforms for digital testing of software in a technical system.



**Expanding beyond automotive and data-driven engineering.** We are looking to welcome members from different industries that can enrich our existing membership base. To do this, we need to offer them the opportunity to work together. We need to strengthen our links with new associations, particularly in the areas of autonomous systems and connected products. We also need to position ourselves as a platform for the digital transformation of industry, in aviation and other sectors. In addition, we need to work with prominent experts who can help us research and publish on topics related to the key drivers we have identified.



**Virtual certification and homologation.** New approaches to virtual verification and validation are required for the approval of products and software packages that change product behavior during use. These approaches need to be accepted by regulators. To demonstrate and implement our recommendations for verification and validation, the association should strengthen its collaboration with regulators and technical services at national, European, and international levels. The goal must be to use virtual tests for approval purposes. This requires ensuring the consistency of digital models and model parameters and the validity of assumptions from the product domain. This makes verification and validation tests traceable in real time and retrospectively for experts and decision-makers both in the company and in the regulatory authorities.



**Future collaboration.** Cloud-based IT architectures and sovereign data platforms are moving more and more into the focus of existing and public-funded projects in the association's technical work. The technology and services based on Gaia-X and IDSA are interesting. They need to incorporate our recommendations and product development perspectives. We need to assert our established basis for companies in an added-value chain with multiple partners to collaborate in product creation.

**People and skills.** Change requires new skills and capabilities from people, who are the main drivers of

change. The rapid pace of knowledge obsolescence is a huge challenge for them, as they need to keep learning not only about what they do, but also how they do it. Yesterday they needed to be agile, today they need to collaborate online with colleagues around the world from their home offices. Although globalization has made work cultures more similar across countries, there are still significant differences, such as how different companies and

managers deal with mistakes. Helping people and adapting their processes could be an important role for the association. In this context, it is important for each employee to recognize his or her importance and the need for change. Competence in different areas (e.g. MBSE, digital twin, data science) is crucial and needs to be strengthened for a digital-first and system-oriented development strategy.



For companies in a range of industries, the digital twin is developing into a multifaceted approach for the digitalization of their business processes and cross-enterprise value chains. The association should therefore develop a community-wide understanding of the different variants and views of the digital twin, and not only from the developmental perspective or that of any one specific industrial sector.

Furthermore, the association should support its members in establishing data engineering as a new enterprise

discipline by extending its membership and the issues it addresses to include the conditioning of field data using algorithms and software. Learning and understanding data is essential. Data engineering goes far beyond current product data management activities and demands new roles and responsibilities. Its task is to determine the data required for the development processes, the production processes and for application in the field, to condition this data and prepare it in a way suitable for analysis.

## Interview with the Board of Management

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# A look behind the scenes of prostep ivip Association



Members of the prostep ivip Board (from left to right):  
**Professor Dr. Rainer Stark** (Technical University Berlin),  
**Tomohiko Adachi** (Mazda), **Philipp Wibbing** (Unity),  
**Dr. Henrik Weimer** (Airbus), **Jens Poggenburg** (AVL List),  
and **Thomas Kamla** (Volkswagen)

*Congratulations on the 30th anniversary of the prostep ivip Association! Which highlights do you connect as an individual board member with the association?*

**Henrik Weimer:** I have joined the board in 2018 elected by the member group 1 'Users', and was the first board member for group 1 that does not come from the German automotive industry. I see this as a recognition by the members that in fact our transformation challenges are the same across many industries, including aerospace and automotive. Building on this realization, I am mainly focused on developing the association beyond the automotive area, while continuing to fully serve the strong and historic base. Moreover, I am passionate to develop prostep ivip further into the area of modeling and simulation: Model-based system engineering, model-based engineering, model-based enterprise, the digital thread, and digital twin.

**Thomas Kamla:** The annual symposia are a very important networking platform. Furthermore events like the systems engineering day in Japan to get in contact with the Japanese automotive industry are exciting. Every company which is facing the digital transformation has its own challenges. Therefore the networking events are always really beneficial for all participants.

**Philipp Wibbing:** I appreciate the opportunity to work on these exciting topics in a trusting environment with committed leaders and experts. Many thanks to the previous drivers of the prostep ivip idea, my previous and new colleagues in the association leadership team and all the dedicated experts in the technical program as the heart of the association.

*What are the tasks of the Executive Board and how is it structured?*

**Henrik Weimer:** In the current board we have for the first time specific missions assigned to Tomohiko Adachi with Mazda to help develop the international footprint of prostep ivip, and to Thomas Kamla with Volkswagen to foster the interests of the automotive community in the association.

**Tomohiko Adachi:** Right. I'm in charge of internationalization. In particular, we are working hard to build relationships with Asia, including Japan. In relation to Asia, it will be realized through collaborative activities with Japan's JAMBE, holding events, and collaborative activities with JSAE/JAMA, which are influential in the Japanese automobile industry.

**Rainer Stark:** The Board has the responsibility and accountability for the entire operation of the association which accounts for aspects financials, membership, technical program, strategy, political and public relations, and research activities. It is structured in various subjects according to the membership groups but acts as common decision group for all matters.

*What events and trends in the market does the board draw inspiration from?*

**Henrik Weimer:** First, the board represents the members of the association. To capture member's needs we interact with and listen to the members at the symposium, at smaller specific events such as the Circle of Excellence and through specific interviews and activities. Building on this feedback from the members the board maintains a strategy for the association that helps guide the activities.

**Rainer Stark:** Generally speaking, the board takes all major trends and changes in considerations which are visible in the technology arena, in industrial practice, in research and education as well as in business segment market situations. Also, political elements such as the federal programs and EU regulations play a major role. The Board has direct influence together with the Technical Steering Committee which new topics and working groups should be established, all in pre-competitive mode. It holds also responsibility to start and close memberships. The procedures are established as operating rules in the board's regulations based on the foundation of the operating principles of the association.

**Tomohiko Adachi:** From discussions at regular board meetings and discussions within the Circle of Excellence, and board members are in management

positions (or equivalent) in the companies and organizations they belong to. They are the most sensitive to trends in the industry they belong to. Circle of Excellence is functioning as the best process for obtaining consensus among board members.

*Which decisions or project results of the association had a particular impact on your business?*

**Rainer Stark:** Quite a lot to be honest. For instance, to enter new fields of association work such as smart systems engineering in 2012, dealing with Digital Twins (2016 and 2022) as well as pushing the association into the new future – this strategy work started between 2020 and 2022.

**Tomohiko Adachi:** Publishing SmartSE Recommendation Version 3 and holding System Engineering Day in Japan. I think the former is a good result of gathering the knowledge of systems engineering in Europe and Japan. As for the latter, we were able to gather more participants than ever before in Japan, a country with a concentration of automobile industries, and we believe that this has raised the attention of the Japanese industry to Europe.

**Henrik Weimer:** For me personally the contribution to prostep ivip is a great learning and development opportunity. For example, I have learned about openness requirements for software vendors through the CPO which we have then adapted for contractual relationship to vendors in Airbus. I have learned about MBSE from our project smart systems engineering. I have learned that many members share the same transformation challenges, represented in the association's strategy pillars.

**Philipp Wibbing:** The prostep ivip association now also takes on other roles. For example, digital transformation of products and processes is a critical challenge for companies. Best practices that are easy to copy are lacking and so insights and experiences are being developed as we move forward. This makes it all the more valuable to learn from the experiences of others instead of making every experience on our own. This is why many members make intensive use

of the prostep ivip exchange platform and gain valuable insights for their own transformation process. The special combination of user companies, software vendors, consultancies, and research institutions form the foundation for success.

*What makes the interaction between industry and research so valuable?*

**Tomohiko Adachi:** As you know, many breakthroughs in industry are often based on the results of research institutions. On the other hand, research results by themselves are immature, and it is only through co-creation activities with industry that we can create products that are suitable for the market environment.

**Henrik Weimer:** According to Wikipedia, research is systematic activity undertaken to increase the stock of knowledge. So in this sense, research helps us to push the boundaries beyond what humanity is able to do today. We can leverage research to analyze complex situations, and to explore and develop solutions to problems that we cannot solve today. Also in the areas of digital transformation for product creation this has opened many fields. To name just one example: the modeling and simulation of our products e.g. through computational fluid dynamics.

**Rainer Stark:** New ideas from research and the neutral stance of research give the foundation of both, the future operating principals and solutions of PLM and virtual product creation of tomorrow. Also, the research and education group provides new talents and new future aspirations, such as

sustainability. The industry and Vendor groups are excellent partners for potential research projects of academia.

**Thomas Kamla:** Networking between industry and research is becoming more and more important. The integration of graduates provides us with a very good source of knowledge and gives us new inspirations. What is striking is that this is becoming much more international and diverse than ever before, at the same time that we get additional competencies in this way.

In addition, research and educational institutes are getting increasingly important for the qualification of our own employees, for example in order to anchor new working methods, for example those ones which are connected to the introduction of systems engineering. It is much more effective to cooperate with institutes than trying to build up the knowledge by ourself. We are happy to use the network provided by prostep ivip for this purpose.

*What is the board's message to the members of the prostep ivip Association?*

**Thomas Kamla:** We need this neutral space to drive projects forward within the framework of digital transformation. This opportunity provided by prostep ivip Association is a big asset. The results of the project is accessible to all members. For this reason I am happy to invest my time for the activities of the association. Let us use this space even more to develop a common language on the individual topics through the project work!



**Rainer Stark:** Bring new encouragement into the association work, do not hide against traditions and former success models. Use the association to design the digital future!

**Tomohiko Adachi:** World politics is heading towards division. But industry makes and sells products for the well-being of people all over the world. Products in recent years are so sophisticated and complex that it is impossible to complete them on your own. Therefore, it is most important to share best practices, formulate rules where we can reach agreement, and engage in co-creation activities with research institutes in pursuit of breakthrough gems. For that reason, as an engineer, I would like to create an environment where everyone can connect.

**Henrik Weimer:** prostep ivip as an association is there to serve its members. So I invite members to share their experiences and needs in the forums and projects of the association, and also to contribute actively to the activities of the association. Without member contribution, there would be no activity and no outcome of the association –so please contribute and thereby take benefit from the contribution of others!

**Philipp Wibbing:** The idea of coordinating cross-company collaboration is more relevant than ever. After all, our products and services are becoming increasingly networked – and so it's only logical that our product development must also be increasingly integrated across company boundaries. This can only be done efficiently multilaterally.

*Gentlemen, thank you for your comments!*

Interview: Dr Bernhard D Valnion

Note the contribution of member of Board Jens Poggenburg on pages 52–55.

ProSTEP Verein

## The Association

- Platform for industry-related research
- Standardization
- Worldwide collaboration



ProSTEP GmbH

## The GmbH (Ltd.)

- Competence Center
- Software developer
- Interface between application and standardization



## Interoperability across domains

Promotion, development and implementation of the ISO 10303 (STEP) international standard for product data exchange



## ProSTEP

An initiative from Automotive to master product data technology

1993

# 1993–2002

Foundation and first growth phase with surprising success

## Digital Thread in product creation

Innovative software Tools for an integrated product creation in heterogeneous IT landscapes

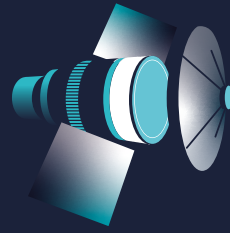


1998



**STEP is  
web-enabled!**

2002



## Establishing Leadership in IT-based engineering

STEP ISO 10303, JT ISO 14306, OMG  
ReqIF, VDA ECM, SimPDM, FMI,  
LOTAR, I++ DMS, AutomationML,  
VEC, OSLC, ...

## Production and Additive Manufacturing



# 2003–2012

First phase of systematic internationalization  
and the establishment of leading standards

## STEP AP 214

**Core Datafor Automotive Mechanical  
Design Processes ( ISO 10303-214)**



The ProSTEP iViP Symposium is growing to become the largest neutral PLM networking conference in the world



prostep iViP

2017



2018

**Internationalization  
and partnerships  
in Japan**

**Cognitive  
Engineering**



A common understanding with regard to the openness of IT-systems and related requirements in the context of PLM.



**AI-Marketplace**



2020

# 2013–2022

Highlights in this period are the acquisition of Boeing, Mazda and Toyota as partners, Codex of PLM Openness, and after Corona the tying of the old attendance records at the prostep ivip symposium

## Industrial Digital Transformation

### Beyond Automotive



### Software in the product



### Virtual Homologation

Verification & Validation

### People & Skills

- Data Engineering
- ML / AI
- MBSE & Digital Twin



### Future Collaboration

- Cloud-based IT architecture
- Sovereign Data Platforms



2022

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## AI in product creation



### **Ulrich Ahle**

CEO, FIWARE Foundation, Berlin

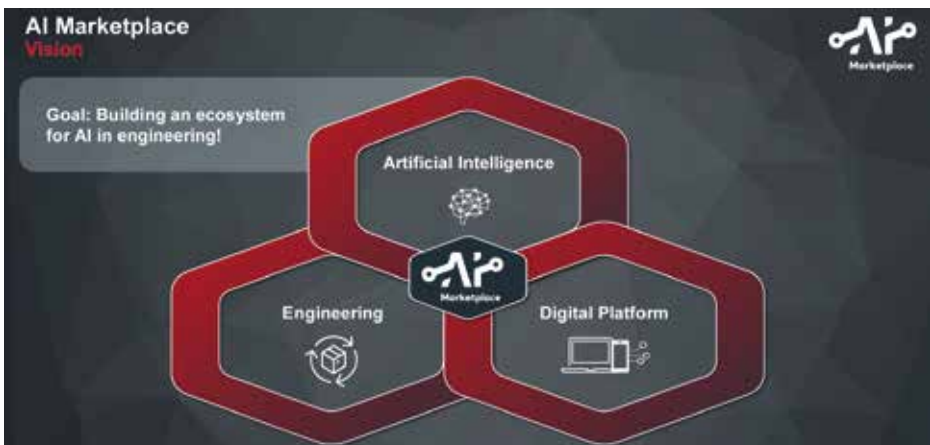
Former Member of the Board, prostep ivip Association



Artificial intelligence (AI) is an important key for innovative product creation processes. Product creation is a central task in manufacturing companies: The software share is constantly increasing in the digital transformation and is making products increasingly complex. More than ever, development requires the combined expertise of different disciplines. AI applications are opening up far-reaching potential to optimize processes and enhancing the performance of manufacturing companies. Specifically, development capacities can be increased, and development times as well as subsequent manufacturing costs reduced. However, the necessary AI expertise is often lacking. In turn, providers of AI solutions often lack access to user and domain knowledge. An AI Marketplace offers a solution for this.

In the environment of IT's OWL, with the support of Fraunhofer Association, the prostep ivip Association, FIWARE, and other partners, a unique ecosystem is being created with the AI Marketplace, which brings together AI experts, providers and users to exploit the potential of artificial intelligence. The AI Marketplace is a platform in which a space for secure data exchange and data sovereignty is offered alongside an intelligent bringing together of AI service providers and end-companies. In addition, an app store for AI solutions and a range of comprehensive AI solutions

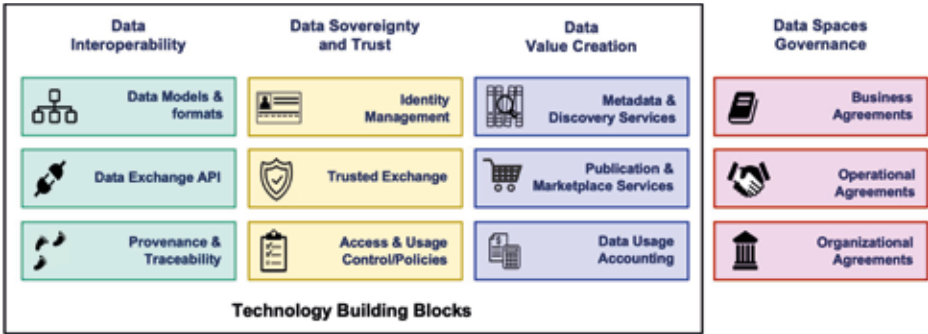
*Idea of a marketplace for AI solutions*



are provided based on a building block principle. With the 'plug & play' principle, small and medium-sized enterprises should be able to put together AI applications themselves and integrate them into their processes without having to hire a service provider. In this context, the topic of uniform interfaces and uniform data models is of great importance in order to make the integrability of AI solutions into the IT process landscape of a user company as simple as possible. Here, both the prostep ivip Association and the FIWARE Foundation contribute extensive experience and existing solutions. The project consortium of research institutions, networks and companies thus supports medium-sized businesses in particular in making artificial intelligence usable for their product development. The AI marketplace makes an important contribution to securing the competitiveness of industry and significantly increasing the global visibility of Germany in the field of artificial intelligence.

At the same time, the FIWARE Foundation is working on the connectivity of the AI Marketplace to the emerging Data Spaces at European level, in particular the Manufacturing Data Space. Together with the three other partners of the Data Spaces Business Alliance (Big Data Value Association, Gaia-X AISBL, and International Data Spaces Association), a technology framework has been developed that enables the establishment of interoperable Data Spaces in different domains.

*Building blocks for the upcoming data spaces*



A total of twelve building blocks have been created, which are divided into the following groups

- Data interoperability
- Data sovereignty
- Data value creation
- Data management.

At the end of 2022, a consortium with the four members of the Data Spaces Business Alliance in its core was commissioned by the European Commission to build and operate these building blocks and the services required for the establishment of interoperable Data Spaces within the framework of the Data Space Support Centre (DSSC) for the next few years. Currently, the DSSC supports a total of 15 different consortia, each of which is preparing the establishment of Data Spaces in specific sectors. In addition to the manufacturing industry, these include sectors such as mobility, energy supply or the area of cities and communities. The goal of all these measures is to establish data spaces in the various sectors based on a European value system to support data-driven business processes in Europe.

### **Projects in which you were involved**

My time in the prostep ivip environment began with the IVIP project (Integrated Virtual Product Creation), which I was allowed to lead from 1998 to 2002 together with Fraunhofer IPK and Volkswagen. Afterwards I was on the board of the prostep ivip Association for 16 years and represented the member group of system providers there. During this time I was strongly involved in the development of the Codex for PLM Openness on the one hand, and on the other I was responsible on the board for the expansion of the symposium into the globally leading manufacturer-independent PLM event.

### **Remaining personal impressions and professional benefits from dealing with the association**

During my time on the board I was able to learn a lot, but I was also able to contribute my PLM knowledge as my personal core competence. Certainly, the global network I created with people in charge of engineering IT also helped me professionally in my stations at Siemens, Atos, and now FIWARE.

### **Your advice to the association**

Keep the balance between end users, system providers, and research institutes, because this is the real added value of the association for all three groups of members.

**prostep ivip Symposium**

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A unique success story



**Joachim Christ**

Director Marketing  
PROSTEP AG, Darmstadt

For 30 years, the prostep ivip Association has been doing extraordinarily valuable work in the field of standardization and the development of forward-looking solution approaches for the respective current digitalization topics. The prostep ivip Symposium has always been a showcase for precisely these activities – and has developed into ‘the’ world’s leading independent event in the PLM realm. Without this unique success, the prostep ivip Association would probably not have the international visibility and recognition it has and deserves today.

We started in 1999 with an event in Sindelfingen close to Stuttgart with just 100 participants, who at that time mainly wanted to exchange ideas on the topic of STEP. Since then, the symposium grew and has grown every year until it cracked the magic 700 mark for the first time in 2018. Up to 2019, the organization of this very special event was my responsibility.

What started as a kind of ‘family reunion’ of German PLM users and system vendors has developed over the years into the largest platform for information exchange and networking for the international PLM community. What has always been important to me, and what I am particularly proud of, is that despite growth and internationalization, we have managed to



maintain the unique spirit and family atmosphere of the symposium.

The worldwide unique success story is the result of good teamwork on all levels. It is Only thanks to with the enormously strong team at my side that, we have been able to maintain the high level of the event over all these years. Just as important, of course, was the coordination with those responsible for the prostep ivip Association, which always functioned perfectly despite the natural personnel changes in management and the board. Ultimately, however, the trusting cooperation between user companies, IT vendors, and scientists in the association has formed a network and created a sense of togetherness that has contributed significantly to the success of the symposium.

It is ultimately thanks to this success that the prostep ivip Symposium, unlike many other events, has come through the difficult last two years well, which have been especially challenging for events, well, and in 2022 more than 500 participants again found their way to the presence in-person event in Stuttgart. As an honorary member of the prostep ivip Association, I wish for the prostep ivip Symposium that it can continue on its successful path in the future and thus help the association to gain even more visibility.



### **Projects in which you were involved**

I have been with the prostep ivip Symposium from the very beginning and then was responsible for organizing the event for 20 years together with a great team.

### **Remaining personal impressions and professional benefits from dealing with the association**

Organizing the prostep ivip Symposium was not only a challenge, but also a lot of fun, too, and it gave me many unforgettable moments. I have met many great people and gained a lot of experience over two decades. My most important experience: With a strong team, anything is doable!

### **Your advice you give to the association**

The strength of the prostep ivip Association has always been to put new and, above all, the right topics related to the digitalization of product development on the agenda at an early stage. This has also made the prostep ivip Symposium an internationally appreciated and recognized event for the entire PLM community. My wish for the prostep ivip Association is that it will continue to have such a knack for choosing topics and so much power in implementing them.

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30 years of successful work in the  
optimization of engineering processes



**Prof. Dr. Martin Eigner**

Executive Managing Director,  
EIGNER Engineering Consult, Baden-Baden  
Former Member of the Board,  
prostep ivip Association, in different roles



In the last three decades, the prostep ivip Association has played an important role in the development of processes, methods and IT solutions – initially in the areas of CAD and PLM. The resulting standards such as STEP, ReqIF, JT and PLM XML have become widely accepted in the industry and have helped to increase efficiency, reduce costs and optimize collaboration across the entire product lifecycle. In accordance with the current requirements for modern, interdisciplinary engineering, the association has constantly developed and today makes significant contributions in the areas of model-based systems engineering, system architectures and interdisciplinary cooperation – both in application-oriented research and in subsequent standardization.

The association has also been involved in diverse research and development projects and organizes excellent events and conferences to share knowledge and best practices. The association has a broad membership base, consisting of companies, research institutes and individuals from different industries and countries. Efficient networks and many friendships have developed.

Overall, the prostep ivip Association has made significant contributions to the engineering methods, processes and IT tools, and its 30th anniversary is testimony to its continued relevance and importance in the industry.

Congratulations and many more successful years!

### **Projects in which you were involved**

STEP AP 214, JT, PLM XML, Smart Systems Engineering, Standardization Strategy Board, among others

### **Remaining personal impressions and professional benefits from dealing with the association**

The results of the prostep ivip working groups could be used excellently in all my professional functions. Standardization of processes and IT tools is an essential part of operational optimization and supports the exchange of information along the supply chain. I also see another non-technical benefit in the work of the committees and the exchange of best practice and know-how in the working groups and conferences. This has resulted in efficient networks and many personal friendships.

### **Your advice to the association**

Engineering-IT has changed extremely over the past 30 years. While CAD and PDM were in the foreground when the association was founded, in particular in the mechanical application, interdisciplinary cooperation across all disciplines and across all phases of the product lifecycle is necessary today. The association has taken up new topics such as interdisciplinary product development and cooperation across the supply chain, but the membership structure is still very much 'mechanics-heavy'.

**prostep ivip Association**

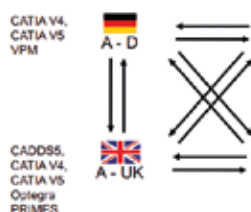
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# The constant of movement in the PLM cosmos



**Bernd Feldvoss**

PLM Interoperability Standards Specialist  
Airbus Operations GmbH, Hamburg



More than 20 years ago, we at Airbus started implementing STEP AP214 to exchange cDMU product data (product structure, metadata, for example about status and validity, as well as references to 3D geometries).

To this day, we use these basic principles both internally and with our suppliers and partners. It is impressive to see how long-lasting such solutions can be. Of course, the underlying standards, such as AP203 and AP214, have evolved. They have since been merged into AP242, but as I said, such standards enable efficient collaboration and allow our suppliers to work with other TDM/PDM solutions, for example. In such cases, the product structure and metadata can be transferred without errors. For the 3D geometries, we sometimes use either references to native CATIA V5 data or, if our vendors work with other CAD tools, we also use the geometry as STEP. Inspiration for this solution was an implementation based on the PDM scheme in the Eurofighter project, together with BAE Systems, Leonardo, and Airbus Defense & Space (Germany and Spain).

**Projects in which you were involved**  
SSB, LOTAR, STEP Benchmark, and CAX IF

### Remaining personal impressions and professional benefits from dealing with the association

prostep ivip represents a broad, cross-industry network that deals with all the relevant topics of PLM and also allows you to see the bigger picture.

### Your advice you give to the association

Over time, the annual prostep ivip Symposium has developed into the 'class reunion' par excellence, and you always meet lots of associates there for a good chat.

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IT-supported collaboration  
is not just a question of technology



**Peter Gerber**

Project Manager Engineering IT & Digitalization,  
Schaeffler, Herzogenaurach

Our world is becoming smarter, more integrated, more connected. Every day we use machines and electronic devices that are networked with each other without knowing exactly how they work. We network systems every day and exchange data across IT system borders, company borders, national borders and continents. All of this is only possible with standards that are state-of-the-art. However, the rapidly advancing progress and the increasing number of new technical capabilities pose a challenge for the definition of standards.

For many years, collaboration between companies has been based on exporting, transferring, and importing documents. Now, digitalization and new technologies enable the networking of data from different areas, systems and even companies.

Theoretically, this opens up many opportunities. In practice, these opportunities clash with a large number of established procedures and processes. Technology is not enough to leverage the potential of digitalization. It is necessary to rethink cooperation and test established methods.

### **Projects in which you were involved**

Currently: Collaborative Digital Twin (Chair); Standardization Strategy Board

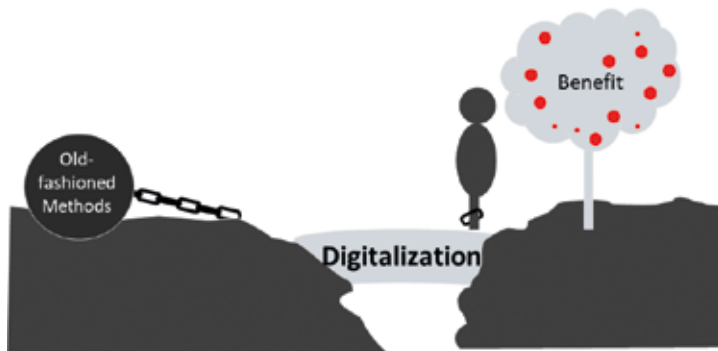
Completed: SysML WF Forum (Chair); Interdisciplinary Collaboration Framework (Chair); Cross-Discipline Collaboration Framework (Chair)

### **Remaining personal impressions and professional benefits from dealing with the association**

With standards and methods of data exchange, the Association has been the basis for successful cooperation across company boundaries for decades. In all working groups in which I was allowed to participate, the focus was on the appreciation of each individual and the benefit for everyone in open discussions.

### **Your advice to the association**

Stay open to new technologies, requirements and ideas and keep the solid basis of 'state-of-the-art standards'. You are well known among specialists, but think about the decision-makers at your clients' companies, too: Keep doing good and talk about it!



*The picture is self-explanatory*

## Digital transformation

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Driven by prostep ivip Association



### **Dr. Siegmund Haasis**

CEO HaasisDEC –

Digital Engineering Consulting, Baltmannsweiler

Former CIO R & D Mercedes-Benz AG, Sindelfingen

Digital transformation, and digital engineering in particular, is based on best practice and data representation standards that provide efficiency and system independence along the product creation process within the company or collaboration between partners or manufacturers / OEMs and suppliers.

In addition to formats for requirements specification, systems engineering, downstream applications and engineering collaboration, the standardization of semantic 3D data representation using JT and its value cases along end-to-end process chain and collaboration played an important role in the last decade. At Mercedes, the format was processed in PLM platform as a supplement to the native formats and used for digital twins with great benefit.

The different data formats were initiated and coordinated in the VDA working group Digitalization of Product Development, and detailed in the prostep ivip initiatives Workflow Forum with affected users and Implementor Forum addressing relevant software vendors with acceptance criteria for implementation.

In the format of Technology Days, best practice reports of the companies have ensured further dissemination and continuous site expansion. The so-called JT Days have taken place annually very successfully in the using companies.

### **Projects in which you were involved**

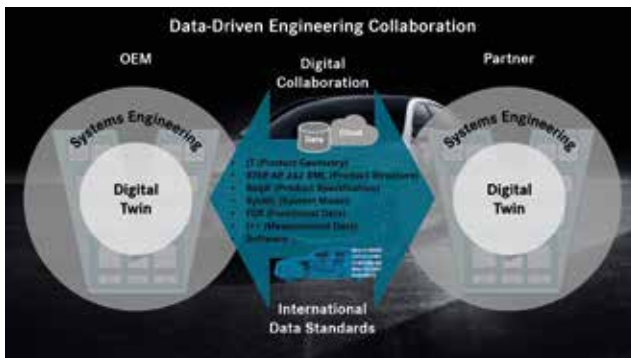
Member of VDA Working Group PLM / Chairman of Digitalization in Product Development with great execution support by prostep ivip Workflow Forum & Implementor Forum; JT Initiatives with several JT Days.

### **Remaining personal impressions and professional benefits from dealing with the association**

To experience cross-industry / cross-domain communities to promote digitalization in the product creation process, standardization of data and exchange format, and dissemination of best practice methodologies and IT technology.

### **Your advice to the association**

Successful continuation of digital transformation with a focus on digital twin, digital prototype, E/E digitalization and software-defined vehicle.



*Overview of different data standards of VDA and prostep ivip Association, respectively*

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## How ProSTEP became prostep ivip



### **Professor Alfred Katzenbach**

Independent management consultant and  
lecturer at the University of Stuttgart, Gaienhofen  
Former board member and honorary member  
of the prostep ivip Association



The ProSTEP Association was founded in 1993 as a supplement to the then ProSTEP GmbH and was essentially dedicated to promoting the STEP exchange format. I do not want to report about the beginnings here, that will certainly be done by other authors.

In the second half of the 1990s, a BMBF lead project (German Federal Ministry of Education and Research) 'integrated virtual product development' was carried out in cooperation between science and industry. The steering committee of this project consisted of Dr Trac Tang from VW, Ulrich Ahle from Siemens and Prof. Frank-Lothar Krause from Fraunhofer IPK in Berlin. In this project valuable foundations were laid for the future development of product development from various aspects. Towards the end of the project, the idea arose to ensure the sustainability of the results through an association. The ProSTEP association could serve as a successful example. On closer examination, it became clear that the member companies of this new association, which was to be founded, overlapped to a large extent with those of the ProSTEP association.

Thus, discussions were initiated to explore whether the same goal could be achieved by realigning the ProSTEP Association and broadening its mission.

These discussions were not easy, because here two self-confident groups met, and they were both very focused on their interests and objectives. It was a typical team-building process, at the end of which, however, agreement was reached on a common future. The name of the new association was particularly difficult to decide on, and the two established names were then combined. The association was renamed 'prostep ivip Association'. The board structure with one representative each of the OEMs, the suppliers, the IT industry and science was kept. At the next elections Ulrich Ahle and Frank-Lothar Krause (from the iViP-Board) were appointed to the board. Andre Radon (Delphi Automotive Systems) and Alfred Katzenbach (Daimler) from ProSTEP-Board continued to serve on the Board of Management.

The merger also marked the beginning of intensive work on content. The new purpose of the association was no longer CAD and BOM data exchange, but the topic of engineering collaboration with its various aspects. The business model was also developed further. Whereas previously the working groups were financed from the association's budget, there was now a participatory concept in which the companies involved in the working groups participated in the financing as the work results matured. This allowed the available resources to be significantly expanded. The control of the working groups via a 'Technical Steering Committee' (TSC) was retained, as well as the annual symposium, which to this day enjoys great popularity among all participants. While at the beginning there were only a double-digit number of participants, this could be increased to more than 500 participants per event. The range of topics has always adapted to the changing boundary conditions up to the present day.

While the basic idea of the developed association has always been international, it has de facto been a rather German event. However, this has developed very positively over the years.

The association has developed not only in terms of content, but also in terms of its membership base. The long-term archiving project LOTAR, with its very great importance for the aviation industry, was an important expansion.

Today we can state that the association has a committed and active membership group in Japan, which makes an important contribution to the successful work.

This has now been taken into account and the previously four-member board has been expanded to include a representative of the aviation industry and Japan.

**Projects in which you were involved**

On many projects, but essentially on the board. But I would like to emphasize the standardization of the JT format to ISO 14306 and, in extension, to DIN-Spec 91383 - 2021.

**Remaining personal impressions and professional benefits from dealing with the association**

It is an association of people for whom cooperation across corporate boundaries is a matter close to their hearts. This has resulted in many partnerships and friendships that go beyond the concrete work in the projects. The annual symposium is therefore also to a certain extent an annual 'family reunion'.

**Your advice to the association**

Today, the association is facing a new challenge and a paradigm shift as it did during the transition to the prostep ivip Association. Back then IVIP was the trigger, today it is initiatives like Gaia-X, Catena-X, and technologies like 'X as a service', data analytics or artificial intelligence. The move from products to product-service systems is also opening up new opportunities.

I would very much like to see the association successfully master this transformation and, after another 10 to 20 years, we can continue the story of the association's transformation into a new dimension.

## Pioneering spirit boosted

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# The founding phase of ProSTEP



### **Dr. Bodo Machner**

until 2000 Member of the Management Board  
of ProSTEP GmbH, Darmstadt

2000-2016 Head of department with BMW IT, Munich;  
today retired

The history of the ProSTEP Association actually begins as early as 1990 and is closely linked to the history of German reunification. Under the leadership of Prof. Dieter Richter and Lutz Blecke, we had also been working on the STEP standard and its application in industry since the end of the 1980s at the Product Data Department of the Academy of Sciences in East Berlin. After a first visit to Adlershof in 1990, Dietmar Trippner, Wilhelm Kerschbaum, and others matured the plan to establish a German STEP center following the example of PDES, Inc. (STEP center in the USA). One year later, in the fall of 1991, the first ProSTEP project was launched under the leadership of BMW, Bosch, Daimler-Benz, Siemens, and VW/Audi with the support of the German Federal Ministry of Economics. The way there demanded pioneering work: The East Berlin Academy was dissolved on December 31, 1991, in accordance with the provisions of the Unification Treaty. We employees founded a company, GIDA, and were thus able to secure STEP know-how for the project. In GIDA we also took over the operative control of the project work. At the beginning there was no uniform telephone network and only a few lines between East and West. For telephone calls to Munich or Stuttgart, we drove to telephone booths in neighboring West Berlin. For the project meetings, the guests from the old federal states stayed in the nearby 'Trans-Hotel' - a former guest house of DDR's State Security.

The project quickly gained momentum: The original eight project partners were quickly joined by others – eventually 24 partners were working together in the project. Contacts with STEP centers in the USA, France, and Japan were established.

After two years of project work, the project results were presented at the STEP Forum on October 5, 1993, and the ProSTEP Association was founded by 38 companies and institutes.

## Projects in which you were involved

I was head of the project center in Berlin Adlershof on the first ProSTEP project from 1991 to 1993/94. In the STEP/PDMI project, which I then initiated and led (1994 to 1996), the goal was to secure and disseminate the STEP application – particular also for product data management and going beyond data exchange. At the STEP Forum in spring 1997 at BMW in Munich, the association already counted 180 members and started the next project PDMI2. This was about the interoperability of STEP with other standards like OMG/Corba or XML.

## Remaining personal impressions and professional benefits from dealing with the association

The ProSTEP Association was and is a unique network of experts for IT application in product development. This network helped me during my time at ProSTEP GmbH, but especially afterwards during my 15 years in management with BMW IT. The annual PropSTEP iViP forums developed into the leading event for PDM experts in Europe and were at the same time a 'family reunion' – with the old and always new 'family members'.

## Your advice to the association

The biggest challenge is certainly the ever faster pace of change. (For example, most of the founding members of the association no longer exist today in their former legal form). Today, it is not only the change in IT technology or the processes of the industry but the complete change of business models, new players and thus new drivers for standards. Here, the association can and must provide orientation and help through its network – I am sure it will do so.



*Four historical documents from the association founding: One page each from two project flyers, which were created in 1992/93. And the official invitation to the STEP Forum 1993, where the founding of the association was on the agenda*

## ProSTEP

Rechnungstechnische Produkte sind unverzichtbar in der Entwicklung und Fertigungstechnik. STEP-Standard für die Exchange of Product Model Data wird als neue internationalisierte, internationale Produktdatenformate entwickelt, um Planung, Ausführung und Verwaltung von Produktdaten zu ermöglichen (z. B. für CAD/CAM-Systeme). Dies schließt die Voraussetzung für die weitere Automatisierung und Rationalisierung technischer Prozesse in der Entwicklung, Fertigung, Wartung und Einbringung von Produkten und Betriebsmitteln.

Die industrielle Einführung, Durchsetzung und Weiterentwicklung von STEP ist technisch, betrieblich und volkswirtschaftlich nur durch ein gemeinsames, abgestimmtes Vorgehen der deutschen Industrie zu bewerkstelligen.

Auf Initiative von BMW, Bosch, Carlisle, Daimler-Benz, Siemens und VOLKSWAGEN AG wurde im September 1991 das Verbandprojekt ProSTEP begonnen. Weitere Partner sind GDA, IKT, Universität Karlsruhe und TU Berlin als Auftraggeber sowie Alcatel, Autoteile, C&P, C&P, Computervision, Digital Equipment, Eigen-Partner, GOMAG, Hewlett Packard, IBM, Intergraph, Matsushita, SONY, Opel, EDS, Solfid, Talsi und Tactem. Ziel des Projektes ist es, durch Zusammenarbeit von Herstellern und Zulieferern, von Anwender und Systemanbieter STEP in der industriellen Anwendung einzuführen.

Mit dem ProSTEP-Forum werden erstmals die ersten Ergebnisse der Öffentlichkeit präsentiert. Darüber hinaus wird die Neugründungsgesellschaft in Form der ProSTEP Produktionsforschungs GmbH, und dem ProSTEP Verein zur Förderung internationaler Produktdatenformate V vorgestellt. Die Veranlassung steht mit der Gründung des Vereins.

ProSTEP wird gefördert durch das Bundesministerium für Wirtschaft.

## Programm

**ProSTEP-Forum**  
am Dienstag, dem 06.10.93  
Hotel Berlin, Lützowplatz 17, Berlin

Beginn: 11:00 Uhr

Begrüßung

Herr Heggen, BMW

Industriestandort Deutschland:  
Sind wir noch Sprinter?

Herr Mr. Dr. Dr. Ott  
Bundesministerium  
für Wirtschaft

STEP als gelungenes Beispiel  
entwicklungsleitender Normung

Herr Prof. Reichen  
Präsident DfV

Erklärung der internationalen  
Weltweitendigkeit durch die  
Optimierung der Zusammenarbeit  
zwischen Hersteller und Zulieferer

Herr Prof. Dr. Zimmermann  
Gesamthochschule VDA

ProSTEP: Eine Initiative der deutschen  
Automobil- und Elektroindustrie  
zur Beherrschung der  
Produktentwicklungstechnologie

Herr Schuster  
VOLKSWAGEN

ProSTEP Projektziele:  
Einsparung von Kosten einer  
Hersteller-Zulieferer-Produktentwicklung

Herr Zühl, Siemens

Gründungs-ProSTEP-Vereins zur  
Förderung internationaler Produktdatenformate e.V.

Mittagsessen / Buffet gegen 12:30 Uhr

Um 13:30 Uhr: 15:00 Uhr und 16:15 Uhr werden die ProSTEP Ergebnisse in einer Ausstellung präsentiert.

## Für Ihre Terminplanung

Ich habe mich zum  
ProSTEP-Forum,  
Beginn 11:00  
am 05.10.93 im Hotel Berlin, Lützowplatz 17, Berlin  
angemeldet.

Ich nehme an diesem Abend an einer Präsentation um  
19:30 Uhr, 15:00 Uhr oder 16:15 Uhr teil.  
☐ Ja ☐ Nein

(Teilnehmerlisten liegen am Veranstaltungsort aus)

Ich möchte mich hiermit zum ProSTEP-Forum an-  
melden.

☐ Ja

☐ Nein

Ich komme in Begleitung von:

Name: \_\_\_\_\_  
Firma: \_\_\_\_\_  
Telefon: \_\_\_\_\_  
E-Mail: \_\_\_\_\_



ProSTEP-Forum



ProSTEP

ProSTEP-Projektzentrum  
c/o GDA mbH  
Rudower Chaussee 5  
D-12484 Berlin  
Telefon (030) 6392 6040  
Telefax (030) 6392 6050

Für weitere Fragen stellen wir Ihnen gerne  
zur Verfügung.

**Asien:**

Name: \_\_\_\_\_  
Firma: \_\_\_\_\_  
Telefon: \_\_\_\_\_  
Telefax: \_\_\_\_\_  
E-Mail: \_\_\_\_\_

ProSTEP-Projektzentrum  
c/o GDA mbH  
Rudower Chaussee 5  
D-12484 Berlin

## Ihr Weg zum Hotel

von Flughafen Berlin-Tegel

mit dem Bus 109 Richtung Rudow/Spaß bis zur Haltestelle  
Schöneberg

von Flughafen Berlin-Tempelhof

mit dem Bus 109 Richtung Rudow/Spaß bis zur Haltestelle  
Schöneberg

von Bahnhof Zoologischer Garten

mit dem Bus 109 Richtung Rudow/Spaß bis zur Haltestelle  
Schöneberg oder Bus 100 Richtung Alexander Platz bis Haltestelle  
Schiller-Platz

mit dem PKW

über den Stadtring A100 Richtung Wannsee bis Ausfahrt  
Karl-Liebknecht, weiter Lützowplatz Str. „An der U-Bahn“



Hotel Berlin, Lützowplatz 17

## Einladung



ProSTEP-Forum

am  
5. Oktober 1993  
in Berlin

Projektsergebnisse /  
Gründungsveranstaltung

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# The crisis as an opportunity for change



**Dr. Bernd Pätzold**

President & CEO, PROSTEP AG, Darmstadt



Financial crisis, pandemic, Ukraine war, energy crisis, inflation, climate change – we can no longer find our way out of crisis mode. Perhaps we should simply accept the crisis as an opportunity and use it for change. It's probably never been any different, except that the intervals between one crisis and the next have shortened, just as innovation and technology cycles have accelerated. The world is changing faster and faster.

German industry, and above all the automotive industry, is once again facing profound changes as a result of the political decision to bury the internal combustion engine. When it comes to CASE (Connected, Autonomous, Shared, Electric) topics, others are leading the way in some cases, and German Automotive-OEMs are under intense competitive and innovative pressure. But this is actually not an entirely new crisis experience, and it is closely linked to the genesis of the prostep ivip Association.

We Germans remember the early 1990s as a happy moment in history because of peaceful reunification. A history that supposedly came to an end with the break-up of the Soviet Union, as the Japanese political scientist Yoshihiro Francis Fukuyama erroneously postulated. The German automotive industry was also threatened with the 'end of history' at that time, but for different reasons. With a development and production depth of 80 percent, it was hopelessly inferior to the 'lean' Japanese competitors. As unbelievable as it sounds, Volkswagen was a restructuring case at the time!

German automakers, led by Volkswagen, BMW, and Mercedes-Benz, rose to the challenge and underwent a huge transformation from which they emerged stronger. In order to become faster and reduce risk, they accelerated development by using new technologies such as 3D-CAD, while at the same time putting their value chains on a broader footing. But they couldn't do that without a standard for 3D data exchange. That was the birth of the ProSTEP project, from which the association and later ProSTEP Produkt-datentechnologie GmbH emerged. The rest is history, and one with a great future.



Without the prostep ivip Association, there would be neither the STEP standard nor a common understanding of a product data model. Even though STEP has not gained the widespread acceptance in the automotive industry that was initially hoped for, the standard is used productively on a daily basis by thousands of companies worldwide in a wide variety of industries. This is a tremendous achievement for which I can only congratulate all those who have contributed to the standardization process, both nationally and internationally!

Today, we are once again facing a transformation process similar to that of the early 1990s, except that today it is Tesla and the Chinese competitors who are making life difficult for the German manufacturers in the field of e-mobility. For the association, this is a huge opportunity. If it manages to anticipate these chan-

ges and sustainably support the community in its transformation, it has a great future ahead of it. To do this, it needs to address new topics more strongly, such as cross-domain collaboration in systems engineering, software development, or verification and validation.

The paradigm shift in product development is called 'digital first': The digital model describes the behavior of the product, which must be fulfilled as best as possible by the physical implementation. This is a revolution for companies. With its proven methods and thirty years of experience in the field of standardization of data formats and collaborative processes, the association is well equipped to accompany the community in this paradigm shift. It is always strong when the community is strong. With this in mind, I wish it a successful future.

**Projects in which you were involved**

Perhaps most importantly, today's PROSTEP AG was originally established as an R & D center and operating arm of the association, with the goal of translating the emerging STEP standard into technical solutions. Although our symbiotic relationship has loosened over time as the company's success has grown, our employees are still active in numerous project groups, and we also still operate the association's office.

**Remaining personal impressions and professional benefits from dealing with the association**

What I find impressive is how the association, which came into being as a national response to an international competitive situation, has developed into a global community that emphasizes 'commonality' instead of 'against each other'. The association has managed to open itself up to new topics and new sectors, and it has successfully driven forward its internationalization, which is reflected, among other things, in the fact that one board member now comes from Japan.

**Your advice to the association**

The association must not get bogged down in the minutiae of association work. It needs more young, committed people to drive new issues forward in the community. The financial tools are there. What is perhaps still missing is a vision that is filled with life by its members and that must be constantly developed. This is not just a task for the board and members, but for the entire community.

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## Shaping together the digital chance



**Jens Poggenburg**

Executive Vice President Software Products, Emission and Services, Instrumentation and Test Systems, AVL List GmbH, Graz

In times of multiple disruptions, it is of fundamental importance to focus on the essentials, to motivate through a clear mission statement and to use all opportunities for sharing best practices. I am proud, that the prostep ivip Association provides a strong base for making this happen. The recently released strategy is strongly future-oriented and calls for continuous implementation by the members and the board.

Vehicles as part of holistic mobility systems via car-to-car or car-to-environment communication including over the air (OTA) software update, real-traffic information or charging-optimized navigation mean a significant augmentation of our partner ecosphere.

In this context, new relevant partners become part of the game, such as telecommunication providers, infotainment producers or infrastructure companies. This does not only have an influence on the future business models in the automotive industry, but it also includes a much higher influence of these partners in topics like software integration or cyber security. Consequently, this leads to new development partnerships that call for seamless data integration and data governance to be successful.



IoT, software-defined business models, software-driven development, the value of data, holistic system integration, reduced resource usage through design-to-sustainability: Just some representative characteristics which describe the relevance of topics driven by the prostep ivip Association for all industries. Therefore, it is of utmost importance for us to augment our activities by going 'beyond automotive' – sharing best practices and driving the key levers for optimized collaboration in the value creation process.

Industry – not only the automotive industry – is being driven to an increasing extent by software, data-driven technologies and sustainability. There is a significant rise and evolution of gateways and vehicle network processing – driven by autonomous driving, electrification, and connectivity. All this calls for new skills in systems engineering, software architecture and development, cyber security, data analytics and other key fields.

We want to significantly increase the interest – and competence – of the upcoming generations in these topics, to be prepared for the future.

For the prostep ivip Association and all of us, I wish that through our cooperation we will manage to be purely sustainable, meaningfully digital and highly effective in the next ten years.

*Interview with fellow board member Tomohiko Adachi-san, Mazda, on the challenges in development to virtual validation and homologation related to software-defined vehicle approaches*



**Projects in which you were involved**

Since June 2022 I have been the board's new representative of suppliers at the prostep ivip Association. But I have been following AVL's participation in the association for many years – be it in the projects, at the prostep ivip Symposium or in the ProduktDaten Journal. My first assignment in the association was in a 'Push-to-Future' format, where it was a real honor to interview board colleague Tomohiko Adachi-san about the challenges in development up to virtual validation and homologation in relation to a software-defined vehicle. A very exciting format that provides deep insights into a topic in a relatively short time.

**Remaining personal impressions and professional benefits from dealing with the association**

Since there is a huge overlap in the strategy of the prostep ivip Association with the mid- and long-term objectives of AVL, I am happy to contribute as a board member of the association to its future success. We are all facing the same challenge: How to ensure seamless collaboration in cross-organizational networks. Digitalized processes, well-defined interfaces, appropriate skills, and global interaction are essential success factors that I would like to move forward. I am very optimistic about creating relevant impact for the member group of suppliers in the association.

**Your advice to the association**

It is of outmost relevance for us as the prostep ivip Association to influence and drive the layout of a future-proven framework and network. Our project landscape clearly proves our ambition to act as a front-runner here. I am particularly glad that we are also expanding into an even stronger global approach.

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## On the importance of an association like prostep ivip



### **Reinhold Pohl**

Engineering and IT consulting, freelancer, Wiesbaden  
Former Divisional Information Officer, Continental TEVES,  
Frankfurt/Main

Former board member and honorary member of the prostep  
ivip Association



One of the reasons for the founding of the prostep ivip Association was to enable communication between the automotive and supplier industries. At that time, the different IT system environments, especially in the R&D arena, did not allow this.

The idea was to find a (neutral) solution that allows the participants of development projects to send product data from one system environment to another. Both sides should have the same content available, which was ultimately the idea behind STEP (Standard for the Exchange of Product Data).

But with the availability of STEP, the requirements of the industry for the exchange of data were not fulfilled at all. With more complex and more detailed products and IT systems, the need evolved to exchange data and to communicate between companies on a different level.

Year by year and product generation by product generation, the need for product-related data is growing. Just geometry related data are no longer sufficient.

To sum up, during the past 30 years the need for data, connections, dependencies, continuity, quality related topics, etc. has increased, and it is still increasing.

As a consequence more solutions, support functions, services and at least standards are required. prostep ivip has delivered on industry requirements, not only for car makers and their suppliers, but for other branches, too.

But as in the past, today and in the future, too, new challenges in this area will come up and prostep ivip will take the lead in finding and establishing the solutions needed.

### **Projects in which you were involved**

During my ten years as member of the board, I was involved in many of the projects. The result of all the projects did help the industry to get ahead.

### **Remaining personal impressions and professional benefits from dealing with the association**

The internationalization of the association in the direction of the Asean region with Toyota as the first Japanese member was great progress for the prostep ivip and is still in my mind. JT as one of the standards generated by prostep ivip and CPO (Code of PLM Openess) just to name two more topics from which I benefit in my daily business.

### **Your advice to the association**

As I mentioned before, in the upcoming years, product- and product-lifecycle-related topics, artificial intelligence, augmented reality and others will be challenges for which solutions will be found. As long as the prostep ivip Association focuses on these challenges as it has done before, I have no doubt that it will reach its 50<sup>th</sup> anniversary.



### **University Professor Dr. Oliver Riedel**

Institute Director of the Institute for Control Technology of Machine Tools and Manufacturing Facilities (ISW) at the University of Stuttgart and Institute Director of the Fraunhofer Institute for Industrial Engineering and Organization (IAO); Head of controlling of the planning processes and coordinating product-related IT, Audi AG, Ingolstadt  
Former Member of the Board of the prostep ivip Association

## Projects in which you were involved

I have been a member of the association since 2004 and have been able to work on many projects. I particularly remember the time on the board of the association. During these years I was able to gain many positive experiences in working with the people within the association. In particular, together we managed to establish an association on the Japanese market and thus in Asia.

We have also succeeded in attracting more members from the aviation industry, thereby expanding the association's network and competences. Another important project for me was the worldwide introduction of the Code of PLM Openness.

In addition to these projects, I was also able to successfully implement a new marketing approach in the prostep ivip Association.

## Remaining personal impressions and professional benefits from dealing with the prostep ivip Association

A personal impression that has stuck with me is the high level of professionalism and competence of the members of the prostep ivip Association. By working with experts from a wide variety of industries worldwide, I benefited from a wealth of knowledge and experience. By exchanging ideas and opinions in the network, I was able to expand my own knowledge and gain new perspectives. The association's network has also helped me to make valuable contacts in the industry, which have proved to be very useful. In summary,

I can say that working with the association was not only of great professional benefit, but also represented an enriching experience for me personally.

In addition, I also see a great professional benefit in the open and globally valid standards that prostep ivip promotes and supports. These standards help ensure that the various companies and organizations within the industry can work on a common basis, thus achieving greater efficiency and interoperability. This in turn can lead to faster and cheaper product development and commercialization, which is invaluable to me as a professional in this field.

## Your advice to the association

The prostep ivip Association will continue on its successful path – I'm sure of that. It will continue to address current issues and will not shy away from looking behind the curtain. It is important to ask critical questions and also to address inconvenient truths in order to expand the knowledge and competence in the association's network of people and to promote more transparency and integrity in the industry. In this way, the association will continue to make a valuable contribution to improving the product lifecycle management industry in the future. I can only say: Keep it up!

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# Systems engineering



**Dr. Stefan Rude**

Expert Systems Engineering  
BMW AG, Munich

Systems engineering based on IT systems requires models for the description of technical products in the form of requirements, functions, physical effects, and software as well as their physical representation as components described geometrically and materially. Moreover, models for the integration, verification, and validation of components and their assemblies are needed. Partial models for the different aspects of technical products have been theoretically penetrated for more than 30 years and are described in different parts of ISO. The prostep ivip Association has been working on these issues at the interface between OEMs and suppliers for over ten years. IT systems are available that support individual aspects of product-descriptive data, including mechatronic and software-based functions. However, we continue to work intensively on completeness, freedom from overlaps, continuity, mastery of different levels of abstraction and different views of the same artifacts.

There is a need for action to coordinate and standardize the required data models, particularly at the interfaces between companies in the supply chain. Work on this can be summarized very well under the heading 'systems engineering'.

More than ten years ago, the prostep ivip project Smart Systems Engineering (SmartSE) dealt with the identification of important topics in systems engineering and came to the conclusion that, especially for simulation with regard to standardization, traceability, accuracy, etc. the greatest need for action exists. The reason for this is that simulations usually require different types of representation of one and the same product / product components, e.g. as a CAD model, FEM mesh, MBS representation, etc. The interaction of different partial models for simulating integral aspects of technical products for various simulation tasks is shown schematically in the figure below.

By way of example, it becomes clear that various more complex simulation tasks require partial models of different characteristics.

In addition, in the area of application of automated systems, products are simulated in their respective application environment and the requirements for partial models are thus extended to include modeling of the respective test environment. This applies in particular when sensors and actuators interact with their respective operational environment and the behavior of a product cannot be described independently of changes in the operational environment.

This in mind, it can be deduced that there is still a great need for action to penetrate and further develop the interaction of different types of representation under the heading of systems engineering, ideally on the basis of standards.

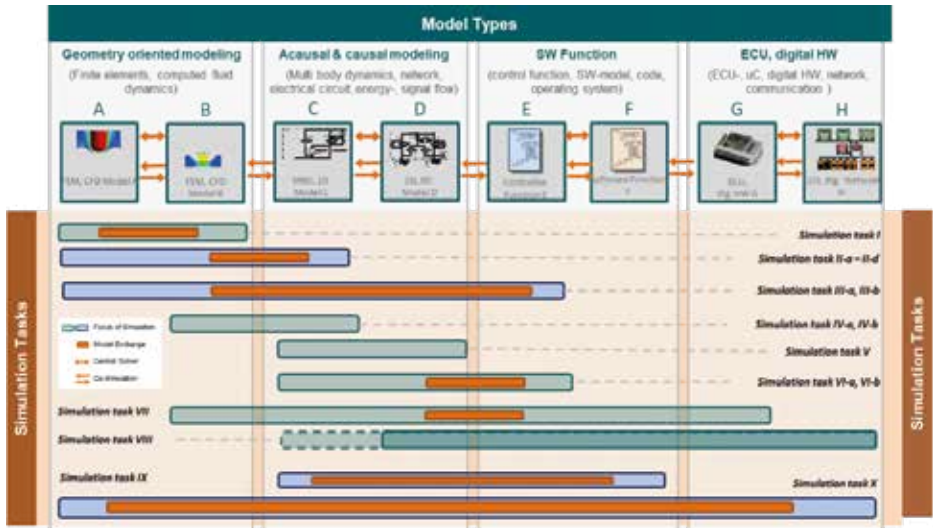
### **Projects in which you were involved**

I was active as a sponsor for Smart Systems Engineering (SmartSE) for ten years and exemplified the support of the functional mockup interface (FMI) for the standardized description of causal simulation models and for the classification of different levels of virtual control units (V-ECUs).

I was also involved in the Standardization Strategy Board (SSB) to coordinate the need for action for important IT standards and to describe them as fact sheets.

### **Remaining personal impressions and professional benefits from dealing with the association**

Projects organized via the prostep ivip Association at the interface between OEMs and suppliers, with the participation of IT vendors, service providers, and research institutes allow the processing of essential IT topics from product development in a pre-competitive environment. This sharpens perspectives on future topics and makes it easier to assess the importance of topics in your own professional environment. In particular, the cooperation with top-class experts from other companies and research institutes demands and promotes one's own view of this technically demanding area.



Interaction of different partial models

Source: prostep ivip project SmartSE, Recommendation V3

### Your advice to the association

Openness to the participation of all interested companies and research institutes worldwide is essential for the association. The description of topics that also provide short-term benefits is an art and a tightrope walk that requires a lot of experience but also youthful energy with the will to push topics forward. Personal encounters with experts outside of your own company play the most important role and should continue to be supported by the association.

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## The core of a 30-year-lasting success story



### **Dr. Dietmar Trippner**

CEO, dreiconsult, Landberied

Former Vice President Group IT, BMW AG, Munich; Managing Director of ProSTEP GmbH, Darmstadt; Advisory Board in the ProSTEP Association Board of Directors, Darmstadt



At the beginning of the 1990s, the German economy had fallen into a threatening recession and Japanese automotive companies were showing the established European carmakers how lean production could be used to achieve success. The perplexity among the board members of the automotive companies grew, and delegation after delegation was sent to Japan to better understand lean production as described in the book 'The Machine That Changed The World'.

At the same time, the focus was on a company's own strengths. Computer use in production was already well advanced, and computer support in product development was just beginning, but promised great potential. Especially if solutions could be found for the insufficient data integration of the systems within and between the companies that used a variety of different systems. This was a huge task that was very difficult for a single manufacturer to accomplish alone.

This led companies that were in fierce competition with each other to initially collaborate in 1991 in a joint project, which they named 'ProSTEP'. The aim of this project was not only to develop the STEP product data standard, but also to develop software components based on them for data exchange and data management, to pool know-how and to prepare for the establishment of an independent ProSTEP organization.

On October 5, 1993, the time had come, and the ProSTEP Association was founded in Berlin with distinguished guests. This was followed on November 2, 1993 by the founding of ProSTEP GmbH, whose largest shareholder was the ProSTEP Association. Together they formed the ProSTEP Center, based in Darmstadt. The association grew rapidly; after about two years, more than 150 companies, universities, and research institutes had already become members of the ProSTEP Association. In addition, an international network was already established at that time with PDES, Inc. in the US, GOSET in France, and the Nippon STEP Center in Japan for international cooperation.

The construction of the organization was open to everyone from the beginning due to the foundation of the association and the participation of the association in the GmbH (limited liability company). Manufacturers, suppliers, system vendors, and research institutes, independent of industry and country, could and still can become members of the prostep ivip Association – as the association has been called since the merger with the iViP project in 2002.

The basic idea and the life of an open and trusting cooperation, especially between competitors, was and is the core of the success story of the prostep ivip Association and PROSTEP AG. Over the past 30 years, this successful cooperation has enabled the development and implementation of a large number of important international PLM standards and solutions and made prostep ivip an internationally recognized, neutral player.

As the initiator of the ProSTEP joint project, former managing director of ProSTEP GmbH and long-standing member of the advisory board of the prostep ivip Association board, I see exactly this core as being threatened. I always sense fear and concerns from company representatives when I talk about their involvement in the prostep ivip Association and also the cooperation with competitors. A fear that is completely unfounded due to the structure of the working groups and the free availability of the work results for the members, but which fuels uncertainty and endangers the core of open and trusting cooperation.

Against the background of the great challenges associated with IoT, AI, and the electrification of the products, cooperative and open cooperation in the pre-competitive area is necessary in order not to overburden the individual and to produce viable solutions. prostep ivip Association has shown how it's done for 30 years! Let's hold on to this core of success! The ProSTEP association was indeed a child of the crisis, but we shouldn't wait for another crisis to discover the advantages of working together in the spirit of the prostep ivip Association.

### **Remaining personal impressions and professional benefits from dealing with the association**

The realization of the ProSTEP organization, as well as my involvement in the association, has enriched me immensely, both personally and professionally. The many contacts, professional discussions, and intensive project work on a national and international level have constantly expanded my knowledge and perspectives. Many friendships have developed from initial professional contacts that I would not want to miss.

### **Your advice to the association**

The basic idea and life of open and trusting cooperation, especially between competitors, was and is the core of the success story of the prostep ivip Association and PROSTEP AG. I would like to see this basic idea remain intact so that we can successfully master future challenges in the product data technology environment together.

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## Driving innovation in a global network



### **Dr. Steven Vettermann**

Program Manager, Ascon Systems Holding GmbH, Stuttgart  
Former General Manager prostep ivip Association, Darmstadt



*Public launch of the CPO initiative during Hanover Fair in 2012*

prostep ivip is something unique. It is a vivid organism, that, over the decades, has reinvented itself several times. Thereby one constraint has never been forgotten: Users, vendors, and researchers coming together to drive innovation in the industry. It is neither an x-only network, nor something country-specific, it is a community where everybody is invited to contribute. And the clear target is to deliver something concrete in a defined time frame, budget etc.

My first contact with prostep ivip is now nearly 20 years ago – 20 years, oh boy! In my time as General Manager of prostep ivip, the technical program grew from a handful of projects to nearly two dozen. Together with the Board and the Technical Steering Committee, we established management and controlling instruments to guarantee the highest benefits for the members. Running an association like a company is characteristic of prostep ivip, which also makes it unique.

But doing what any other standardization organization is doing has never been enough for prostep ivip. Over the years, the association has explored several topics which were seen as potentially beneficial for the industry in future, but which were not mature

enough at the time. One good example is the 'Code of PLM Openness' (CPO). At a time where a massive concentration of software vendors could be observed on the market on the one hand, and the industry was preparing for the next steps in digitalization on the other hand, providing a harmonized catalog of criteria for assuring and/or measuring the openness of IT systems was inevitable.

Another good example is Smart Systems Engineering (Smart SE). A decade ago, everybody was talking about systems engineering, and, in isolated cases, some companies were working on application scenarios. But prostep ivip opened the neutral space, so that users, vendors, and researchers could come together and create something that they could not realize on their own: Neutral processes for manufacture-supplier collaboration and related IT requirements –

fully in line with existing antitrust regulations. This is a two-in-one benefit of being engaged in prostep ivip, an aspect that cannot be valued highly enough.

But in times of globalization, doing all this is good, but not enough. To assure the international acceptance of results, relationships to other/foreign organizations are necessary. Since its beginnings, prostep ivip had good relations to the US-based PDES organization and other STEP-Centers. Within Germany, good relations have been fostered with the German Automotive Association (VDA) and the German Machinery and Equipment Manufacturers Association (VDMA). But over the years topics came up, where prostep ivip had no relationship. 15 years ago, this was really a weak point of prostep

*First JAMA-METI-prostep-ivip workshop in 2018, Darmstadt*



ivip. But unlike most individual companies, an association has the means to build up these kinds of relationships. So, we started with ASD-STAN and the AIA for aerospace, later on with the Object Management Group (OMG) for ReqIF and SysML, with AutomationML and ASAM. Here, we raised a voice on behalf of all our members, even if they were not a direct member of this or that association.

But, what about Asia, especially Japan? Those of you who ever tried to create a (business) relationship in this direction know how tricky this is. But at the end of the day, we did it, and today one of the prostep ivip board members is Japanese. I will never forget the day of our first bigger meeting. We expected the Japanese delegation to participate at a joined Smart SE meeting. We knew they would come, but we didn't know how many would come. And then a huge bus arrived and opened its doors. We were 60 people in the room – that was really groundbreaking! One year later, we did our first prostep ivip conference together in Tokyo.

At prostep ivip, decision makers and domain experts have always come together and created results that were valuable for the members, be it use cases, process descriptions or data models. Here, the association has acted as a think-tank and provided guidance and advice, seed funding to address new topics, and has tracked the effectiveness of projects. If we consider this from the future, too, we can expect prosperous times.

## **Projects in which you were involved**

I shan't name them all, that would go far beyond the scope of this booklet. I learnt a lot from Engineering Change Management (ECM) and ECAD/MCAD Collaboration. I practiced humbleness when pushing JT and STEP AP242 through the ISO standardization. I experienced the power of prostep ivip as we were standardizing the OMG Requirements Interchange Format (ReqIF) and set up the related Implementor Forum. I was proud as we safeguarded governmental support for the Code of PLM Openness (CPO). And I never stopped smiling while driving Smart Systems Engineering (Smart SE).

## **Remaining personal impressions and professional benefits from dealing with the association**

Being a prostep ivip 'activist' always helped me to get into contact with people, to maintain and to expand my network. Having trust-based relationships is one of the spices of life. Technology is too complex to know everything, but to know someone who can help or knows someone else who can help, that's worth a lot.

## **Your advice you give to the association**

First of all: My best wishes for the future. An organization like prostep ivip always faces two challenges: Addressing the industry-relevant topics of the future and providing substantial results to the industry today. Doing both at once is challenging, but please stay tuned. 'Ganbatte kudasai', as the Japanese say.



1993



1994





1995

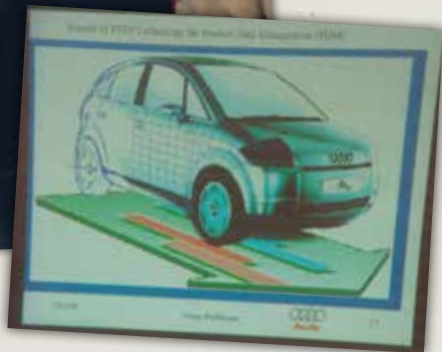


1996





1999







2003





2004



2005



ESTABLISHING  
LEADERSHIP  
IN IT-BASED  
ENGINEERING

[www.prostep.org](http://www.prostep.org)



2005



2018







2019



## A warm welcome!

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# The office of the prostep ivip Association introduces itself



**Rachel Bauer**  
Research & Innovation Manager

As Research & Innovation Manager, I am responsible for the conception, organization and implementation of research and funding projects in the prostep ivip Association. The varied and forward-looking topics are particularly exciting. For example, artificial intelligence for product development, CO<sub>2</sub> reduction in the product lifecycle or new concepts for collaborative work can be the focus of such research projects. The research and analysis of new future topics, always in coordination with the overall strategy of the asso-

ciation, ensures that we always have our finger on the pulse and work on topics that offer real added value for our members. Our community of science, industry and IT, which has grown over many years, offers the ideal breeding ground for successful innovation projects in the neutral, pre-competitive framework that the prostep ivip Association represents.





**Kirsten Cornet**  
Account Manager

I am responsible for all financial transactions, whether from or into the association, whether small or larger sums. I have been in our association's accounting department for over a decade. I ensure that all accounting processes run smoothly and professionally. From the financial aspects of the projects in the technical program, the handling of publicly funded projects, to membership fees and financing of publications and events – it is my job that all the association's financial matters are processed.



## **Fabienne Kreusch**

Public Relations &  
Event Management

The prostep ivip association is one big family. That's not just a figure of speech. People know and appreciate each other's knowledge. Therefore, every live event is a big asset for all participants. Today's problems and tomorrow's questions are discussed together, and new networks are always created. The prostep ivip Association is about more than just a product. New goals are worked out together, new ideals are explored and implemented. The powerful energy that all these people bring to our community motiva-

tes us to make these ideas and ideals even more visible: Whether at events, in social media, as a film or published publication. The trust that people place in each other here is not something that can be taken for granted. For me, the prostep ivip Association is a role model for cross-border cooperation, where the common goal is greater than the interests of individuals. For me, the interplay of people and creative ideas makes the prostep ivip Association an exciting place to work. What are we tackling today?

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## **Nora Tazir**

Technical Program Manager



## **Sabrina Reis**

Project controlling  
and member support

I am the first point of contact for all association members and external interested parties. I try to conscientiously answer all kinds of inquiries about the prostep ivip Association and, if necessary, coordinate them with those responsible within the association. Member support also includes supporting new members and ensuring that various club mailing lists and lists of members are up to date, as well as organizing general meetings of members.

In addition to looking after members, project controlling is also one of my

tasks. I ensure that the projects in the technical program stay within their respective budgets, that the offers and invoices from the service providers are correct and fit the respective project budget. In addition, there is communication with the project managers to release the respective documents.

With more than ten years of experience at prostep ivip, I am very familiar with the processes and procedures in the association and I am always available to provide the association members with competent advice and support.

As Technical Program Manager, I am responsible for the 20 to 30 technical project groups that form the core of the prostep ivip Association. The association offers a neutral platform on which stakeholders from different companies work together to develop solutions to cross-company challenges of all kinds. In addition to coordinating the various project topics, my tasks also include establishing cross-thematic connections and identifying interfaces. I also accompany new topics on their way from the project idea to the ongoing project group. It is always

important to bring people from different areas with the same interests together and exchange ideas.

The close coordination with our party organizations, both nationally and internationally, is an exciting field. Commonalities and the same interests of different sectors, such as the automotive industry and the aerospace industry, are recognized and brought together, but also the interaction between different cultures and the joint development of successful solutions contribute to the diversity of my work.

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