Business plan for a DIN SPEC project according to the PAS procedure on

„Goals, Methods and Metrics for Automated/Semi-Automated Runtime Monitoring of AI Systems for Non-Adversarial Performance Degradations“

Status:

For developing the DIN SPEC after adoption on 2024-10-11

Requests to participate in the project and/or comments on the business plan are to be submitted by 2024-10-08 to adrian.seeliger@din.de[1]

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, 2025-04-14 (Version 2)

[1] 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.

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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 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 Adrian.seeliger@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 SPEC after adoption on 2024-10-11 (Version 2)**

  Changes to the previous version 01:

  – e.g., Section 2: Table of participating organizations added

  – e.g., Section 7: Information on consortium leader added

2 Initiator and other consortium members

- **Initiator:**

Person/Organization	Short description
Yunus Bulut, Validaitor UG	VALIDAITOR is a spin-off from the Karlsruhe Institute of Technology (KIT), pioneering the development of tools to ensure quality in Artificial Intelligence. The platform offers comprehensive testing and validation capabilities for AI systems, allowing companies to enjoy fast iteration while adhering to AI regulations. With a unique out-of-the-box testing and continuous compliance approach, the platform enables companies to automate their AI quality assurance and achieve continuous certification. VALIDAITOR partners with companies to evaluate their AI systems as external auditors, providing insights into the quality of AI systems and facilitating the adoption of a comprehensive AI risk and quality management framework. Drawing on the academic excellence of KIT, VALIDAITOR supports the adoption of trustworthy and responsible AI best practices.

- **Other potential participants:**

This DIN 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

– AI developers, testers and auditors

– etc.

take part in the development of this DIN SPEC.

- Organizations that have registered for participation

Person	Organization
Yunus Bulut	Validaitor
Michael Graf	Validaitor
Sebastian Krauß	Validaitor
Henri Meeß	Fraunhofer IVI
Jens Ziehn	Fraunhofer IOSB
Masoud Roschani	Fraunhofer IOSB
Adrian Seeliger	DIN e.V.

- **Organizations**[Fehler! Textmarke nicht definiert.]**, that have adopted this business plan (consortium members):**

Person	Organization
Yunus Bulut	Validaitor
Michael Graf	Validaitor
Sebastian Krauß	Validaitor
Daniel Weimer	Ceel.Ai
Jens Ziehn	Fraunhofer IOSB
Anne Sielemann	Fraunhofer IOSB
André Meyer-Vitali	DFKI
Jingxing Zhou	Porsche Engineering
Oliver Maspfuhl	Deutsche Bank
Adrian Seeliger	*DIN*

3 Objectives of the project

3.1 General

The monitoring of system components that are using artificial intelligence (AI), including but not limited to machine learning (ML), is a critical task during the operation. On a technical level, the operation of systems at advanced levels of autonomy requires the monitoring of these systems either by another system, by own capability of monitoring itself or by the involvement of some humans. The health of the systems using AI can degrade over the operation time for various reasons. These reasons can include, but are not limited to:

- A degradation of the internal AI system, e.g., through flawed updates or erroneous learning

- A degradation of the surrounding technical systems, e.g., through wear and tear in sensors or actors.
- A “domain shift” in the operational environment, for example changed lighting conditions, changed seasons, changed population characteristics, etc.
- A “concept drift” due to changes in the meaning of concepts over time or location, as well as the emergence of new semantic concepts.

Note: Cyber security-related monitoring is excluded from the scope of this specification and left for future work.

To support the implementation of technical measures during the runtime of an AI component of a system, this specification provides guidance on methods and metrics that can be used to detect a degradation in AI component health or performance at runtime, and that – to a certain degree – can operate without or with only limited human supervision. The implementation of such methods can then enable the selection of adequate, use case-dependent thresholds on which external measures, such as a re-evaluation or maintenance of the system are prescribed.

3.2 Planned scope

This document defines methods and metrics that allow to measure the degradations in performance and health of AI-based systems and to detect their operational anomalies, including guidance regarding the following topics:

- Applicability of the method or metric for a given AI component of a system
- Suitability of the method or metric given a type of expected degradation,
- Reference implementations of the methods and metrics for the exemplary use cases,
- Factual background information on statistical measures and their characteristics.

Cyber security-related monitoring is excluded from the scope of this specification and left for future work.

This document is intended for "AI developers", "AI testers" and "AI auditors".

3.3 Related activities

The subject of the planned DIN 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:

- *ISO/CD 27090 as the interface to the (here excluded) cybersecurity perspective*
- *ISO 26262, ISO 21448, ISO 8800, CENELEC 50126, primarily from the perspective of testing before operation*
- *EU AI Act & EU Machinery Regulation*
- *DIN SPEC 91516 as a benchmark for AI performance*
- *DIN SPEC 92001-1*
- *DIN SPEC 92001-2*
- *DIN SPEC 92001-3, all of the above in the context of evaluating AI systems*
- *DIN SPEC 92005 to address uncertainty aspects in monitoring*
- *DIN SPEC 92006 to address the role of physical objects*
- *ISO/IEC JTC 1/SC 42 / NA 043-01-42 GA DIN/DKE Gemeinschaftsarbeitsausschuss Künstliche Intelligenz*

4 Work programme

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

The kick-off meeting is planned to take place on 2024-10-09 in Berlin/virtually. The project duration will be about 3 months.

At this kick-off meeting, the consortium for developing the DIN SPEC will be constituted, further organizational issues will be decided on and clarified, and, where possible, work on the subject matter will be begun.

A draft for public commenting will not be published.

A total of 3 project meetings (kick-off meeting and work meetings) and 3 web conferences will be held, during which the content of the DIN SPEC will be presented, discussed and approved. The content of the DIN SPEC can be drawn up by individual consortium members or in working groups.

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

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

If the DIN Executive Board approves the project, the initiator of the project will then conclude a contract with DIN.

Consortium membership and participation in the project meetings is free of charge until the end of the year 2024, as the costs incurred by DIN throughout the performance of this project will be financed by funding from the research project "Geschäftsstelle KI" funded by the Bundesministerium für Wirtschaft und Klimaschutz/BMWK (funding reference: 46DIN21F5).

6 Rules of cooperation in the DIN 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.

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[2]. 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 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.

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.

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

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 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 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.

If consortium members cannot be present when the DIN 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 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 SPEC or its draft, or who have abstained, will not be named in the Foreword.

Any expansion of the consortium at a later date 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;

[2] Organizations are legal entities and natural persons, insofar as they participate in business transactions on a commercial or freelance basis. If several legal entities are part of a group or a corporate structure within the meaning of Section 15 of the German Stock Corporation Act (§ 15 Aktiengesetz) or Section 271 (2) of the German Commercial Code (§ 271 Absatz 2 Handelsgesetzbuch), they are deemed to be one organization.

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 SPEC.

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 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 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.

7 Contacts

- **Consortium leader:**

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Annex: Project schedule (preliminary)

DIN SPEC Project	2024													2025		
	Jun		Jul		Aug		Sep		Oct		Nov		Dez		Jan	Feb	Mar
Initiation																	
1. Request and review																	
2. Business plan drawn up																	
3. Publication of business plan																	
Development phase																	
4. Kick-off meeting/consortium constituted																	
5. DIN SPEC drawn up																	
6. DIN SPEC approved by consortium																	
Publication																	
7. Review and release by DIN																	
8. Publication of DIN SPEC																	
Milestones								**K**	**W**	**W**	**W**	**W**	**W**	**A**			

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