



Towards Policy Development of Entrepreneurial Ecosystem: A Review in Indonesia Financial Technology Sector

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ABSTRACT

Finance sector is one of the crucial sectors with high potential growth in Indonesia. However, the sector face challenges because the policies have not been able to cover the headway of the financial technology. Furthermore, the finance sector perceived as lack of interactive cooperation between the stakeholder in the game, which makes its ecosystem less entrepreneurial. This research assesses policy development through a literature review on the entrepreneurial ecosystem of financial technology. Financial technology devises innovation to add more value between consumers and businesses —this study draws attention to the financial technology sector, which has matured compared to other industries. The study deployed a qualitative approach using an entrepreneurial framework by Isenberg, which discussed actors, roles, infrastructure, organizations, and actions that produce an environment that supports entrepreneurs. The results show the player and key roles among regulators' policies and consumers of financial technology, especially when it relates to the benefit perceived. There are also overlapping related to delivering support for financial technology between regulators, but lack of social performance improvement. Current disruptive technology in finance, such as artificial intelligence, blockchain, cloud computing, and big data, could play vital roles in achieving sustainability. The framework of the entrepreneurial ecosystem is given to provide an understanding of the policy strategy in the financial technology case.

CCS CONCEPTS

- **General and reference** → Document types; General literature;
- **Social and professional topics** → Computing / technology policy; Government technology policy; Governmental regulations.

KEYWORDS

Policy Development, Entrepreneurship Ecosystem, Financial Technology

ACM Reference Format:

Wawan Dhewanto, Aang Noviyana Umbara, and Rozan Hanifan. 2022. Towards Policy Development of Entrepreneurial Ecosystem: A Review in Indonesia Financial Technology Sector. In *2022 The 8th International*

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ICIBE 2022, September 27–29, 2022, Macau, China

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ACM ISBN 978-1-4503-9758-2/22/09...\$15.00

<https://doi.org/10.1145/3568834.3568841>

Conference on Industrial and Business Engineering (ICIBE 2022), September 27–29, 2022, Macau, China. ACM, New York, NY, USA, 9 pages. <https://doi.org/10.1145/3568834.3568841>

1 INTRODUCTION

The financial sector has an important role in the economy and continues to develop according to the needs of the community. Innovation in the financial sector is known as financial technology. Financial Technology, shortly called Fintech, is a combined result of financial services with technology that eventually changes the business model from conventional to modern [1]. Initially, in the financial sector, people did business in face-to-face payments carrying cash. However, they now facilitate long-distance transactions by making payments that can be processed in seconds. Press Report from Bank Indonesia (2021) stated that there are more than 320 Fintech startups currently operating in Indonesia. Chair of the Indonesian Chamber of Commerce mentioned that fintech has the potential to help provide alternative sources of financing for Micro, Small and Medium Enterprises (MSMEs), facilitating inclusive and stronger growth. Currently, although MSMEs contribute 60% to GDP and 97 percent of employment, only 25% of MSMEs receive the required financing. Therefore, fintech allegedly has the potential to increase the inclusiveness of financial services, especially for the 100 million population who still do not have a banking account and cannot access financial services from banks. During pandemic, the success of traditional business actors from the region in expanding their business thanks to the support of digital technology and fintech [2].

Fintech emerged in line with changes in society's lifestyle, which fast-paced users of information technology currently dominate [3]. With Fintech, problems in business transactions and payments, such as not having time to look for goods in offline shopping places, banks/ATMs to transfer funds, and reluctance to visit a site because unpleasant services can be minimized. In other words, Fintech helps transactions and payment systems become more efficient and economical but remain effective. The rapid change of fintech is encouraged by Bank Indonesia, the Central Bank of the Republic of Indonesia, to ensure that the payment traffic that has been penetrated by technology continues to run in an orderly and safe manner. Regarding fintech policies, it has been regulated through Bank Indonesia Regulation No. 18/40/PBI/2016 about Implementation of Payment Transaction Processing, Bank Indonesia Circular No. 18/22/DKSP Regarding the Implementation of Digital Financial Services, and Bank Indonesia Regulation No. 18/17/PBI/2016 about Electronic Money. Indonesia's finance sector is sufficient in compliance of available rules. However, the problems arise since the

growth of technology is not keep up with the pace of the regulation. Thus, the financial sector lagged behind. The current issue on financial sector also included sustainable finance and lack of risk assessment initiatives [4].

The Fintech in ASEAN 2021 [5] report shows the composition of Indonesian financial technology (fintech) companies or financial technology is dominated by payment and loan applications. As many as 29% of Indonesian fintech companies are engaged in payments, and 23% of companies are involved in loans. In the report, the large composition of companies involved in this sector is mainly due to the many people who are not served by banks (unbanked) or are not served by banks (underbanked). Furthermore, investment technology covers 14% and financial, and accounting technology covers 13% of the total fintech companies in Indonesia. Meanwhile, companies engaged in new cryptocurrencies account for 8% of the entire companies.

The Financial Services Authority (*Otoritas Jasa Keuangan* or OJK) Report in 2021 [6] noted that the distribution of fintech P2P (Peer to Peer) lending loans reached Rp. 13.78 trillion \approx USD 936 million, as of January 2022. This value was up 1.32% compared to the previous month, Rp. 13.60 trillion \approx USD 924 million. The distribution of fintech lending loans in January 2022 also increased 46.90% compared to the same period last year. In January 2021, the distribution of fintech lending was recorded at Rp. 9.38 trillion \approx USD 637 million. The fintech lending loans were distributed to 13.56 million borrowing entities (borrowers) in February 2022. The number of borrowers increased slightly by 0.66% compared to the previous month. The majority of 10.78 million borrowers came from the Java region. Rp 8.43 trillion or around USD 572 million in loans, or 61.21%, was given to the productive sector. Of that amount, Rp 2.92 \approx USD 198 million trillion was loaned to other non-business sectors. Loans disbursed to the wholesale and retail trade sector reached Rp 2.17 trillion \approx USD 147 million. Meanwhile, loans to the household sector were recorded at Rp 690.81 billion (\approx USD 46 million). In terms of lenders, the number reached 10.45 million entities with Rp 10.83 trillion (\approx USD 735 million). During this period, cooperative lending by institutional lenders (super lenders) was contributed by 69 conventional financial service institutions amounting to Rp 1.81 trillion (\approx USD 122 million). This shown the Indonesian finance sector is large and is one of the backbones with great potential growth.

Indonesia's financial service indicates to drive entrepreneurial ecosystem in a country [7]. However, the real value of a technology can be realized when it is being implemented together with the improvement of the entrepreneurship ecosystem [8]. There is limited research on the ongoing scholarly discussion related to financial technology sector in Indonesia with its relation to policy in terms of the entrepreneurial ecosystem, especially in Indonesia. Thus, this study intends to discover and understand deeper of the actors, roles, infrastructure, organizations, and actions that produce an environment that supports entrepreneurs. This study research questions are 1) How is current policy of financial technology sector in Indonesia that is supporting entrepreneurial ecosystem? 2) What are the recommended policy improvements for the fintech sector? Finding out a better theoretical comprehension of the issues and policies, this study also mapping the classification of actors, roles, infrastructure, organizations, and actions that produce an

environment that supports entrepreneurs. Therefore, this research main goal is to raise understanding and offer a conceptual framework that could assist future research and shed light on the further challenge issue in financial technology sector of Indonesia.

2 LITERATURE REVIEW

In this section, the literature review will discuss about the ongoing scholarly which relevant to the topic of research. Therefore, the explanation divided into two categories: policy development in entrepreneurial ecosystem and review of financial technology sector in Indonesia.

2.1 Policy Development in Entrepreneurial Ecosystem

The entrepreneurial ecosystem [9] discusses the collaboration of players, functions, infrastructure, institutions, and occasions/activities that enable an environment that advocates entrepreneurial activity. The entrepreneurial ecosystem is assembled from various elements and counterparts with incorporated aids to achieve entrepreneurial goals and is established on shared peril and prospect.

Policy development that advocates an entrepreneurial ecosystem in this research is related to government action towards financial technology through reviewing and resolving issues such as consumer protection, financial integrity, and legislation chain—a significant regulation part of business activity [10]. The financial sector is one of the most influenced industries by the regulatory circumstances due to its regulatory orders for transparency and market risk reduction [11]. As to support its policy development regarding entrepreneurial ecosystem, government assist the entrepreneur with incubators. The incubator is considered a bridge between "fin" and "tech" which makes fintech superior with exponential growth [12]. In 2022, Indonesia has 85 incubators listed under Technology Business Incubator Institute. [13]. The number is assumed too low for the entrepreneur ecosystem to improve. The entrepreneurship program is carried out by the National Research and Innovation Agency (Badan Research and Innovation Nasional or BRIN) and the Ministry of Education, Culture, Research, and Technology. There are 14 programs as tabulated in Table 1. Most of the entrepreneurial policy in Indonesia is targeted towards higher education students. Fortunately, most of the support are dedicated to entrepreneurs or startups in technology sector.

The ratio of the entrepreneurs' number to the population in Indonesia is lower than in some countries in Southeast Asia. The balance is only 3.47 percent, much lower than Singapore's (7 percent). One of the factors for the low number of entrepreneurs in Indonesia is the lack of highly skilled individuals. According to a report by the research institute SMERU, only 0.5 per 100 individuals aged 15 years have remarkable skills [14]. Other countries also had better results, such as the United States with 6.5 per 100 individuals, Thailand with 9.4 and South Korea with 18.2. The low percentage is because the educational curriculum only focuses on technical skills, such as reading, memorizing, and arithmetic, but has not yet accustomed individuals to thinking critically, analytically, and solving problems. The lack of individual skills makes it difficult for Indonesia to produce new entrepreneurs. Related to

Table 1: Indonesian Entrepreneurship Program

Program	Indonesia Name	Year	Institute	Website
Indonesian Student Entrepreneurship Program (PKMI)	Program Kewirausahaan Mahasiswa Indonesia (PKMI)	2021	Ministry of Edu	https://dikti.kemdikbud.go.id/pengumuman/tawaran-program-kewirausahaan-mahasiswa-indonesia-2021/
Indonesian Student Entrepreneurship Activities (KBMI)	Kegiatan Berwirausaha Mahasiswa Indonesia (KBMI)	2021	Ministry of Edu	https://sim-pkmi.kemdikbud.go.id/download/PKMI_2021_-_KBMI.pdf
Indonesian Student Startup Acceleration (ASMI)	Akselerasi Startup Mahasiswa Indonesia (ASMI)	2021	Ministry of Edu	https://sim-pkmi.kemdikbud.go.id/download/Panduan_ASMI_2020.pdf
Indonesian Student Entrepreneurial Assistance (PWMI)	Pendampingan Wirausaha Mahasiswa Indonesia (PWMI)	2021	Ministry of Edu	https://sim-pkmi.kemdikbud.go.id/download/PKMI_2021_-_PWMI.pdf
Vocational Student Entrepreneurship Program (PWMV)	Program Wirausaha Mahasiswa Vokasi (PWMV)	2021	Ministry of Edu	http://kemahasiswaanptvp.kemdikbud.go.id/pwmv/
Entrepreneurial Skills Education Program (PKW)	Program Pendidikan Kecakapan Wirausaha (PKW)	2021	Ministry of Edu	https://www.kemdikbud.go.id/main/blog/2021/07/pembelajaran-perdana-program-pendidikan-kecakapan-wirausaha-pkw-level-platinum-resmi-dibuka
Entrepreneurship Workshop	Workshop Kewirausahaan	2021	Ministry of Edu	https://dikti.kemdikbud.go.id/pengumuman/workshop-kewirausahaan-mahasiswa-tahun-2021/
Indonesian Student Entrepreneurship (KMI) Expo	Kewirausahaan Mahasiswa Indonesia (KMI) Expo	2020	Ministry of Edu	https://dikti.kemdikbud.go.id/kabar-dikti/kabar/kewirausahaan-mahasiswa-indonesia-kmi-expo-xi-2020-resmi-dibuka/
One Million Jobs Technopreneur Program (STSP)	Program Seribu Technopreneur Sejuta Pekerjaan (STSP)	2021	BRIN	https://stsp.inetek.org/
Technology-Based Startup Company Prospective Program (CPPBT)	Program Calon Perusahaan Pemula Berbasis Teknologi (CPPBT)	2020	BRIN	https://www.brin.go.id/wp-content/uploads/2020/02/2020_CPPBT_Panduan_pub-1.pdf
Technology-Based Startup Company (PPBT) activity program	Program kegiatan Perusahaan Pemula Berbasis Teknologi (PPBT)	2020	BRIN	https://www.brin.go.id/wp-content/uploads/2018/08/PEDOMAN-PPBT-2019.pdf
Technology-Based Advanced Corporate Funding Program (PLBT)	Program Pendanaan Perusahaan Lanjutan Berbasis Teknologi (PLBT)	2020	BRIN	https://inovasi.brin.go.id/perusahaan-lanjutan-berbasis-teknologi/
PKM for Entrepreneurship (PMK-K)	PKM Bidang Kewirausahaan (PMK-K)	2020	BRIN	http://lldikti7.ristekdikti.go.id/uploadpengumuman/Buku-Pedoman-PKM-2020.pdf
Indonesian Innovation Startup Program	Program Startup Inovasi Indonesia	2021	BRIN	https://sii.brin.go.id/

entrepreneur education, Indonesia only has 33 Entrepreneurship Study Programs that have been accredited [15]. Currently, The Presidential Decree on National Entrepreneurship Development is needed to catch up with the number of entrepreneurs in Indonesia, which still reaches 3.47 percent. The government targets the growth of the entrepreneurship ratio in 2024 to reach 3.95 percent so that the national economic structure grows stronger. The government fosters this number by announcing the Presidential Regulation of the Republic of Indonesia Number 2 of 2022 about National Entrepreneurship Development 2021–2024. The facilities as referred to in the Regulation in Article 11 are given to Entrepreneurs in the form of registration of business licenses; facilitation of domestic and export standardization and certification; access to financing; priority in the procurement of government goods and services; prioritizing State-Owned Enterprise digital market access; gain access to the supply of raw materials and auxiliary materials; accessing public facilities including commercial area land, shopping areas, and strategic promotion places on public infrastructure; conducting research and business development; gain access to increasing business capacity through mentoring, education and training, and technical guidance.

The policy development on the entrepreneurial ecosystem is now in the embryonic phase. However, the policy development related to financial technology is not created yet, even though the business has high potential. From 2018 to 2021, the Investment Alert Task Force closed 3,365 illegal online loans in Indonesia. This data reflects that it is a real challenge for industry players who commit to keeping their industry good and from the regulator's side. The Minister of Finance revealed that the government legislative is currently drafting a Bill for the Development and Strengthening of the Financial Sector. This Bill will discuss the definition and scope of fintech, fintech operating legal entities, regulation and supervision, coordination of fintech supervision and development arrangements, licensing of fintech associations, and consumer protection [17]. Even in the future, in this Bill, the term "fintech" will be changed to "financial sector technology innovation" to cover activities within a reasonably broad industry. Furthermore, The Financial Services Authority will introduce a regulatory sandbox that allows digital financial innovation to develop [18]. Furthermore, policy related to digital economy [2] agreed on 12 elements strongly associated to fintech: (1) strengthening fintech commitments (2) enabling new technologies to improve financial service provision (3) strengthening competition and commitment to open, free, and fair competition (4) encouraging fintech to promote financial inclusion and financial market development (5) monitoring developments in deepening understanding of emerging financial systems (6) adapting regulatory and supervisory frameworks for regular development and financial system stability (7) maintaining financial system integrity- (8) modernization of legal frameworks for provision of legal landscape (9) domestic monetary and financial system stability (10) financial and data infrastructure to maintain sustainability of fintech benefits (11) encouraging international cooperation and information exchange (12) increasing collective oversight of international monetary and financial systems.

2.2 Review of Financial Technology Sector in Indonesia

Financial services describe business conducts, advantages and satisfactions correlated with the sale of capital that delivers users and consumers economic value. The financial services business is changing its service by stressing customer-centric benefits that would be apt of merging acceleration and flexibility, endowed by techniques and cutting-edge innovation. Financial Services Authority Indonesia represented "FinTech" as when financial service business changes their business by employing technology to provide financial solutions, which directs to numerous innovations such as Internet Banking, mobile payments, crowdfunding, peer-to-peer lending, Robo-Advisory, artificial intelligence for online identification, blockchain, cryptocurrency, and much more to come.

The evolution of financial technology until now has been evolved into three phases [19]: FinTech 1.0, FinTech 2.0, FinTech 3.0 and in the future, is predicted to be FinTech 4.0. The first generation of FinTech, called FinTech 1.0, transpired from 1866 until 1967, is still analog using telegraph and telephone. The second generation named FinTech 2.0, where developed nations commence employing and innovating technologies such as ATM (Automatic Teller Machine) and e-banking. The third period, called FinTech 3.0, formed in 2009 until now. FinTech 3.0 demonstrates that providers of financial services might not exclusively be in the regulated financial services industry, which is ascertained by the arrival of the non-bank institution, mainly uses a technology innovation in its process. FinTech 3.0 happened in developed countries due to its linkage to the financial crisis in 2008.

Fintech appeared fast in Indonesia in 2010 [20]. This emergence resulted from Indonesia's massively grown communication and provider technology during the prior decade, which delivered online and mobile approaches. There are six Fintech participants in Indonesia: the nonbank payment system, investment management, funding, insurance, market provisioning, and deposit & lending. Fintech in Southeast Asia has ample prospects to unravel the financial circumstances' considerable problems [21]. Fintech has a significant role, with an estimated value of \$40 billion and annual growth of nearly 50%. By 2025, fintech will be worth more than \$100 billion, driven by existing digital services. Fintech in Indonesia is the most dynamic and competitive sector in the world. This is shown by the presence of 4 fintech unicorns with a value of more than \$1 billion and one decacorn with a value of more than \$10 billion [18]. At the beginning of fintech development in 2016, the available service solutions focused only on payments and loans. In 4 years, fintech services have developed into various business models, including digital capital raising, InsurTech, and market provisioning [18]. Digital banking and electronic money are escalated to grow by 30.1% (YoY) and 35.7% (YoY) [22]. Fintech lending developed fast, with outstanding loans in August 2021 significantly boosted to Rp. 26.09 trillion, with total new loans throughout 2021 bearing Rp. 101.47 trillion. Behind future great innovation possibilities, Indonesia is still facing challenges in creating an excellent digital economy ecosystem. The 2020 Indonesia Global Innovation Index shows Indonesia's rank is 85th out of 131 nations. Furthermore, the 2020 Indonesian Digital Literacy Index is on a medium scale.

Bank Indonesia has taken several steps to support the acceleration of digital transformation [2], for instance: (1) publishing the Blueprint of Indonesia Payment System 2025; (2) launching national standardization in the payment system in the form of QRIS (Quick Response Code Indonesian Standard) and SNAP (National Standard Open API Payments); (3) Prepare digital innovations for retail payment systems through BI-FAST; (4) reforming payment system regulations; and (5) improving government program services through electrification of the distribution of social assistance funds. The movement shows that Indonesia's fintech is accelerated and supported well mannered.

3 METHODOLOGY

The study utilizes qualitative methodology [23] to investigate pertinent literature on financial technology policies in Indonesia to comprehend its transition over the years and what subjects entail in the present state. The literature is also strengthened by appropriate policy documents, relevant news articles, and views from an expert. The data organized is to be scrutinized by looking at the policy of entrepreneurship and fintech. The current ongoing policy revision and more recent mechanisms are also reevaluated. Since some approaches only exist in Indonesia, this study provided a proposition by examining fintech policies and a chance of a research agenda related to fintech.

4 RESULTS AND DISCUSSION

4.1 Mapping of Player and Key Role Indonesia based on Entrepreneurial Ecosystem

The fintech policies here would be divided based on the Isenberg classification of Entrepreneurship Ecosystem in the Policy domain [9], Leadership and Government. The leadership will be related to support, social legitimacy, advocate, entrepreneurship strategy, urgency, crisis and challenge—meanwhile, the government institutions, financial aid, regulatory framework, research institutes, venture-friendly legislation. The leadership subdomain comes from the community or private institutions—the leadership subdomain example is the emergence of the fintech association and its financial solution alternatives. The government subdomain is understood as the output of government institutions, for example, the ease to start a business, tax incentives, and laws that could encourage the climate for business to improve, technology infrastructure. Both the leadership and government subdomain will be explained on who the player is and what is the crucial role.

In the leadership domain, the featured only player, and their key roles, since the regulation is mostly for an internal or informal suggestion. Table 2 elaborates that the key player in fintech in subdomain leadership is the association, fintech startups, education and training institutions, business players and media. Collaboration with each player is promoted. Intermediate information channel collaboration by utilizing available data and through distribution channels that each player has built. Utilization of the Fintech function is expected to improve the business efficiency of banks and institutions. Fintech or other key players have a consumer database as a valuable resource. The database is utilized as a system built to run a specific financial transaction mechanism. However, the public trust in banking or fintech is still low because it is often

considered to endanger data privacy. In addition, fintech is also considered scary because of the proliferation of high-interest shark loans (maximum around 25% per year) [16].

Table 3 details the regulation related to the government subdomain. Various financial innovations that emerge will attract the attention of the Indonesian consumer and providers to use financial services to align with the government's expectations. So, in the future Indonesia's financial literacy and inclusion index will increase. These policy innovations will significantly assist the people in carrying out their supervisory function of the government. On the other hand, the government also minimizes corruption because the public can easily access detailed information. Applying such fintech, coupled with a cashless society, will undoubtedly overhaul the practice of bribery and extortion. With a cashless society that is fully realized, there will be no corrupt transactions through cash. And the only trade sent via digital money is through fintech. With the existence of fintech, everything will be recorded in detail and accurately. Besides, digitalized and integrated transaction systems can accurately provide information about MSMEs for the government. With the existence of fintech and the application to support cashless communities, the government can monitor digital money transactions circulating in the community. The circulation of counterfeit money, mainly from multi-level entrepreneurs, can be eradicated. The absence of counterfeit money will certainly ensure the welfare and security of the community in transactions. Figure 1 illustrated the fintech policies best practice involved government to provide laws and leadership to a spirit of becoming leading sector.

4.2 Issue and Recommendation of the Policies in Fintech Sector

Fintech is extending because technological advances deliver options for secure, speedy, and straightforward financial services. Shifts in people's behavior, such as limitations on going out and working from home policies during a pandemic, drive all sectors to transform digitally. Fintech targets were expanded to be underbanked, which means they have limited access to financial services) and unbanked, which have no access to financial services at all. The Indonesia Stock Exchange reveals that the total population without access to financial services is more than 75% of the total population of Indonesia. [24].

The first issue is infrastructure [16]. Minister of Finance in the 3rd Indonesia Fintech Summit 2021 mentioned that Indonesia's digital infrastructure investments are Rp. 7 trillion (USD 474 million) in 2019, increasing to IDR 10 trillion (USD 678 million) in 2020 [25]. Finance Minister, Sri Mulyani, explained the obstacles to developing Indonesia's digital economy in Jakarta's 2018 High-Level Conference Annual Meetings discussion. One of the obstacles for Indonesia to reaching the potential of the digital economy is infrastructure. The uneven distribution of infrastructure and internet networks in Indonesia is one of the crucial problems to overcome. Of course, without adequate infrastructure and an internet network, the discourse of a cashless society will also not materialize. People will use physical money to transact if the infrastructure and internet network do not support it. The potential for corruption and budget transparency is not easy to suppress. In addition, the public does not benefit from fintech or the digital economy. The disparity between

Table 2: Fintech Industry – Leadership Subdomain

Player	Key Role
Association	<ul style="list-style-type: none"> •Intermediary or liaison between national and international fintech institutions. •As a research institute on policy. •As the organizing committee for special activities for the fintech community, for example, a certified seminar event for members. •Receiving complaint and providing customers convenience in obtaining information and submitting complaints related to Fintech services and services. •Supervision of Fintech players.
Fintech Startups	<ul style="list-style-type: none"> •Active participant in the community and promote collaboration <p>Encouraging the competition. Several types of new FinTech startups: 1. Asset management facilitates the company’s operational activities such as payroll, employee management, financing systems, and Expense Management System platform for businesses. 2. Crowdfunding for raising funds and channeling them to people in need, such as victims of natural disasters, wars, or those who need assistance 3. E-money for paying bills and encourage the cashless society program. Examples of e-money FinTech startups. 4. Insurance to register for insurance and provide services to users through hospital information, professional doctors, and other health-related matters. 5. P2P lending to provide loans online. 6. Payment gateway to be a liaison between e-commerce and customers in terms of payment. 7. Remittance FinTech for payments between countries 8. Securities Investments such as stocks, mutual funds, and other types of investments are now made online.</p>
Education and Training Institutions	Embed entrepreneurship in formal or informal education by implementing curriculum or vocational learning. Some universities have policies and roadmap to create entrepreneurial university which helps the students to link up with the incubators, mentors, and investors.
Business players another sector	<ul style="list-style-type: none"> •Disseminate knowledge and equip leadership. •Helps with business models, such as shortening the transaction chain; increasing capital efficiency and operational resilience.
Media	<ul style="list-style-type: none"> •Cultivate new entrepreneurs or new startups. •Emphasize the value of entrepreneurship and increasing financial literacy •Helping the unbankable by providing awareness •Manage news and job fairs, discussions and panels related to fintech

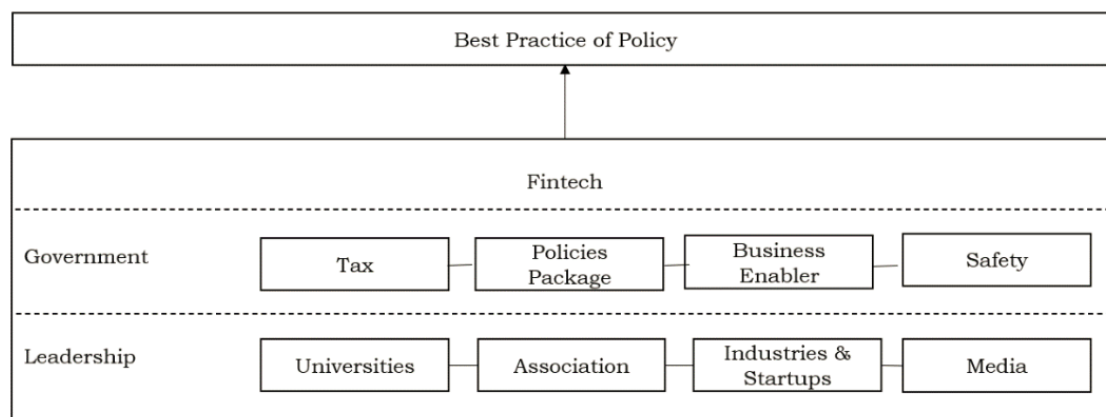
**Figure 1: Best Practice to Financial Sector**

Table 3: Fintech Industry – Government Subdomain

Player	Key Role	Regulation
Coordinating Ministry for Economic Affairs Republic of Indonesia	Coordinate with all the ministries, and institutions to implemented policy related to fintech	<ul style="list-style-type: none"> •Through policy package XIV, the government makes an electronic-based national trade roadmap. As explained in this policy package, the government targets 1000 technopreneurs to advance the digital economy in Indonesia. •Government Regulation Number 71 of 2019 about the Implementation of Electronic Systems and Transactions; •Presidential Regulation Number 114 of 2020 about the National Strategy for Financial Inclusion.
Ministry of Finance	Tax incentive	<ul style="list-style-type: none"> •Regulation of the Minister of Finance Number 32/PMK.05/2014 about the Electronic State Revenue System; •Minister of Finance Regulation Number 69/PMK.03/2022 about Income Tax and Value Added Tax on the implementation of Financial Technology
Indonesia Financial Services Authority	As regulator, supervisor examiner, and investigator	<ul style="list-style-type: none"> •POJK Number 77/POJK.01/2016 about Information Technology-Based Borrowing-Lending Services; •POJK Number 13/POJK.02/2018 about Digital Financial Innovation in the Financial Services Sector; •Financial Services Authority Letter Number 20/SEOJK.02/2019 about the Registration Mechanism for Digital Financial Innovation Providers; •Financial Services Authority Letter Number 21/SEOJK.02/2019 about Regulatory Sandbox; •Financial Services Authority Letter Number 22/SEOJK.02/2019 about Appointment of the Association for Digital Financial Innovation Providers; •Digital Finance Innovation Roadmap and Action Plan 2020-2024; •POJK Number 57/POJK.04/2020 about Securities Offering through Information Technology-Based Crowdfunding Services. •Regulation No. 6/2022 about consumer and financial services sector protection. •PBI Number 18/40/PBI/2016/2016 about the Implementation of Payment Transaction Processing.
Bank Indonesia	Business Enabler	<ul style="list-style-type: none"> •PBI Number 19/12/PBI/2017 of 2017 about the Implementation of Financial Technology; •PBI Number 20/6/PBI/2018 of 2018 about Electronic Money; •Regulation of Members of the Board of Governors Number 21/18/PADG/2019 about Implementation of the Quick Response Code National Standard for Payments; and •PBI Number 22/23/PBI/2020 about Payment System effective July 1, 2021.

regions, especially the Indonesian West Region and the Eastern Indonesia Region, is still a significant obstacle to infrastructure development. The Director of Resources and Administration at the Ministry of Communications and Information revealed that areas outside Java are the most that the internet has not reached. At least there are still 70 million Indonesians who have difficulty getting internet access [26]. The need to keep up with the advancement of infrastructure, especially 5G, is more imminent. Infrastructure priority is equal distribution of internet access and narrowing the gap in digital services throughout Indonesia.

The second issue is data safety [27]. Current financial-related digital platforms have not implemented good personal data protection governance, which also shows the weakness of Indonesia's data protection system, which does not yet have commission and criminal sanctions for data breaches. However, to address the issue, the Financial Services Authority ensures that handling complaints from cybercrime victims has been regulated in Regulation 6 of 2022 concerning Consumer Protection and the Financial Services Sector.

Data leak in August 2020 around 890,000 from the fintech service provider. The National Cyber and Crypto Agency reported that from January to August 2021, more than 888.7 million cyber-attacks ensued in Indonesia. With fintech, this issue should not only have been about awareness but also how to overcome and strengthen security.

The third is financial literacy [28]. Knowledge of public financial literacy is one of the essential factors in the development of the digital economy. Financial literacy is the knowledge of planning and manage personal or family finances. Financial literacy will affect how people save, borrow, invest and manage finances. At the national level, good financial literacy from the community will positively impact the nation's economic progress. According to the Financial Services Authority (OJK), Indonesian people's financial literacy index in 2019 shows a number of 38.03% which means that from every 100, there are about 38 people in the population who are well literate. This result shows an increase from the previous survey, namely 29.7% in 2016 and 21.8% in 2013. Although it shows

an increase, on the other hand this data shows that there are still many Indonesian people who are not well literate. Referring to the 2019 financial literacy index data it can be concluded that out of every 100 residents, there are around 62 people who do not have the right knowledge, beliefs, skills, attitudes, and behavior about financial service institutions and products and services of formal finance [29]. It is hoped that the improvement in the financial literacy and inclusion index of the Indonesian people can be achieved through the 2021–2025 Indonesian Financial Literacy National Strategy. Three strategic programs have been created, namely Financial Capability, Wise Financial Attitudes and Behaviors, and Financial Access. This program is expected to increase public financial literacy conventionally and to improve people's welfare through financial inclusion, which is targeted at 90% [30]. Financial and digital literacy must continue to be improved, supported by a conducive ecosystem and cross-sectoral collaboration to maximize the impact of various Government programs and initiatives.

The fourth issue is new genre of financial technology, sharia fintech. The current statute governing fintech is Regulation from Financial Service Authority about Information Technology-Based Lending and Borrowing Services, which was issued at the end of December 2016. However, the regulation only regulates fintech financing with a conventional system and does not regulate the sharia system, which is also developing market. On the other hand, Bank Indonesia has also established regulations for fintech operators whose activities are related to the payment system. The reason is that from several regulations issued both from the Financial Service Authority and Bank Indonesia, there is still a lack of clarity between the rules for conventional fintech and Islamic fintech. Therefore, the government needs firmness to protect fintech in Indonesia with one regulatory umbrella.

5 CONCLUSION

This research underscores the significant role of fintech and digital technology in transforming the Indonesian economy. The development of policies and regulations needs to continue to be carried out to foster the extraordinary potential of digital technology as well as fintech, but still maintain data security and the safety of the public against things that are criminal and distorting. One of the efforts to promote the ever-growing financial technology is to look at its policies, player, key roles, and issues. Fintech is still newly emerging in Indonesia and early stage of adoption. Meanwhile, the technology itself is gaining attention from the emerging latest technology and startups. This study is one of few studies in Indonesia that discuss financial technology, entrepreneur ecosystem and policy development. Due to fintech's early stage in Indonesia, most related research is only focused on technology or innovation, mostly cryptocurrencies, blockchains, and artificial intelligence. This study's findings contribute to the framework of policies in the entrepreneurial ecosystem of fintech. However, this research focused on the entrepreneurial ecosystem's financial technology policy development. Further research to discover how the policy development in the entrepreneurial framework developed could be interesting. Future research with a quantitative approach related to measuring the significance of whether a policy impacts society or not should be conducted. Studies about how the new Bill solves the

ongoing issues could also be performed to pinpoint the effective way of establishing financial technology. The implication for the policymaker is that the financial technology ordinance should be more vigorous and comprehensively recognized. The synergy is also needed among the business owners and the policy maker to bridge what can be developed and what kind of future is required by the current fintech business.

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