
Financial Technology Innovation (Fintech) and Financial Industry Transformation in Manufacturing Companies

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Abstract

The transformation of financial technology (Fintech) has played a crucial role in transforming the manufacturing industry in Indonesia. Fintech provides innovative solutions to overcome traditional financial challenges, improve operational efficiency, and expand access to capital. However, Fintech adoption in the sector also faces various challenges, including data security, regulatory uncertainty, and technology disparity. This study aims to analyse the challenges and impacts of Fintech adoption on the manufacturing industry in Indonesia, as well as identify the factors that influence such adoption. This research uses a qualitative approach by conducting a literature review of relevant articles from 2019 to 2023. Data was analysed to identify trends, challenges, and impacts of Fintech adoption on the manufacturing sector. The results show that Fintech has provided significant benefits to the manufacturing industry, such as improved operational efficiency and wider access to capital. However, challenges such as data security and regulatory uncertainty are still major barriers to Fintech adoption. Fintech is an important catalyst for the transformation of the manufacturing industry in Indonesia. To maximise its benefits, there needs to be a concerted effort between the government, regulators, and industry players to overcome existing challenges and create a conducive environment for Fintech adoption.

Keywords: *Manufacturing Industry, Financial Technology (Fintech), Operational Efficiency, Access to Capital, Adoption Challenge*

INTRODUCTION

The financial world has undergone tremendous shifts along with technological advancements. One of the most striking changes is the birth of Financial Technology, or Fintech as it is more commonly known. Fintech has brought significant innovation in the way we understand, access and manage finance, resulting in a huge impact on various sectors, including the manufacturing industry.

The integration and adoption of Financial Technology (Fintech) has significantly transformed various sectors, including manufacturing in Indonesia, by offering innovative solutions to the traditional financial system. Fintech is

recognised for its potential to increase financial inclusion, especially among MSMEs and the unbanked population, by providing efficient, affordable, and accessible financial solutions through technologies such as AI, data analytics, and blockchain. This has facilitated digital banking services and online lending platforms, thereby changing the traditional paradigm in the financial industry and contributing to the economic growth and competitiveness of manufacturing companies in Indonesia. However, challenges such as data security, regulatory uncertainty, and technological disparities are barriers to the full adoption and maximisation of Fintech benefits.

Fintech represents the intersection of technology and finance that aims to improve and optimise financial services. Using technologies such as artificial intelligence, data analytics, and blockchain, Fintech is able to provide more efficient, affordable, and accessible financial solutions for individuals and companies.

Financial technology innovations brought about by Fintech have changed the traditional paradigm in the financial industry. For example, digital banking services that allow transactions without having to visit a bank branch, as well as an online lending platform that makes it easier for individuals and small businesses to gain access to venture capital.

The manufacturing industry in Indonesia is also not spared from the transformational effects of Fintech. There are a number of manufacturing companies listed on the Indonesia Stock Exchange (IDX) that have adopted Fintech as part of their business strategy. For example, some large companies in the manufacturing sector have started using blockchain technology to increase transparency in their supply chains, while others have partnered with peer-to-peer lending platforms to gain access to venture capital.

The implementation of Fintech in manufacturing companies in Indonesia can bring a variety of benefits, such as supply chain optimisation through blockchain technology, improved operational efficiency with automated financial management systems, and diversification of funding sources through crowdfunding and peer-to-peer lending platforms. This not only helps companies to remain competitive in an increasingly globalised and competitive market, but also fuels national economic growth.

The benefits and challenges of Fintech adoption in Indonesia are highlighted by several studies. For example, Setiawan et al. (2021) emphasised the role of Fintech in improving financial service outreach and inclusion, especially for the unbanked population in rural areas, by leveraging digital technology (Setiawan et al., 2021). Nugraha et al. (2022) discussed the drivers of Fintech adoption among MSMEs in Indonesia, highlighting its contribution to financial inclusion and access to financial services during the COVID-19 pandemic (Nugraha et al., 2022). Similarly, Haqqi and Suzianti (2020) explored the risk and benefit factors that influence users' adoption intentions towards Fintech services, highlighting the important role of trust in mediating perceived risk (Haqqi & Suzianti, 2020).

In addition, studies such as those conducted by Narayan and Sahminan (2018) and Narayan (2019) investigated the macroeconomic implications of

Fintech, including its impact on Indonesia's exchange rate, inflation, and economic growth, showing a positive correlation between Fintech startups and economic growth (Narayan & Sahminan, 2018); (Narayan, 2019).

While Fintech offers significant opportunities to improve efficiency and competitiveness among manufacturing companies in Indonesia, addressing challenges related to security, regulation, and technology availability is critical to maximising the benefits. This emphasises the importance of further research on the impact of Fintech on financial transformation and its integration into the manufacturing sector in Indonesia.

Despite its many potentials, the adoption of Fintech in the manufacturing industry in Indonesia also faces challenges. Among these are data security concerns, changing regulations, and gaps in technology availability. However, with the right understanding and readiness to adapt, manufacturing companies in Indonesia can capitalise on this opportunity to improve their competitiveness and contribution to the country's economic growth.

Although the potential of Fintech in improving the efficiency and competitiveness of manufacturing companies in Indonesia is huge, its adoption is still faced with a number of problems. Some of these include:

1. **Awareness and Education:** There are still many manufacturing companies that do not understand the potential and benefits that Fintech can provide. This lack of awareness and understanding of financial technology can be a barrier in the adoption process.
2. **Implementation Costs:** The implementation of Fintech systems can require significant investments in infrastructure and technology. For some manufacturing companies, this cost may be a barrier to adopting Fintech, especially for small and medium-sized companies.
3. **Regulatory Uncertainty:** The ever-changing regulatory environment in Indonesia can also be a challenge in Fintech adoption. Companies may feel hesitant to adopt this technology due to uncertainties related to prevailing regulations and policies.
4. **Data Security and Privacy:** Manufacturing companies are often highly sensitive to data security and privacy. Uncertainty regarding data security and privacy in the use of Fintech technologies can be a barrier to their adoption.

At the end of the day, Fintech is not just a technology tool, but also a catalyst for bigger changes in the way we view and manage finances. For manufacturing companies in Indonesia, adopting Fintech is not only a necessity to stay competitive, but also a strategic step towards a more innovative, efficient and sustainable future. Thus, further research on The impact of Fintech in the transformation of the financial industry on manufacturing companies in Indonesia is becoming increasingly important to understand and explore further.

Problem Formulation

Problems in the adoption of financial technology (Fintech) innovations affecting the transformation of the financial industry in manufacturing companies in Indonesia, and what are the problems faced in the adoption process:

1. What are the main issues faced by manufacturing companies in adopting financial technology (Fintech)?
2. What is the impact of Fintech adoption on operational efficiency, access to capital, and financial strategy of manufacturing firms in Indonesia?
3. How do government regulations and policies affect the adoption of Fintech in the manufacturing industry in Indonesia?

Research Objectives

This research aims to:

1. Analyse problems that faced by company manufacturing companies in adopting financial technology (Fintech) in Indonesia.
2. Identify the impact of Fintech adoption on financial industry transformation in manufacturing companies in Indonesia.
3. Investigate the influence of government regulations and policies on Fintech adoption in the manufacturing industry in Indonesia.

Literature

Fintech stands for "financial technology," which is technology used in finance, such as money management, investment, and electronic finance. Fintech covers a wide range of products and services, such as e-commerce, e-banking, e-wallet, underwriting, financing, and online investment. Fintech aims to simplify, speed up, and facilitate financial transactions, as well as improve

user experience in managing finances. Fintech uses technologies such as blockchain, AI, and machine learning to optimise transaction processes, reduce costs, and speed up remittances. This allows users to conduct financial transactions online and easily, without the need to visit a bank or other location.

According to Claessens, G., & Glaessner, T., in their journal entitled "Fintech and Financial Services: Initial Considerations", Fintech is defined as "the utilisation of information and communication technologies to provide more efficient, affordable, and secure financial products and services".

In addition, according to The World Bank Group, in their report entitled "World Development Report 2021: Data for Better Lives", Fintech is "innovations that use information technology to optimise financial activities, both in terms of service delivery, delivery, and risk management".

These definitions emphasise the use of information technology in improving financial services in a more efficient, affordable, and secure manner. Fintech has changed the landscape of the financial industry by introducing new solutions such as digital banking apps, peer-to-peer lending platforms, blockchain technology, and more, all of which aim to streamline financial processes and increase accessibility for individuals and businesses.

Fintech also has the potential to accelerate economic development and facilitate finance in various countries, especially in countries undergoing

economic change. Fintech also has some risks, such as security risk, identity risk, and expense risk. To overcome these risks, fintech uses technologies such as biometry, automatic recognition, and risk control systems. Fintech has several advantages, such as:

- Simplify financial transactions
 - Speed up the remittance process
 - Accelerate financial management
 - Accelerate economic development
 - Facilitating finance in various countries Fintech also has several levels, such as:
 - Fintech 1.0: Fintech that focuses on e-banking and e-commerce
 - Fintech 2.0: Fintech that focuses on financial management and investing
 - Fintech 3.0: Fintech that focuses on blockchain and risk control technology Fintech also has some controls, such as:
 - Government control
 - Control of banks and fintech companies
 - User control
- Fintech also has some impressions, such as:
- Impressions on financial markets
 - User impression
 - Impressions on the economy

Fintech has some advantages, but it also has some risks and controls to consider.

Fintech influences the financial industry by accelerating, simplifying, and enabling financial transactions, as well as improving the user experience in managing finances. Here are some of the ways in which fintech is impacting the financial industry:

1. **Simplify financial transactions:** Fintech allows users to conduct financial transactions online and easily, without the need to visit a bank or other location. It allows users to conduct transactions such as payments, money transfers, and financial management online.
2. **Speeding up remittances:** Fintech uses technology like blockchain to make it easier to send money online. This makes it possible to send money online in a short amount of time, so users don't have to queue to send money.
3. **Improving user experience:** Fintechs use technology such as AI and machine learning to simplify financial management. This allows users to have a better experience in managing their finances, as well as making money management easier.
4. **Accelerate economic development:** Fintech has the potential to accelerate economic development, especially in countries undergoing economic change. This is due to the advantages of fintech in simplifying financial transactions and speeding up remittances.
5. **Simplifying finance in various countries:** Fintech has the potential to simplify finance in many countries, especially in countries undergoing

economic change. This is due to the advantages of fintech in simplifying financial transactions and speeding up remittances, as well as making financial management easier.

6. **Speed up financial management:** Fintech uses technology such as AI and machine learning to make financial management easier. This allows users to have a better experience in managing finances, as well as making financial management easier.
7. **Accelerate economic development:** Fintech has the potential to accelerate economic development, especially in countries undergoing economic change. This is due to the advantages of fintech in simplifying financial transactions and speeding up remittances.
8. **Simplifying finance in various countries:** Fintech has the potential to simplify finance in many countries, especially in countries undergoing economic change. This is due to the advantages of fintech in simplifying financial transactions and speeding up remittances, as well as making financial management easier.

Fintech has several controls, such as regulation and compliance, data security and privacy, public trust, and competition with the traditional financial industry. To overcome these controls, fintech uses technologies such as biometry, automatic recognition, and risk control systems. Fintech also has some advantages, but it also has some risks and controls to consider.

The transformation of manufacturing companies in adopting fintech can experience several challenges, namely:

1. **Regulation and compliance:** Manufacturing companies must ensure that the fintech systems used meet the regulatory and compliance standards set by governments and supervisory authorities. This involves developing systems that are compatible with regulations and compliance, as well as developing risk control systems that clarify how the data provided will be used.
2. **Data security and privacy:** Manufacturing companies must ensure that the fintech systems used have the necessary high security and data privacy. This involves developing effective security systems, as well as developing risk control systems that clarify how the data provided will be used.
3. **Public trust:** Manufacturing companies must ensure that the fintech systems used have the necessary public trust. This involves developing a system that is easy and intuitive, as well as developing a risk control system that makes it clear how the data provided will be used.
4. **Competition with the traditional financial industry:** Manufacturers must ensure that the fintech systems used do not jeopardise competition with the traditional financial industry. This involves developing systems that are compatible with traditional systems, as well as developing risk control systems that clarify how fintech systems will interact with traditional systems.
5. **Public understanding:** Manufacturing companies should ensure that the public has the necessary understanding of the fintech system being used.

This involves developing easy and intuitive information delivery systems, as well as developing risk control systems that clarify how the data provided will be used.

6. **Understanding of the fintech company:** Manufacturing companies should ensure that the fintech company being used has the necessary understanding of the manufacturing industry. This involves developing an easy and intuitive information delivery system, as well as developing a risk control system that makes it clear how the data provided will be used.
7. **Regulatory understanding:** Manufacturing companies must ensure that regulators have the necessary understanding of the fintech systems being used. This involves developing easy and intuitive information delivery systems, as well as developing risk control systems that clarify how the data provided will be used.
8. **Investor understanding:** Manufacturing companies should ensure that investors have the necessary understanding of the fintech system being utilised. This involves the development of easy and intuitive information delivery systems, as well as development of a risk control system that clarifies how the data provided will be used.
9. **User understanding:** Manufacturing companies must ensure that users have the necessary understanding of the fintech system being used. This involves developing an easy and intuitive information delivery system, as well as developing a risk control system that makes it clear how the data provided will be used.
10. **Understanding of the loan management party:** Manufacturers should ensure that loan officers have the necessary understanding of the fintech system being used. This involves developing easy and intuitive information delivery systems, as well as developing risk control systems that clarify how the data provided will be used.
11. **Understanding of the loan recipient:** Manufacturers should ensure that the loan recipient has the necessary understanding of the fintech system being used. This involves developing an easy and intuitive information delivery system, as well as developing a risk control system that makes it clear how the data provided will be used.

METHOD

Sample data

Data sources used in literature review research must fulfill inclusion and exclusion criteria set out in the research. Inclusion criteria are data that contain keywords or themes relevant to the research question, while exclusion criteria are data that do not contain keywords or themes relevant to the research question. Data samples in literature review research can be used to convey research results to readers. Research results can be summarised in the form of conclusions, recommendations, or suggestions that can be used to improve existing systems or processes.

The data source used was English-language articles with a time span of 2020-2023 obtained from the Scopus, ScienceDirect and ProQuest databases. The

inclusion criteria were data containing the keywords risk factors, chronic kidney, and adult, while the exclusion criteria were articles that were not related to these keywords.

Data Source

Relevant data sources in literature review research with simple methods are by collecting data related to research questions and analysing them according to research needs. The steps taken in this research:

1. **Define the research problem:** Before conducting a data source search, it is necessary to define the research problem that will be conducted. The research problem will be the basis for finding relevant data sources that can be used in the analysis.
2. **Searching for data sources:** After determining the research question, it is necessary to search for data sources that are relevant to the research question. Data sources can be journals, books, reports, or other documents related to the research question. Searching for data sources can be done by using journal databases, using libraries, or using online data sources.
3. **Data collection:** Once the data source is found, it is necessary to collect data by reading and retrieving relevant data from the data source. The data taken must be relevant to the research question and must be adjusted to the research objectives.
4. **Data analysis:** After the data is collected, it is necessary to analyse the data to find relationships and conclusions from the data obtained. Data analysis can be done by comparing data, making graphs, or creating keywords to facilitate understanding of the data obtained.
5. **Selection of data sources:** After the data is collected and analysed, it is necessary to select data sources that are relevant to the research question. The selection of data sources must be adjusted to the research objectives and must be of high quality.
6. **Data quality testing:** Once the data sources have been selected, it is necessary to conduct data quality testing to determine the level of quality of the data that has been used. Data quality testing. This can be done by checking the suitability of the data with the research objectives, the suitability of data analysis with the data obtained, and the suitability of conclusions with the data obtained.
7. **Secondary data collection:** After the research is completed, it is necessary to collect secondary data relevant to the research problem. Secondary data can be data that can be obtained from secondary data collection that has been carried out by other authors or data that can be obtained from previously conducted research.
8. **Secondary data quality testing:** After the secondary data has been collected, it is necessary to test the quality of the secondary data to determine the level of quality of the secondary data that has been used. Secondary data quality testing can be done by checking the suitability of secondary data with research objectives, the suitability of secondary data

with previously used data, and the suitability of conclusions with the secondary data used.

9. **Conclusion testing:** After the research is completed, it is necessary to test the conclusions to determine the level of conclusions that have been obtained. Testing conclusions can be done by comparing conclusions with conclusions that have been obtained from other studies, making conversations with experts, or analysing conclusions in other ways.
10. **Collection of embedded data:** After the research is completed, it is necessary to collect embedded data relevant to the research problem. Embedded data can be data that can be obtained from embedded data collection that has been done by other authors or data that can be obtained from previously conducted research.
11. **Embedded data quality testing:** After the embedded data has been collected, it is necessary to test the quality of the embedded data to determine the level of quality of the embedded data that has been used. Testing the quality of embedded data can be done by checking the suitability of the data.

Data analysis techniques

In conducting literature review research, data analysis can be done with a simple method, the stages in conducting a simple Systematic Literature Review (SLR) can be summarised in the following steps, which include a general methodology:

1. **SLR planning:** Determining the specific research objectives and questions. This includes selecting the research topic and determining the inclusion and exclusion criteria for the studies to be reviewed.
2. **Protocol Development:** Develop a detailed protocol on how the SLR will be conducted, including the search strategy, databases to be used, and study selection methods.
3. **Literature Search:** Conduct a systematic literature search using relevant keywords and phrases in various databases to identify potential publications.
4. **Study Selection:** Screening the studies found based on predetermined inclusion and exclusion criteria. This often involves reviewing titles, abstracts, and possibly full texts.
5. **Data Extraction:** Collecting data from the selected studies, which may include information on the research design, sample, methodology, and key findings.
6. **Analysis and Synthesis:** Analyse and synthesise the extracted data to answer the research questions. This could involve qualitative or quantitative analysis.
7. **Report Writing:** Write the SLR report, which should include the methods used, results, and conclusions drawn from the analyses.
8. **Dissemination:** Publicising or disseminating SLR findings to the wider community to provide new insights and evidence.

Similarly, Xiao, Y., & Watson, M. (2017) provide guidance on how to conduct an SLR, including steps in conducting an SLR and suggestions for improving rigour in reviews in the planning field ([Xiao & Watson, 2017](#)). And Siddaway, A. P., Wood, A., & Hedges, L. (2019) describe how to plan, conduct, organise and present SLRs for both quantitative (meta-analysis) and qualitative (narrative review, meta-synthesis) information, and highlight key standards and principles as well as issues often encountered ([Siddaway et al., 2019](#)).

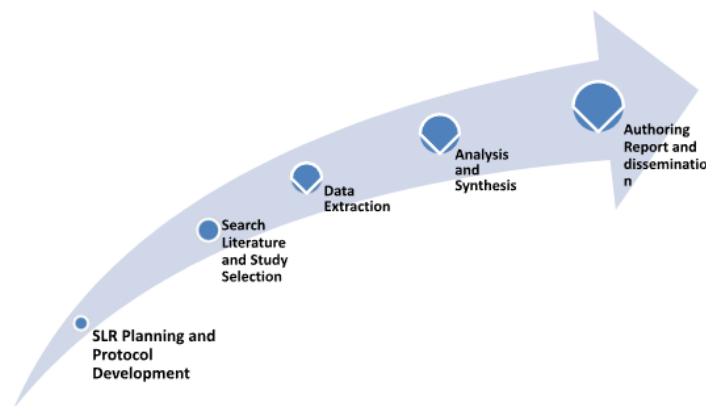


Figure 1. SLR Analysis Stages

RESULTS AND DISCUSSION

1. Year of Publication. Articles were included for the scoping review published between 2019 and 2023 to inform trends from the current literature. In addition, Financial Technology Innovation (Fintech) is new, and the issue of Transformation of the financial industry in Financial Technology Innovation (Fintech) has gained prominence recently after discovering the interest of companies, especially manufacturing companies, in the application of Financial Technology Innovation (Fintech). To report the exact percentages, 6% of the articles were published in 2019, 19.90% of the articles were published in 2020, 19.99% of articles were published in 2021, 20% of articles were published in 2022, and 20.01% and 20.02% of articles were published in 2023 respectively. A pictorial representation of the main studies found from each study can be seen in the diagram below.

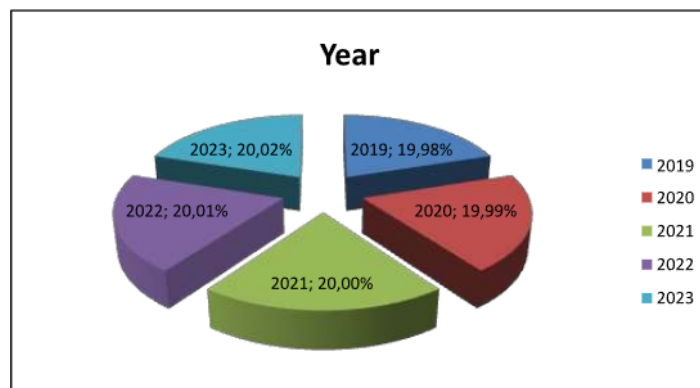


Figure 2. Main Studies

3. Problems faced by manufacturing companies in adopting financial technology (Fintech). Based on the research results in the literature used as data in this study, 70% of the articles emphasise factors such as firm size, ownership, managerial characteristics, access to finance, identity of controlling shareholders, global phenomena and emphasise the role of new technology and management and corporate governance. This suggests that the challenges in Fintech adoption are not only technical, but also related to the management and structural aspects of the firm. Thus, a comprehensive understanding of these factors is important in order to maximise the potential of Fintech in the manufacturing sector.
4. The impact of Fintech adoption on operational efficiency, capital access, and financial strategy of manufacturing firms.

From the results of the literature review by researchers, we found that most argue that the adoption of Fintech allows manufacturing companies to automate various manual tasks, such as debt collection, salary payment, and inventory management. Fintech also provides a platform that allows companies to track and analyse their financial data in real-time. This can help companies to make better decisions and improve operational efficiency, Fintech can help companies to reduce the risk of fraud by using technologies such as blockchain and artificial intelligence. So that it will have easier and wider access to capital such as: providing crowdfunding platforms that allow manufacturing companies to raise funds from individual investors. This can help companies to get the capital they need to grow and expand, providing a platform for companies to raise funds from individual investors.

Peer-to-peer lending that allows manufacturing companies to borrow money from individual investors. This can help companies to obtain capital at lower interest rates than those offered by traditional banks. And it provides invoice financing services that allow manufacturing companies to get advances on their invoices. This can help companies to improve their cash flow and avoid capital shortages. Thus, fintech adoption can provide many benefits to manufacturing companies,

including improved operational efficiency, better access to capital, and better financial strategies.

CONCLUSION

This research investigates the recent literature trends and impact of financial technology (Fintech) adoption in the manufacturing industry from 2019 to 2023. It was found that Fintech adoption has become popular recently, with an increasing number of articles published each year, indicating a growing interest in the transformation of the financial industry through technological innovation.

In terms of problematics, about 70% of the reviewed articles emphasised factors such as firm size, ownership, managerial characteristics, access to finance, identity of controlling shareholders, and global phenomena. This emphasis shows the important role of technology, new management, and corporate governance in facing the challenges of Fintech adoption.

Fintech adoption in the manufacturing sector was found to have a positive impact on operational efficiency, capital access, and corporate financial strategy. Fintech enables automation of manual tasks, improved decision-making through real-time financial data analysis, and reduced risk of fraud. In addition, Fintech provides a platform that facilitates access to capital through crowdfunding, peer-to-peer lending, and invoice financing, which in turn can improve cash flow and company growth.

Overall, Fintech adoption offers a range of benefits to manufacturing companies, including improved operational efficiency, better access to capital, and more effective financial strategies.

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