Peer review history for:

Reviewer A: Round 1
Date completed: 03 May 2024
Recommendation: Accept / Revisions required / **Resubmit for review** / Decline
Conflicts of interest: None

Does the manuscript fall within the scope of SAJS?
Yes/No
Is the manuscript written in a style suitable for a non-specialist and is it of wider interest than to specialists alone?
Yes/No
Does the manuscript contain sufficient novel and significant information to justify publication?
Yes/No
Do the Title and Abstract clearly and accurately reflect the content of the manuscript?
Yes/No
Is the research problem significant and concisely stated?
Yes/**No**
Are the methods described comprehensively?
Yes/No
Is the statistical treatment appropriate?
Yes/No/**Not applicable**/Not qualified to judge
Are the interpretations and conclusions justified by the research results?
Yes/**Partly**/No
Please rate the manuscript on overall contribution to the field
Excellent/Good/**Average**/Below average/Poor
Please rate the manuscript on language, grammar and tone
Excellent/Good/**Average**/Below average/Poor
Is the manuscript succinct and free of repetition and redundancies?
Yes/No
Are the results and discussion confined to relevance to the objective(s)?
Yes/No
The number of tables in the manuscript is
Too few/**Adequate**/Too many/Not applicable
The number of figures in the manuscript is
Too few/**Adequate**/Too many/Not applicable
Is the supplementary material relevant and separated appropriately from the main document?
Yes/No/**Not applicable**
Please rate the manuscript on overall quality
Excellent/Good/**Average**/Below average/Poor
Is appropriate and adequate reference made to other work in the field?

Yes/No

Is it stated that ethical approval was granted by an institutional ethics committee for studies involving human subjects and non-human vertebrates?

Yes/**No**/Not applicable

If accepted, would you recommend that the article receives priority publication?

Yes/**No**

Are you willing to review a revision of this manuscript?

Yes/No

Select a recommendation:

Accept / Revisions required / **Resubmit for review** / Decline

With regard to our policy on 'Publishing peer review reports', do you give us permission to publish your anonymised peer review report alongside the authors' response, as a supplementary file to the published article? Publication is voluntary and only with permission from both yourself and the author.

Yes/No

Comments to the Author:

This research provides a valuable step towards a possible solution for developing countries where many people are part of the unbanked population. The idea of using smart contracts on a blockchain to manage food/shelter vouchers is a great idea with potential. The paper was easy to read and follow, but there are many areas of improvement, especially where detail has been excluded. I assume this was mainly due to the fact that the paper is limited to only 6000 words.

The Introduction can be shortened, and a Literature Review section can be added. The literature review should provide more details regarding the problem and explain what blockchain technology is, including smart contracts. Only then can the "System Functional Requirements" follow as the reader is still in the dark about how a blockchain will solve the problem. A reader with a limited blockchain background will not follow the argument at this stage.

The Introduction mentions the economic inequality, but no mention is made of the educational level of the disadvantaged communities. Economic inequality and education levels are usually linked. I do not recommend that this study now include the education part, but a reference to such a mention can strengthen the study. At this stage of the paper, I had questions regarding how easy this recommended system would be to use. Will the beneficiary require a mobile device? How will they afford it if they are already reliant on vouchers? What about an internet connection? Only later in the paper, the author address these concerns.

General
- Line 104: Why are the words "blockchain technology" used when the abbreviation BCT was introduced in line 96?
- Line 109: The abbreviation VMDS was already introduced in line 98.
- Line 203: The author mentions that "NFT and vouchers are similar in that they are both digital assets…". "Vouchers", in this case, must be written as "digital vouchers" to clarify this statement.
- Line 205: The same comment above applies here as the author states, "…while vouchers are typically digital versions of physical vouchers…".
- Line 227: The following is unclear "..all three of these use cases..". The use cases must be numbered (first, second, etc.) where they are mentioned, or they should be listed here, maybe between brackets, to avoid uncertainty.
- Line 234-235: It should be mentioned that the donor receives a voucher that contains a QR code. The first sentence refers to a voucher, and the second sentence refers to a QR code. It is also unclear if the voucher is a printed document and, if so, what it contains. Does it only have the QR code, or does it display the store name and product as well?
- Lines 236-237: It is unclear how the voucher is claimed and how the transaction is now "securely handled by the blockchain platform".
- Lines 241-243: When does the escrow function release the money it keeps safe? After the

beneficiary redeems the voucher?
- Figure 2: The text is too small. The escrow function lists "Deposited" and "Released". What does this refer to? This links to the previous bullet statement.
- Figure 3: The text is too small to read.

References
- Lines 46, 72: Incorrect referencing style is used.
- Lines 51, 65: Confirm if references 5 and 6 are in the correct place. Should they not be before the period at the end of the sentence?
- Line 78: The statement requires a reference.
- Lines 186-194: References are needed.
- The list of references must be checked to ensure that the correct referencing style (Vancouver) is used. See https://www.sajs.co.za/vancouver-referencing-style. Some of the specific issues I picked up are as follows: URLs should not be underlined; The cited date should be between square brackets; Some article publication dates have been omitted.

Technical
- The grammar and language can be improved.

Author response to Reviewer A: Round 1

The Introduction can be shortened, and a Literature Review section can be added. The literature review should provide more details regarding the problem and explain what blockchain technology is, including smart contracts. Only then can the "System Functional Requirements" follow as the reader is still in the dark about how a blockchain will solve the problem. A reader with a limited blockchain background will not follow the argument at this stage.

AUTHOR: We feel that the introduction is necessary to motivate why the system was developed. We have rearranged the text so that voucher systems and blockchain are presented just after the Introduction. The reader is thus informed of these before the actual system design is presented. The major changes are indicated in blue text (arrangement and minor additions) and green text (major additions).

The Introduction mentions the economic inequality, but no mention is made of the educational level of the disadvantaged communities.

AUTHOR: We added references 7 and 8 and added a sentence in the Introduction about this.

Will the beneficiary require a mobile device? How will they afford it if they are already reliant on vouchers? What about an internet connection?

AUTHOR: No, they will not require a mobile device, or internet connection. This was an important consideration by us – we do not want the device to be exclusive or valuable. We mention at the bottom of page 3:

"The conservative assumption is that the beneficiary does not own a mobile device and will be issued with a simple, cheap device like a quick response (QR) code. For this reason, e-vouchers and card-based systems could be considered as digital means for distributing donations."

AUTHOR: We increased the emphasis on the QR codes and the NFC cards.

Line 104: Why are the words "blockchain technology" used when the abbreviation BCT was introduced in line 96?

AUTHOR: We changed it to BCT.

Line 109: The abbreviation VMDS was already introduced in line 98.

AUTHOR: We deleted "voucher donation management system" and replaced it with "DVDMS".

Line 203: The author mentions that "NFT and vouchers are similar in that they are both digital assets...". "Vouchers", in this case, must be written as "digital vouchers" to clarify this statement.

AUTHOR: We added "digital"

Line 205: The same comment above applies here as the author states, "…while vouchers are typically digital versions of physical vouchers…".
AUTHOR: we added "digital" as requested.

Line 227: The following is unclear "..all three of these use cases..". The use cases must be numbered (first, second, etc.) where they are mentioned, or they should be listed here, maybe between brackets, to avoid uncertainty.
AUTHOR: We changed to: "This research aims to explore three use cases in the form of 1) vouchers as tokens, governed by the 2) logic of smart contracts, all on 3) a decentralised platform such as a blockchain."
Line 234-235: It should be mentioned that the donor receives a voucher that contains a QR code. The first sentence refers to a voucher, and the second sentence refers to a QR code. It is also unclear if the voucher is a printed document and, if so, what it contains. Does it only have the QR code, or does it display the store name and product as well?
AUTHOR: We added a concept description at the top of page 4 to clarify this. We also added Figure 1 and a short description to elaborate on the process.
Lines 236-237: It is unclear how the voucher is claimed and how the transaction is now "securely handled by the blockchain platform".
AUTHOR: We added more text above Figure 2: "All transactions are securely handled by the blockchain platform, and the expiry of the voucher token is based on the conditions set in the smart contracts."
Lines 241-243: When does the escrow function release the money it keeps safe? After the beneficiary redeems the voucher?
AUTHOR: Yes, we added some text to clarify. Above Figure 3 we added "An escrow function keeps the money paid safe while the digital voucher is transferred to the beneficiary." The money is released when the voucher is claimed. Figure 3 shows the escrow function on the right, with the red arrows showing the flow of the money.
Figure 2: The text is too small. The escrow function lists "Deposited" and "Released". What does this refer to? This links to the previous bullet statement.
AUTHOR: We redrawn the figure and made the text larger.

Figure 3: The text is too small to read.
AUTHOR: We redrawn the figure and made the text larger.

Lines 46, 72: Incorrect referencing style is used.
AUTHOR: Changed to "…research4…"

Lines 51, 65: Confirm if references 5 and 6 are in the correct place. Should they not be before the period at the end of the sentence?
AUTHOR: No, according to the SAJS web site, if the reference applies to the full sentence, the number comes after the punctuation. We have asked the proofreader to specifically look at our style and she made corrections which we accepted.
Line 78: The statement requires a reference.
AUTHOR: We feel that the next two sentences substantiate the statement, but we added a colon after it.

Lines 186-194: References are needed.
AUTHOR: We added reference 24 which confirms that BCT has smart contract functionality. We added 25, 26 and 27 to substantiate the use of smart contracts with BCT, and smart contracts supporting digital, secure vouchers.
The list of references must be checked to ensure that the correct referencing style (Vancouver) is used. See https://www.sajs.co.za/vancouver-referencing-style. Some of the specific issues I picked up are as follows: URLs should not be underlined; The cited date should be between square brackets; Some article publication dates have been omitted.

AUTHOR: We carefully checked each requirement and tried to make sure that each was applied. The proofreader made substantial changes to the references which we accepted.

The grammar and language can be improved.

AUTHOR: We paid a language editor at an SA university to proofread the manuscript. The proof of payment was provided to the Editor.

Reviewer C: Round 1
Date completed: 07 May 2024
Recommendation: Accept / Revisions required / Resubmit for review / Decline
Conflicts of interest: None

Does the manuscript fall within the scope of SAJS?
Yes/No
Is the manuscript written in a style suitable for a non-specialist and is it of wider interest than to specialists alone?
Yes/No
Does the manuscript contain sufficient novel and significant information to justify publication?
Yes/No
Do the Title and Abstract clearly and accurately reflect the content of the manuscript?
Yes/No
Is the research problem significant and concisely stated?
Yes/No
Are the methods described comprehensively?
Yes/No
Is the statistical treatment appropriate?
Yes/No/**Not applicable**/Not qualified to judge
Are the interpretations and conclusions justified by the research results?
Yes/Partly/No
Please rate the manuscript on overall contribution to the field
Excellent/**Good**/Average/Below average/Poor
Please rate the manuscript on language, grammar and tone
Excellent/**Good**/Average/Below average/Poor
Is the manuscript succinct and free of repetition and redundancies?
Yes/**No**
Are the results and discussion confined to relevance to the objective(s)?
Yes/No
The number of tables in the manuscript is
Too few/Adequate/Too many/**Not applicable**
The number of figures in the manuscript is
Too few/Adequate/Too many/**Not applicable**
Is the supplementary material relevant and separated appropriately from the main document?
Yes/No/Not applicable
Please rate the manuscript on overall quality
Excellent/**Good**/Average/Below average/Poor
Is appropriate and adequate reference made to other work in the field?
Yes/No
Is it stated that ethical approval was granted by an institutional ethics committee for studies involving human subjects and non-human vertebrates?
Yes/No/Not applicable
If accepted, would you recommend that the article receives priority publication?
Yes/No

Are you willing to review a revision of this manuscript?
Yes/No
Select a recommendation:
Accept / Revisions required / Resubmit for review / Decline
With regard to our policy on 'Publishing peer review reports', do you give us permission to publish your anonymised peer review report alongside the authors' response, as a supplementary file to the published article? Publication is voluntary and only with permission from both yourself and the author.
Yes/No
Comments to the Author:
Please accept.

Author response to Reviewer C: Round 1

Thank you for your thorough review of our manuscript, we appreciate it.

Reviewer A: Round 2
Date completed: 07 August 2024
Recommendation: Accept / Revisions required / Resubmit for review / Decline
Conflicts of interest: None

Does the manuscript fall within the scope of SAJS?
Yes/No
Is the manuscript written in a style suitable for a non-specialist and is it of wider interest than to specialists alone?
Yes/No
Does the manuscript contain sufficient novel and significant information to justify publication?
Yes/No
Do the Title and Abstract clearly and accurately reflect the content of the manuscript?
Yes/No
Is the research problem significant and concisely stated?
Yes/No
Are the methods described comprehensively?
Yes/No
Is the statistical treatment appropriate?
Yes/No/**Not applicable**/Not qualified to judge
Are the interpretations and conclusions justified by the research results?
Yes/Partly/No
Please rate the manuscript on overall contribution to the field
Excellent/Good/**Average**/Below average/Poor
Please rate the manuscript on language, grammar and tone
Excellent/Good/Average/Below average/Poor
Is the manuscript succinct and free of repetition and redundancies?
Yes/No
Are the results and discussion confined to relevance to the objective(s)?
Yes/No
The number of tables in the manuscript is
Too few/**Adequate**/Too many/Not applicable
The number of figures in the manuscript is
Too few/**Adequate**/Too many/Not applicable
Is the supplementary material relevant and separated appropriately from the main document?

Yes/No/**Not applicable**
Please rate the manuscript on overall quality
Excellent/**Good**/Average/Below average/Poor
Is appropriate and adequate reference made to other work in the field?
Yes/No
Is it stated that ethical approval was granted by an institutional ethics committee for studies involving human subjects and non-human vertebrates?
Yes/**No**/Not applicable
If accepted, would you recommend that the article receives priority publication?
Yes/No
Are you willing to review a revision of this manuscript?
Yes/No
Select a recommendation:
Accept / Revisions required / Resubmit for review / Decline
With regard to our policy on 'Publishing peer review reports', do you give us permission to publish your anonymised peer review report alongside the authors' response, as a supplementary file to the published article? Publication is voluntary and only with permission from both yourself and the author.
Yes/No
Comments to the Author: Congratulations on a well-structured document that addresses all of my concerns. The document is clear and easy to read and to follow. The explanation of the entire system, the role players, and the role of the blockchain is very clear. I still believe this research provides a valuable step towards a possible solution for developing countries where many (poor) people are part of the unbanked population. The idea of using smart contracts on a blockchain to manage food/shelter vouchers is a great idea with potential. I have only one suggestion that the authors can follow if the Editor feels that it is necessary: the list of keywords can be sorted alphabetically.