Tender

Blockchain Ideas Competition

October 2023

Content

1 Preamble

With the increasing digitalisation of society and the economy, new business processes, products, and services are emerging. In this digital transformation a key technology is distributed ledger technology. As the most widely used distributed ledger technology, the blockchain represents a powerful tool that enables transactions and information to be stored and managed in a tamper-proof, transparent, and secure manner through a decentralised and distributed database. The blockchain is a continuously expandable list of records in individual blocks. Each block contains a group of transactions and is linked to the previous block by a cryptographic hash value. In addition to the hash value and transaction data, each block contains a timestamp. This creates an unchanging and chronological sequence of transactions, which makes it impossible to manipulate or erase the existence or content of the earlier transactions without simultaneously changing all later transactions as well. A blockchain is based on three characteristics: decentralisation, immutability, and consent. Therefore, blockchain applications are used in decentralised networks with many participants when a state needs to be represented in a tamper-proof way. There are different types of blockchain networks: public, private, hybrid, and consortial.

In addition to a multitude of opportunities, however, there are still some significant challenges that have hindered the wider use of blockchain technology in a wide variety of contexts. A key disadvantage for blockchain applications is their latency or time responsiveness. As the number of users increases, more time is needed for processing and confirmation. In addition, blockchain applications usually require a lot of computing power and therefore have a very high energy consumption. There is also a technical and organisational implementation effort, which requires trained personnel. In addition, there are security risks in the storage of private keys and in the management of user identities. Depending on the use case or the product market fit, the cost-benefit considerations diverge.

With the digitalization strategy for Baden-Württemberg, the state government is providing an important impetus for the integration of blockchain technology into Economy 4.0 . Even if the expected blockchain potentials have not yet been comprehensively realised, the state government sees multiple opportunities to tap into these potentials.

Blockchain and other distributed ledger technologies are already well established in Baden-Württemberg and networks and initiatives already exist. Baden-Württemberg benefits from an excellent and broad-based research landscape of academic and non-academic institutions that

make important contributions in basic and applied research in the field of blockchain and distributed ledger technologies. These strengths are to be further expanded through the **Blockchain Ideas Competition**. Applications can benefit from this in areas such as health, climate protection, the environment, and mobility.

2 Aim and subject of the call

The **Blockchain Ideas Competition** serves to examine novel, innovative, and sustainable use cases of distributed ledger technology (including blockchain) in terms of their economic, technological, and social feasibility and possible implementation within the framework of feasibility studies. The aim here is to identify important risks and evaluate solution approaches regarding their prospects of success. Also, to facilitate decision-making by objectively and rationally presenting strengths and weaknesses as well as opportunities and threats. This includes an analysis of the resources required to carry out a project and the prospects of success, with a particular focus on technical feasibility and market potential. It also includes a consideration of the advantages and potentials for the state of Baden-Württemberg. Only blockchain or distributed ledger technologies that do not have increased energy consumption compared to conventional solutions and are compliant with data protection regulations should be used.

Feasibility studies can be carried out as individual projects or joint projects—in which several research institutions cooperate.

The focus is on the following topics:

1. Blockchain/Distributed Ledger Technologies and AI
    - Clear labelling of training data
    - Decentralised storage of training data
    - Democratic provision of training data

2. Blockchain/Distributed Ledger Technologies in Security Applications
    - Digital identity management with blockchain
    - Fraud detection with blockchain

3. Blockchain/distributed ledger technologies in the energy sector
    - Decentralised trading of energy
    - Local balancing of energy production and consumption

4. Blockchain/distributed ledger technologies in logistics
    - Clear labelling of goods and products
    - Traceability of flows of goods (e.g., smart contracts as a substitute for customs documents)
    - Assessment of products‘ life cycle
    - Identification of waste generation

5. Blockchain/Distributed Ledger Technologies in Healthcare
    - Decentralised and secure storage of sensitive health data
    - Secure and legally compliant processing of sensitive health data
    - Rights management system for the secure transfer of health data between doctors and/or health care facilities

6. Blockchain/Distributed Ledger Technologies in Production Environments
    - Secure machine-to-machine communication
    - Optimisation through decentralised organisation and control of production processes

In addition to the topics mentioned above, all other fields of application for which blockchain or other distributed ledger technologies are the most suitable solution can be processed. However, applications in the area of financial services—such as cryptocurrencies and second-layer technologies—are explicitly excluded from the Blockchain Ideas Competition.

3 Eligibility

Eligible to participate are publicly basic-financed research institutions as well as non-profit research institutions based in Baden-Württemberg. Industrial cooperation is possible under certain circumstances. Details can be found in the terms and conditions.

4 Terms and conditions

The feasibility studies are carried out on behalf of the Baden-Württemberg Stiftung gGmbH on the basis of a commissioned contract with the research institution (contract research). The Baden-Württemberg Stiftung gGmbH is entitled to the rights arising from the results of the feasibility studies.

Applications can be submitted by individual working groups/research institutions as well as by a consortia of different research institutions. Interdisciplinary approaches to solving complex problems are welcome. In any case, it must be demonstrated that the applicants have all the necessary competences to work on the research project.

Personnel and material costs are financed.

If several partners are involved, a coordinator must be appointed who will be the contact person for the Baden-Württemberg Stiftung gGmbH. They will also be responsible for coordination between the research institutions and for overall project management vis-à-vis the Baden-Württemberg Stiftung gGmbH.

In the case of industrial cooperation, companies are not allowed to receive their own funds, but can be included in a project as subcontractors by the research institutions. The amount that companies can receive as subcontractors is capped at 50% of the total project costs applied for. However, disproportionately high amounts can be a criterion for exclusion during the selection review. Accordingly, the facts must be decided on a case-by-case basis. Research institutions must also bear in mind that companies may only be subcontracted for services. This means that subcontractors may not conduct research themselves, and it must be ensured that the project is oriented in such a way that the project results can also be used by other companies.

Furthermore, the research institutions must work towards concluding suitable non-disclosure agreements with the industrial partners within the framework of contract research. This is to ensure that the knowledge remains with the Baden-Württemberg Stiftung gGmbH.

A single-stage application procedure is planned. The applications must be submitted by the aforementioned deadline and will be evaluated by an independent panel of experts who will submit proposals for a decision to the Baden-Württemberg Stiftung gGmbH.

The most important evaluation criteria are:

- Level of innovation and starting point
- Quality of the scientific-technical approach and work plan
- Experience of the actors and competences in relation to Blockchain/Distributed-Ledger technologies
- Relevance of the market and user potential
- Presentation of the economic usability
- Presentation of the sustainability potentials
- Energy and resource consumption (e.g., for special mining hardware)
- Adequacy of the financial plan.

No reasons will be given for rejection of the project under this call for proposals. There is no entitlement to funding. By submitting the project description, applicants agree to the terms and conditions.

The feasibility studies are to take place between April 1, 2024, and March 31, 2025. They must be completed after nine months. An extension of the project duration will be denied in all cases. The Baden-Württemberg Stiftung gGmbH has up to 1.4 million euros available for the Blockchain Ideas Competition.

5 Application process

All applications from higher education institutions must be submitted via the rectorates and have legally binding signatures. Applications from the area of non-university research institutions must be submitted via the management of the institutions.

6 Deadlines

Applications must be submitted electronically in German or English to the project management organisation by **20.12.2023**, 16:59 (deadline). Applications must be submitted via the submission portal listed in section 8.

7 Scope and content of the applications

The following structure is provided for the application documents.

1. General information

   Title of the project, applicant institution, project leader, total costs

2. Summary

   Brief, general comprehensive description of the project

3. Destination

   Problem definition, objective and approach, identification of the specific market

4. Description of the starting position and the expected added value

   State of the art internationally in research and technology, differentiation of the project from this or the expected added value

5. Choice of distributed ledger technology

   Justification for choosing blockchain/distributed ledger technology and the consensus method in terms of energy and resource consumption, security, data protection, and scalability; explanation of why other types of cryptographically secured databases are not an option for this use case

6. Own preparatory work

   Project-relevant own preliminary work and publications (maximum 5)

7. In the case of joint applications: Description of the division of tasks

8. Description of the main working steps and content

9. Information on staffing

10. Planning

    Work plan, timetable, verifiable, binding, quantitatively defined milestones; Gantt chart

11. Application and marketing potential
12. Financial plan (net cost statement with indication of VAT; if no VAT is shown, it is assumed to be a gross cost statement including VAT):
    - Personnel costs correspond to the DFG's personnel funding rates[1] for the year 2024
    - Summarised total costs
    - In the case of cooperations there must be a clearly separate financing plan that conclusively shows which posts and funds are earmarked for each project partner.

The requested costs may not exceed the amount of EUR 70,000. In the case of collaborative projects, the maximum costs that can be awarded is EUR 100,000 for all applicant institutions together.

The entire application document (incl. title page and bibliography) must not exceed **10 A4 pages** (font size 12p; 1.15 line spacing; at least 2 cm margins).

[1] German Research Foundation

8 Project management

The Baden-Württemberg Stiftung gGmbH has commissioned the project management organisation VDI/VDE Innovation + Technik GmbH (VDI/VDE-IT) with the implementation and supervision of the research programme. This project management organisation is responsible for the organisational management of the programme and is the central contact for the applicants.

The application can be submitted via the submission portal (https://www.vdivde-it.de/submission/bekanntmachungen/2318). An application in PDF format signed by the rectorate of the higher education institution or the management of the research institution must be uploaded to the submission portal. A signature in the PDF document is sufficient. Original submission by post or fax is not required.

Contact persons of the project executing agency are:

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