# A CONCEPTUAL MODEL FOR E-PARTICIPATION BY OMANI CITIZENS USING BLOCKCHAIN TECHNOLOGY

**Abdul K. Shaikh, [1] Leon T. Goldsmith[2]**

'Information Systems Department, College of Economics & Political Science, Sultan Qaboos University Oman

[2]Politics Programme, University of Otago, New Zealand

shaikh@squ.edu.om[1]

leon.goldsmith@otago.ac.nz[2]

**ABSTRACT.** *The expansion of effective state-society participatory channels at the national and local levels has proven a challenge in the Sultanate of Oman since the 1980s. In this regard, the rapid emergence of technological disruptions raises opportunities for new forms of political participation. The central concept of e-participation involves Information and Communication Technology (ICT) been deployed to facilitate citizen engagement with government and policymaking. E-participation systems provide possible solutions for the physical, logistical, and perceived barriers to enhance participation rates. However, electronic systems, relying on centralized servers, have limitations in terms of satisfying cybersecurity, transparency, and trust concerns. Blockchain technology can remedy this problem via its decentralized, immutable, and incorruptible nature. The objective of the proposed research is to design a new Blockchain model that can provide innovative e-participation solutions, contribute to the global academic and applied literature on e-participation, address the questions of user satisfaction, and position the sultanate as a leader in this critical area. The proposed model will be mutually beneficial to the government sector and the citizens of Oman.*

**Keywords:** E-participation, blockchain, conceptual model, satisfaction..

## 1   INTRODUCTION

Socio-technical systems that utilize and interlink technology and human behaviour are increasingly commonplace. This socio-technical fusion has been present in the private commercial sphere for some time in areas such as Fintech in banking, for instance, but is now penetrating the realm of political organisation and policymaking. The question of how to foster inclusive, constructive and efficient citizen participation has long been a critical global issue which holds great importance to the evolving political system in the Sultanate of Oman. The rapid growth of technology has the potential to transform the way citizens participate in new and evolving political landscapes. Citizen participation plays a crucial role in the politics of democratic countries with the most obvious expression of this being voting processes to establish national parliaments or local councils. In this sense, e-participation is a subset of e-democracy, which utilises advanced technologies to facilitate participation in governance [1]. This paper will focus more on e-participation along with the user satisfaction and transparency issues that are addressed in our model.

In recent times, traditional electronic and/or online participation and voting processes have raised many questions for both governments and citizens, including transparency issues, user satisfaction, cost issues, geographic location issues, electoral delays, the distribution of electoral materials, and a general lack of confidence in the electoral process. All of these concerns may limit participation rates or reduce the legitimacy and, therefore, the effectiveness of participatory institutions [3].

It is essential to resolve the basic requirements of an effective e-participation system, including user satisfaction, transparency, security, reliability, speed, and accuracy, to attract the necessary buy-in from citizen- stakeholders. Adapting these requirements to the ongoing development of e-participation can enhance the political stability of any country. By using Blockchain technology, which is decentralised in nature, ballot papers will be masked with a crypto key that can only be decrypted via the private key of voters; i.e. this process cannot be targeted by hackers [4]. So, while Blockchain technology provides transparency, security, and accuracy, the level of complexity and scalability might affect system performance. To address these ongoing issues, we propose a model to handle the scalability and reduce the complexity of the system while still increasing transparency and hence the interest of users who participate electronically for a specific purpose.

The main contributions of this proposed model include 1) To explore the shortcomings of existing e-participation systems 2) To identify real challenges that slow the performance of the e-participation process 3) To identify the opportunities of using Blockchain technology in e-participation that confirm the requirements for user satisfaction, and 4) To propose a conceptual model for e-participation using Blockchain technology to enhance citizen participation

The remaining sections of the paper are organized as follows: Section 2 briefly discusses the current literature. Section 3 explains the methodology of the proposed approach. Section 4 describes the significance of the research. Finally, Section 5 concludes the paper and discusses possible future work.

## 2   Literature Review

This section reviews the most relevant prior research in the field and summarises common themes of significance to our proposed model. The research paper [5] outlined the characteristics of e-participation and demonstrated some examples from government agencies United Kingdom that use advanced ICT to provide access to policy information. The examples described in the study showed clearly how ICT tools can provide people with the capacity to participate and influence decision-making.

Another study [6] mentioned the positive role of e-participation in facilitating information exchange and coordinating community activity on different issues when those communities are actively engaged in ICT-based participation. The paper refers to the case of Ireland and describes how politicians are engaging with the community directly via e-newsletter and email. Conversely, the community uses the same platforms of exchange to organise their own activities and coordinate programs. This demonstrates how e-participation can act as an essential conduit for both government and citizens.

During 2019, the Sultanate of Oman faced a period of political and economic uncertainty; this uncertainty produced risks to Oman's objectives of continuing the country's strong record of stable development. An

important step towards addressing this uncertainty lies in increasing the quantity and quality of citizen participation at local [10] and national [11] levels. Moreover, in the year of 2015 national Majlis Al- Shura elections, for example, only 56% of 525,785 registered voters cast their ballots, despite a concerted government campaign to encourage participation in the lead up to the elections. The voter turnout diminished further in the most recent 2019 elections with only 349,680 voters casting ballots out of 713,335 registered voters, equating to a participation rate of 49% [12]. Therefore, the exploration of innovative methods of facilitating citizen participation should include a thorough examination of the benefits of e-participation via Blockchain technology. Blockchain is increasingly being seen as the most critical technological disruptor since the expansion of the internet in the early 1990s and is likely to gather rapid momentum in the coming years. It is vital that Oman commence extensive inquiries to inform proactive strategic planning for the utilisation and/or management of these technologies.

By considering the above issues related to traditional e-participation, our proposed model utilises Blockchain technology with its extreme decentralizing function and the consequent impact of making centralized systems redundant. With a Blockchain system information is stored in a large number of interconnected distributed ledgers, which are incorruptible; there is no central ledger, server, or another form of the centralised information management system, which can be vulnerable to human error, malfunction, or external attacks.

In terms of assessing the overall state of the literature, an empirical paper [16] reviewed the e-participation- related body of knowledge from 2000 to 2019. The findings of this systematic mapping of the existing literature presented that only 25% of papers discussed the tools, area and level of e-participation. The research concluded that the current challenges in e-participation include trust, transparency, and their impact on decision making. Based on the remaining gaps and the common findings and recommendations in the literature, we perceived the need to focus on transparency and user satisfaction in terms of trust in designing our proposed model.

## 3    Methodology and Model Design

The overall methodology follows a mixed-method approach that combines the importance of qualitative treatment of users' and stakeholders' perceptions with technical, quantitative approaches in terms of system design. In this sense, the twin approaches of political science and information systems of the two researchers are appropriate. The system architecture related to the proposed model is explained as below. Our conceptual model is shown in Fig. 1 is adapted and extended from the research of [17] to make it more transparent and secure by adding a verification process and user evaluation and feedback components.
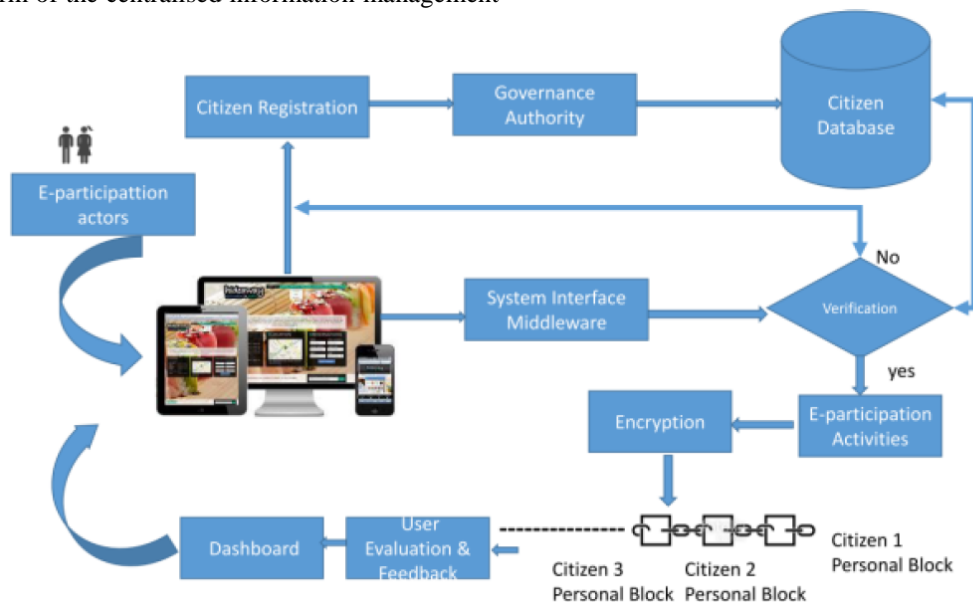


**Fig. 1. The system architecture of Electronic Voting System Using Blockchain**

## 4    Significance of the Research

Citizen participation has gained wide recognition as being important for any developed country as it is associated with political and economic decision-making. It empowers individuals and communities which can improve the legitimacy and resilience of the country. As the research proposes the new framework for e- participation will add value by enhancing citizen participation and reducing the costs directly related to economic conditions in the country. The impact of such a system can lead to a positively on society by increasing the level of trust that is currently lacking in many existing participatory and voting systems.

The potential impact of this study lies in two key areas: first, it illustrates the potential for Oman to position itself as a regional and global leader in e-participation and e-voting. Second, it can shed light on how this innovation can lead to major impacts on electoral efficiency, legitimacy, and turn-out, which could lead to better citizen engagement in the policy-making and representative institutions. Nonetheless, there are many question marks still surrounding the limitations, challenges, and risks of applying decentralising Blockchain Technology to state-society interactions at local and national levels. Hence, the significance of this study for Oman lies in the clarification of the practical applications [18] of block chained e-participation systems.

# 5   CONCLUSION

It is essential to explore the emerging linkages between new technologies and socio-political challenges of fostering political participation. In Oman, political participation has been dropping in recent years, even as the government has been pursuing strategies to encourage citizen involvement. This trend carries the risk of state legitimacy and resilience. This paper has addressed this issue in the context of the Sultanate of Oman through the proposed block-chained e-participation model, which has wider applications in terms of reconciling the longstanding barriers to effective and widely adopted e-participation, especially in the key areas of cybersecurity, transparency and trust highlighted in the literature. The model contains components that systematically engage and verify actors, present and facilitate activities, and securely and openly display results. We believe that this model can advance the field of e-participation with further quantitative testing in the lab as well as qualitative assessment amongst actors in the field.

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