A Comparative Study on Security and privacy challenges in Smart cities

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Abstract: Blockchain is one of the most recent organization based advancements, which will fundamentally affect most businesses including the travel industry. Despite the fact that blockchain innovation is at the outset phase of improvement, apparatuses like digital currencies, keen agreements, and Decentralized Applications have started to impact the travel industry exchanges. This paper makes an endeavor to feature the critical attributes of blockchain innovation related to the Smart city/the travel industry structure while making suggestions of how the innovation would develop and impact the business. Significant issues identified with the innovation just as difficulties are likewise talked about, including a few misinterpretations.

Keywords: Smart Home, Security, Privacy, Unauthorized access

1. Introduction

The idea of "Smart Cities" has arisen over the most recent couple of years to portray how interests in human and social capital and present day Information and Communication Technologies (ICT) framework and e-administrations fuel maintainable development and personal satisfaction, empowered by shrewd administration of common assets and through participative government [1]. As indicated by [Caragliu et al. 2011], a shrewd city can be characterized along six measurements: Smart economy, keen portability, brilliant climate, keen individuals, keen living and keen government. Each measurement incorporates a few factors that can additionally portray the possibility of them. For example, brilliant versatility could include global or public openness, accessibility of ICT foundation, and reasonable, inventive and Smart transportation frameworks. The brilliant city starts from the idea of "More astute Planet" which was advanced by IBM in November 2008 ([2]). They endeavor to infuse the new age of data innovations into the business, government and common society of the city. They might likewise want to introduce sensors in objects in a convoluted framework (for example a framework organization), to screen its status and associate every one of the sensors together to the web. At that point, the focal super PC or distributed computing assets could oversee exercises, expectation for everyday comforts and creation in a better manner [3-10].

As of now, the Smart City is as yet an idea going through development and experimentation. It targets featuring the part of ICT in an advanced city, and at incorporating and upgrading the assets of a city, to make city life more effective, energy-financial and smart ([Jin 2014]). Brilliant city enormous scope projects have been dispatched, notwithstanding scholarly exploration. The Smart City Lyon project([Metropole 2014]), dispatched by the Grand Lyon Bureau, energizes the improvement of inventive administrations for the up and coming age of urban communities and is a proving ground for advancing tests. The blue print of Smart City Lyon incorporates:

- taking into account ecological difficulties and energy limitations;
- promoting the systems administration approach of partners with one another: neighborhood specialists, occupants and organizations;
- allowing the change from possession to utilize: clients' inclusion in the plan of items and administrations;
- integrating new advancements (IT and correspondence, mechanical technology, keen transportation frameworks, and so forth)

In spite of the fact that the keen city is acquiring progressively more consideration, there are still no fruitful precise models to follow. Scientists regularly need to envision and configuration seriously intriguing and promising situations of use. Notwithstanding, one of the difficulties that the brilliant urban communities are confronting, is the way to carry creative innovations or ideas to the normal machines or everyday life which residents are as of now acquainted with. This is on the grounds that it requires some investment for the last to acknowledge such changes and client propensities can't be changed either effectively or rapidly. In this interaction, while advancements or ideas become less noticeable to clients, clients are progressively being inundated in a pervasive climate. As indicated by the depictions of Mark Weiser ([Weiser 1999]), The most significant advances are those that vanish. They mesh themselves into the texture of regular daily existence until they are indistinct from it. However, the "vanishing gadgets" could be characterized as all gadgets in an omnipresent climate associated with one another flawlessly, so clients can zero in on the assignment they need to do, instead of spotlight on which gadgets they should utilize.

2. Literature review

The idea of "Keen Cities" has arisen over the most recent couple of years to portray how interests in human and social capital and present day Information and Communication Technologies (ICT) foundation and e-administrations fuel practical development and personal satisfaction, empowered by shrewd administration of normal assets and through participative government [David et al. 2012]. As indicated by [Caragliu et al. 2011], a brilliant city can be characterized along six measurements: shrewd economy, savvy portability, keen climate, keen individuals, keen living and keen government. Each measurement incorporates a few factors that can additionally depict the possibility of them. For example, savvy portability could include worldwide or public openness, accessibility of ICT foundation, and practical, imaginative and canny transportation frameworks. The shrewd city begins from the idea of "More astute Planet" which was advanced by IBM in November 2008 ([IBM 2008]). They endeavor to infuse the new age of data advances into the business, government and common society of the city. They might likewise want to introduce sensors in objects in a confounded framework (for example a framework organization), to screen its status and associate every one of the sensors together to the web. At that point, the focal super PC or distributed computing assets could oversee exercises, expectation for everyday comforts and creation in a better manner.

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•   taking into account natural difficulties and energy imperatives;
•   promoting the systems administration approach of partners with one another: neighborhood specialists, occupants and organizations;
•   allowing the change from possession to utilize: clients' contribution in the plan of items and administrations;
•   integrating new advances (IT and correspondence, mechanical technology, brilliant transportation frameworks, and so forth)

Despite the fact that the brilliant city is acquiring progressively more consideration, there are still no fruitful precise models to follow. Analysts frequently need to envision and configuration seriously intriguing and promising situations of use. Nonetheless, one of the difficulties that the brilliant urban areas are confronting, is the way to carry inventive advancements or ideas to the normal machines or everyday life which residents are as of now acquainted with. This is on the grounds that it requires some investment for the last to acknowledge such changes and client propensities can't be changed either effectively or rapidly. In this cycle, while advancements or ideas become less noticeable to clients, clients are slowly being drenched in an omnipresent climate. As per the portrayals of Mark Weiser ([Weiser 1999]), The most significant advancements are those that vanish. They mesh themselves into the texture of regular daily existence until they are undefined from it. In any case, the "vanishing gadgets" could be characterized as all gadgets in a universal climate associated with one another consistently, so clients can zero in on the undertaking they need to do, instead of spotlight on which gadgets they should utilize [35].

3. Problem Formulation

In spite of the fact that urban areas are hoping to become "more brilliant," savvy city applications raise various wellbeing and protection concerns and difficulties. Savvy urban communities ought to have the option to protect the data required from unapproved access, distribution, interruption, change, examinations and obliteration as a data and systems administration worldview. In the data, correspondence and actual universes, the fundamental security and protection necessities, including classification, honesty, non-renouncement, accessibility, access control and protection ought to be fulfilled [11-15]. Notwithstanding these overall prerequisites, the security of wise urban communities actually faces various special difficulties. From one viewpoint, Smart City gathers data of a granular scale and affectability to security from individuals' lives and their current circumstance, and then again it measures, controls and influences individuals' lives. As a result of these extraordinary highlights, security and protection issues become difficulties and keep wise urban areas from being adequately enticing to empower more use.

Since private information are gathered, sent and prepared, Smart City is helpless against security and data delivered by outside assailants. In astute urban areas, the revealed security may remember the character and area of the client for transport, medical issue in medical care, keen observation style, shrewd energy, home and local

area, etc. It would be a significant oversight to unveil such touchy information in both the actual world and the correspondence world to untrusted or unapproved substances. Some off-rack security and protection procedures like encryption, secrecy and access control are accessible to save client security during information detecting [16] and [17]. Martinez et al.[5] propose a bunch of protection ideas for keen city applications and general security necessities. Personality, request, area, impression and proprietor protection is distinguished and some essential thoughts are given to tackle the overall issues. Notwithstanding, unknowingly a segment of private data may in any case be uncovered to untrustworthy elements. Shrewd reconnaissance, for instance, can catch residents' regular clue, style or even security, albeit initially intended to screen genuine and digital world wrongdoing. Keen home likewise utilizes an observing camera to identify burglary or unusual occasions. The interrupted savvy home aggressors may get private data on the home territory, which is hindering to the security of the home. Most existing protection and security safeguards [18-23] are created against outer busybodies and aggressors. Notwithstanding, potential inside aggressors, like specialists, workers and safety officers, can either take the client's information or leave a hole for outer assailants. Besides, the information in the insightful city are profoundly granular in scale and of different sorts so the security necessities shift with various kinds. The advancement of customizable security assurance systems in wise urban areas to adjust exchange among protection and effectiveness is testing [25].
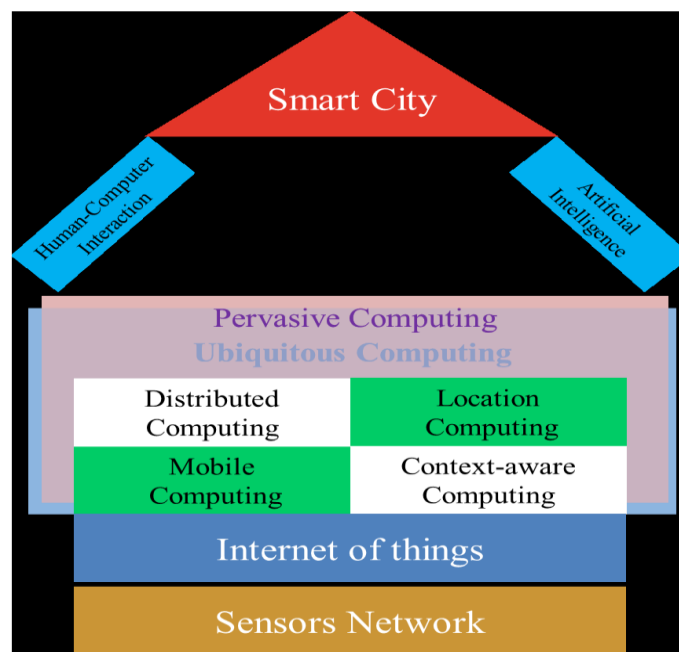

Fig. 1 Smart city and associated computing techologies

When cities become smarter, the vulnerability of smart city applications can threaten people with a number of security and privacy threats [24]. Noxious aggressors can, for instance, create bogus data to control detecting results so that administrations, choices and controls in shrewd urban communities are impacted and not "brilliant" enough. What's more, these noxious aggressors may likewise dispatch forswearing of-administration assaults that meddle with detecting, transmission and control to harm the nature of brilliant city administrations. The pervasive video reconnaissance in brilliant urban communities additionally catches a huge number of pictures or video cuts, which can be utilized to induce the direction of residents and imperil their private lives innately. The information gathered and oversaw by smart home applications can assist with revealing the profoundly protection delicate way of life of the property and even lead to monetary misfortune.

Fig. 2. Smart city applications

Albeit some off-the-rack strategies (encryption, validation, namelessness, and so on) and approaches may be straightforwardly applied to deflect these issues [5], the arising "savvy" assailants could in any case induce and disregard security from various perspectives, for example, side channel assault and cold boot assault [26].

4. Limitations

Difficulties and obstructions are sorted to give basic devices and the board approaches for manageable metropolitan advancement for Smart Cities partners dependent on existing legislative and corporate activities. Be that as it may, there are a few limits to this examination.

The main limit is that the quantity of cases picked can't address total Smart City Project insights. This condition is additionally not seen because of the quick improvement of keen and green innovations around the world. Arising nations are currently extending IT arrangements, and new Smart Cities are becoming similarly as "downpour mushrooms." Therefore, all cases can't be thought of and this exploration just audits cases which are generally referenced in media and logical examination [27-34].

The second limitation is that cases have not been classified by particular categories (such as regional level, maturity, characteristics and objectives), so the consequences derived are very generally given to certain types of Smart City projects without specific suggestions.

5. Scope of study

The issue of security of information in an intelligent city covers a number of aspects, including social, economic, and structural and governance factors. This thesis gives an extensive overview of the threats, vulnerabilities and solutions available to facilitate much-needed research into smart city security issues. Technological factors are crucial when a smart city is deployed and maintained. In fact, technology is the driving force behind a clever city to deliver the promised services. Nevertheless, the importance of studying the safety of a smart city in terms of governance and socioeconomic factors helps to identify safety concerns and needs of the stakeholders concerned. In addition, this practise facilitates the plausible identification of risks and vulnerabilities. Security is obviously the weakest link in implementation.

6. Blockchain for smart city

In the advancement of the travel industry objections Smart urban areas are shared networks that have incorporated frameworks that encourage productivity and resident commitment and improve personal satisfaction (Snow et al., 2017). A few keen urban communities, including Amsterdam, Barcelona, Brisbane, Dubai and Seoul (Gretzel, Sigala et al, 2015; Khan et al., 2017), feature qualities including the cutting edge ICT, co-innovative partner stages and effective utilization of information (Koo, Park, and Lee, 2017).

Along with blockchain-related patterns (second era), these improvements propose that smart agreements may work on the advantages for the two residents and explorers. It is notable that astute urban communities and wise the travel industry have a typical design (Koo et al., 2017). Table 2 gives data on keen urban communities and savvy the travel industry design with the suitable parts and major blockchain innovation segments coordinated to each level. Savvy town and clever the travel industry engineering, as per Koo et al. (2017), comprises of six levels: IT framework, information, stage, strategy, citizenship and traveler. The "Explorer" for canny the travel

industry is situated at the highest point of the "Resident" layer, though the initial four layers have similar segments. Subsequently it very well may be presumed that shrewd the travel industry is an augmentation of astute urban communities [26].

These layers likewise help to clarify the primary blockchain parts. Blockchain itself comprises of dependable hyper-pioneers appropriated everywhere on the world, which can be gotten to effectively continuously [35].

Hence, different digital forms of money will be accessible to clients available by methods for solid coin trade markets, which will build the notoriety of blockchain. Simultaneously, clients will pick their own coins/tokens and DApps to meet their specific prerequisites, and using innovation through savvy contracts (underly blockchain). Blockchain is required to change a wide scope of ventures definitely in the coming years (Seffinga et al., 2017). Be that as it may, it is too soon to foresee a more extensive scope of mechanical effects, especially as it concerns the travel industry. The accompanying patterns offer an understanding into how Blockchain could impact savvy urban areas and wise the travel industry.

Digital forms of money

The most referenced illustration of blockchain is the utilization of Bitcoin as an advanced money (Boucher et al., 2017; Seffinga et al., 2017). Cryptographic forms of money are an advanced cash that isn't focal or delegate – similar to the case with blockchain – when all organization accomplices approve financial trade, assisting with improving the exactness, recognizability and security of these monetary standards at low expenses (Boucher et coll. 2017) (Schlegel et al., 2018). After Bitcoin, other well known coins like BitcoinCash, LightCoin, Tether, Monero, Dash, and so on have been exchanged. These coins are principally expected to encourage money related trade while beating Bitcoin's constraints, like versatility or protection.

For occupants of a canny city who have embraced digital currencies, installments can be made safely and effectively, while exploiting every one of the advantages of blockchain. In the travel industry setting, a few little island objections have built up their own cryptographic forms of money or executed current monetary standards (Kwok and Koh, 2018). In these specific circumstances, digital currencies are utilized to grow various systems in which occupants and vacationers can make installments (see Sov, 2018).

At the point when combined with a developing number of movement organizations that utilization blockchain (see Travala, 2018; Travelblock, 2018; Travelchain, 2018), vacationers could book and pay for their excursions through Blockchain and digital forms of money without cash trade.

Brilliant agreements

Smart arrangements are free and self-carrying out, which basically include a coded understanding system between at least two gatherings (Boucher et al., 2017). Ethereum is the principal at any point shrewd agreement supplier to utilize blockchain. Such projects altogether affect organizations since they may encourage more prominent disintermediation, better venture execution and the improvement of the Decentralized Autonomous Organizations (DAOs), (Seffinga et al., 2017; Önder and Treiblmaier, 2018) (Boucher et al., 2017). DAOs are an assortment of associations that, in blend, can adequately work as an organization with negligible or no human information sources and administration through blockchain (Boucher et al., 2017; Government Office for Science, 2016). Boucher et al. (2017) utilizes the instances of a DAO that maintains a taxi business claiming a self-driving vehicle and paying fuel, parts, fixes, protection, and saving installments through savvy gets, all of which require practically no human intercession (p. 20). Slock. Slock. It likewise gives a model, giving lodging administrations through their "All-inclusive Sharing Network" (USN), which gives insightful sharing business gets that can affect organizations like Airbnb (Slock.it, 2018).

By methods for wise agreements, firms can consequently put orders, perform assignments and issue installments without the requirement for endorsements and directions on the grounds that these are now remembered for contracts as an independently employed escrow work. This capacity to escrow smart agreements permits two obscure gatherings to take part in trust exchanges. Applications can mechanize moderately little and dreary undertakings, for example, lodging key programming (Pilkington, 2017), which can be moved up to incorporate huge and complex exchanges relying upon the idea of the arrangement. They may go from installment, buy, installment of pay rates (Boucher et al., 2017), rewards and focuses (Pilkington, 2017), and inventory network the executives (Boucher et al., 2017). These applications will make it simpler to execute clever urban areas and smart objections in a more extensive scale [13].

Public administrations

Governments are likewise researching the conceivable utilization of blockchain and deciding its applications' monetary and social reasonability (Zhao, Fan, and Yan, 2016). Blockchain offers better and more recognizable

options in contrast to public legal officials, verifications and confirmations for records, vault the board (Boucher et al., 2017), casting a ballot, legal inclusion and government assistance installments (Schlegel et al., 2018) (Business Wire, 2016). This depends on the upsides of blockchain innovation, including improved effectiveness, misrepresentation control, mistake decrease, and cost decrease (Government Office for Science, 2016). Blockchain is likewise accessible to upgrade record streams, for example, travel visas and identifications. The Blockchain applications in Dubai Switzerland (still in the advancement stage) make a computerized traveler identification to erase manual visa controls (D'Cunha 2017; FINews 2017) are great models.

The capacity to take advantage of shrewd urban areas and clever objections goes connected at the hip. The upsides of having a completely associated town, including legislative administrations, can make numerous cycles for all included more clear, simpler and quicker. Blockchain based visas (D'Cunha, 2017; FINews, 2017) have had the option to deal with "stream" from entering government or even the country, particularly when joined with clever entryways and scanners (Khan et al., 2017). Given that more than 20,000 British visas are lost or taken in Spain alone consistently (Kim, 2016), blockchain-based personality frameworks may refute that issue, or possibly make new identification demands simpler to finish. With a character safely put away and open on the organization, it very well may be considerably more proficient to affirm your personality and orchestrate a substitute visa. A similar situation likewise apply to driving licenses where blockchain can give access with no extra documentation to global settings – neighborhood law requirement can get the essential data through blockchain driving licenses (see Nash and Havers, 2018).

To accomplish high dependability, straightforwardness and discernibility of the exploration cycle is significant. The examination procedure will along these lines present the whole exploration configuration directing this investigation altogether. This technique starts with a short introduction of the pre-assessment going before this examination followed by a conversation about research plan and epis-temological suppositions, methodological contemplations and key exploration dynamic. A precise introduction follows, how the writing survey was completed and how the hypothetical system was created. The second piece of the part gives an account of the assortment and examination of exact information, just as conversation on quality and morals.

7. Vision and conclusion

The idea of urbanisation across countries means that cities must be efficient and managed more efficiently. It is essential to improve management of all aspects, ranging from socio-economic issues to the provision of ICT, to provide public monitoring services and to ensure public safety, privacy and safety. The clever city is centralised by intelligent governments that take the step of outlining the city/plan country's and direction that allows industries to seize opportunities for projects (easy to receive benefit with the support of government). The ICT forms the data collection architecture as a prerequisite. Most of the focus is on data analytics and surveillance data applications. The data volume is endless and the computer calculation speed is limited when compared with data size and computational power. Opportunities are that less granular data (low costs) may first be used for some services and if possible, raw, high frequency and quality data may be used.

In any case, surveillance systems are believed to be around people in the near future, regardless of whether artificial intelligence and advanced technologies are mature. Monitoring data are useful in keeping the public safe for police and security guards. The upcoming 5G deployment in 2020 could support high-quality video data streaming but could lead to a significant deterioration in big data storage (the data set is more massive).

References

1. Agyeman J, McLaren D (2014) 'Smart Cities' Should Mean 'Sharing Cities'. In: Times
2. Al-Hader M, Rodzi A, Sharif AR, Ahmad N (2009) Smart city components archititure, 2009 International Conference on Computational Intelligence, Modelling and Simulation, IEEE., pp 93–97
3. Anthopoulos L, Fitsilis P (2010) Intelligent Environments (IE), 2010 Sixth International Conference on, IEEE., pp 301–306
4. Aurigi A (2005) Making the digital city: the early shaping of urban internet space. Ashgate Publishing, Ltd, Hampshire
5. Avizienis A, Laprie JC, Randell B, Landwehr C (2004) Basic concepts and taxonomy of dependable and secure computing. IEEE Trans Dependable Secure Comput 1(1):11–33
6. Bătăgan L (2011) Smart cities and sustainability models. Inf Econ 15(3):80–87
7. Belk R (2014) You are what you can access: Sharing and collaborative consumption online. J Bus Res 67(8):1595–1600
8. Bhattacherjee A (2002) Individual trust in online firms: Scale development and initial test. J Manag Inf Syst 19(1):211–241

9. Boulton A, Brunn SD, Devriendt L (2011) 18 cyberinfrastructures and 'smart'world cities: physical, human and soft infrastructures. In: International Handbook of Globalization and World Cities., p 198

10. Caragliu A, Del Bo C, Nijkamp P (2011) Smart cities in Europe. J Urban Technol 18(2):65–82

11. Chourabi H, Nam T, Walker S, Gil-Garcia JR, Mellouli S, Nahon K, Pardo TA, Scholl HJ (2012) Understanding smart cities: An integrative framework, System Science (HICSS), 2012 45th Hawaii International Conference on, IEEE., pp 2289–2297

12. Cocchia A (2014) Smart and Digital City: A Systematic Literature Review. Smart City: How to Create Public and Economic Value with High Technology in Urban Space. Dameri RP and Rosenthal-Sabroux C (eds). Springer International Publishing, Cham, p 13–43

13. Ashok Kumar and Dr. Yogesh Kumar Sharma," Reviewing cloud resource management schemes used in Cloud computing system", International Journal of Recent Research Aspects ISSN: 2349-7688, Vol. 3 Issue 4, December 2016, pp. 104-111.

14. Dillahunt TR, Malone AR (2015) The Promise of the Sharing Economy among Disadvantaged Communities. In: Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems. ACM, Seoul, pp 2285–2294

15. V. A. Sindekar, Y. K. Sharma, and D. Sharma, "A Guide for Selecting CMS Tools: Wordpress, Joomla, Drupal," Studies in Indian Place Names, vol. 40, no. 35, pp. 621–626, 2020.

16. Ergazakis K, Metaxiotis K, Psarras J (2004) Towards knowledge cities: conceptual analysis and success stories. J Knowl Manag 8(5):5–15

17. Forest F, Lavoisy O, Eurich M, Van Gurp J, Wilson D (2009) Roadmap for Real World Internet applications, Towards the Future Internet-A European Research Perspective., pp 325–334

18. Giffinger R, Gudrun H (2010) Smart cities ranking: an effective instrument for the positioning of the cities? ACE Archit City Environ 4(12):7–26.

19. Larsen K (1999) Learning cities: the new recipe in regional development, vol 217/218, Organisation for Economic Cooperation and Development. The OECD Observer., p 73

20. Malek JA (2009) Informative global community development index of informative smart city. Proceedings of the 8th WSEAS International Conference on Education and Educational Technology.

21. Malhotra A, Alstyne MV (2014) The dark side of the sharing economy & hellip; and how to lighten it. Commun ACM 57(11):24–27

22. Dalal S., Agrawal A., Dahiya N., Verma J. (2020) Software Process Improvement Assessment for Cloud Application Based on Fuzzy Analytical Hierarchy Process Method. In: Gervasi O. et al. (eds) Computational Science and Its Applications – ICCSA 2020. ICCSA 2020. Lecture Notes in Computer Science, vol 12252. Springer, Cham. https://doi.org/10.1007/978-3-030-58811-3_70

23. Morrison A (2016) Blockchain and smart contract automation: How smart contracts automate digital business., http://www.pwc.com/us/en/technology-forecast/blockchain/digital-business.html

24. Seth B., Dalal S., Kumar R. (2019) Hybrid Homomorphic Encryption Scheme for Secure Cloud Data Storage. In: Kumar R., Wiil U. (eds) Recent Advances in Computational Intelligence. Studies in Computational Intelligence, vol 823. Springer, Cham.

25. S. Pradeep and Y. K. Sharma, "A Pragmatic Evaluation of Stress and Performance Testing Technologies for Web Based Applications," in 2019 Amity International Conference on Artificial Intelligence (AICAI), 2019, pp. 399–403.

26. Seth B, Dalal S, Jaglan V, Le DN, Mohan S, Srivastava G Integrating encryption techniques for secure data storage in the cloud. Trans Emerg Telecommun Technol e4108, 1-24

27. Ranchordás S (2015) Does sharing mean caring: Regulating innovation in the sharing economy. Minn JL Sci Tech 16:413

28. Schuler D (2001) Digital cities and digital citizens. In Kyoto Workshop on Digital Cities. Springer, Berlin Heidelberg, p71–85

29. SpendMatters (2015) Why Bitcoin's Blockchain Technology Could Revolutionize Supply Chain Transparency. In: Spend Matters., http://spendmatters.com/2015/11/09/why-bitcoins-blockchain-technology-could-revolutionize-supplychain-transparency/

30. Sundararajan A (2014) Peer-to-peer businesses and the sharing (collaborative) economy: Overview, economic effects and regulatory issues, Written testimony for the hearing titled The Power of Connection: Peer to Peer Businesses, January

31. Tedjasaputra A, Sari E (2016) Sharing Economy in Smart City Transportation Services. In: Proceedings of the SEACHI 2016 on Smart Cities for Better Living with HCI and UX. ACM, San Jose, pp 32–35

32. Panthee, M., & Sharma, Y. K. (2019). Review of e-government implementation. International Journal of Recent Research Aspects, ISSN: 2349-7688, 6(1), 26–30.

33. Washburn D, Sindhu U, Balaouras S, Dines R, Hayes N, Nelson L (2009) Helping CIOs understand "smart city" initiatives. Growth 17(2):1–15

34. Y. K. Sharma and M. D. Rokade, "Deep and Machine Learning Approaches for Anomaly-Based Intrusion Detection of Imbalanced Network Traffic.," IOSR Journal of Engineering, pp. 63-67, 2019.

35. Bijeta Seth, Surjeet Dalal, Dac-Nhuong Le, Vivek Jaglan, Neeraj Dahiya, Akshat Agrawal, Mayank Mohan Sharma, Deo Prakash, K. D. Verma, Secure Cloud Data Storage System Using Hybrid Paillier–Blowfish Algorithm, Computers, Materials & Continua, Vol.67, No.1, 2021, pp.779-798, doi:10.32604/cmc.2021.014466

36. Zhao JL, Hsu C, Jain HK, Spohrer JC, Tanniru M, Wang HJ (2008) ICIS 2007 Panel report: bridging service computing and service management: how MIS contributes to service orientation. Commun Assoc Inf Syst 22(1):22