TRUSTCHAIN
FIFTH OPEN CALL FOR PROPOSALS

Pactus Nexus

(Pactus Novel Exchange for Unified Solutions)

Submitted by:

(Coordinator)

(Partner)

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1. PROJECT SUMMARY

Pactus Nexus (Pactus Novel Exchange for Unified Solutions) is an innovative, open-source blockchain initiative built on the Pactus platform to address the pressing challenges of sustainability, scalability, and security in decentralized technologies. By optimizing the Solid State Proof of Stake (SSPoS) consensus mechanism, Pactus Nexus reduces the consensus process from three steps to two, dramatically improving computational complexity from originally $O(n^2)$ to $O(n)$. This enhancement not only boosts efficiency but also minimizes resource requirements, making the system highly performant and scalable.

One of the project's standout features is its remarkable energy efficiency. Pactus validators operate on devices as lightweight as Raspberry Pi Zero, which consume just 2 watts of power, significantly reducing the environmental impact compared to traditional Proof-of-Work systems.

Pactus Nexus adopts a user-centric design, ensuring real-world relevance and scalability across sectors such as finance, healthcare, and supply chain management. With its plug-and-play framework and compliance with regulatory standards like GDPR and eIDAS2, the project facilitates cross-border data sharing while ensuring interoperability with existing data-sharing frameworks.

Achieving TRL 7, Pactus Nexus will be validated in real-world settings, offering open-source APIs and SDKs to empower developers in creating sustainable decentralized applications. The project builds on prior TrustChain initiatives, incorporating digital identity, data governance, and interoperability solutions to deliver a comprehensive, interconnected blockchain environment.

By blending Sensifai's AI and Web3 expertise with Pactus's cutting-edge blockchain innovations, Pactus Nexus sets a new standard for energy-efficient, scalable, and secure decentralized technologies, aligning perfectly with the objectives of NGI TrustChain Open Call #5. This transformative initiative exemplifies the fusion of sustainability, accessibility, and advanced technology for a unified and trustworthy digital future.

2. APPLICANT BACKGROUND – Team/Consortium Profile
<u>Sensifai: Innovating at the Intersection of AI and Web3</u>

Founded in Belgium in 2016, Sensifai (https://sensifai.com) is an innovative company in artificial intelligence and blockchain technologies. Sensifai is the core partner and lead collaborator with Pactus since its launch date in January 2024. Sensifai serves as the intellectual foundation of Pactus, providing the research base for its consensus protocols. Moreover, the Company works on video and image recognition expertise with groundbreaking advancements in Web3 and decentralized systems. Over the past three years, Sensifai has expanded its focus to include decentralized marketplaces, blockchain architectures, and consensus models, solidifying its position as a leader in the Web3 ecosystem. Among its notable achievements is the launch of Artogenia.com, a pioneering Web3 marketplace for artworks that connects over 1,000 artists worldwide, enabling seamless digital art commerce on a decentralized platform.

As a key partner in the Pactus blockchain project, Sensifai played a pivotal role in developing the Solid State Proof of Stake (SSPoS) consensus model, which powers the Pactus network. This revolutionary consensus mechanism is designed for energy efficiency, scalability, and security, aligning perfectly with the principles of sustainable blockchain innovation. By contributing to Pactus, Sensifai has demonstrated its ability to engineer next-generation blockchain solutions

that address critical challenges in distributed ledger technologies. Sensifai's ability to bridge AI innovation with Web3 technologies showcases its forward-thinking approach in emerging markets. With a portfolio spanning decentralized platforms, blockchain solutions, and AI applications, Sensifai empowers industries with scalable, secure, and user-centric software. This dedication positions Sensifai as a trusted partner for organizations seeking transformative solutions in visual data analysis and decentralized technologies.

Pactus: Where Community Builds Trustless

Pactus (https://pactus.org/) is a unique and innovative blockchain platform designed to be decentralized, user-friendly, and fair. It aims to address the common challenges of scalability, security, and complexity found in other blockchain networks. Unlike traditional blockchains, Pactus uses a novel consensus mechanism called Solid State Proof of Stake (SSPoS). This approach enables fast and secure block creation without the need for delegation or mining, resulting in a system that is both energy-efficient and highly decentralized.

The Pactus network is built to be inclusive and accessible, providing a simple, intuitive GUI application that allows anyone, regardless of technical expertise, to run a node and interact with the platform. This user-friendly approach is further supported by Pactus's percentage-based fee model, ensuring fairness and predictability for all users. This model calculates fees proportionally to the value of transactions. Pactus also enables users to make up to two zero-fee transactions daily, further enhancing its accessibility. In addition to its user-friendly features, Pactus offers a dedicated decentralized storage option, which allows users to purchase storage space that can be renewed annually, leading to reduced costs for data storage and smart contract execution. Pactus's commitment to sustainability is also notable. The network's lightweight nodes can run on a Raspberry Pi Zero using minimal energy, which makes staking and participation in the network more accessible and environmentally friendly. The native coin of the Pactus ecosystem is called PAC, with a fixed supply of 42 million. PAC is used for various purposes, including transaction fees, staking, storage purchases, and access to other services on the platform. Pactus is a community-driven project that encourages participation and collaboration from anyone interested in the decentralized future.

3. DETAILED PROPOSAL DESCRIPTION

3.1 CONCEPT AND OBJECTIVES
The Pactus Nexus project directly addresses the TrustChain Open Call #5 objective by developing a green, scalable, and sustainable Distributed Ledger Technology (DLT) using the energy-efficient Solid State Proof of Stake (SSPoS) consensus mechanism. This user-centric, plug-and-play framework enables a novel exchange of data and value within a unified blockchain environment while ensuring interoperability, regulatory compliance, and enhanced security, particularly in digital identity and data governance. As the market increasingly demands environmentally sustainable, energy-efficient, and user-friendly blockchain solutions, Pactus Nexus meets this need by offering a low-cost, accessible system that seamlessly integrates with existing infrastructures, balancing decentralization with user privacy and technical simplicity.

TrustChain OC5 Challenges and Methodology:
- Pactus Nexus directly addresses the challenge of high energy consumption in DLTs. This is done by using the Pactus platform's SSPoS consensus algorithm, which removes the need for high-energy-consuming processes, making the solution sustainable.

- The project addresses the need for interoperability by designing the solution to integrate with other DLT infrastructures seamlessly
- User-centricity is a core focus, ensuring the final solution meets the needs of diverse end-users, including vulnerable populations, as highlighted by the TrustChain initiative.
- The project follows a co-creation methodology, engaging end-users and relevant stakeholders in the design and validation process.

While some existing projects, such as Tezos, offer more energy-efficient alternatives to Proof-of-Work blockchains, these solutions often lack the plug-and-play approach and user-friendly interface that Pactus Nexus aims to provide. Previous TrustChain initiatives have addressed aspects of digital identity (Open Call #1), data governance (Open Call #2), and data exchange (Open Call #3). Pactus Nexus builds on these, integrating them into a unified framework to enhance interoperability and data management. Our own Pactus platform provides the base consensus mechanism for the project.

Pactus Nexus adopts a user-centric approach by prioritizing user needs and ease of use in the design and development process. This includes a plug-and-play design for easy adoption, open-source APIs and SDKs to empower developers, and a focus on accessibility for diverse user groups. By integrating user feedback and co-creation practices throughout development, the project ensures that the final solution is user-friendly, practical, and addresses the real needs of the end-users. The design focuses on providing solutions that are not only technically sound, but also address the specific requirements of real-world applications. The new value proposition of Pactus Nexus is to provide a <u>sustainable, scalable, secure, and user-friendly framework for DLT applications</u>. The target groups include: a) Developers, who need open-source, interoperable solutions for building decentralized applications; b) Businesses and organizations seeking cost-effective, environmentally responsible, and regulatory-compliant DLT solutions; and c) End-users who desire secure, private, and easy-to-use access to decentralized services across various sectors.

Pactus Nexus contributes to the TrustChain Large Scale Pilot by providing a working solution for a green, scalable, and user-friendly DLT. The project integrates previous work from TrustChain Open Calls and provides a holistic solution that can be further deployed and tested in a real-world setting. Its open-source design and adherence to regulatory standards make it suitable for integration into the TrustChain ecosystem. It also promotes a user-centric approach, which is in line with TrustChain's mission to empower citizens and ensure ethical, democratic values are embedded in the digital landscape.

3.2 PROPOSAL SOLUTION & METHODOLOGY

The **Pactus Nexus** project introduces a novel, open-source framework built on the Pactus blockchain platform to address the core challenges of sustainability, scalability, and security within the landscape of decentralized technologies. The prototype, Pactus Nexus, will serve as a unified exchange layer, facilitating the secure and efficient exchange of data and value, applicable across various sectors. This framework is designed to be a plug-and-play solution, easily integrated with existing infrastructures and systems. The project will focus on creating a modular system that can be deployed in various contexts and is accessible to users with varying degrees of technical expertise.

The Pactus Nexus solution tackles the challenge of high energy consumption in DLTs by utilizing the Pactus platform's Solid State Proof of Stake (SSPoS) consensus mechanism. This mechanism eliminates the need for energy-intensive mining, making it a significantly more sustainable alternative. In terms of scalability, the project will implement methods to optimize data management by exploring ways to reduce the storage demands of the blockchain, as well as to enable consensus-less DLT functionality where applicable. It also ensures interoperability with

existing systems and aligns with the goals of the TrustChain initiative by being open-source, user-centric, and regulatory-compliant. This will be achieved by using the open standards for digital identity management and data governance, and by designing the system in a way that is compliant with GDPR and eIDAS2 standards.
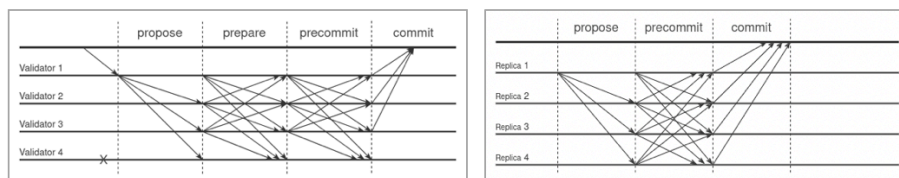

Figure 1. SSPoS Normal Execution (Left), vs. SSPoS Cheetah Execution (Right)

The scientific approach employed by Pactus Nexus will center on a rigorous, iterative, and empirical development process. The design will follow a co-creation methodology, involving end-users and stakeholders from the very start. The team will conduct thorough research and analysis of existing literature and solutions to ensure the design addresses identified gaps. The project will also implement comprehensive testing and validation procedures, both during development and in real-world settings, to ensure that the final product meets the required performance and usability standards. The approach will also include a deep dive into the implementation of the various APIs and SDKs to ensure that these provide full support and usability to the developer community.

The originality and novelty of Pactus Nexus lie in its unique combination of the Pactus platform's energy-efficient SSPoS consensus, its unified exchange layer, and its user-centric design philosophy. While existing solutions address some aspects of these challenges, none provide a comprehensive, open-source framework combining these features in a plug-and-play manner. The project aims to push the boundaries of existing blockchain technology by providing a highly scalable and interoperable platform that is also incredibly easy to use, further enabling its broad adoption across diverse sectors.

Pactus's original innovative Solid State Proof of Stake (SSPoS) consensus mechanism distinguishes itself from traditional consensus protocols by eliminating the need for locking mechanisms and checkpointing. Pactus Nexus enhances the performance even further by considerably reducing complexity to $O(n)$ with having 2 steps as depicted in Figure 1. See Table 1 for comparing consensus protocols.

Table 1. Comparison of Consensus Protocols

	Normal Case		Faculty Case	
Protocol	Steps	Complexity	Locking	Checkpointing
PBFT	3	$O(n^2)$	No	Yes
Tendermint	3	$O(n^2)$	Yes	No
HotStuff	4	$O(n)$	Yes	No
Pactus	3	$O(n^2)$	No	No
Pactus Nexus	2	$O(n)$	No	No

The current maturity of the Pactus platform, upon which Pactus Nexus is built, is at a pre-production stage. The core technology is functional and has been tested with thousands of validators. The Pactus Nexus prototype is in its early development phase. By the end of the project, it is expected to achieve Technology Readiness Level 7 (TRL 7), demonstrating a fully functional prototype that is validated in real-world scenarios. This will include extensive testing in different use cases and the demonstration of its ability to seamlessly integrate within various existing systems. This validation will also include an evaluation of the sustainability and energy efficiency, as well as compliance with regulatory requirements.

Pactus Nexus employs a user-centric design approach that will be a core part of the development process. This is aligned with the user-centric design requirements of the TrustChain Open Call #5. To better understand users' needs, a participatory design methodology will be employed, involving focus groups and interviews with potential users. This approach also includes direct collaboration with organizations in sectors like finance, healthcare, and supply chain management. This will allow for collecting feedback early in the development cycle. Additionally, the project will provide support documentation and tutorials for different users, from developers to end users.

The validation of the proof of concept will include a user sample of approximately 30 to 50 participants from diverse backgrounds including developers, business users, and individual end-users, reflecting the different user groups of the solution. The testing plan will involve a pilot program using a range of scenarios across the use cases of the target sectors. Ethical clearance will be obtained as required for any sensitive data usage, and user data will be handled in compliance with GDPR. A variety of methods will be used for collecting user feedback, including questionnaires, surveys, and direct interviews. Positive feedback will be defined by the participants confirming ease of use, usefulness, and reliability of the Pactus Nexus framework. This will be evaluated by a combination of quantitative data such as ease of use ratings, and task completion rates, and qualitative data including user testimonials and suggestions.

The project's overall methodological approach ensures that the developed solution is technically sound and also practical, user-friendly, and sustainable. This combination of technological innovation, scientific approach, and user-centric validation will make Pactus Nexus an important contribution to the goals of TrustChain Open Call #5 and to the wider goals of a secure, sustainable, and user-friendly digital future.

3.3 EXPECTED IMPACT

The Pactus Nexus project is poised to make significant contributions to the objectives of the TrustChain initiative by directly addressing the challenges of sustainability, scalability, and security in Distributed Ledger Technologies (DLTs). This proposal directly aligns with TrustChain Open Call #5's focus on green, scalable, and sustainable DLTs, offering a practical solution that will help to overcome current limitations in the field. The project will particularly contribute to better acceptance of green DLTs by providing a tangible, user-friendly framework that demonstrates the viability of energy-efficient blockchain technologies. This will be especially beneficial for end-users who are increasingly concerned about the environmental impact of technology.

Pactus validators function with impressively low energy consumption, as they can operate on Raspberry Pi Zero devices that use just 2 watts of power. This contrasts with traditional blockchain networks that rely heavily on energy-intensive mining rigs and high-spec servers. By leveraging a group of personal computers and shared Virtual Private Servers (VPS), Pactus strikes a balance between energy efficiency and high performance.

The project adds significant value to the TrustChain established impact by providing a modular, interoperable framework that can be seamlessly integrated with existing TrustChain solutions and also with other systems. This is particularly important for enabling the wide adoption of the TrustChain ecosystem. By building upon existing concepts and technologies and by delivering open-source APIs and SDKs, Pactus Nexus ensures that the existing TrustChain ecosystem is not fragmented, but enhanced. The project addresses the needs of various target groups by providing a platform that is accessible to a broad range of users, from developers to end-users with different levels of technical expertise.

The industrial impact of Pactus Nexus at the European level and worldwide is expected to be substantial. By providing a practical, scalable, and sustainable alternative to traditional blockchain solutions, Pactus Nexus can lower the barrier to entry for businesses seeking to adopt DLT. This will be particularly relevant for sectors like finance, supply chain management, and healthcare. Measurable indicators of impact will include the number of businesses and developers using the platform, the number of deployed applications, and the reduction in energy consumption compared to other DLT solutions. These will serve as evidence of its practical value and market acceptance.

This project will advance the competitiveness of the Pactus platform by showcasing its potential as a next-generation blockchain infrastructure. By integrating it into the TrustChain framework, it will increase the visibility and the trust associated with the platform. It will also drive further development and adoption of the Pactus ecosystem. This will result in a stronger position in the blockchain market and attract more users and developers. Furthermore, the project's open-source approach ensures that the benefits of the research will be widely available to the global community, furthering the potential for its adoption.

From a socio-economic perspective, Pactus Nexus can create new opportunities for digital innovation and empowerment. Its user-friendly approach lowers the barrier of entry for various groups of people, enabling them to participate in the digital economy in a secure and sustainable manner. Furthermore, its open-source nature ensures that knowledge and innovation are shared freely, promoting collaboration and further innovation. From an environmental perspective, by using the Solid State Proof of Stake (SSPoS) consensus, Pactus Nexus greatly reduces the energy consumption associated with traditional blockchain technologies, thus contributing to a more environmentally sustainable digital economy.

The dissemination and communication plan for Pactus Nexus focuses on maximizing the visibility and accessibility of the project and its outcomes. It includes several key strategies, including:

- **Regular updates**: The project progress will be regularly updated via public channels like project websites and social media.
- **Open source**: All source code and documentation will be made available under an open-source license.
- **Publication of research**: All relevant research will be published in reputable peer-reviewed journals to reach wider audiences.
- **Engaging the community**: Regular webinars, workshops, and online discussions will be organized to share information and solicit feedback.
- **Showcasing achievements**: The project will actively participate in relevant industry events and conferences.
- **Collaborations**: The project will seek to collaborate with other projects and organizations to create joint dissemination activities.

This plan will not only help to reach target audiences but will also build awareness of the project and its benefits.

The project will generate a range of data, including:

- **Performance data**: Metrics about the performance, scalability, and efficiency of the **Pactus Nexus** platform.
- **User feedback**: Feedback from end-users, developers, and other stakeholders collected during user testing and validation activities.
- **Technical documentation**: Technical specifications and documentation for developers.
- **Research findings**: Results of scientific research and analysis conducted throughout the project.

All of this data will be managed responsibly and ethically, following the General Data Protection Regulation (GDPR) and eIDAS2 requirements.

A brief data management plan will involve the following activities:

- Data will be stored securely on encrypted servers with access controls.
- The data will be anonymized whenever possible to protect the user's privacy.
- All data will be maintained with a clear audit trail.
- Only the project team will have access to the data.
- The data will be made publicly available via open repositories and open access channels whenever it is possible to do so without disclosing sensitive user data.

This management plan ensures that all project data is handled with care, maximizing its usefulness while maintaining privacy and regulatory compliance.

Pactus Nexus is more than just a technological advancement; it represents a paradigm shift in how decentralized technologies can be deployed to achieve a more sustainable, inclusive, and user-centric digital future. By integrating with the TrustChain ecosystem, it will empower businesses and individuals with a powerful platform for innovation and collaboration. It will also provide a solution that can be easily used by a broad range of users, therefore driving a wider adoption of decentralized technologies.

In conclusion, through its open-source approach, its focus on interoperability, its energy efficiency, and its commitment to real-world validation, **Pactus Nexus** will have a substantial positive impact, furthering the goals of the TrustChain project and fostering a more sustainable and equitable digital ecosystem for the Next Generation Internet.

3.4 BUSINESS MODEL AND SUSTAINABILITY

The Pactus Nexus project has significant business potential as it addresses critical challenges in blockchain technology, including scalability, energy efficiency, and user accessibility, which are highly relevant in today's market. With the increasing demand for decentralized and environmentally sustainable solutions, Pactus Nexus provides a highly energy-efficient and scalable blockchain framework, powered by the Solid State Proof of Stake (SSPoS) consensus mechanism. This positions the project to capture market segments such as finance, supply chain, and healthcare, where secure and transparent data exchange is crucial. The solution's plug-and-play design, coupled with low operational costs, ensures broad appeal to both enterprises and developers. By offering open-source APIs and SDKs, Pactus Nexus will drive adoption among blockchain developers, fostering a robust ecosystem of decentralized applications (dApps).

The primary target market includes enterprises, small businesses, and developers looking for blockchain-based solutions to enhance operational efficiency while meeting environmental and regulatory standards. Revenue will be generated through a combination of subscription-based models for advanced features, transaction fees on the network, and dedicated decentralized storage sales. Enterprises and developers will be incentivized to adopt Pactus Nexus due to its low energy requirements, which translate to cost savings, and its seamless integration capabilities with existing infrastructures. Additionally, the increasing emphasis on data privacy and regulatory compliance ensures that organizations will recognize the value of this solution.

Pactus Nexus differentiates itself from existing commercial solutions by offering a highly energy-efficient consensus mechanism that can operate on low-power devices like Raspberry Pi Zero, significantly reducing the environmental impact of blockchain operations. Unlike energy-intensive Proof-of-Work systems or traditional Proof-of-Stake models that rely on complex delegation processes, Pactus Nexus ensures scalability, security, and decentralization without

compromising performance. This positions the platform as a cost-effective and sustainable alternative to current blockchain solutions.

To ensure economic sustainability, the project's next steps include building partnerships with industry players, conducting pilot projects in targeted sectors, and expanding the network's ecosystem through developer engagement. Scaling the platform to accommodate more use cases and industries will involve enhanced marketing efforts and the launch of enterprise-grade service packages. The solution's compliance with environmental sustainability is ensured by its energy-efficient architecture, minimal hardware requirements, and alignment with global sustainability goals. These features not only reduce the carbon footprint of blockchain operations but also make the solution appealing to organizations prioritizing green initiatives.

3.5 IMPLEMENTATION

The Pactus Nexus project will be executed over a 9-month timeframe, structured into 4 distinct phases to ensure a systematic progression from concept to validation. In the first phase (Months 1-2), the focus will be on refining technical specifications, analyzing use cases, and conducting co-creation sessions with end-users to ensure their needs are captured. This phase will result in an initial deliverable, including an overview, use case analysis, and preliminary specifications. The second phase (Months 3-4) will focus on technical design, coding, testing, and validation, with the goal of completing the software work plan, demo scenarios, and a preliminary business plan. In Months 5-7, the solution will be deployed, tested, and validated in real-life scenarios, with feedback from end-users contributing to the third deliverable. The final phase (Months 8-9) will involve solution finalization, documentation, code refactoring, and the preparation of a business plan, training materials, and a go-to-market strategy. Throughout the project, co-creation will be emphasized, and necessary ethical and data protection approvals will be obtained. See Table 3.

The co-creation approach will be integrated throughout the entire project lifecycle. End-user feedback will be a key input for decision-making. Regular consultations will be held to incorporate the latest user insights into the development process. This approach is critical for ensuring the solution addresses the needs of the end-users. Also, the entire project team will follow an agile methodology to be able to incorporate user feedback into the process.

The project's management procedures are structured to ensure efficient and transparent execution. A project manager will be responsible for the overall coordination of activities, and also for monitoring and reporting progress against defined milestones. A weekly project team meeting will be held to track progress and also to make any necessary adjustments. The resources employed include the team's expertise (developers, system architects, and experts), development tools, testing infrastructure, and access to the TrustChain community and network. The allocation of resources will be continuously evaluated to ensure the project's objectives are met on time and on budget.

Throughout the project, the team will be following all the ethical requirements and also all the GDPR requirements. A data protection impact assessment will be carried out to ensure data privacy for the users. All the user data will be managed safely and according to regulations. The project team will also get ethical approval if required.

Risk Management Plan (outline) – The Pactus Nexus project incorporates a comprehensive risk management strategy to proactively identify, evaluate, and mitigate potential challenges that could impact project outcomes. Technical risks, such as implementation challenges, unexpected bugs, or compatibility issues with existing TrustChain solutions, will be addressed through rigorous testing, continuous integration, and regular code reviews to ensure high-quality software.

A dedicated technical team will work closely to resolve any issues promptly, ensuring the system's reliability and seamless interoperability.

To manage market risks, including low user adoption or the emergence of competing solutions, the project will implement a robust user validation process and detailed business analysis to align with market needs. This includes stakeholder engagement, pilot testing in real-world scenarios, and iterative feedback loops to refine the solution based on end-user requirements. Regulatory risks, such as changes in compliance requirements, will be mitigated by actively monitoring evolving regulations and maintaining alignment with frameworks like GDPR and eIDAS2. Regular consultations with legal and regulatory experts will ensure the project remains compliant, minimizing any potential roadblocks to adoption. This proactive approach ensures the project is resilient and adaptable, reducing uncertainties and supporting successful deployment.

TABLE 2: WORK PLAN

Work plan tasks	Description *	Start	En
Technical Specifications and Use Case Analysis	Refine the project's technical specifications, analyze use cases, and explore existing solutions. Conduct co-creation sessions with end-users to capture their needs.	Month 1	Month 2
Detailed Technical Design and Software Implementation	Complete the software implementation work plan and prepare a demo scenario, including coding, testing, and validation of software.	Month 3	Month 4
Deployment, Testing, and Validation	Deploy, test, and validate the solution in a real-life application scenario with end-users, setting up a test environment, onboarding users, and collecting feedback.	Month 5	Month 7
Solution Finalization and Documentation	Finalize the solution, prepare documentation, and create a business plan including code refactoring and training materials development.	Month 8	Month 9

3.5.1 Deliverables and milestones
TABLE 3: TABLE OF DELIVERABLES AND MILESTONES

#	Deliverable / milestone	Description	Type	Month	TRL
1	D1: State-of-the-art overview, use case analysis, and preliminary technical specification of the solution	This deliverable will present a comprehensive analysis of the state-of-the-art, specific use cases, and initial technical specifications for the proposed blockchain solution, and clarify how it extends or upgrades the state-of-the-art.	Report	2	4
2	D2: Detailed technical specification, software implementation work plan, demo scenarios, and preliminary business plan	This deliverable includes the detailed technical specifications, the software implementation work plan, demo scenarios, and a preliminary business plan, all required to bring the project forward.	Report	4	5
3	D3: Implementation, deployment, testing, demonstration, and validation roadmap and results	This deliverable will cover the implementation, deployment, testing, demonstration, and validation roadmap of the solution in a real-life application scenario. It will also include the results of the validation process with end-users.	Report, Software	7	7

4	D4: Modularized software components ready for distribution, full documentation for developers/users, and final business plan	This deliverable will provide the modularized software components ready for distribution, complete documentation for developers and end-users, and the finalized business plan.	Software, Document	9	7
5	Kick-off event participation	Attend the kick-off event to connect with other third parties and to learn about their project and their contribution to TrustChain.	Event	1	NA
6	Meeting for KPI set-up	Participate in meetings where KPIs will be linked to the funding of the project.	Event	2	NA
7	Midterm event with a pitch contest	Attend the midterm event and present progress according to KPIs with a pitch contest and present a prototype and the deployment scenarios.	Event	5	NA
8	Final event with a pitch contest	Present the project's final solution, including modularized software components, with a demo.	Event	9	NA

Progress monitoring is a key component of the project management strategy. A project manager will oversee all activities, ensuring that progress aligns with defined milestones. Weekly project team meetings will serve to track progress, make necessary adjustments, and ensure efficient and transparent execution. The project team will follow an agile methodology to effectively incorporate user feedback into the development process. The co-creation approach will be central throughout the project, involving regular consultations with end-users to incorporate their insights into the development process. This iterative process ensures that the project aligns with user needs, which is essential for producing a user-friendly and effective solution.

Throughout the project, the team will adhere to ethical and GDPR requirements. This involves conducting a data protection impact assessment to safeguard user privacy and obtaining ethical approval if needed. The project team will manage user data securely, adhering to regulations. The project employs a combination of team expertise (developers, system architects, and domain experts), development tools, testing infrastructure, and access to the TrustChain community. The allocation of resources will be continuously evaluated to ensure the project remains on time and within budget.

Dissemination and Exploitation of Results – The project will employ a multi-channel strategy to share results with stakeholders and end-users, ensuring maximum visibility, accessibility, and engagement. Key activities include hosting webinars and workshops tailored to specific sectors such as finance, healthcare, and supply chain, where stakeholders can experience live demonstrations of the Pactus Nexus platform. Open-source repositories (e.g., GitHub) will be used to publish modularized software components, accompanied by detailed technical documentation and user guides. Periodic updates will be shared via blogs, newsletters, and social media platforms, targeting both technical audiences and non-technical stakeholders. Additionally, the project will actively participate in industry conferences, such as blockchain expos and NGI events, to showcase progress and gather feedback. A dedicated developer portal will facilitate community engagement, offering APIs, SDKs, and forums for feedback and collaboration, ensuring the results are accessible and usable by developers and enterprises alike.