


# Chapter 4


## Understanding Non-Fungible Tokens (NFTs) in Smart Cities

**Wasswa Shafik**

 <https://orcid.org/0000-0002-9320-3186>


*Universiti Brunei Darussalam, Brunei*

**Muhammad Muzamil Aslam**

 <https://orcid.org/0000-0002-8711-2907>

*Universiti Brunei Darussalam, Brunei*

**Ali Tufail**

 <https://orcid.org/0000-0003-4871-4080>

*Universiti Brunei Darussalam, Brunei*

### ABSTRACT

*This chapter depicts the role of Non-Fungible Tokens (NFTs) in the development of smart cities in this digital era, focusing on its perspective to boost urban governance, community engagement, and resource management. A unique digital asset fosters transparent ownership and provenance tracking of urban resources, such as public art, land, and community spaces. The integration of NFTs enhances service delivery and planning as demonstrated in the chapter advance participatory governance, granting citizens to engage in decision-making processes through tokenized voting mechanisms. Moreover, NFTs promote community engagement and tokenized identity expressions, thereby boosting local economies. Finally, the study highlighted the transformative potential of NFTs in creating sustainable, inclusive, and innovative urban environments.*

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## INTRODUCTION

Non-Fungible Tokens (NFTs) are unique digital assets that can carry and transfer value, much like cryptocurrencies. However, the individuality and uniqueness of NFTs compared to other fungible cryptocurrencies provide them with a different relevance and purpose in the realm of blockchain applications (Napoli & Gatteschi, 2023). Smart cities are defined as urban areas where various elements such as policies and regulations, experiences, and lifestyles are based and managed through technology to improve or maintain a desired core functional need in delivering a sustainable and high-quality life. In the blockchain world, NFTs could help to yield a new field for city management and urban governance, leading to entirely new options to give city managerial policies stemming from inputs by residents rather than just the city (Venugopalan & Aydt, 2023).

NFTs' seized attributes point to the integral role that they can play beyond entanglement in the world of digital and sometimes physical collectibles and art. This comes as over half the people in the world are living in urban centers, as cities are positions of innovation. Thus, the time is ripe to explore and open the way for conditions to yield a new urban environment. In effect, the term Smart City is slowly becoming more familiar to urban populations and communities across the world. However, as a society, little can be done to inform the population about the importance of designing and governing national and urban infrastructure based on blockchain and NFTs. Therefore, all of us need to have an understanding of both the backgrounds of NFTs and Smart Cities (Khalil et al., 2022). Researchers of cities, security, and blockchain experts are also inclined to have an understanding of these two emerging technologies and bodies of experience to interpret and grapple with issues and concepts related to the new, potential applied, and theoretical variation.

The most referenced definition of a NFT could be “a unit of data stored on a digital ledger called a blockchain that certifies a digital asset to be unique and therefore not interchangeable.” However, a more detailed examination of NFT characteristics points to three main features that make NFTs different from other digital assets. The first NFT attribute refers to its uniqueness. This means that no two NFTs are actually the same: each token is different from other tokens and has distinctive features. The second feature refers to the fact that NFTs are not divisible. This means that every NFT is a whole that cannot be further split into smaller units. Instead of having 1 NFT, 2 NFTs, or 3 NFTs, we can talk about 0 or 1, where 1 represents the existence of an intrinsic non-divisible digital asset signed on a blockchain and stored on the network (Khalil et al., 2024). The last feature of NFTs refers to the metadata that could be associated with them. This metadata provides information on the object's authenticity, provenance, and various other characteristics that establish the asset.

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