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Cybersecurity Assessment of Decentralized Autonomous Organizations in Smart Cities

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Abstract : A smart city is the integration of digital technologies in urban environments to enhance the quality of life. Smart cities capture real-time information from devices, sensors, and network data to analyze and improve city functions such as traffic analysis, public safety, and environmental impacts. Current smart cities face controversy due to their reliance on real-time data tracking and surveillance. Internet of Things (IoT) devices and blockchain technology are converging to reshape smart city infrastructure away from its centralized model. Connecting IoT data to blockchain applications would create a peer-to-peer, decentralized model. Furthermore, blockchain technology powers the ability for IoT device data to shift from the ownership and control of centralized entities to individuals or communities with Decentralized Autonomous Organizations (DAOs). In the context of smart cities, DAOs can govern cyber-physical systems to have a greater influence over how urban services are being provided. This paper will explore how the core components of a smart city now apply to DAOs. We will also analyze different definitions of DAOs to determine their most important aspects in relation to smart cities. Both categorizations will provide a solid foundation to conduct a cybersecurity assessment of DAOs in smart cities. It will identify the benefits and risks of adopting DAOs as they currently operate. The paper will then provide several mitigation methods to combat cybersecurity risks of DAO integrations. Finally, we will give several insights into what challenges will be faced by DAO and blockchain spaces in the coming years before achieving a higher level of maturity.

Keywords : blockchain, IoT, smart city, DAO
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