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A Framework for the Profitable Integration of Distributed Ledger Technologies in Enterprise Networks: Open Review

Tan Gürpinar,[*] Michael Henke,[*] Boris Düdder[‡]

Reviewers: Reviewer A, Reviewer B, Reviewer C

Abstract. The final version of the paper "A Framework for the Profitable Integration of Distributed Ledger Technologies in Enterprise Networks" can be found in Ledger Vol. 10 (2025) 47-76, DOI 10.5195/LEDGER.2025.395. There were three reviewers involved in the review process, none of whom has requested to waive their anonymity at present, and are thus listed as Reviewers A, B, and C. After initial review by Reviewers A and B, the submission was returned to the authors with feedback for revision (1A), with Reviewer A recommending "Accept" and B recommending "Decline." The authors resubmitted their work and responded to reviewer comments (1B). Reviewer B provided further feedback but, with a "Resubmit for Review" recommendation, a third "tie-breaker" review was sought from Reviewer C, who provided additional feedback (2A). The authors responded to Reviewers B and C (2B) and resubmitted a version of the manuscript accounting for the reviewers' comments. Reviewers B and C were consulted on the revised submission and provided a final round of feedback (3A), after which the authors made further changes. These changes were accepted by the editors, thus ending the peer-review process. Author responses have been bulleted for reader clarity.

1A. First Round of Review

Reviewer A

Does this paper represent a novel contribution to cryptocurrency or blockchain scholarship?

Yes, important contribution(s)

Please briefly explain why you think the paper makes or does not make a novel contribution.

Publications at the intersection of blockchain and supply chains are rare, but very

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important. This piece gives a very good overview over the topic.

Is the research framed within its scholarly context and does the paper cite appropriate prior works?

- Yes

Please assess the article's level of academic rigor.

Excellent (terms are well defined, proofs/derivations are included for theoretical work, statistical tests are included for empirical studies, etc.)

Please assess the article's quality of presentation.

Excellent (the motivation for the work is clear, the prose is fluid and correct grammar is used, the main ideas are communicated concisely, and highly-technical details are relegated to appendixes).

How does the quality of this paper compare to other papers in this field?

This is one of the best papers in the field.

Please provide your free-form review for the author in this section.

I read the paper with great interest and think that it provides and excellent overview. Given the importance of the legal framework of supply chains, in particular after the adoption of the Corporate Sustainability Due Diligence Directive, I am just wondering whether you could elaborate a bit more on this aspect. For instance, I could imagine many new use cases for blockchain adoptions in order to certify compliance with these legal requirements re sustainability criteria.

Reviewer B

Does this paper represent a novel contribution to cryptocurrency or blockchain scholarship?

No

Please briefly explain why you think the paper makes or does not make a novel contribution.

The paper does not make a novel contribution because it largely reiterates general assumptions and findings already established in existing literature on blockchain profitability, especially with the focus on supply chain management. The proposed profitability factors are hypothetical and based on outdated literature or pilot studies,

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without real-world data to support them.

Is the research framed within its scholarly context and does the paper cite appropriate prior works?

Important references are missing

Irrelevent/spurious references are included

Please assess the article's level of academic rigor.

Unsatisfactory (better than poor but a long way from excellent)

Please assess the article's quality of presentation.

Unsatisfactory (better than poor but a long way from excellent)

How does the quality of this paper compare to other papers in this field?

The paper has some value but it can easily be replaced by better scholarship in the field.

Please provide your free-form review for the author in this section.

Thank you for the opportunity to review your manuscript titled "A Framework for the Profitable Integration of Distributed Ledger Technologies in Enterprises and Enterprise Networks." While your paper addresses a timely and significant topic, there are several areas that require attention to strengthen the clarity and depth of your research. Below, I provide specific feedback on various aspects of your article:

1) Literature & Research Gap: Own of the main stated aim of your paper is to address the gap between the promised and actual business value of blockchain solutions. However, your analysis does not fully succeed in this regard. There is extensive research available on blockchain success factors that is not sufficiently acknowledged. I recommend that you more thoroughly engage with existing literature on blockchain profitability and success factors, particularly those that explore how ecosystem factors contribute to or inhibit success.

2) Research Design: You have chosen grounded theory as your methodological approach, but this raises questions given the availability of established theories that focus on blockchain value and profitability in supply chain management, such as the Transaction Cost Economics or the Principle-Agent Theory. It remains unclear why these established theories were not considered appropriate for your study. It would be helpful to provide a stronger rationale for the choice of grounded theory, especially when your comparison in Figure 1 already suggests a more general assessment of factors affecting profitability across technologies.

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3) Findings and Discussion:

a) You employ an established framework for categorizing the challenges of blockchain solutions, but you do not apply the same rigor when discussing the benefits. This inconsistency makes the analysis feel incomplete and somewhat arbitrary. Established models could be used here to categorize benefits, which would add coherence to your argument.

b) Additionally, your proposed profitability factors come across as highly hypothetical, based largely on literature from 2020 and earlier, as well as proof-of-concept (PoC) projects and pilot studies. Given the limited availability of real-world data, these factors need to be framed more cautiously as potential indicators rather than definitive conclusions. It would also help to clarify the distinction between actual benefits and perceived benefits, as it seems the interviews may reflect perceptions based on widely reported advantages of blockchain, which have already been discussed in both academic and grey literature.

c) Moreover, the distinction between actual and perceived benefits should be central to your analysis, as perceived benefits often influence technology adoption and investment decisions. Acknowledging and exploring this distinction would strengthen the contribution of your paper. The Technology Acceptance Model or Technology-Organization-Environment Framework – which both have been widely applied to analyze the adaption of blockchain solutions – could thereby provide some basic thoughts about the deference in perceived and actual benefits.

4) Design Principles: The six design principles you propose at the end of the article present an interesting contribution and are the most original aspect of your paper. However, they are introduced too briefly and lack sufficient development. These principles could serve as the foundation for a more robust framework, which would indeed be novel and valuable. I encourage you to elaborate on these principles and explore their practical implications for the integration of blockchain technologies.

5) Contribution:

a) Unfortunately, the paper does not fully deliver on its promise to enhance our understanding of how blockchain technology impacts profitability in real-world applications. Instead, it largely reiterates general assumptions and findings already well-established in the literature. To fulfill its potential, the paper needs a deeper integration of existing IT profitability frameworks and concepts from the supply chain literature. Incorporating these would enable a more rigorous analysis of how blockchain technology specifically influences enterprise profitability.

b) Additionally, also the claim that the taxonomy serves as a tool for enterprises to assess their current project status and compare it to others is currently overstated. The taxonomy, as presented, is purely descriptive and used to analyze the interview data. It does not provide guidance on what constitutes successful approaches to blockchain technology, nor

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does it offer insights into what would be a profitable design for blockchain solutions in specific contexts.

In summary, the paper addresses a relevant topic but needs significant revisions to meet its stated goals. A more in-depth engagement with existing profitability theories, an update regarding the current literature in blockchain and supply chain management, a clear distinction between actual and perceived benefits, and a more developed discussion of the design principles could elevate the quality and contribution of the manuscript.

6) Minor Errors:
- p. 4: Reference Downey is not nr. 20 – please check all references again
- p. 4: TradeLens closed operations and was never a purely blockchain solution
- p. 6: Missing a statement about the time frame of the literature research
- p. 7: Why the authors are mentioning here “77 articles from the conducted literature reviews” when they said just before that 50 articles were at the end taken into consideration?
- p. 10: Literature references in the table 1 and 2 are not listed in the article
- p. 13: Second quote is not complete
- p. 18: Table 4: Baas was once a business idea that got mainly obsolete over the last years

1B. Author Response to First Round of Review

Reviewer A

Thank you for the opportunity to review your manuscript titled "A Framework for the Profitable Integration of Distributed Ledger Technologies in Enterprises and Enterprise Networks." While your paper addresses a timely and significant topic, there are several areas that require attention to strengthen the clarity and depth of your research. Below, I provide specific feedback on various aspects of your article:

- Thank you for taking the time to review our manuscript. We appreciate your feedback, which helped us in improving the clarity and depth of our work. We have carefully considered all comments and have made substantial revisions throughout the manuscript. Below, we respond to each specific observation.

1) Literature & Research Gap: Own of the main stated aim of your paper is to address the gap between the promised and actual business value of blockchain solutions. However, your analysis does not fully succeed in this regard. There is extensive research available on blockchain success factors that is not sufficiently acknowledged. I recommend that you more thoroughly engage with existing literature on blockchain profitability and success factors, particularly those that explore how ecosystem factors contribute to or inhibit success.

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- We acknowledge your suggestion to engage more thoroughly with the existing literature on blockchain profitability and success factors. We have revisited and expanded our literature review that already spanned multiple reviews from 2018 to 2023 and tried to particularly focus on studies that examine how ecosystem factors contribute to the success of blockchain implementations. By incorporating recent research on success factors, we have strengthened the analysis and more explicitly addressed the gap between promised and actual value of our work (pages 4, 5).

2) Research Design: You have chosen grounded theory as your methodological approach, but this raises questions given the availability of established theories that focus on blockchain value and profitability in supply chain management, such as the Transaction Cost Economics or the Principle- Agent Theory. It remains unclear why these established theories were not considered appropriate for your study. It would be helpful to provide a stronger rationale for the choice of grounded theory, especially when your comparison in Figure 1 already suggests a more general assessment of factors affecting profitability across technologies.

- We understand you are concerned about the choice of grounded theory as a **methodological framework** over the use of Transaction Cost Theory or Principal-Agent Theory as **established theories**. While our cited prior work already sheds light on blockchain-based financial transactions (transaction cost theory) and governance approaches as well as stakeholder management (principal-agent theory), in this manuscript we are focusing on the profitability of enterprise blockchain solutions. We therefore follow the capabilities theory (as a theoretical lens) that conceptualizes a firm as an administrative unit with a goal to allocate resources efficiently. By analyzing capabilities in dynamic environments, we argue that technologies might not be a source of value on its own, and value might be realized through organizational adaptation that utilizes technologies for creating superior capabilities beyond the boundaries of a focal firm in a network. This is our starting point to theorize by weighing different network capabilities.

- Grounded theory is used as a **methodological approach** - not a theoretical lens. We have added a more detailed explanation of why grounded theory was chosen for this study, emphasizing that it allowed for the development of a framework based on real-world data from actual blockchain integration project teams. Additionally, we explain how grounded theory complements the well-known theories rather than disregards them, specifically in the context of exploring blockchain profitability in enterprise networks (pages 3, 4, 5).

3) Findings and Discussion:

a) You employ an established framework for categorizing the challenges of blockchain solutions, but you do not apply the same rigor when discussing the benefits. This inconsistency makes the analysis feel incomplete and somewhat arbitrary. Established

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models could be used here to categorize benefits, which would add coherence to your argument.

- We understand you are concerned about where the theoretical foundations of the benefits. We re-integrated passages into the paper that had been erased due to paper length. On page 4, we introduce the theoretical framework that is applied to categorize blockchain-caused costs and revenues and described their interrelation to challenges and benefits. On page 9, we discuss the framework established by Cole et al., connecting blockchain benefits to four key blockchain characteristics: distribution and synchronization across networks, use of smart contracts, peer-to-peer network basis, and immutability of data. Following Cole et al., the first three benefit categories - **transparency and visibility**, **traceability**, and **trust and reliability -** are connected to blockchain's characteristic of **distribution and synchronization across networks**. Blockchain's decentralized, consensus-driven structure ensures that all stakeholders access the same data, closing information gaps, and enabling traceability and trust through immutable records and the achieved single source of truth. The fourth benefit category, **automated triggers and decisions**, is tied to the use of **smart contracts**, which autonomously execute processes once predefined conditions are met, enabling process automation. The fifth benefit category, **disintermediation**, is linked to blockchain's **peer-to- peer network basis**, which allows direct transactions between stakeholders, reducing reliance on intermediaries. The sixth benefit category, **data security and accountability**, is tied to the **immutability** characteristic of blockchains and their cryptographic mechanisms, which ensure that data is securely stored and traceable, enhancing accountability. As the focus of the work is more on costs and revenue factors, the description above has not been included into the paper in the highest detail level.

b) Additionally, your proposed profitability factors come across as highly hypothetical, based largely on literature from 2020 and earlier, as well as proof-of-concept (PoC) projects and pilot studies. Given the limited availability of real-world data, these factors need to be framed more cautiously as potential indicators rather than definitive conclusions. It would also help to clarify the distinction between actual benefits and perceived benefits, as it seems the interviews may reflect perceptions based on widely reported advantages of blockchain, which have already been discussed in both academic and grey literature.

- We understand there is a misunderstanding about the nature and source of the profitability factors discussed in the paper. Therefore, we reviewed our methodology section to be clearer about our applied research process in which we interviewed over 40 project leads of current blockchain integration projects and conducted workshops to identify profitability factors from the empirical material. Results were sent back to the respective interviewees for an additional review and confirmation to be sure we don’t deal with subjective perceptions (Table 7 in the appendix). Finally, profitability factors were determined and displayed in the

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profitability matrices as guidance for companies that plan to run blockchain integration projects. Here, a second round of workshops consisting of blockchain scholars, consultants, and developers has been conducted as a peer-debriefing mechanism.

c) Moreover, the distinction between actual and perceived benefits should be central to your analysis, as perceived benefits often influence technology adoption and investment decisions. Acknowledging and exploring this distinction would strengthen the contribution of your paper. The Technology Acceptance Model or Technology-Organization-Environment Framework – which both have been widely applied to analyze the adaption of blockchain solutions – could thereby provide some basic thoughts about the deference in perceived and actual benefits.

- Thank you for your suggestion to use further theoretical frameworks, we think both are a great fit to better understand blockchain adoption. While we did use both the Technology Acceptance Model and the TOE Framework in cited prior work, in this paper we tried to focus on profitability considerations of current blockchain integration projects. Therefore, the analysis is grounded in the understanding that profitability, defined as the difference between total revenues and total costs, is the fundamental measure of business performance. This focus on actual financial metrics aligns closely with the behavioral goal of enterprises to maximize profits. We analyze effects on actual processes, resources, expenses, and potentials to increase revenues to make sure we advance current research stopping at the discussion of subjective perceived benefits. We acknowledge the complexities involved in assessing the profitability of information technologies in general, as highlighted in the paper. Many benefits of blockchain solutions are strategic and intangible. However, our applied theoretical framework supported deriving tangible factors (Fig. 6-9 and Fig. 11) as well as generalized descriptions to guide other organizations (Fig. 10 and Table 4).

4) Design Principles: The six design principles you propose at the end of the article present an interesting contribution and are the most original aspect of your paper. However, they are introduced too briefly and lack sufficient development. These principles could serve as the foundation for a more robust framework, which would indeed be novel and valuable. I encourage you to elaborate on these principles and explore their practical implications for the integration of blockchain technologies.

- Thank you for your feedback regarding the design principles. We appreciate your recognition of their potential contribution to the field. Given the scope (29 pages) and objectives (development of profitability factors) of this paper, we would like to continue working on the design principles and the actual profitability assessment model in a subsequent paper. As we have already received empirical insights on how such a model should function, we wanted to include the current state. Adding further theoretical design considerations for profitability assessment

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models would be interesting but we think it could risk diluting the current core insights and might overwhelm readers with too much information.

5) Contribution:

a) Unfortunately, the paper does not fully deliver on its promise to enhance our understanding of how blockchain technology impacts profitability in real-world applications. Instead, it largely reiterates general assumptions and findings already well-established in the literature. To fulfill its potential, the paper needs a deeper integration of existing IT profitability frameworks and concepts from the supply chain literature. Incorporating these would enable a more rigorous analysis of how blockchain technology specifically influences enterprise profitability.

- Thank you for your feedback regarding the paper's contribution to understanding blockchain's impact on profitability – this has been our exact goal. We appreciate the suggestion to further integrate IT profitability frameworks and models but please note that, while you seem to already have an advanced understanding of blockchain profitability, our current findings are new and advance current literature (please see research gaps and questions) by delivering factors for cost savings based on actual processes and resources as well as potentials for revenue increase. We did collect and continue collecting a large number of IT profitability models that we evaluate alongside specific requirements posed by blockchain technology. This comparison is designed to provide a comprehensive understanding of how existing models can be adapted or extended for blockchain use cases. However, the main focus of this paper is to fill gaps in the literature regarding the identification of blockchain-specific profitability factors first, which remains an underexplored area. In the findings of this paper, we highlight a critical area where further work is needed that focuses on the quantification of profitability factors through real-world data and the development of a detailed profitability model.

b) Additionally, also the claim that the taxonomy serves as a tool for enterprises to assess their current project status and compare it to others is currently overstated. The taxonomy, as presented, is purely descriptive and used to analyze the interview data. It does not provide guidance on what constitutes successful approaches to blockchain technology, nor does it offer insights into what would be a profitable design for blockchain solutions in specific contexts.

- Thank you for your feedback on the practical application of the taxonomy. We appreciate your perspective and the opportunity to clarify this point. In our workshops, we did use the heatmap that is based on the taxonomy to assess the blockchain project’s status and compare it with other companies. The heatmap provides a structured framework that highlights various dimensions of blockchain implementation projects while displaying how other projects are doing, allowing companies to benchmark their progress and identify potential areas for

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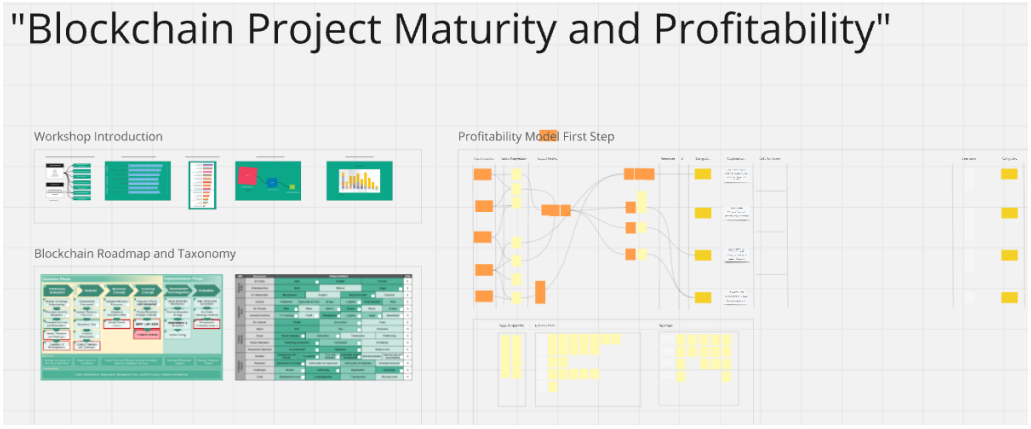
improvement. The examples presented in the revenue matrix aim to inspire practitioners by showcasing potential revenue streams, helping them consider additional application areas that may be relevant to their context. Similarly, the cost matrix offers insights into common challenges and cost considerations, guiding managers in their risk assessment and project planning. To further support the practical value of the taxonomy, we are including a screenshot of a workshop conducted with a company, where the taxonomy was applied to assess the company's blockchain projects. The taxonomy and heatmap facilitated discussions around project maturity and profitability potentials, helping the company identify strategic opportunities for scaling and innovation.



In summary, the paper addresses a relevant topic but needs significant revisions to meet its stated goals. A more in-depth engagement with existing profitability theories, an update regarding the current literature in blockchain and supply chain management, a clear distinction between actual and perceived benefits, and a more developed discussion of the design principles could elevate the quality and contribution of the manuscript.

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6) Minor Errors:

- p. 4: Reference Downey is not nr. 20 – please check all references again

- Thank you, we adapted the references and reached out to the editor to request the use of a citation software to make sure we didn't to manual mistakes. The current template of the journal suggests to implement references manually, which has been a lot of work.

- p. 4: TradeLens closed operations and was never a purely blockchain solution
- Thank you, we adapted the description that said "blockchain-based".

- p. 6: Missing a statement about the time frame of the literature research

- Thank you, we added the time frame of our literature research.

- p. 7: Why the authors are mentioning here "77 articles from the conducted literature reviews" when they said just before that 50 articles were at the end taken into consideration?

- Thank you for this comment. In the course of 2018 to 2023 we conducted several literature reviews. Here we are referring to one that has been used to control the quality of our taxonomy by comparing it to existing taxonomies and other typologies of similar topics. We adapted our text to be more specific.

- p. 10: Literature references in the table 1 and 2 are not listed in the article

- Thank you for this comment. We worked on our references. We also reached out to the editor to request the use of a citation software to make sure we didn't do manual mistakes. The current template of the journal suggests to implement references manually, which has been a lot of work.

- p. 13: Second quote is not complete

- Thank you for this comment. The box needed to be adjusted and now shows the whole quote.

- p. 18: Table 4: Baas was once a business idea that got mainly obsolete over the last years

- Thank you for this comment. We adapted the table.

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2A. Second Round of Review

Reviewer A

Did you review an earlier version of this submission? (If "no," please contact the editor.)

Yes

Has the submission been sufficiently revised to address your previous concerns?

No

If you answered "no" to the previous question, please provide more detailed feedback here.

Thank you for submitting the revised version of your manuscript. While some points have been addressed, others still require further attention.

Profitability Factors: It remains unclear why the profitability factors presented from the interviews are treated as established facts, particularly when "most of the projects are allocated to a Proof-of-Concept (PoC) status" and "only a few projects enter the status of productive systems that actively integrate a running blockchain solution into established processes" (p. 14). In this context, the statement that "The majority of projects featured in the interview study stated that their supply chain processes are improved in terms of transparency, visibility, traceability, as well as automation" (p. 15) should be presented more cautiously. It seems the interviewees are more likely referring to anticipated benefits they hope to achieve with their PoC projects, rather than benefits that have already been realized.

Additionally, it is not clear to what extent these profitability factors can be directly attributed to blockchain technology. This raises a critical question: Is blockchain truly necessary to achieve these benefits, or could they be attained more easily and cost-effectively through other technologies? This uncertainty is precisely why companies often engage in PoC projects—to evaluate the costs and benefits of new technologies. Therefore, the question persists: If most of the applications are still in the PoC stage, how can the interviewees' claims about the benefits of blockchain be considered conclusive? A more cautious approach to analyzing your data is warranted, as the responses seem to reflect various biases.

Given that your data is primarily derived from PoC projects, I am not convinced that this study can genuinely "enhance the understanding of how blockchain technology impacts the profitability of its applying entities" (p. 19), as stated in the conclusion. A more careful interpretation of the data would be appropriate, particularly concerning two points:

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1) How might the responses be biased by the fact that the interviewees are blockchain project representatives who are, in fact, testing the profitability (benefits minus costs) of blockchain technology through PoC projects?

2) Is blockchain truly necessary to achieve the claimed benefits, or might those benefits be more easily and affordably achieved using alternative technologies?

Both of these questions are critical to address when making claims about the profitability of blockchain, especially considering that many PoC projects and blockchain initiatives have failed to deliver the promised benefits. I would therefore recommend making it clearer throughout your study that you are discussing the 'perceived' and 'claimed' benefits and costs (and therefore profitability factors). However, this would also imply that you need to be more careful with the claimed contribution of your study in the light of the current literature and the identified knowledge gap.

Do you have any new concerns specific to this revision?

No

Reviewer C

Does this paper represent a novel contribution to cryptocurrency or blockchain scholarship?

Yes, incremental contribution(s)

Please briefly explain why you think the paper makes or does not make a novel contribution.

It systematizes existing knowledge but methodological choices and lack of critical analysis limit its value

Is the research framed within its scholarly context and does the paper cite appropriate prior works?

Yes

Please assess the article's level of academic rigor.

Good (not excellent but a long way from poor)

Please assess the article's quality of presentation.

Excellent (the motivation for the work is clear, the prose is fluid and correct grammar is

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used, the main ideas are communicated concisely, and highly-technical details are relegated to appendixes).

How does the quality of this paper compare to other papers in this field?

This is a good or average paper.

Please provide your free-form review for the author in this section.

This is a well-written paper and its aspiration is relevant and useful in the field. Author(s) situate the paper well in the literature and define their objectives clearly. The results presented are certainly useful but of somewhat limited value once the methodological limitations are taken into account.

One issue concerns the initial research design, which I found restrictive since the keyword search probably excluded scholarship that is relevant to the intersection of supply chains and blockchain without specifically mentioning it in the title.

A second issue concerns the distinction between proposed/hypothesized profitability parameters and actually observed parameters. It seems that the paper focuses on the former (or it doesn't clarify). While the results obtained are reasonable, it would make the study significantly more useful if we knew with more certainty whether the parameters are hypothetical or are backed empirically. The interviews would be particularly useful in that regard, although they cannot be exhaustive by nature.

Relatedly, how are parameters weighed against each other? Is there a way to know which factors affect profitability more than others?

Moreover, I was wondering if there was some sort of "sanity check" around the results obtained. For instance, on p 12 medium enterprises are in white as opposed to to small and large enterprises, which are in dark grey, so what would explain this result?

Lastly, usually, articles of this kind, which aim to do a literature review/systematization, or present a framework, provide also some critical remarks that go beyond simply putting existing literature together. This could be particularly useful in this paper since it does not result in a unified framework but rather in the clustering of relevant parameters, which all together can result in a framework. It would be useful to get author(s) views on their results/observations. What do their results mean for blockchain profitability, what advice/recommendations result from them etc.

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2B. Authors' Response to Second Round

Reviewer A

Thank you for submitting the revised version of your manuscript. While some points have been addressed, others still require further attention.

Profitability Factors: It remains unclear why the profitability factors presented from the interviews are treated as established facts, particularly when "most of the projects are allocated to a Proof-of- Concept (PoC) status" and "only a few projects enter the status of productive systems that actively integrate a running blockchain solution into established processes" (p. 14). In this context, the statement that "The majority of projects featured in the interview study stated that their supply chain processes are improved in terms of transparency, visibility, traceability, as well as automation" (p. 15) should be presented more cautiously. It seems the interviewees are more likely referring to anticipated benefits they hope to achieve with their PoC projects, rather than benefits that have already been realized.

- Thank you for being careful about the details. We have adapted the text as requested to clarify that while companies indicate realized benefits, these only apply to their MVPs. In terms of fully operational blockchain solutions, these benefits should be considered perceived rather than actualized. Please see page 15 for the revised text. Additionally, we have referenced the maturity assessment in Section 4 to explain our selection of blockchain projects, emphasizing that only a few have reached operational stages. Furthermore, we have revised the third research question to explicitly focus on perceived profitability factors. To further address this point, we also considered adding a section to the related works introducing a recently developed blockchain integration model that outlines profitability assessment steps. This model helps clarify that our study conducts an ex-ante profitability assessment (before full implementation) rather than an ex-post assessment (after the blockchain solution is fully operational). However, as the model is comprehensive and our paper already extends to 30 pages, we prefer to explore the exact profitability assessment steps in a subsequent publication. If you feel otherwise, please let us know.

Additionally, it is not clear to what extent these profitability factors can be directly attributed to blockchain technology. This raises a critical question: Is blockchain truly necessary to achieve these benefits, or could they be attained more easily and cost-effectively through other technologies? This uncertainty is precisely why companies often engage in PoC projects—to evaluate the costs and benefits of new technologies. Therefore, the question persists: If most of the applications are still in the PoC stage, how can the interviewees' claims about the benefits of blockchain be considered conclusive? A more cautious approach to analyzing your data is warranted, as the responses seem to reflect various biases. Given that your data is primarily derived from PoC projects, I am not convinced that this study can genuinely "enhance the understanding of how blockchain

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technology impacts the profitability of its applying entities" (p. 19), as stated in the conclusion. A more careful interpretation of the data would be appropriate, particularly concerning two points:

1) How might the responses be biased by the fact that the interviewees are blockchain project representatives who are, in fact, testing the profitability (benefits minus costs) of blockchain technology through PoC projects?

2) Is blockchain truly necessary to achieve the claimed benefits, or might those benefits be more easily and affordably achieved using alternative technologies?

- Thank you for this feedback. We acknowledge your concern regarding the attribution of profitability factors specifically to blockchain technology. To clarify, our study does not claim that blockchain is the only technology capable of achieving these benefits. Rather, we explore and document how companies perceive and describe profitability factors in supply chain processes associated with blockchain PoCs, pilot projects, and operational solutions. As noted in our revised text on page 15, in the research design, and in the limitations, these findings primarily reflect anticipated benefits. In this study, we capture the current state of industry perceptions regarding its profitability potential. To address your concerns, we also added text describing the consensus among study participants that blockchain solutions in supply chain management will not replace existing ERP software but are implemented as a trust anchor that doesn't compare to centralized server solutions. To address concerns about bias, we have revised several sections of the manuscript ensuring a balanced discussion of profitability factors while transparently acknowledging the limitations of our approach.
- 1) Potential Bias in Interview Responses
  You are absolutely right that the interviewees – primarily blockchain project representatives – may have a bias toward blockchain's profitability potential (some positive and some negative), given their role in PoC initiatives. To address this, we have now also in the revised conclusion explicitly stated that our findings primarily reflect perceived rather than realized profitability factors.
- 2) Blockchain vs. Alternative Technologies
  We fully agree that it is important to critically assess whether blockchain is the best or necessary technology for achieving the reported benefits. We had planned to first identify a wide range of profitability parameters from the literature and expert interviews in this paper, many of which are context-dependent, influenced by factors such as industry, blockchain maturity, and the specific application within the supply chain. Hereby, we show which profitability categories exist in the space and which ones apply to a large number of blockchain projects (as can be obtained from the taxonomy). In a second step we would love to get the chance to receive reviews on a (development just started) tool to trace profitability factors back to particular technological features while also prioritizing them. Therefore, we are working with an impact-chain-analysis to fully address how these factors emerge, interact, and which ones are most influential. We will need to conduct

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additional empirical research that quantitatively assesses the impact of each parameter.

Both of these questions are critical to address when making claims about the profitability of blockchain, especially considering that many PoC projects and blockchain initiatives have failed to deliver the promised benefits. I would therefore recommend making it clearer throughout your study that you are discussing the 'perceived' and 'claimed' benefits and costs (and therefore profitability factors). However, this would also imply that you need to be more careful with the claimed contribution of your study in the light of the current literature and the identified knowledge gap.

- Thank you once again for your valuable feedback. In response, we have taken additional steps to ensure a more cautious framing of our findings. We have clarified throughout the study that our results primarily reflect perceived and claimed profitability factors, particularly in sections discussing the maturity of projects and the nature of PoC evaluations. The theoretical and practical contribution statements as well as the limitations sections have been refined to align with this perspective. We acknowledge the broader context of blockchain initiatives, including cases where expected benefits were not realized, and have described our findings as a foundation for further empirical validation, rather than conclusive proof of blockchain's profitability.

Do you have any new concerns specific to this revision?

No

Reviewer C

Please provide your free-form review for the author in this section.

This is a well-written paper and its aspiration is relevant and useful in the field. Author(s) situate the paper well in the literature and define their objectives clearly. The results presented are certainly useful but of somewhat limited value once the methodological limitations are taken into account. One issue concerns the initial research design, which I found restrictive since the keyword search probably excluded scholarship that is relevant to the intersection of supply chains and blockchain without specifically mentioning it in the title.

- Thank you for your careful consideration of our research design. Our literature search process was indeed extensive and involved multiple steps. We began with an open search that yielded over 37,000 results, as we had problems finding blockchain-specific literature and initially started by screening profitability studies in the broader information systems domain. To ensure clarity and relevance, we then refined our focus. The core of our review, as presented, is based on a search

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across titles, abstracts, and keywords. Your comment made us realize that simply illustrating this in the graphic may not have been sufficient, and a clearer explanation was needed in the text. We have now added this clarification to ensure transparency in our methodology.

A second issue concerns the distinction between proposed/hypothesized profitability parameters and actually observed parameters. It seems that the paper focuses on the former (or it doesn't clarify). While the results obtained are reasonable, it would make the study significantly more useful if we knew with more certainty whether the parameters are hypothetical or are backed empirically. The interviews would be particularly useful in that regard, although they cannot be exhaustive by nature. Relatedly, how are parameters weighed against each other? Is there a way to know which factors affect profitability more than others?

- We have now explicitly clarified in all sections, but mainly in sections 4, 5, and 6 that the study primarily focuses on perceived profitability factors, which were derived from the literature and expert interviews. Additionally, we have referenced the maturity assessment to be transparent about our selection of blockchain projects, noting that only a few have reached operational stages. Furthermore, we have revised the third research question to focus on perceived profitability factors and we have adjusted both theoretical and practical contributions statements as well as the limitations of our study. We also considered adding a new section in the related works to introduce a recently developed blockchain integration model that outlines profitability assessment steps. This model would help clarify that our study addresses an ex-ante profitability assessment (before the blockchain solution is fully operational), rather than an ex-post assessment (after operation). However, as the model is comprehensive and we already have 30 pages of text, we prefer to delve deeper into the exact profitability steps in a subsequent publication. If you feel differently, please let us know

- The question of how profitability parameters are weighed against each other is indeed very interesting for all technologies and complex, given the diverse and sometimes contradictory nature of the factors. Thank you for raising this. We had planned to first identify a wide range of profitability parameters from the literature and expert interviews in this paper, many of which are context-dependent, influenced by factors such as industry, blockchain maturity, and the specific application within the supply chain. Hereby, we show which profitability categories exist in the space and which ones apply to a large number of blockchain projects (as can be obtained from the taxonomy). In a second step we would love to get the chance to receive reviews on a (development just started) tool to prioritize and hierarchize profitability factors in more detail. We are working on an impact-chain-analysis to fully address how these factors interact and which ones are most influential. We will need to conduct additional empirical research that quantitatively assesses the impact of each parameter.

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Moreover, I was wondering if there was some sort of "sanity check" around the results obtained. For instance, on p 12 medium enterprises are in white as opposed to to small and large enterprises, which are in dark grey, so what would explain this result?

- Thank you for your observation regarding the classification of enterprise sizes in our results. We cross-checked our classification and confirmed the correctness. The differentiation in shading in this case (medium enterprises in white, small and large enterprises in dark grey) does reflect the distribution of interview data and observed cases in the literature. Specifically, medium-sized enterprises are underrepresented in both sources, which is consistent with broader industry trends – while small enterprises often engage in the blockchain space as technology providers, and large enterprises initiate PoCs, medium enterprises frequently lack the resources to develop their own solutions and the influence to drive adoption within their networks. We have now clarified this aspect on page 12 and added a discussion part.

Lastly, usually, articles of this kind, which aim to do a literature review/systematization, or present a framework, provide also some critical remarks that go beyond simply putting existing literature together. This could be particularly useful in this paper since it does not result in a unified framework but rather in the clustering of relevant parameters, which all together can result in a framework. It would be useful to get author(s) views on their results/observations. What do their results mean for blockchain profitability, what advice/recommendations result from them etc.

- We also appreciate this suggestion and have now included an additional discussion both in the theoretical contributions and practical contributions section that critically reflects on the results. These sections highlight key insights for blockchain profitability in supply chains and outline practical recommendations for businesses considering blockchain adoption. We also added another part to the limitations of the paper to be clear about the perceived profitability factors.

3A. Final Round of Review

Reviewer A

Did you review an earlier version of this submission? (If "no," please contact the editor.)

Yes

Has the submission been sufficiently revised to address your previous concerns?

Yes

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If you answered "no" to the previous question, please provide more detailed feedback here.

Thank you for your revised version of the manuscript and for incorporating my earlier feedback, particularly in highlighting that your study assesses only the 'perceived' profitability factors. Based on these adaptations, I can conditionally accept the paper for publication. However, I would like to address the following aspects before final acceptance:

1. Tables 1 & 2 – Literature References:
I am still not fully confident that all references in Tables 1 and 2 are accurate - especially in Table 1. For instance, the references cited for "Automated decisions of AI agents and in DAOs" (24 and 33) are not related to blockchain in supply chains. Please carefully check and correct all references - even if this process has to be done manually, as an academic paper cannot be published with incorrect or misleading citations.

2. Missing Critical Studies and Assumption about Profitability:
Currently, the manuscript still seems to implicitly accept that blockchain must provide profitability for supply chains. However, this assumption is not yet clearly proven due to the lack of fully operational and long-running blockchain-based solutions in the industry. Given that many blockchain projects remain at the Proof-of-Concept (PoC) stage or have failed to demonstrate clear profitability (e.g. TradeLens), this remains an open question rather than a given fact. There is also a growing body of critical literature discussing these challenges which could be included in the article (e.g. Lustenberger/Spychiger, 2025; Sternenberg et al., 2021).

That said, this unclear situation actually strengthens the relevance of your research. The fact that blockchain's profitability in supply chains has not yet been definitively demonstrated underscores the need for studies like yours that critically assess its perceived benefits and provide frameworks for evaluating profitability. Therefore, I suggest explicitly framing your study as contributing to this ongoing debate. You could emphasize that while profitability remains uncertain, there is a strong need for structured models that help assess profitability claims in blockchain projects.

Lustenberger, M., & Spychiger, F. (2025). Blockchain in supply chains: an unfulfilled promise. Supply Chain Management: An International Journal. https://doi.org/10.1108/SCM-03-2024-0192

Sternberg, H. S., Hofmann, E., & Roeck, D. (2021). The struggle is real: insights from a supply chain blockchain case. Journal of Business Logistics, 42(1), 71-87. https://doi.org/10.1111/jbl.12240

3. Figures 6 to 11 – Consistent Formatting:
The design of Figures 6, 7, 8, 9, 10, and 11 needs to be harmonized to ensure consistency. Please check whether citations within the figures have spaces between them and apply a uniform format throughout.

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Once these points have been addressed, I would support the publication of your article. I appreciate your efforts in improving the manuscript and look forward to your final revisions.

Do you have any new concerns specific to this revision?

No

Reviewer C

I've gone through the article and I think we can publish it. However, can you please ask them to include more details in Part 3 on how their research (and research design) differs from the extant literature that they review, and why those differences and the ensuing analysis is novel and significant? There is very little in the introduction and I think that one would only be able to appreciate their contribution relative to extant literature if they are already familiar with it and read this entire paper. Adding in Part 3 will readily highlight all that for readers.

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