



Business plan for a DIN SAE SPEC project  
according to the PAS procedure on  
**"Terms, definitions, and characteristics for  
the use of digital twins in electric vehicles"**

Status:  
**for developing DIN SPEC after adoption on  
04.07.2023**

Requests to participate in the project and/or comments on the  
business plan are to be **submitted by**  
**2023-01-10** to [yihan.chen@din.de](mailto:yihan.chen@din.de)<sup>1</sup>

Recipients of this business plan are requested to name **all patent rights**  
known to them to be relevant to the project and to make available  
all supporting documents.

Berlin, 2023-07-07 (Version 2)

---

<sup>1</sup> Applications for participating in the project and comments on the business plan that are not received by the deadline do not need to be taken into consideration. Once constituted, the project workshop will decide whether or not to consider the comments received in good time.

## Table of contents

1. Status/version of the business plan.....	3
2. Initiator and other consortium members .....	3
3. Objectives of the project.....	4
4. Work programme.....	6
5. Resource planning .....	6
7. Rules of cooperation in the DIN SAE SPEC consortium .....	8
8. Contacts .....	9
Annex: Project schedule (preliminary) .....	10

## 1. Status/version of the business plan

- **For public commenting (Version 1)**

This business plan is intended to inform the public of a new DIN SAE SPEC project. Any interested party can take part in this project and/or comment on this business plan. Please send any requests to participate or comments by e-mail to [yihan.chen@din.de](mailto:yihan.chen@din.de).

Once this business plan is published, the Chairman of DIN's Executive Board decides whether or not the project is to be carried out.

If the project is accepted, all those who have applied for participation or have commented on the business plan by the deadline will be invited to the kick-off meeting of the project consortium.

- **For developing the DIN SAE SPEC after adoption on 4<sup>th</sup> July 2023**

Changes to the previous version 1:

- Title page, Section 1: Status changed to “For developing DIN SPEC after adoption on 04.07.2023”, as well as an update of the consecutive revision number (version 1 → version 2)
- Section 2: Table of participating organizations added
- Section 4: Kick-off meeting statements adjusted → e.g., “The kick-off took place [...]”
- Section 7: Information on consortium leader added

## 2. Initiator and other consortium members

- Initiator:

Person/Organization	Short description
Dr. Markus Schütten, MHP Management and IT-Consulting (a Porsche Company)	MHP is a consultancy specialized in IT and process consulting in the automotive and manufacturing sectors.

- Other potential participants:

This DIN SAE SPEC will be developed in a consortium (temporary body) that is open to any interested party. The participation of other experts would be helpful and is desired. It is recommended that

- Research establishments for IoT environments
- Cloud providers

- IoT equipment suppliers
- Developers in the field of IoT
- etc.

take part in the development of this DIN SAE SPEC.

- Organizations<sup>2</sup> that have registered for participation:

Person	Organization
Dr. Markus Schütten	MHP Management und IT-Beratung
Dr. Pouyan Asgharzadeh	MHP Management und IT-Beratung
Adam Rasheed	Amazon Web Services
Ashish Naik	Amazon Web Services
Mike Tzamaloukas	Amazon Web Services
Jonathan Kyle	Amazon Web Services
Dr. Enno Kätelhön	Accenture GmbH
John Tintinalli	SAE International
Yihan Chen	DIN Deutsches Institut für Normung e. V.

- Organisations that have adopted this business plan (consortium members):

Person	Organization
Dr. Markus Schütten	MHP Management und IT-Beratung
Dr. Enno Kätelhön	Accenture GmbH
Ashish Naik	Amazon Web Services
Sven Kauffeld	Amazon Web Services
Yihan Chen	DIN Deutsches Institut für Normung e. V.

### 3. Objectives of the project

#### 3.1. General

As digital twin research and development intensifies and commercialization is under way in previously unthinkable fields of application, various industry stakeholders have expressed an urgent need to establish a common language and understanding across industries, particularly with regard to the application in IoT environments, e.g. automotive. In the current discussion on simulations, virtual models, and real-time data applications, specific terms such as “digital twin” or “modelling” are frequently misrepresented or used in multiple contexts. Terms also differ among countries.

There is a certain urgency to harmonize digital twin characteristics, as it is a necessary precursor to the standardization of simulations across technology providers and even industries.

To meet this urgency, a document providing terms and definitions as well as characteristics of digital twins will be developed and subsequently be offered for international adoption and translation into other languages to facilitate communication among all stakeholders.

### **3.2. Planned scope**

This document defines terms, definitions and characteristics pertaining to digital twin technology for their use in electric vehicles (EVs), and a framework to help users categorize their use cases in EVs. This document serves as a foundation for upcoming developmental steps and scaling activities. The document also serves as a facilitator to improve communication between international cross-industry partners. This document does not provide requirements for industry-specific use cases, nor does it define requirements for algorithms, testing data, validation procedures, deployment. The standard is supposed to provide a glossary and a common understanding of a complex, interdisciplinary field, and is directed towards researchers, developers, cloud providers, and IoT equipment suppliers.

### **3.3. Related activities**

The subject of the planned DIN SAE SPEC is not at present the subject of a standard. However, there are committees, standards and/or other technical rules that deal with related subjects and thus need to be taken into account - and involved or incorporated, where necessary - in this project:

- DIN SPEC 91406:2019-12 - *Automatic identification of physical objects and information on physical objects in IT systems, particularly IoT systems*
- DIN IEC/TS 63188\*VDE V 0824-1:2019-08 - *Smart Cities – Smart Cities Reference Architecture Methodology*
- VDI/VDE 2206:2021-11 - *Development of mechatronic and cyber-physical systems*
- VDI/VDE 3693 Blatt 2:2018-12 - *Virtual commissioning - Introduction of virtual commissioning in companies*
- VDI 4497:2020-09 - *Employment of emulation in realization of automated logistics systems*
- ISO 23247-1 - *Automation systems and integration — Digital twin framework for manufacturing — Part 1: Overview and general principles*
- ISO 23247-2 - *Automation systems and integration — Digital twin framework for manufacturing — Part 2: Reference architecture*
- ISO 23247-3 - *Automation systems and integration — Digital twin framework for manufacturing — Part 3: Digital representation of manufacturing elements*

- ISO 23247-4 - *Automation systems and integration — Digital twin framework for manufacturing — Part 4: Information exchange*

#### **4. Work programme.**

The aim of the project is to develop a DIN SAE SPEC according to the PAS procedure (see [www.din.de/go/din-spec-en](http://www.din.de/go/din-spec-en)). The DIN SAE SPEC shall be consistent with the body of German standards and shall not be in conflict with any DIN Standard.

The kick-off meeting took place on 2023-07-04 **online** via MS Teams Meeting. The project duration will be about 4 months.

At this kick-off meeting, the consortium for developing the DIN SAE SPEC was constituted, further organizational issues were decided on and clarified, and, where possible, work on the subject matter began.

A draft for public commenting will not be published.

A total of 2 project meetings (kick-off meeting and work meeting) and 4 web conferences will be held online, during which the content of the DIN SAE SPEC will be presented, discussed, and approved. The content of the DIN SAE SPEC can be drawn up by individual consortium members or in working groups.

Dates of further meetings and/or web conferences were agreed on within the consortium in consultation with DIN.

The DIN SAE SPEC will be drawn up in English (language of meetings, minutes, etc.). The DIN SAE SPEC will be written in English.

**NOTE** The calculation covers only one language version. Please keep in mind the fact that other language versions involve additional expenses; for this reason, they shall be agreed on separately. If another language version is desired, Beuth/DIN can provide a translation. Requests for translations are to be submitted after the DIN SAE SPEC manuscript has been approved for publication.

#### **5. Resource planning**

Each consortium member shall bear the expenses he/she incurs as a result of participation in the project.

The performance of this project as set out in the programme of work will result in DIN incurring costs to a total of 30.000 euros, excluding VAT. Additional services give rise to additional costs. Sharing the burden of these costs is a prerequisite for membership in the consortium. By adopting this business plan, consortium members declare their willingness to bear their share of the project costs, which is based on the number of consortium members. Each consortium member is to declare this willingness to take on his/her share of costs by individual agreement with DIN.

If the consortium is expanded later, the additional consortium members shall pay DIN the same fee to cover costs as the original consortium members.

DIN is obliged to use the financial resources that have been made available to him/her by the consortium members solely for purposes furthering the project, and to return any surplus amount in equal parts to all consortium members without delay.

## **6. Foundation and expansion of the consortium**

The consortium will be constituted during the course of the kick-off meeting. The kick-off meeting will not take place until the business plan has been published and approved by DIN's Management Board. The consortium shall comprise at least three members from different organizations. It is not necessary that these members come from different areas and represent different stakeholders. By approving this business plan, the interested parties declare their willingness to participate in the consortium and will be formally named (the organization) as consortium members, with the associated rights and duties. Participants at the kick-off meeting who do not approve the business plan are not given the status of a consortium member and are thus excluded from further decisions made during the kick-off meeting and from any other decisions regarding the project.

As a rule, the consortium is closed once it is constituted. The current consortium members shall decide whether any additional members after the consortium is closed will be accepted or not.

Any expansion of the consortium at a later date after the consortium was closed is decided on by the members making up the consortium at that time. It is particularly important to consider these aspects:

- a) expansion would be conducive to shortening the duration of the project or to avoiding or averting an impending delay in the planned duration of the project;
- b) the expansion would not result in the project taking longer to complete;
- c) the new consortium member would not address any new or complementary issues beyond the scope defined and approved in the business plan;
- d) the new consortium member would bring complementary expertise into the consortium in order to incorporate the latest scientific findings and state-of-the-art knowledge;
- e) the new consortium member would actively participate in the drafting of the manuscript by submitting concrete, not abstract, proposals and contributions;
- f) the new consortium member would ensure wider application of the DIN SAE SPEC.

During the kick-off meeting, the consortium members shall elect a consortium leader, who is responsible for content management and any decision-making and voting procedures. The leader is supported by the responsible DIN Project Manager, whereby DIN will always remain neutral regarding the content of the DIN SAE SPEC. Furthermore, the DIN Project Manager shall ensure that DIN's rules of procedure, rules of presentation, and the principles governing the publication of DIN SAE SPEC have been observed. Should a consortium leader no longer be able to carry out his/her duties, the DIN Project Manager shall initiate the election of a new leader.

The DIN Project Manager is responsible for organizing and leading the kick-off meeting, in consultation with the initiator. Further project meetings and/or web conferences shall be organized by the DIN Project Manager in consultation with the consortium leader.

## **7. Rules of cooperation in the DIN SAE SPEC consortium**

This project is governed by the PAS procedural rules. All interested parties and consortium members are to inform themselves of these procedures by going to [www.din.de/go/din-spec-en](http://www.din.de/go/din-spec-en).

If an organization (e.g. an association) sends someone who is not an employee to the consortium, this person shall be authorized by the organization, who shall provide proof of this to DIN.

Each consortium member is entitled to vote and has one vote. If an organization sends several experts to the consortium, that organization has only one vote, regardless of how many consortium participants it sends. Transferring voting rights to other consortium members is not permitted. During voting procedures, decisions are passed by simple majority; abstentions never count.

If consortium members cannot be present when the DIN SAE SPEC or its draft is approved, an alternative means of including them in the voting procedure shall be used (e.g. in writing, electronically).

All consortium members who voted for the publication of the DIN SAE SPEC or its draft will be named as authors in the Foreword, including the organizations which they represent. All consortium members who voted against the publication of the DIN SAE SPEC or its draft, or who have abstained, will not be named in the Foreword.

To allow the legal reproduction and distribution of results for the purposes of project work, the consortium members grant DIN rights of use on the basis of the copyright that will accrue to them for the results of their work on the DIN SAE SPEC. The transfer of these utilization rights does not prevent the consortium members from using and further developing the knowledge, experience and findings they bring to the project.

Consortium members are requested to inform DIN of all patent rights known to them to be relevant to this DIN SAE SPEC project.

Subsequent changes to the scope (Section 3.2) or to the resource planning (Section 5) require, in addition to a two-thirds majority of all votes cast, the approval of DIN.

## 8. Contacts

- Consortium lead:  
Dr. Markus Schütten  
MHP Management und IT-Beratung  
Königsallee 49  
71638 Ludwigsburg  
markus.schuetten@mhp.com
- Project managers:  
Yihan Chen  
DIN Deutsches Institut für Normung e. V.  
Am DIN-Platz  
Burggrafenstraße 6  
10787 Berlin  
Tel.: + 49 30 2601-2353  
Fax: + 49 30 2601-42353  
e-mail: yihan.chen@din.de
- Initiator:  
Dr. Markus Schütten  
MHP Management und IT-Beratung  
Königsallee 49  
71638 Ludwigsburg  
markus.schuetten@mhp.com

## Annex: Project schedule (preliminary)

DIN SAE SPEC project	2022				2023												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
<b>Initiation</b>																	
1. Request and review																	
2. Business plan drawn up																	
3. Publication of business plan																	
<b>Development phase</b>																	
4. Kick-off meeting/consortium constituted																	
5. DIN SAE SPEC drawn up																	
6. DIN SAE SPEC approved by consortium																	
<b>Publication</b>																	
7. Review and release by DIN																	
8. Publication of DIN SAE SPEC																	
<b>Milestones</b>																	

- K** Kick-off
- M** Project meeting
- W** Web conference
- A** Adoption of DIN SAE SPEC