Financing Small and Medium Enterprises with Blockchain Technology: Connecting SMEs and Investors in Europe

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Abstract

This research explored the use of blockchain technology to address the scalability and transparency challenges faced by Small and Medium Enterprises (SMEs). Specifically, it focused on how blockchain could enhance SMEs' ability to attract investors across Europe.

SMEs often struggle to expand their operations beyond limited regions due to a lack of investor interest, which stems from concerns over inadequate transparency in financial reporting and liquidity. Addressing these challenges is crucial for improving investor confidence and enabling the growth of SMEs.

The study conducted a systematic review of existing literature, utilising secondary data collection to assess the potential of blockchain technology in improving SME financing. A bibliographic study was performed to ensure a comprehensive understanding of the existing research landscape. Thematic analysis was then employed to identify key themes and insights from the literature.

The findings suggest that blockchain technology can significantly improve the transparency of SMEs' financial processes through the use of distributed ledgers. This enhanced visibility would allow investors to access real-time financial data, thereby fostering greater trust and encouraging inv investment. Additionally, the use of tokenisation and smart contracts was identified as a means to streamline asset sharing and funding processes, further supporting SME growth.

Keywords/tags (subjects)

SMEs, Blockchain technology, Distributed ledgers, collateral, liquidity, cross-border payments, and immutable records.

Miscellaneous (Confidential information)

For example, the confidentiality marking of the thesis appendix. See Project Reporting Instructions, Section 4.1.2.

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1 Introduction

1.1 Research Background

A financial enterprise can be defined as a business that is mainly involved in financial activity or any financial intermediation. It can be stated that the success of the entries is based on the accessibility of sufficient finance. Financing is also considered as the procedure of giving the funds in order to help the activities of the businesses (Ilbiz and Durst, 2019). It supports the business in investing or making the purchases the relevant thing needed for their business. Financial administration including banks is responsible for giving capital to small and medium finance enterprises, investors and customers.

Blockchain technology can be stated as the mechanism for the database that permits the sharing of information transparently within a business network. Blockchain in the SME can be used for transferring crypto assets, recording transactions storing ownership of digital assets, and providing a transparent and secure voting platform (Łasak, 2022). The blockchain allows businesses to order or transfer capital including crypto assets quickly and securely. It also works in business in order to create a public digital ledger, distributed and decentralised digital ledger.

Entrepreneurship in Europe has been promoted by the European Union and also motivates new organisations including small and medium SMEs to grow and also supports them with financial help from the UK administration. In 2023, small and medium enterprises got a valuation of €20 billion for SMEs. In order to support the small enterprises, the EIB group has partnered with the different banks. Other than this, small companies also connected with the EIB group in order to get financial help.

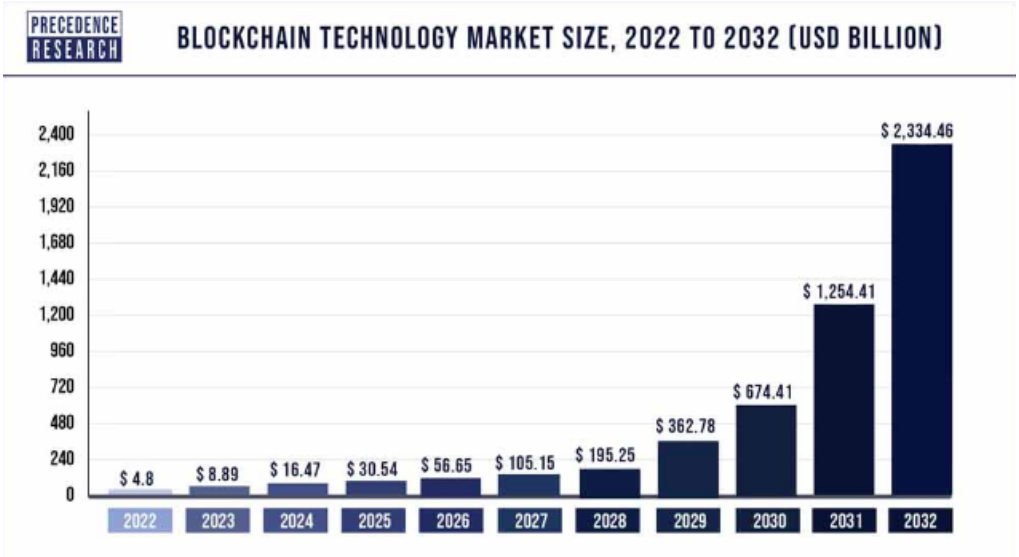


Figure 1 Market size of the blockchain from 2022 to 2032

(Source: Precedence Research, 2024)

It has been observed that blockchain technology has risen in the last few years and it is estimated to have a value of USD 4.8 billion in 2022. It is expected to grow in the upcoming years, projected value of USD 2,334.46 billion by 2032 (Precedence Research, 2024). SMEs can be stated as the backbone of Europe and also play a crucial part in the job creation, innovation, global economy, and also contributing to economic growth. Blockchain supports the traceability and verification of multistep transactions required in the traceability and verification. Small and medium enterprises are considered crucial for the development of the economy of the world. But, it is also noticeable that these companies face major problems including financial problems. It is essential to understand that the blockchain has the potential to improve the asymmetric issues of the SMEs related to the business.

1.2 Problem Statement

Financing small and medium companies through blockchain technology can be beneficial and also help SMEs to finance through different aspects. However, limited investor awareness can be denoted as the problem that occurred primarily. Investors with large capital including angel investors and venture capitalists mostly concentrate on the investment in large deals or there is the probability of having less knowledge regarding the opportunities provided by the SMEs (Dang, et al., 2022). One of the challenging factors for SMEs in attracting and reaching out to investors is the lack of awareness about investing in certain companies. Small businesses (SMEs) are hampered by the fact that they are not known by many people; this is a big problem because these businesses require investors to aid in their expansionist agendas. It is as if it were an inscrutable secret, and most likely no assistance would be forthcoming unless people were aware of it. It becomes difficult for SMEs to attract financial support when nobody including investors knows about them. This lack of awareness means that such companies may not take advantage of growth opportunities.

1.3 Research Rationale

Financing Small and Medium Enterprises through Blockchain remains challenging due to limited investor awareness. The problem originating from this lack of investor knowledge could also be described as being information-poor (Li, et al., 2020). Big investment sizes, for instance, would be more appealing to some wealthy financiers such as angel investors or venture capitalists with limited exposure when it comes to identifying opportunities available for SMEs. Lack of understanding of investments into particular firms among small business organizations can pose a challenge for SMEs when it comes to hiring employees and seeking investors. Based on the limited awareness of SMEs, a major problem arises as these organizations depend on investors for expansion. You might as well have something you cannot reveal even if there was someone who could help you out with it (Chen et al., 2021). If individuals such as potential investors do not recognize these firms, then financing becomes hard especially when it comes to SMEs. Numerous growth opportunities are

missed due to the widespread lack of general knowledge regarding this issue. Thus, research should be conducted on the subject matter so that we can find a way forward on how best we can solve this issue with companies utilizing blockchain technology where the majority have already ignored benefits accruing from such investment.

1.4 Research objectives and questions

Aim

This research aims to discuss the financing of small and medium enterprises (SMEs) with the help of Blockchain technology and connect the SMEs and Investors in Europe.

Objectives

- To identify the challenges faced by SMEs around Europe in terms of financing, finding investors
- To analyse the role of Blockchain technology in helping SMEs in Financing and scaling in the European market
- To identify the potential Blockchain system to improve the SME financing process.

Research Questions

- What is the role of blockchain technology in the support of SMEs mainly in financing around the market in Europe?
- How to identify the potential blockchain system to enhance the small and medium enterprises financing process

1.5 Significance of Research

Despite the benefits of the blockchain for financing small and medium-sized enterprises, it becomes necessary to research the subject and it also justifies the significance of the research as some of the issues relating to limited investor awareness, which has a direct impact on SMEs will also be covered in these reports. Limited knowledge is a term used to describe the problem, which was mainly caused by investor ignorance (Vijayakumar, 2021). Investors with a large amount of capital, such as angel investors or venture capitalists, tend to concentrate on sizeable investments and are more likely to have less knowledge about the opportunities offered by SMEs. Lack of knowledge about investments in specific companies may be a problem for SMEs to attract and look for investors.

1.6 Research Structure

Introduction: This can be considered as the chief of the research that is used to provide crucial info on the subject and also includes research questions, objectives and aims

Literature Review: This segment of the research critically analyses the views of the different author perspectives derived from the research papers and Journals.

Research Methodology: In this segment, the kind of information is related to the tools, tactics and data instruments that have been used to gather the data for the research.

Data analysis: In this chapter, the finding has been studied with the support of the particular process

Conclusion and Recommendation: It can be considered the final chapter of the research that contains the summarising of the collected information

2 Literature Review

2.1 Introduction

This chapter discusses the reviews of different journals, research papers and articles related to the topic of this report “Financing Small and Medium Enterprises with Blockchain Technology: Connecting SMEs and Investors in Europe”. Multiple research and articles discussed in this chapter that are published by different authors on this subject have been studied from Google Scholar, Research Gate and other authentic sources. The different point of view of several authors provides a brief understanding of the subject of this research and help to identify the research gap to proceed further with this study. This chapter discusses various research done by different authors on challenges faced by SMEs in Europe regarding financing and finding investors to scale their businesses. Several articles also shed light on the role of Blockchain technology in helping to get funding and scaling SME businesses in Europe. It also discusses different blockchain systems ideas discussed by several authors to improve the financing process for small and medium enterprises.

2.2 Challenges Faced by SMEs in Europe for Financing and Finding Investors

According to Ayadi, et al., (2009), small and medium size enterprises are the backbone of Europe’s economy. These SMEs represent 99 per cent of all the businesses in the European Union. These enterprises give employment to almost 100 million people and contribute to Europe’s GDP by 50 per cent. However, the SMEs are still facing a lot of challenges in scaling their business and getting the required funding amount. They have limited access to the financial market and investors compared to large-scale enterprises. The SMEs get limited benefits from the stock market, financial operations and elaborated treasury operations. These challenges limit the growth and expansion of these enterprises along with reduced ability to handle operational and financial risks. The studies show that new, small and medium firms have high success rates and they grow faster compared to large and older firms. At the same time, these firms face severe restrictions in financing compared to large-scale firms.

In the view of Eggers, (2020), the SMEs have fewer resources and assets in their control which makes them vulnerable to external and internal threats such as competition, natural disasters, skilled employees quitting their jobs, and declined funding. These small firms have a huge negative impact from the economic crises. SMEs give innovative solutions to solve issues and spread innovations throughout Europe, solutions such as social cohesion, pollution and climate change. The SMEs are essential for European markets in economy, industrial ecosystem, competition in the market and prosperity (European Commission, 2024). The authors discuss that macroeconomic conditions affect SMEs through financial fragility. The major issue SMEs face is the lack of credit history because large-scale investor and banks look at the credit history of the companies while investing in their businesses. The lack of credit history shows that small firms are a risky investment for investors and that is the major issue in finding investors for SMEs.

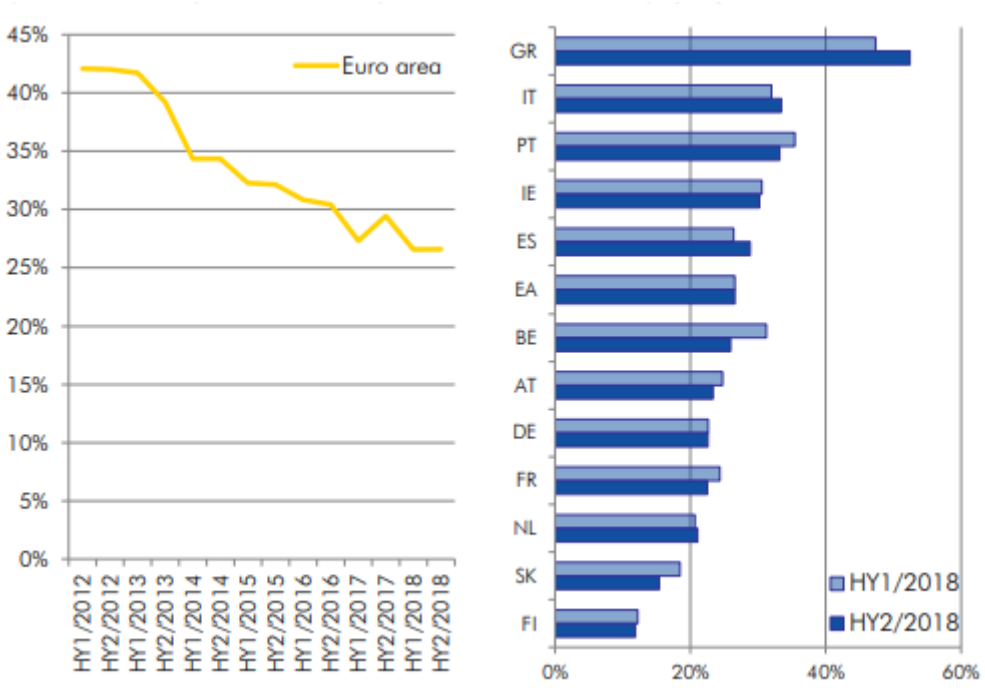


Figure 2: SMEs ranking according to their access to Finance.

(Source: Kraemer-Eis, et al., 2019)

According to Kraemer-Eis, et al., (2019), the above figure shows that access to finance for SMEs is different from country to country. Greece has the highest access to finance in the figure, likely due to favourable economic conditions, government policies and increased demand for funding during that period. Another big challenge the SMEs face concerning funding and investor access is inadequate collateral. Investors and banks always look for some sort of collateral for the loan or investment, which becomes a challenge for SMEs because they do not have enough assets to put as collateral. The small and medium enterprises also do not have enough knowledge about government schemes that promote SME financing. This lack of awareness of government policies is also a significant challenge for SMEs because this reduces many opportunities for the companies for financial support. The unawareness or lack of information limits the ability of SMEs to access financial support. Small and medium enterprises also face increased compliance cost that makes it challenging for SMEs to spend their resources efficiently. SMEs also do not have proper information about their business, finances, resources and sales, which makes it hard for investors to analyse their business and provide funding.

From the point of view of Brown and Lee, (2019), the UK government has a core policy to increase the credit for SMEs and access to finance, however, the evidence shows that SMEs rely on equity sources of finance or either strapped for cash. Europe has a wide market and there are different countries with various rules and regulations. These countries have different investors, investment criteria and business environments. The economic condition of every country also varies which also affects the investment of SMEs and any kind of

disruption in the country's economy such as geopolitical tension and financial crisis leads to low funding for SMEs. Small and medium enterprises operate on a small scale compared to large enterprises which makes them less profitable or less attractive to financers or investors. Investors prefer large-scale companies that give high returns on their investments with low risk and investment assurance.

According to Ackah and Vuvor, (2011), another reason for low investment for SMEs is the high default rate in repayment of funding. The investors provide investments on high-interest rates for SMEs that make it difficult to pay on time or take loans of such interest rates. The SMEs are also not focusing on advanced technologies which results in low interest of investors because of low profitability and trust issues. Most of the SMEs cannot meet the demands of investors or financers which is also a big reason for low investment for SMEs. The major requirement for most investors is the lack of collateral and a small equity base. The investors assume the risk of their investment if the small and medium enterprises have lack of collateral

Based on the different views of the authors, it can be stated that the small and medium enterprises in Europe have to face challenges from large-scale companies as they lack adequate funding to scale their business. It is difficult for them to find investments from investors as they provide lower returns. These SME companies are unable to gain large amounts of loans from the banks as they lack adequate resources to provide the banks with collateral. These companies also lack knowledge regarding the schemes that are provided by governments for supporting small-scale businesses. These companies often face challenges in repaying their loans due to poor sales that are impacted by their declining sales. The geopolitical and economic situations in the country also affect their business equity.

2.3 Blockchain Technology's role in helping SMEs in Financing and Scaling in Europe

According to Hellwig and Huchzermeier, (2019), multiple enterprises are adopting Distributed Ledger Technology (DLT) based approaches in their operations. The view of blockchain works just as a magic bullet in improving transparency, creating new products, and highlighting operational issues or challenges. DLF provide financial services to SMEs without involving any intermediary. This technology helps SMEs to access finance, loans and access other financial funding while having no contact with banks or financial organisations. This blockchain decentralisation accelerates the financing process and provides more flexible financing methods for SMEs. Another blockchain application for SMEs is smart contracts which can reduce the intermediators and automate the financing agreements. Smart contracts write the contract in terms of code and these contracts are self-executing as well. These contracts help in managing and automating SMEs' collateral, interest payments, and loan processes. They also ensure the successful removal of smart agreements and remove the administrative issues on SMEs.

In the views of Chen, et al., (2021), SMEs also adopt closed-loop credit and self-testing models to control and manage the security and safety risks and ensure the smooth flow of financial processes. It is an essential and

supporting method for SMEs to solve financing issues or problems. The benefits of blockchain such as traceability, temper-proofing and decentralization provide new methods to solve the issues in the development of finances for SMEs. Blockchain can also provide benefits to SMEs indirectly by developing an effective, accountable, traceable and transparent supply chain that attracts investors to invest in such SMEs. This transparency also be used to secure the finances and create trust for financial institutions in the reliability of SMEs. These benefits also have the potential to improve and create a more accessible term for supply chain financing. It also reduces the transaction process and helps to provide real trade data.

According to the views of Łasak, (2022), financial technology helps in providing financial inclusion for SMEs and improving the financial condition of SMEs in developing countries. The blockchain also helps SMEs to create transactions that cannot be tampered with transparency and security. The improved and enhanced security of finances and transactions builds trust between investors and SMEs. The transparent flow of transactions helps SMEs to create collaboration or partnerships with investors because this ensures the reliability of SMEs to investors. The blockchain also provides the history of all the transactions to all related parties which is helpful for investors to analyse the finances and create investments in small and medium enterprises. Another benefit is it creates partnerships between large-scale enterprises and SMEs because of their transparent transaction by analysing the profitability of the investment. This is a safe and secure method to show the profitability of the business to banks or financial institutions to seek investment in their business.

As per the views of Pavlidis, (2021), the application of blockchain has been recognised by the European Union (EU) and after the COVID-19 pandemic, it has been discussed the need for digital finance strategies to remove the regulation gap and help SMEs to grow and succeed. This leads to improved finances and an increase in funding for SMEs. It also provides effective financial products for consumers that improve the financing and financial inclusion of small and medium-level enterprises. The decentralization of blockchain removes the dependency on the traditional infrastructure of banking and allows a smooth flow of financial services. In different regions of Europe, blockchain technology can help SMEs get financial services without needing any physical banking infrastructure. This also enhances financial inclusion and it empower SMEs that are not included in the traditional financial system. It also reduces the limitation of financial services in undeveloped regions and allows SMEs to access financial services according to their capabilities.

According to Ilbiz and Durst, (2019), the use of blockchain frameworks helps in the reduction of cost, and digital representation of assets and resources for SMEs to attract investors and scale their business operations. The applications of blockchain also help in automating the compliance regulation process for SMEs. This also ensures that contacts are legit and it is meeting the contract obligations without any intermediary. It also helps in adhering to the legal requirements of the business without any extra effort and increases the efficiency in regulating the more complex regulations. The blockchain also helps SMEs to raise funds with the

help of token offerings. Many small firms also issue digital tokens that show their ownership and future profits of the company. The advantages of this technology help SMEs to connect to global investors and raise funding to scale their business. Most traditional banks take high charges and a lot of time in international charges but blockchain reduces this and makes cross-border transactions easy and faster, this allows SMEs to operate their business in the global market and take advantage of it.

Based on the above analysis, it was identified that technological advancements are making disruptions in the field of small-scale industries. The blockchain technology has enabled these companies to gain loans at more reasonable rates. These rates are more affordable as they are built using smart contracts eliminating the intermediaries. Blockchain technology provides a log of the financial history of all the transactions in one place to all the users within the smart contract on the rise of a request. Blockchain technology enables SMEs to gain more visibility to global investors, it also enables businesses to connect to banks with the most affordable rate of interest for international funds transfer.

2.4 Blockchain Systems to Improve the SME Financing Process

According to Sun, et al., (2021), blockchain-based loan systems can be beneficial for SMEs to exchange information between businesses and several financial institutions. This technology also reduces the cost of financing for SMEs which helps the companies to more easy funding. It also improves the information exchange between government departments, SMEs and investors. This process also reduces the need for paperwork and makes the load method more convenient for SMEs. The removal of intermediates and manual work makes the overall process more accessible and reduces the cost for small firms. It also reduces the risk for SMEs while creating secure and trusted funding for small and medium enterprises. The implementation of blockchain increases the performance of overall financial processes and loan systems. It creates equal opportunities for all SMEs to access funding by sharing all the relevant details and their business operation growth with the investors.

As per the views of Purwaningsih, et al., (2024), the SMEs could adopt the VeChain platform of blockchain technology to improve the supply chain of SMEs which leads to an increment in funding and scaling the operations. This platform ensures the quality and authenticity of the supply chain by recording and verifying each step of supply chain operations. The blockchain allows SMEs to secure and transparent supply chain operations that help the investors create accurate risk analyses of the company and invest in their business operations. It helps to create a trusted and effective supply chain that has the potential to increase the revenue of small and medium enterprises, and this increment in revenue could attract investors to invest in their business. Investors always look for a genuine and high return on their investment and the use of blockchain technology in SMEs' business operations ensures their profitability and reliability.

Based on the views of the authors, it was identified that Blockchain has improved the global visibility of the various business process that assists investors in analysing the company's financial position. They are able to analyse the company's true potential to attain growth despite their total number of assets. It improves the direct investment into the company leading to possibilities of future scalability. Blockchain has made the investment process more reliable as it allows the investors to evaluate the authenticity of business operations which leads to higher returns. The process allows for hassle-free documentation that helps in saving the time of the business while reporting to government authorities. Different manual operations that are associated with dealing and handling finances are automated by the integration of blockchain technology into the SME's business operations.

2.5 Summary and Research Gap

From the above literature review, it can be summarised that the small and medium enterprises that are operating within Europe are facing fierce competition from large-scale enterprises. These enterprises often cause them difficulties in capturing the marketing by disrupting the marginal costs that lead to poor sales. The SMEs face difficulties in raising adequate funds for the management of their operations such as scaling to new markets and products. The inclusion of blockchain into these processes has disrupted the marketplace leading to an ample amount of business opportunities for these small-scale businesses. The technology has led to operational transparency attracting higher prospects for businesses to gain loans from the banks (Cecere, et al., 2020).

The technology has enabled the banks to evaluate the different aspects of business that justify their possible growth in the marketplace. It helps these SMEs to gain loans at a comparatively lower rate than before that reduces their financial burden. Smart contracts enable the banks to avoid any middleman in the loan processes and help them to be open for international investments of funds by improving their global visibility. The improved financial visibility helps businesses to attract investors and compete in markets that are dominated by large-scale businesses. Blockchain technology also assists the business in documenting and generating reports based on the data stored in the data logs saving the time of the business (Ilbiz & Durst, 2019). The businesses are able to tokenize their assets as well as protect their finances from being assessed by cyber attackers. The smart contracts also eliminate any hidden costs by automating the agreements with the banks.

Based on the views of Eggers, (2020), Lasak, (2022) and Sun, et al., (2021), it was identified that the authors were effectively able to introduce the positive impact of blockchain technology by outlining the major financial challenges that are mitigated by the technology. It highlighted that SMEs are facing challenges in order to raise an adequate amount of capital for boosting their business operations and scaling the business into the European markets. It also discusses the lack of awareness regarding the government policies for supporting these businesses. However, the authors were unable to recognise potential sources of integration of

blockchain in order to further enhance the research quality. Their research was unable to highlight the major sources of improvements that will be enabled by blockchain and help these SME businesses attain higher investments. It lacks suggestions that will further improve the transparency of the business in terms of global marketplaces.

3 Chapter 3 Research Methodology

3.1 Introduction

The chapter focuses on the various methods and approaches that are used for the collection, interpretation, and in-depth analysis of the data. It provides an appropriate description of the design structure that has been implemented for conducting the concerned research. It focuses on emphasising the approach for analysing the various statements from the key contents of the literature. The research method plays a significant role in stating the type of data that was used to conduct the research along with the data analysis and interpretation methods. These methods help in evaluating the research contents and act as conclusive evidence for supporting the research findings. It helps in meeting the research aim and objective by answering analysis methods. These methods are significant for highlighting the significance of the integration of blockchain technology with small and medium enterprises in order to mitigate the financial challenges leading to higher exposure to investors in Europe.

3.2 Research Design

The research design is described as a systematic framework that is selected to conduct the research, the research design comprises all the techniques used in different aspects of the research. The research design consists of a design model illustrating the methods used in the research. The selection of a design model is significant as it helps the assessment of the research, and the research method can help in driving the research results. The selection of different methods has implications on results as the selection of adequate data collection methods is important for gaining research information and influences the total time taken to conduct the research. The study implements ***Saunder's Research Onion*** for picturing the research structure. The Saunder onion is considered one of the most significant methods for visualising the research methods in a standardised structure (Melnikovas, 2018). Saunder's research onion model for the concerned research is illustrated in the figure below.

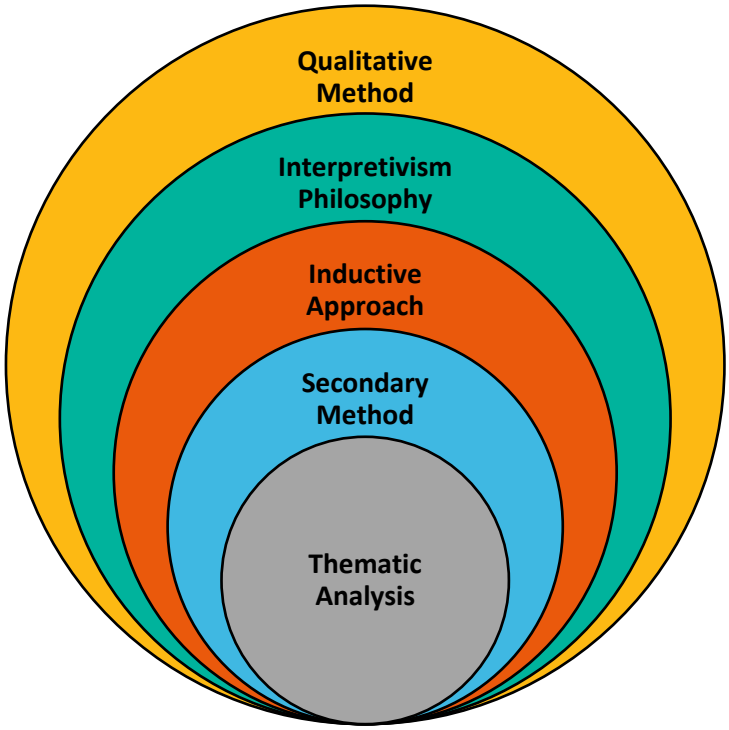


Figure 3: Saunder's Research Onion

(Source: Created by Author)

The above onion models define the layered approach that has been selected to analyse the different research layers. The research utilises the ***Qualitative Method***, which signifies that the research analyses the non-numerical data for analysis of opinions, experiences, and findings of existing researchers (Mardiana, 2020). It utilises the ***Interpretivism Philosophy*** to discover relevant insights from the data. It will further implement an ***Inductive Approach*** for observing patterns in order to reach a general conclusion. The research collects the data from the ***Secondary Method*** which comprises sources such as journals and books in order to complete the research within the specified deadline. It will generate themes using the ***Thematic Analysis*** method in order to support the findings of the research.

The research philosophy refers to the reflection of the assumptions, and perspectives that are used to evaluate the research goals and the estimated outcomes. Research philosophy is classified into four types, majorly known as positivism, interpretivism, pragmatism and realistic research philosophy. Each of the philosophies has its unique drive to conduct the research, it influences the research interpretation The research utilises the ***Interpretivism philosophy*** for observing the financial needs of the SMEs in the European markets, assessing their challenges in scaling, and gaining more investments (Alharahsheh & Pius, 2020). It is the most relevant of the concerned research as it assesses the socially constructed events in the European markets for evaluation of the requirements of funds by the companies. It facilitates the research by analysing the potential impact of blockchain technology on these enterprises for mitigating these identified challenges.

The philosophy is also significant in reaching conclusive research evidence for attracting international investments from various investors. It facilitates the research by suggesting additional means of business growth with the integration of blockchain into its financial processes. In addition to this, it is able to suggest various financially challenged areas that can be mitigated with the help of blockchain technology by improving process transparency.

The Research method refers to the selection of an adequate method for the research data collection. It is used for driving the data collection and data analysis method for the research (Randolph, 2019). The research methods are classified into the ***Qualitative***, ***Quantitative, and Mixed methods.*** Each of the methods comprises a different data collection strategy based on the instrument of data collection. The data collection influences the time taken to conduct the study as certain methods require more time in collecting and analysing the other methods. The research utilises the ***Qualitative Research methodology*** as it analyzes the different findings from the various published literature in authentic sources (Mohajan, 2018). The data collected helps in building robust theories that are used to underpin the key concepts that are gathered from the analysis of financial information in Europe. It helps in analysing the different perspectives from the European theorist regarding the conditions of SMEs highlighting their challenges and opportunities for attaining success through integration of blockchain technology. The different opinions and perspectives help in the generation of a considerate viewpoint compiling of interpretation of blockchain into SME's operations. It assists in building an interpretive view that is used for analysing the positives and negatives of blockchain technology on the funding of small and medium-scale industries.

The research approach refers to a method that drives the outlines of the research findings. The method is s developing an adequate reasoning that drives the research results. It comprises the two key methods Inductive and Deductive approaches. The selection of approach is significant as it implies that research would be developing a new theory based on adequate reasoning to support the findings. The research utilises an ***Inductive approach*** for the analysis of a broad observation in order to reach a general conclusion (Varpio, et al., 2020). The research would analyse the SME's financial performance in the European market leading to the identification of potential solutions that can be implemented using the suggested theoretical framework. The research develops themes from the observation for recognising the hidden patterns comprising challenges and potential solutions. The inductive approach would effectively justify the research findings by adding appropriate backing to the findings statements (Tsai, 2019). It will critically analyse the solution in order to validate the research findings by offering significant improvements made to the funding of SMEs in Europe.

3.3 Data Collection

Data Collection refers to the methods that are used for collecting relevant information relating to the concerned research (Flick, 2018). The selection of adequate data collection methods is significant is it drives the

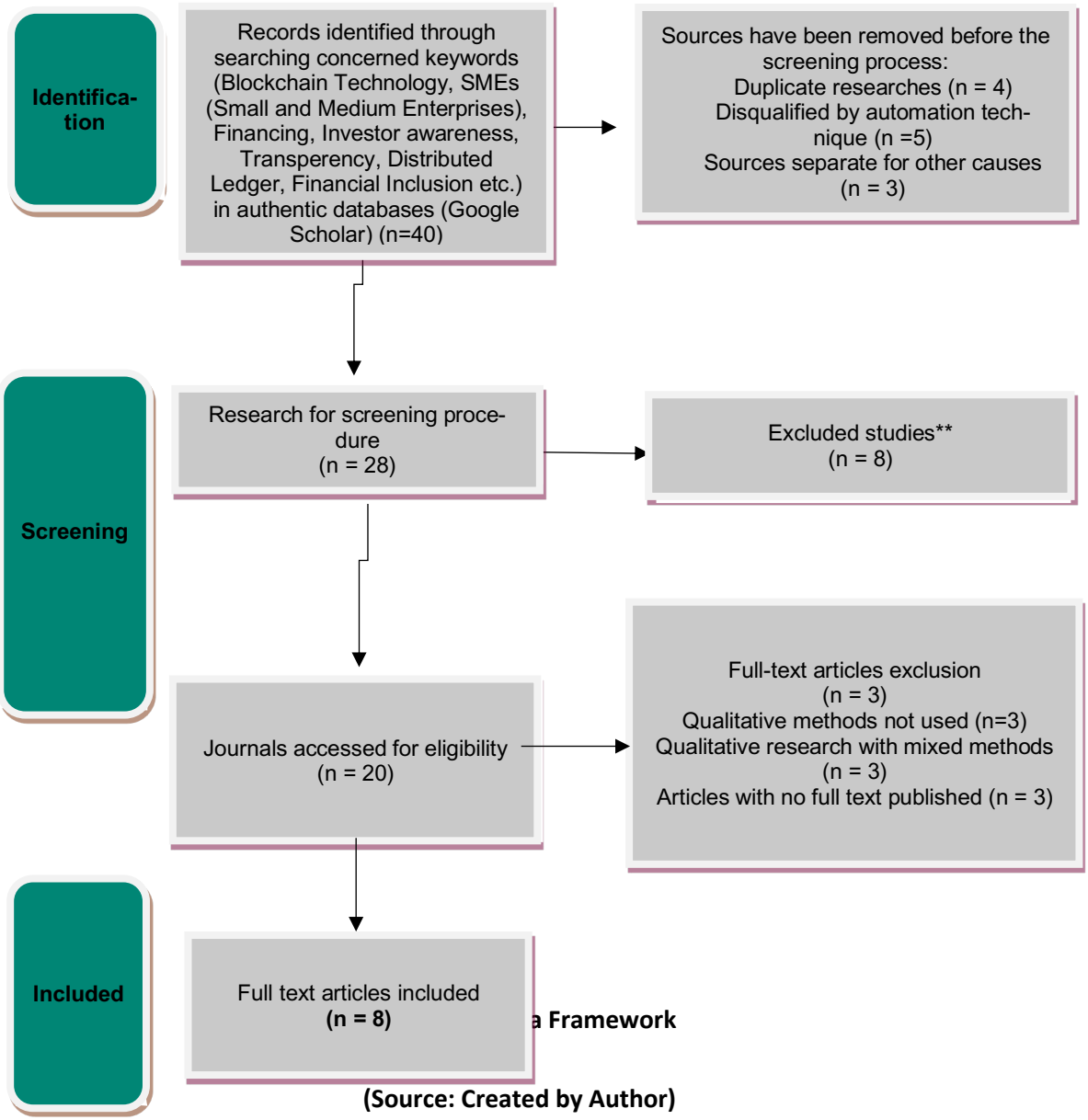
time taken to collect the data and reflects the impact on the analysis methods. The research utilises the ***Secondary Data Collection method***. The research collects the results of papers, articles, and books from authentic data sources such as Google Scholar, Research Gate, and Science Direct for collecting authentic research articles and journals for the concerned research (Sileyew, 2019). The secondary data is used for researching for financing SMEs in Europe with the help of blockchain technology. The research utilises robust inclusion and exclusion criteria for including all the relevant research and excluding any non-relevant research. It also utilises a PRISMA framework for the elimination of all the non-relevant research and justifying the selection of research based on identified factors that amplify the research significance.

Reflecting on the process, the structured nature of PRISMA enhanced data collection and organization. However, improvements could include more thorough pilot testing and earlier identification of potential limitations to enhance the robustness of the research.

3.3.1 Inclusion exclusion criteria

Inclusion	Exclusion
The research inculcated the papers that are-published in 2018 and later.	The research excludes the papers that were published before 2018.
The research encompass papers that are only published in the English language.	The research does not include any source that are published in non-English language.
The research includes papers that include information related to the financing of small and medium enterprises through the integration of blockchain technology.	The research avoids any information related to non-relevant articles that do not include information on the financing of SMEs through blockchain.

3.3.2. Prisma framework for selection process



a Framework

(Source: Created by Author)

The Prisma framework enables the transparency in research filtration and selection process, it is a reliable technique that is used in the selection of appropriate literature. It identifies literature using the predetermined research criteria and standards for the specific keywords. The researches are screened in-depth and excluded for any non-relevant research. **40 research papers has been selected out of which 8 get finalised after screening process.** The selected researchers are further assessed for their methods whether they align with the current research or not. At last, the full-text research articles that meet the criteria for keywords, languages, methods and content are selected for the research.

3.4 Data Analysis

Data Analysis refers to the interpretation of the information that is collected for analysis of patterns, relationships, and trends. The data analysis methods signify the means through which the collected data would be analysed. The research utilises ***Thematic data analysis*** for the development of themes (Castleberry &

Nolen, 2018). It involves pinpointing the patterns of the research from the data, it involves enhancing the familiarity with the data during the preliminary stages. The patterns are recognised for the development of codes that are further used for identifying subthemes and reviewing them for an in-depth analysis. It is one of the most appropriate methods for discovering the various aspects of the integration of blockchain for improving the financial connectivity of investors and SMEs in Europe.

3.5 Ethical Considerations and Limitations

Ethics are the core principles that are significant for stating the research's reliability, trustworthiness, and transparency (Arifin, 2018). The research abides with the safeguards of the university standards and complies with the fair use of journals, reports, and books for references. The data was non-manipulative and did not involve any biased views of the author. It does not fabricate the data to drive the research to certain results and can be considered a fair and reliable piece of literature. The thesis is of utmost reliability as it extends the findings from authentic secondary sources in support of the existing findings that will be gained in the current research through the thematic data analysis method.

The concerned research utilises secondary data collection methods thus it is evident that the boundaries of the research scope are restricted to a limited time frame along with restriction to European geographical locations (Zhou & Jiang, 2023). The restricted scope reflects that research might be focused on certain specific aspects of integrating blockchain technology for better connectivity between SMEs and investors in Europe involving partial views focused on financial scenarios.

4 Chapter 4: Data Analysis and Findings

4.1 Introduction

The main aim of this chapter is to provide accurate, precise and reliable data in order to conduct the analysis and extract meaningful findings for this study. A comprehensive look at the collected data related to the topic by the chapter allows one to reduce the complexities of the overall structure by bringing several variables that relate to the research subject into understanding. In this study, thematic analysis of data has been employed in analysing and interpreting collected information to make useful and dependable findings for this research.

4.2 Data extraction sheet

S. No.	Articles	Research Methodology	Research Outcomes	Keywords
1	Zhang, et al., (2021)	The study was conducted using the secondary data analysis method. It involved the analysis of the literature on blockchain technology and its role in financing SMEs.	The major finding of the study involved the significance of emerging blockchain technology and its role in optimising the supply chain for financing SMEs.	Supply chain, financing, small and medium enterprises.
2.	Naradda Gamage, et al., (2020)	The study was conducted using the secondary data collection method that involved the collection of data from the 110 research papers that were published on the platforms of Emerald, Elsevier,	The study reviewed the challenges that are faced by SMEs in terms of the survival rate while facing global challenges due to economic globalisation and advancement of the technologies.	Economic crisis, global challenges, survival strategies, small and medium enterprises.

		Taylor and Francis and MDPI.		
3.	Merugula, (2021, March)	This study incorporates a primarily qualitative approach to acquire the required information related to the research topic.	The findings of this research outlined that blockchain technology is a dependable, efficient and cheap way of registering goods and buying commodities for SMEs. Thus, blockchain technology improves fund transfers and issuing of securities by facilitating the transactions between small and medium-sized enterprises or start-ups and	Technological innovation, Uncertainty, Blockchain, Security, Standards, Investment, Business, Blockchain technology, small and medium-sized entrepreneurs, financing, and database processing.
4.	Kumar, et al., (2023)	The study uses a systematic approach to assessing data using a secondary research method. It used 53 articles that comprise a theoretical review of SMEs using blockchains using SMEs for finances	The research shows that blockchain technology has improved the financial accessibility and crediting ability of SMEs. It addresses the issues of scalability and regulates any uncertainties.	SME, Block Chain Technology, Supply chain finance.
5.	Wang, et al., (2019)	The study performs the theoretical analysis using secondary	The report offers a decentralised architecture and	Blockchain, SME financing, credit

		data. It uses the blockchain-embedded model and warfare analysis method.	distribution of the computing paradigm that has attracted different sectors of society. It involves the risk pooling and reducing the risks of lending and borrowing.	rationing and information asymmetry.
6.	Tsai, (2023)	The report utilised the secondary data analysis method to collect information from secondary sources involving data regarding the financing of SMEs from the perspective of business application.	The report addresses the issues of delayed payments and suggests solutions for decentralised applications and smart contracts.	SCF, Blockchain technology, decentralised.
7.	Gong, et al., (2022)	This research utilised a secondary research approach to conduct multiple case study analyses to acquire the required information related to the research topic.	In light of the foregoing and based on the innovation adoption theory this study outlined a general implementation framework that is proposed to serve as a useful guideline for organizations looking to embrace BCT in their SCF.	Blockchain technology, supply chain finance, innovation adoption theory, case study
8.	Chen, (2023)	The research utilised the secondary data analysis method to	The report found that the use of Blockchain technology improves the transparency of their business	Blockchain, SMEs, financial distress

		process the information of SMEs and their financing information using blockchain technology.	and helps attract banks and other investors to fund them using the analysis of the information.	information asymmetry

4.3 Theme Development

Themes	Codes
Poor access to finances and credit history affects the funding of the SMEs.	Finances, Credit, funding of SMEs.
Blockchain technology has enabled Distributed ledger leading to transparency and financial inclusions of SMEs.	Blockchain technology, Transparency, financial inclusion, distributed ledgers.
Blockchain loan systems have improved the visibility of funding in SMEs and have helped investors gain knowledge of their financial position and scalability.	Financial position, scalability, blockchain loan system.

4.4 Thematic analysis

Theme 1: Poor access to finances and credit history affects the funding of the SMEs

From the findings of Calabrese, et al., (2020), it was assessed that the access of finances to SMEs in Europe is impacted by increased financial fragmentation. This has led to issues of credit rationing in the companies, it involves higher distrust in the lenders due to the poor financial history of the company in raising credits that potentially impact their current and future loans. Lenders do not trust these SMEs and thus are providing limited credits to the companies. This discouragement in the borrowers leads to a financial crisis in the European SMEs poorly impacting their long-term credit worthiness. The companies are obliged to be available for financial audits due to this distrust that affects their documentation process and it consumes their time. This also exposes the companies to relying on high-interest loans with limited initial payments causing them difficulties due to lack of funds. This also limits their access to global environments as they are unable to scale and gain recognition.

Similarly, from the study by Andries, et al., (2018), it was found that small firms face more issues in raising credits in terms of limited infrastructure and capability of scalability. The SMEs in Europe are competing in competitive markets leading to their issues in creating funding opportunities. Most of the firms are already relying on credit and work with lean profit margins. This impacts their fundraising capability in a significant manner as the investors demand the SME's high interest rates during the allocation of loans to the organisation. This impairs their vision of growth and limits their capability to scale their businesses and compete with large companies. The SMEs are discouraged through such procedures of borrowing as the banks also charge them with interest rates that they are incapable of paying in the long term. This further increases their need to opt for high-interest loans leading to their increased exposure to credit rationing. Many of the companies were also found in facing issues in maintaining appropriate documentation of their credit history leading to poor transparency in their processes.

Theme 2: Blockchain technology has enabled Distributed ledger leading to transparency and financial inclusions of SMEs.

The findings of Davradakis & Santos, (2019), reflected that the inclusion of blockchain technologies into the existing financing and funding procedures of SMEs has significantly improved their performance. This has enabled the company to overcome the issues of fundraising for the company and gain funds at market interest rates. The blockchains have enabled the use of smart contracts in the transaction recording process of the companies this has allowed them to be more transparent about their financial prowess while seeking investments from investors in Europe. The SME's financial records are made using transparent procedures that are tamperproof boosting the trust of the investors around the European region to invest in the companies by showing their capability to invest in the organisation. Blockchain technology helps fill the credit gap through the help of decentralised nature by boosting the overall transparency of the fund crediting process.

Similarly, Merugula, et al., (2021), found that the distributed ledgers have led the SMEs to be financially inclusive of the transactions as they are able to build credit history. These credit records help them boost the overall transparency of the funding process and lead to securing loans or raising adequate capital for the business. The blockchains improve the reliability of the crediting process helping in building trust in the investors to fund the SMEs through the help of Smart contracts automating the process of the loan disbursement securely. The SMEs that are at a geographical disadvantage and have limited credit-raising sources are able to leverage this improved visibility to be more financially inclusive and reach alternate capital sources. The Decentralised financial records (DeFi) allow the companies to yield more funds and reduce their reliance on traditional banks by seeking global investors around Europe. The crediting process in blockchain is immutable thus it leads to building trust regarding privacy and security in the allocation of funds to SMEs.

Theme 3: The blockchain loan system has improved the visibility of funding in SMEs and has helped investors gain knowledge of their financial position and scalability

The study by Series, (2020), found that the inclusion of blockchain has boosted supply chain transparency with the help of its capabilities in providing the traceability of the business and funds control practices. The records of the company's financial transactional and capital are stored into smart contracts allowing them to achieve high security in documenting their finances. These financial reports are provided with a digital identity that helps the companies to know about their asset and positions of liquidity. The companies are able to attract investors and make them aware of their potential profit generation capability and potential scalability in the future. The investors are able to utilise this information and provide adequate funding to the SMEs utilising such information.

From the findings of the study by Tian, et al., (2020), it was found that blockchain simplifies the process of payments by reducing any third-party intermediaries that would be charging additional fees for the transaction. It allows for cross-border payments and increases the transactional limits of the overall funding procedure. The blockchain also provides protection from any fraud as the records that are stored in it are immutable. Blockchain technology can also be used by the end of the investors in allocating them funds using the finance channels of DeFi that enable the proceedings of lending, borrowing and liquidity profile of the companies.

4.5 Discussion

From the analysis of the findings of the literature review, it was found that SMEs (Small and medium scale enterprises) often face the issues of scaling their organisations. This is due to their limited operations and profiting capabilities causing them issues in fundraising. The investors are unable to trust such businesses due to their limited prowess to yield appropriate profits for them or even to return the invested amount along with the interest on time. This is basically due to a lack of transparency in the SME's documentation of their overall financial exchanges that would show their liquidity of funds and assets. Due to the small operational area, the companies are restricted from seeking investors that are present within the European market also there are very few opportunities for them to raise funds from the governments. Their financial positions are also influenced by their past performances in the repayment of loans on time and overall economic performance in certain quarters of the year.

Further analysis of the findings of the data analysis, it is evident that the lack of appropriate access to finances and poor maintenance of the credit history significantly impacts their capability to raise funds for their businesses. The major issue that is present in European SMEs is the financial fragmentation of the companies causes them challenges in attracting investors to invest in their company. This is due to their poor perfor-

mances concerning the financial background of raising loans at high interest causing increased credit rationing. The lenders then provide the funds to the SMEs at increased interest rates reducing the prolonged creditworthiness of the companies. The documentation of these loans is not maintained properly in certain organisations leading to their exposure to limited options and delayed allocation of the funds. Due to such a restricted environment, these organisations are unable to seek appropriate funding options from external sources cause of a lack of appropriate documentation and availability of alternate investors in small markets.

As per the assessment of the literature review, the advancements in technology have significantly impacted the process of fundraising from investors for SMEs in Europe. The inclusion of technologies like blockchain has streamlined the process using the help of smart contracts that are considered much more secure and immutable options for handling financial instruments and related documentation. These can be integrated and programmed to automate various procedures of capturing the activities in the financial environment of the organisation. The smart contracts enable privacy, secrecy and better control over the transaction of finances and related information by excluding any involvement of intermediaries these help in documenting appropriate information regarding the financial status of the organisation helping them in gaining investments from investors by providing them information in a transparent manner. The technology also boosts the visibility of organisations as it is aimed to attract global investors. This is due to the distributed ledger technology (DLT) helping in tracking the visibility of the financial prowess of the organisation.

From the findings of the data analysis, it was found that blockchain technology has enabled the company to overcome the fundraising barriers of the SMEs through gaining better visibility of the market. It also aligns with the findings of the literature review regarding smart contracts thus contributing to emphasising their role in the transparency of the process of funds exchange. These records are tamperproof allowing the investors to trust the process of organisations and continue to fund their operations. The improved transparency also contributes to the credibility of the organisation allowing them to build trust in their potential of scaling and profit generation capability. The SMEs have filled the credit gap using blockchain technology allowing the investors to be more aware of the internal procedures of the organisation. The ledgers store the credit history and record the whole transaction of securing loans along with the tokenised assets that are available for the organisation.

As per the findings of the literature review, blockchain technology has reduced the stress of paperwork and the documentation of information. The process is automated so the SMEs are not required to track the information that is exchanged during the fundraising as the data is conveniently stored in smart contracts that are reliable and do not require any handling from the intermediaries. The adoption VeChain platform of blockchain technology has contributed to enhancing the supply chain leading to improved scaling of the organisation, this will help them attract more investors to the company. The investors can utilise the improved visibility by gaining information regarding the assets that are held by the organisation leading to an increase

in the overall financial position of the organisation. It allows the investors to authenticate the financial operations of the SMEs to evaluate whether they produce higher returns. This improved knowledge helps them also to make wiser decisions before investing in the companies.

Similarly, the findings of the data analysis, contributed that the inclusion of blockchain technology has helped organisations in the maintaining of their financial records. The technology is also capable of enabling the traceability of the funds that are exchanged by the organisation over a period of time. The blockchain keeps track of the ownership of the total assets held by the organisation and can track key performance indicators in order to provide information regarding the liquidity position of the organisation. The blockchain also protects from any fraud by securing the information through immutable records. Blockchain technology helps track the transactional records of the organisation and track cross-border payments by contributing to overall funding procedure through improved transparency.

Based on the analysis it was found that SMES would leverage the most through the integration of blockchain technology into their functions. It allows the organisation to be more visible to the various investors across Europe or other desired regions globally. The analysis also indicated that blockchain technology contributed towards boosting the organisational awareness among the investors in a manner that they are able to gain insights into the operations and overall prowess to generate funds and provide returns to the investors. This boosts the confidence of investors that their investments are secure and would yield them profits while from the point of view, SMEs provide them access to adequate funds that were restricted before. The appropriate funds that are provided to the organisation allow them to direct those to their operations and scale their business while paying the interest at market rates. It opens up the restricted boundaries of gaining funding and provides them with alternate sources through improved trust and transparency.

5 Conclusion and Recommendations

5.1 Introduction

The section summarises the findings of the study and evaluates the findings of the literature review and data analysis. These findings address the research problem while aligning the findings to the aim and objectives. This chapter concludes the findings and concisely summarises them adding value to the research. It also provides robust recommendations that would add value to the research while being a contributor to improving its overall quality.

5.2 Theoretical contributions

This research reflects on the important role that Small and Medium Enterprises (SMEs) play in the European economy, while also highlighting the significant challenges they face in growing their businesses. It has been found that SMEs often struggle with limited access to funding, high interest rates, and difficulties in maintaining a good credit history, which makes it hard for them to expand. This study also reveals that a major issue for SMEs is a lack of financial transparency, which leads to a lack of trust from potential investors.

This study creates new knowledge by looking into how blockchain technology can help. Blockchain's ability to create a transparent and secure record of transactions can make a big difference for SMEs. It allows for automated contracts and secure data storage, which can help build trust with investors. This insight is important because it shows how new technology like blockchain can solve long-standing problems in SME financing and create a more trustworthy financial environment.

5.3. Practical contributions

From a practical standpoint, the findings of this research offer useful insights for both financiers and SMEs. For those who finance SMEs, using blockchain technology means they can see real-time, transparent financial information, which reduces the risks involved in lending. With better transparency and automated processes, financiers can make more accurate decisions, potentially offering lower interest rates and reducing the costs of compliance, making it more appealing to invest in SMEs. For SMEs, blockchain technology can be a game-changer when it comes to securing funding. It helps them build a clear and reliable financial history that boosts investor confidence. This transparency allows SMEs to access more financing options, not just locally but across Europe. Blockchain also makes it easier to conduct cross-border transactions, helping SMEs grow beyond their current markets. Overall, this study shows how blockchain can help SMEs overcome their financial challenges and support their growth in the European market.

5.4. Ideas and Recommendation

1. **Promote Blockchain Education and Training Programs**

Launch awareness creation campaigns among SME owners and their employees to promote knowledge of blockchain technology. These programs should explain the user applications of the technology in the financial sector, focusing on the efficiency, cost and security of the transaction. Experienced professionals must be employed to develop important competencies within SMEs so that the use of Blockchain Technology can be established efficiently. This approach will ensure efficient financial management and the investors will have trust in SMEs as these are businesses that are well informed on these new secure financial technologies.

2. **Develop Specialised Blockchain Financing Platforms**

These platforms must have in-built access points, strong security, smart contracts, and compliance check mechanisms. These platforms can enhance the levels of confidence of the investors besides ensuring that there is better funding. Technology suppliers and financial companies need to coordinate so that such services are secure and efficient and fulfil the SME's requirements. This would enhance credibility and accessibility of funds, and help equip the SMEs with alternate methods to raise and deploy funds for their sustainability and growth.

3. **Implement Incentives for Blockchain Adoption**

Governments should offer different forms of rewards like tax credits, subsidies or grants specifically to SMEs and investors for using the technology. These incentives will help in reducing the burden of the initial cost and thus would boost the use and adoption of blockchain. It will help in improving the financial conditions therefore, the governments can facilitate further steps in terms of the incorporation of blockchain technology in the financing of SMEs for enhanced innovation and effective economic development. Embracing new technologies within the investors, banks and other lending institutes will help SMEs by improving their accessibility to European investors.

4. **Promote Public-Private Partnerships for Blockchain Adoption**

Promote the development of public-to-private partnerships to integrate the use of blockchain technology in the financing of small and medium enterprises. Governmental, financial and technology sectors should develop proposals to highlight the best-practice use cases in order to highlight the value of blockchain. These collaborations will help SMEs to come up with new ideas that are relevant to the market, take advantage of new ways of financing and achieve sustainable growth. Through such collaborations, industry participants are able to have access to adequate capital, human capital, and other resources needed to increase the use of blockchain technology hence improving the efficiency of SMEs in the European region.

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