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Blockchain technology integration in service migration to 6G communication networks: a comprehensive review

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ABSTRACT

The next generation of wireless networks, 6G is being designed with data-intensive applications. One of the key technologies that will enable 6G is blockchain technology. The emergence of blockchain technology and 6G networks has revolutionized service migration. Service migration in 6G networks is a complex process that requires the integration of new technologies, such as artificial intelligence (AI), edge computing, and network slicing. Motivated by these facts, this comprehensive review includes an overview of blockchain and service migration integration in 6G. First, state of art, development frame work and related works were introduced. Then, we used content analysis by WordStat software and bibliographic analysis by VOSviewer to analysis the current status of service migration and blockchain integration in 6G networks. Next, patterns and characteristics, benefits and challenges and potential cases were reviewed. Then, we proposed an architectural blockchain-based model including decentralized architecture, edge computing, network slicing, software-defined networking, and 5G-6G interworking in 6G. Finally, we described potential application service migration-based in 6G networks including digital twin (DT), holograms, robot avatar, high density internet of things (IoT), AR and VR in 6G and collected open research and future directions of service migration and blockchain.

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1. INTRODUCTION

The emergence of blockchain technology and 6G networks has revolutionized service migration. Service migration is an important aspect of digital transformation [1]. This involves the movement of services from one carrier/platform to another or from one system to another. The dawn of 6G communication networks promises to transform the way communication services are implemented and managed. This new technology will enable a more secure and reliable environment for services to migrate from traditional 4G and 5G networks. As part of this shift towards 6G, blockchain technology is becoming increasingly important for providing a secure platform for data storage and management [2]. In this review, we take a look at how blockchain technology is being integrated into service migration to 6G communication networks, as well as its potential applications in the future.

The emergence of 6G networks is expected to revolutionize the way about communication and interaction with technology. 6G networks provide significantly higher data rates, lower latency, and improved reliability compared to current networks [3]. As a result, 6G networks enable new use cases and applications that were not previously possible. However, to take full advantage of 6G networks, service migration will be required. Service migration refers to the process of moving services and applications from one environment to another. In the context of 6G networks, service migration involves moving services and applications from current networks (such as 5G, 4G, and 3G) to 6G networks [4].

Service migration in 6G networks is a complex process that requires the integration of new technologies, such as artificial intelligence (AI), edge computing, and network slicing [5]. Additionally, service migration in 6G networks will require addressing various challenges, such as technical complexity [6], compatibility issues [7], interoperability challenges [8], high costs [9], regulation and standards [10], and security concerns [11]. Furthermore, service migration in 6G networks requires the use of different migration patterns, such as incremental migration [12], cloud-based migration [13], Greenfield migration [14], hybrid migration [15], automation [16], and test-driven migration [17].

The goal of service migration in 6G networks is to improve the scalability, security, and cost-effectiveness of services and applications [18], while blockchain technology works in minimizing downtime and disruption to users. By understanding the challenges and opportunities of service migration in 6G networks, service providers, operators, and vendors can develop migration strategies that are tailored to their specific needs and requirements, and ensure a successful migration to 6G networks. On the other hand, Block-hain technology has great potential for use in 6G communication networks. However, there are some challenges that need to be addressed before it can be successfully implemented on a large scale [19]. With careful planning and execution, however, these challenges can be overcome and service providers can reap the many benefits of this transformative technology.

This comprehensive review focuses on blockchain technology in service migration for 6G communication network [20]. Service migration applications and potential cases and development through blockchain and multiple intelligence edge computing (IEC) gained remarkable importance in recent years according to a huge usage and rapid change of technology in our life [21]-[23]. The authors focus on blockchain technology integration in service migration to 6G explaining the characteristics, patterns, challenges, architectural trends and applications as an emerging technologies. As compared to prior and current literature, the main contribution of this paper is included as [24]:

- This review provides a comprehensive overview of service migration and its integration with blockchain technology and 6G communication networks including characteristics, challenges, patterns and potential cases.
- Qualitative and bibliographic analyzing of the current state of developments in service migration and blockchain in 6G.
- Researchers introduce framework for service migration development and architectural trends and the adoption of blockchain technology in service migration to 6G networks.
- We further discussed the potential applications integrated with blockchain technology and service migration to 6G including: digital twin (DT), holograms, robot avatar, high density internet of things (IoT), and AR & VR.

Service migration is an important aspect of digital transformation. It involves the movement of services from one platform to another or from one system to another. The emergence of blockchain technology and 6G networks has revolutionized service migration [25]. Blockchain technology has enabled businesses to securely and efficiently migrate services across multiple platforms and systems [26], while 6G networks have enabled faster data transmission, enabling businesses [27] to move their services more quickly than ever before. This section explores the state of art about service migration in terms of blockchain technology and 6G networks. We will discuss the use cases, challenges, opportunities and potential solutions for service migration in the context of these two technologies.

Service migration in 6G networks is currently in the research and development stage. 6G networks are not yet widely deployed and the research on 6G networks is still ongoing [28]. However, several research works have been proposed to address the challenges of service migration in 6G networks [29], such as: decentralized architectures [30], edge computing [31], network slicing [32], cloud-native migration [33], test-driven migration [34] and interworking with legacy networks [35]. A large number of service providers are looking to migrate their services from 3G, 4G, 5G communication networks to the more advanced and efficient blockchain technology. This process can be challenging [36], as there can be a lot of legacy systems and data that need to be ported over. However, the benefits of blockchain technology make it worth the effort for many service providers. Some of the advantages of blockchain technology include increased security [37], improved scalability [38], and faster transaction times [39]. Blockchain technology is also more decentralized than traditional communication networks, which can provide additional redundancy and reliability. Service

providers that are considering migrating their services to a blockchain platform should work with an experienced partner that understands both technologies. By working with a partner, service providers can ensure a smooth transition and take advantage of all the benefits that blockchain technology has to offer.

Pervious researches related to blockchain technology in service migration for 6G communication networks is in the first stage. Some of works were conducted trying to investigate possibilities and usage of blockchain in future 6G, IoT and smart cities [20]. On the other hand, noticeable researches have been conducted in service migration in 5G networks and mobile edge computing (MEC) [21]. Other researchers have focused on security and privacy in 6G [22], disruptive technologies in 6G [23], management and sharing [2] and new trends [24]. Table 1 included related works of blockchain technology in service migration to 6G in last years (2018-2023), which shows that limited researches have been conducted. These researches were classified based on year of publication, title of work, methods and main findings. This comprehensive review concentrates on integration of blockchain technology in service migration to 6G networks while prior researches have investigated them solely in 5G/6G or MEC and IEC. Furthermore, this review included comprehensive review of service migration integration with blockchain technology, characteristic, benefits, possible challenges, architectural trends, potential cases and future directions.

Table 1. Prior works related to service migration and blockchain in 6G

Authors/Ref.	Area	Method	Findings
Kalla *et al.* [25]	Blockchain for future 6G	Survey	Review blockchain and 6G technologies and exploring the role of blockchain for 6G trends and requirements, applications and technical aspects.
Khan *et al.* [26]	UAVs network management in 6G	Technical review	Integrating blockchain and AI/ML with UAV networks utilizing the 6G ecosystem.
Kumari *at al.* [20]	Blockchain and IoT for smart cities	Comprehensive review	Introducing blockchain-based decentralized architecture for IoT-integrated smart cities.
Nguyen *et al.* [27]	Blockchain for 5G and beyond	Survey	Discussing potential of blockchain for enabling key 5G technologies including MEC, NFV, NS, and D2D.
Wang *et al.* [21]	Service migration in mobile edge computing	Survey	Review and discuss service migration in MEC through live migration and handover in cellular networks and summarizing virtual machine, container, and agent services.
Wang *et al.* [22]	Security and privacy in 6G	Survey	Overview of main security and privacy issues and emerging technologies related to 6G applications.
Guo *et al.* [23]	Disruptive technologies in 6G	Review and introduction	Introducing some basic knowledge of DT and outlining innovative technologies expected in 6G networks.
Addad *et al.* [24]	Service chain migration in 5G networks	Explanation and evaluation	Determining the right SFC relay pattern depends on user traffic, application requirements, and MEC node resources.
Xu *et al.* [2]	Management and sharing for 6G through blockchain technology	Scenarios discussion	Exploring different scenarios including IoT, D2DC, and Net Slicing for resource management and sharing based on blockchain.
Addad *et al.* [28]	Trends and scenarios of service migration in 5G	Proposal and scenarios	Adopting container-based live migration technology to reduce 50 downtime percent.

2. METHODS AND DEVELOPMENT FRAMEWORK

By considering Scopus database for further review of publications in service migration and blockchain integration in 6G networks, 85 documents were identified. We used 3 keywords: Service migration, Blockchain, and 6G for document' search, but we found only 3 papers. Then, we had changed settings to limit research to service migration and blockchain only, we found 85 papers. For further analysis, we used WordStat software for content analysis and VOSviewer for bibliographic analysis.

The next phase in the evolution of 6G communication networks is the integration of blockchain technology in service migration. Service providers are looking to take advantage of the benefits of blockchain, such as decentralization, immutability, and security, to create more efficient and reliable networks. This comprehensive review will explore the potential of blockchain technology to enable service migration in 6G communication networks and assess the challenges that need to be overcome for successful integration.

Before starting a service migration, it is important to plan and test the migration thoroughly to ensure that it will be successful and that any potential issues will be identified and addressed. The first step in service migration is to identify the services that need to be migrated. This includes both existing services and new services that need to be developed. Once the services have been identified, the next step is to determine the best platform for the services. This could include cloud-based solutions, on premise solutions, or a combination of both. Once the platform has been chosen, the next step is to develop the necessary infrastructure to support the services. This includes the hardware, software, and networking components that are needed to run the services. It is also important to consider the security measures that need to be taken to ensure the safety of the services.

The next step is to migrate the services to the new platform. This includes the transfer of data, applications, and other components that are necessary for the services to run. It is important to ensure that the services are running properly on the new platform before they are released to the public. Finally, the services need to be monitored and maintained. This includes ensuring that the services are running properly and that any issues are addressed quickly. It is also important to ensure that the services are secure and that any security vulnerabilities are addressed. A development framework for service migration in 6G networks can include several key components [40], such as:

- Planning: This component involves identifying the services and applications that need to be migrated, assessing the current environment, and developing a migration plan that takes into account the unique requirements of 6G networks [41].
- Design: This component involves designing the new 6G infrastructure and services that will replace the existing ones, taking into account the new features and capabilities of 6G networks, such as low latency and high throughput [42].
- Development: This component involves implementing the new 6G services and infrastructure, and developing the necessary software and applications that will be needed for the migration process [43].
- Testing and validation: This component involves testing the migration process and the migrated services to ensure that they are working as expected, and addressing any issues that are identified [44].
- Deployment and operation: This component involves deploying the new 6G services and infrastructure, and operating them in a production environment [45].
- Monitoring and maintenance: This component involves monitoring the performance of the migrated services and infrastructure, and performing ongoing maintenance and upgrades as needed [46].

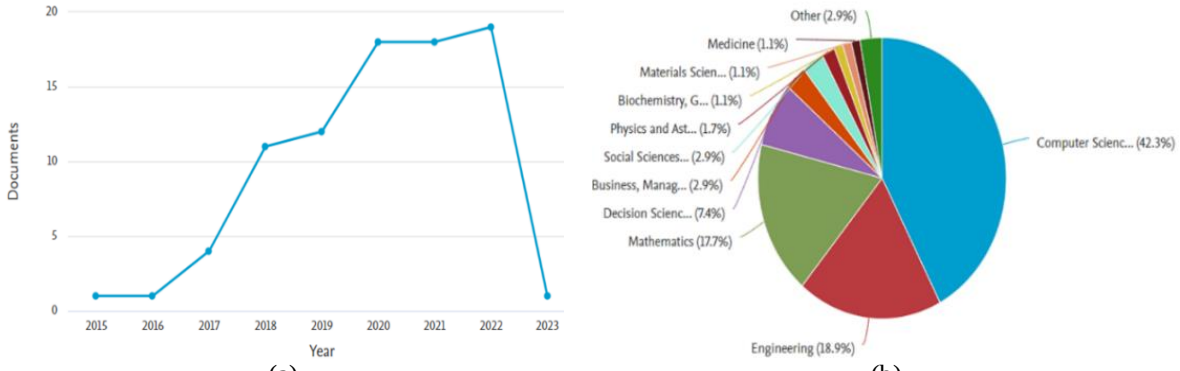
The development framework should also include a continuous improvement process that allows to evaluate the performance of the services and infrastructure, and to make adjustments as needed.

3. RESULTS AND DISCUSSION

In this section, we present the overview of prior publication, development status of blockchain in 6G, patterns and characteristics, benefits and challenges, and architectural trends and potential cases. These analyses were conducted inn three different approaches including: Metadata analysis, Wordstat and VOS viewer. Furthermore, additional explanation about block chain and 6G development were investigated.

3.1. Overview of identified publications

Prior published studies related to service migration and blockchain were limited. There is no paper was published before 2015. Then, since this year to 2023, number of published papers have increased as shown in Figure 1. Figure 1(a) gives more accreditation to our review to indicate the gap in research related to service migration and blockchain technology in 6G networks. One more step to understand type of these publications and which area were contributed to, Figure 1(b) shows these subjects. Computer science, engineering, and mathematics where the top three subjects respectively with cumulative 78% of all studies.

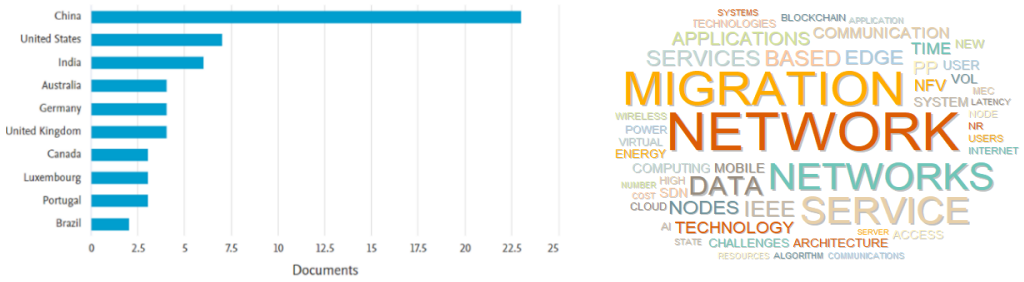


(a) (b)

Figure 1. Metadata analysis, (a) published works in service migration and blockchain and (b) publication by subject area

In addition, publications by country and word cloud analysis were conducted as illustrated in Figure 2. Further descriptive analysis of published works related to service migration and blockchain in 6G is in Figure

2(a). China (23), United State (7) and India (6) are the leader's country respectively. It is interesting that China has 23 publications which indicates that China scholars published more than their peers in the fifth next top publishers. A qualitative analysis of 85 documents related to integration of blockchain and service migration in 6G networks, was conducted by using WordStat application. The aim of this analysis to visualize the word counts in related documents. The results shows that the top three words were network, migration, and service as shown in Figure 2(b). In addition, blockchain was among top 30 keywords which shows the gap in research elated to this technology. Furthermore, top 10 words frequency is identified as in Table 2.



(a) (b)

Figure 2. Descriptive analysis (a) published works by country and (b) word cloud of service migration in 6G

Table 2. Top 10 words and frequency

Word	Net.	Migration	Service	Data	Edge	Node	App.	Tech,	NFV	Mobile
Frequency	770	681	527	377	288	262	257	237	226	198

3.2. Development status of blockchain in 6G

As blockchain technology is emerging in 6G network, we used bibliographic analysis to explore the areas where blockchain is implemented and which of technologies are engaging with blockchain. To do so, we used VOSviewer application and using the same 85 documents. The results of analysis is illustrated in Figure 3. We used overly visualization mode to show years of publication. Four areas (colors) is symbolized to every year. For instance, the yellow color refers to the publication years between 2020 and 2023. The density visualization refers to main areas include cloud computing, edge computing, distributed ledger technology and MEC.

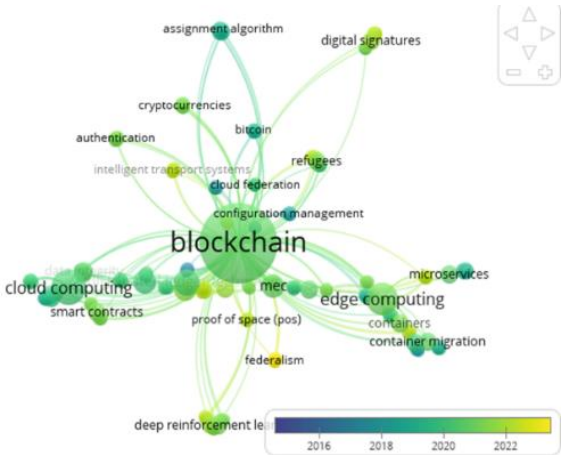


Figure 3. Mapping on-time visualization of keywords co-occurrence of blockchain in 6G

Furthermore, the potential cases of service migration in 6G are numerous and varied. 6G is the next generation of mobile communication technology, and it promises to bring a host of new services and capabilities to the table. As such, service migration in 6G will be an important factor in the success of the blockchain technology. There are many potential use cases for service migration in 6G networks, some of which include:

- Service migration in 6G is the migration of existing services from 4G and 5G networks to 6G [47]. This could include services such as voice, data, and video, as well as other services such as augmented reality and virtual reality. This migration could be done in order to take advantage of the increased speeds and capabilities of 6G networks. Additionally, it could be done to reduce the cost of providing these services, as 6G networks are expected to be more cost-effective than their predecessors.
- Migration of new services to 6G networks: this could include services such as the IoT, AI, and machine learning (ML). These services could be used to provide enhanced capabilities to users, such as improved security, better user experience, and more efficient operations [18]. Additionally, these services could be used to provide new business opportunities, such as the development of new applications and services.
- Autonomous vehicles: 6G networks will enable the use of autonomous vehicles, which require low latency and high reliability for safe operation [28]. Service migration in 6G networks can enable the creation of new services and applications for autonomous vehicles, such as real-time traffic management and predictive maintenance [38].
- Smart cities [48]: 6G networks will enable the use of smart city applications, such as intelligent traffic management, smart lighting, and air quality monitoring. Service migration in 6G networks can enable the creation of new services and applications for smart cities, such as real-time monitoring, and control of city infrastructure.
- Industrial automation: 6G networks will enable the use of industrial automation applications, such as factory automation and predictive maintenance [38]. Service migration in 6G networks can enable the creation of new services and applications for industrial automation, such as real-time monitoring and control of manufacturing processes [25].
- Healthcare [12]: 6G networks will enable the use of healthcare applications, such as telemedicine and remote monitoring of patients. Service migration in 6G networks can enable the creation of new services and applications for healthcare, such as real-time monitoring and analysis of patients' vital signs.
- Remote sensing [18]: 6G networks will enable the use of remote sensing applications, such as weather forecasting and natural resource management. Service migration in 6G networks can enable the creation of new services and applications for remote sensing, such as real-time monitoring and analysis of environmental data.
- Augmented reality [43]: 6G networks will enable the use of augmented reality applications, such as gaming, education, and tourism. Service migration in 6G networks can enable the creation of new services and applications for augmented reality, such as real-time tracking of users and devices and providing the ability to interact with virtual objects in real-world environments.

Finally, service migration in 6G could also include the migration of existing services from other networks to 6G networks. This could include services such as satellite communications, Wi-Fi, and cellular networks. This migration could be done in order to take advantage of the increased speeds and capabilities of 6G networks, as well as to reduce the cost of providing these services. Overall, service migration in 6G will be an important factor in the success of the technology [44]. It will allow existing services to take advantage of the increased speeds and capabilities of 6G networks, as well as provide new opportunities for businesses to develop new applications and services. Additionally, it could reduce the cost of providing these services, making them more accessible to users.

3.2.1. Patterns and characteristics

Blockchain technology has the potential to play a role in service migration to 6G networks by providing a secure and decentralized platform for managing and tracking the migration process. Some of the ways that blockchain technology could be used in service migration to 6G networks include: Secure data transfer [47]: Blockchain technology can be used to securely transfer data between different networks and systems during the migration process, ensuring that the data is protected from unauthorized access or tampering. Blockchain technology provides an immutable and secure ledger that records all transactions in a distributed network. This makes it difficult for malicious actors to tamper with the data or access it without authorization. Furthermore, blockchain technology also enables automated compliance checks, allowing providers/users to ensure that their services are compliant with applicable laws and regulations.

Decentralized management [48]: Blockchain technology can be used to create a decentralized management system that allows multiple parties to collaborate and coordinate the migration process. This can help to minimize the risk of errors and reduce the time required for the migration. Blockchain technology has made service migration easier and more secure by introducing decentralized management solutions. With blockchain technology, businesses can securely transfer services and data from one platform to another without worrying about security breaches or data loss. Additionally, blockchain-based solutions can also ensure that service migrations are completed on time and with minimal disruption.

Smart contract [49]: Blockchain technology can be used to create smart contracts that automate the migration process and enforce the rules and conditions of the migration. With the introduction of blockchain technology, service migration has become easier and more secure. Smart contracts, which are self-executing digital contracts, have become an essential part of service migration on the blockchain. They can be used to automate the entire process, ensuring that all parties involved in the migration are satisfied with the outcome. Smart contracts also reduce the risk of fraud or other malicious activities as they are cryptographically secured and immutable.

Transparency and audibility [50]: Blockchain technology can be used to provide transparency and audibility in the migration process, allowing service providers, operators, and vendors to monitor the progress of the migration and ensure that it is proceeding as expected. Furthermore, blockchain technology also provides an additional layer of security by allowing for the tracking of digital assets in real time. This ensures that all parties involved in the service migration process have access to accurate records at any given point in time, thus providing complete transparency and auditability throughout the entire process.

Digital identity and authentication [51]: Blockchain technology can be used to create digital identities and authentication mechanisms that can be used to verify the identity of devices and services during the migration process. To ensure secure service migration, digital identity and authentication solutions based on blockchain technology have been developed. These solutions provide a secure way for users to access and transfer data between different platforms without the risk of data leakage or manipulation. Blockchain technology also ensures that all transactions are immutable, allowing users to have full control over their data and services.

The relationship between service migration and blockchain technology is one of complementary, where blockchain technology can provide solutions that can help to address some of the challenges of service migration in 6G networks. Service migration refers to the process of moving a service from one environment to another, such as from on-premises to the cloud, or from one cloud provider to another. This can include migrating data, applications, and infrastructure. The goal of service migration is to improve the scalability, security, and cost-effectiveness of the service [52], while minimizing downtime and disruption to users. There are several different approaches to service migration, depending on the type of service and the complexity of the migration. Some common methods include [53]:

– Lift and shift: This involve physically moving the service and its data to the new environment without making any changes to the service itself.
– Re-platforming: This involves making changes to the service, such as rewriting code or configuring new infrastructure, to optimize it for the new environment.
– Re-architecting: This involves fundamentally redesigning the service to take advantage of new technologies or to meet new business requirements.

3.2.2. Benefits and challenges

Service migration is the process of transitioning from one service provider to another, or from one platform to another. It can provide organizations with a number of benefits, including cost savings, improved performance and scalability, and access to new features [58]. Additionally, service migration can help organizations increase their agility and reduce the risk associated with relying on a single provider or platform. In this section, we explore the various benefits of service migration in more detail. Service migration in 6G networks can bring several benefits, such as:

- Improved scalability [54]: 6G networks will have significantly higher capacity than current networks, allowing for more devices and services to be connected. This can enable new use cases and applications that were not previously possible.
- Enhanced security [55]: 6G networks will incorporate advanced security features such as quantum-resistant cryptography and network slicing, which can provide stronger protection against cyber threats.
- Increased flexibility [56]: 6G networks will support a wide range of spectrum bands, including millimeter wave and terahertz, which will allow for more efficient use of spectrum resources and the ability to adapt to different use cases and environments.
- Lower latency [57]: 6G networks will have much lower latency than current networks, which will enable new applications such as real-time control and autonomous systems.
- Greater energy efficiency [58]: 6G networks will incorporate new technologies such as energy-efficient base stations and energy harvesting, which can reduce energy consumption and costs.
- More economic opportunities [59]: 6G networks are expected to bring new business opportunities and revenue streams for operators, service providers, and vendors, as well as to increase productivity and efficiency for various industries.

On the other hand, the challenges associated with service migration in 6G include data security and privacy, cost management, scalability, compatibility issues, latency problems, and resource availability [60].

This process is becoming increasingly difficult due to the complexities of modern-day technologies such as 6G, blockchain, and other digital solutions. Service migration can be challenging for organizations due to the lack of understanding of these technologies, lack of resources needed for migration, and security risks associated with it [58]. In addition, other challenges are associated with service migration such as hardware and software compatibility issues, data transfer issues, integration issues, and cost management [61]. Furthermore, organizations must also consider how they can use 6G technology and blockchain solutions in order to provide a secure environment for their services during the migration process. Service migration in 6G networks can also face several challenges regarding integration with blockchain technology including:

- Technical complexity [62], [63]: 6G networks will incorporate new and advanced technologies, such as AI and edge computing, which can make the migration process more complex and challenging.
- Compatibility issues [52]: migrating services to 6G networks may require changes to the existing infrastructure and applications, which can lead to compatibility issues and potential data loss.
- Interoperability challenges [8]: 6G networks will be required to work seamlessly with existing 5G, 4G, and even 3G networks, which can be a complex task and may require significant testing and validation.
- High costs [64], [65]: the migration process may require significant investments in new infrastructure, equipment, and human resources, which can be expensive for service providers and operators.
- Regulation and standards [66], [67]: the development of 6G networks is still in progress and there may be regulatory and standardization issues that need to be addressed before the migration process can begin.
- Security concerns [11], [68]: as with any new technology, security concerns will be paramount. The security of 6G networks and services will need to be evaluated and addressed throughout the migration process to protect against threats such as cyber-attacks and data breaches.

4. CONCLUSION

In conclusion, service migration in blockchain technology and 6G networks will bring many benefits such as improved scalability, enhanced security, increased flexibility, lower latency, greater energy efficiency, and more economic opportunities. But it will also face several challenges such as technical complexity, compatibility issues, interoperability challenges, high costs, regulation and standards, and security concerns. The architectural trends of service migration in 6G networks will include decentralized architecture, edge computing, network slicing, software-defined networking, AI, and 5G-6G interworking. Advantages, state of art and challenges of recent applications that adopt service migration and blockchain technology in 6G have been discussed. Potential application service migration-based in 6G networks including DT, holograms, robot avatar, high density IoT, and AR & VR in 6G were described. The future directions of service migration in 6G networks will include autonomous systems, virtual and augmented reality, IoT, quantum communication, and MEC. Service providers, operators, and vendors will need to develop migration strategies that take into account the unique requirements of 6G networks and the need to integrate existing networks in order to fully realize the benefits of 6G technology.

5. FUTURE DIRECTION

The future of service migration in 6G is an exciting prospect. With the advancements in technology, service migration will become even more important as organizations continue to move their services to the cloud. As the technology continues to evolve, it is important to ensure that the services are secure and that any security vulnerabilities are addressed. Additionally, it is important to ensure that the services are running properly and that any issues are addressed quickly. With the blockchain technology, service migration can be a successful endeavor for any organization. The future directions of service migration in 6G networks are likely to include:

- Autonomous systems: 6G networks will likely enable new autonomous systems, such as autonomous vehicles, drones, and robots, which will require new migration strategies and solutions.
- Virtual and augmented reality: 6G networks will likely support new virtual and augmented reality applications, which will require new migration strategies and solutions to handle the high bandwidth and low-latency requirements of these applications.
- IoT: 6G networks will likely support a large number of IoT devices and services, which will require new migration strategies and solutions to handle the scale and complexity of these devices and services.
- Quantum communication: 6G networks will likely support quantum communication, which will require new migration strategies and solutions to handle the unique properties of quantum communication such as quantum key distribution and quantum teleportation.
- MEC: 6G networks will likely support MEC which allows to bring the computing, storage and networking capabilities to the edge of the network, which will enable new migration strategies and solutions.

- Integration of 5G/4G/3G networks: as 6G networks will be designed to work seamlessly with existing 5G, 4G, and 3G networks. Service providers will need to develop migration strategies that take into account the need to integrate these different networks.

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