

The Future and the Challenges of the Indonesian Banking Industry in the Digital Era

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Abstract: This article focuses on researching the IT challenges faced by the Indonesian banking industry in the digital age. The rapid development of technology has provided benefits for the banking sector in integrating technology to meet the demands of its customers. Although, this advantage comes with its challenges, as with the emergence of the fintech (financial technology) industry. This study uses an action research method, which is applied to identify challenges faced by conventional banks and provide solutions to overcome the identified challenges. Based on the analysis, it was found that conventional banks have a gap between their digital products and the expectations of their customers; in which majority of the respondent is engaging in the implementation of open application programming interface (API) to facilitate the digital banking activities of its customers via the software and the web-service product created by the Indonesian conventional banks. The implication is that the IT gap between banking services and their customers must be overcome. For this reason, it is recommended that conventional banks work together in order to meet customer expectations and/or banks can use a customer-centric approach in product development.

1 INTRODUCTION

With the rapid development and the implementation of new technologies, all the existing industries have started to use new technologies to improve their operational and business activities. Some of the industries have entered the phase of digitalization, especially in the case of the banking industry. According to the report produced by the company of Frost & Sullivan (2019), it is shown that due to the rapid development and increases of implementation of technology in the case of internet penetration and accessibility, the market revenue of electronic commerce (e-commerce) is estimated to reach the value of US\$ 45.2 billion in 2019 and US\$ 62.3 billion in the following year; to be precise, the aspect of business-to-business (B2B) and business-to-consumer (B2C) are said to be increasing in the area of digital market in Indonesia. In other words, the Indonesian banking industry may capitalize on this opportunity to become the facilitator for the customer in the e-commerce market to handle their digital transactions, both in the domestic and international transactions.

Despite the opportunity and the benefits of the rapid development and implementation of new

technologies, the Indonesian banking industry may have to consider the potential obstacles and challenges of these advantages. One of the obstacles faced by the banks of the digital era is the rise and the emergence of financial technologies (fintech) firm. In which, the product that is produced by the fintech firm has some similarities with the product created by the conventional banks. In general terms, the product of the fintech firm has some feature that already exists in the tradition banking product. Furthermore, Anagnostopoulos (2018) stated that the product created by the fintech firm is easier to use and faster to fulfill the demand of digital transactions of its user compared to the conventional bank, which means that the product of the fintech firms creates challenges to the Indonesian banking industry to facilitate the domestic and international transaction in the field of digital transactions.

Furthermore, the banking sector is one of the sectors that are prone to disruptions (Fichman, et al., 2014). To be precise, the disruptions which are triggered by the rapid growth and development of technologies. These disruptions are putting the conventional banking industry at risk of maintaining their position as an intermediary for their customers in conducting digital transactions, especially in the

case of creating an application that has a better performance to the fintech firms. These disruptions are enforced due to the fintech firms has the upper hand on implementing their technological innovations to provide better digital financial and banking services compared to the conventional banks.

In regards to the obstacles and challenges faced by the Indonesian banking industry, it is considered naïve to believe that the emergence of fintech firms solely creates these challenges. The other aspect that needs to be considered in this matter is the changes in the digital culture. In other words, it is about how the banks' customers perceive the implementation and the benefits of technology in fulfilling their needs in banking and financial demand in a digital manner. It is predicted that smartphone users will dominate the banking market share by the year 2020 in regards to digital transactions (AT Kearney, 2014; Wirdiyanti, 2018). By this prediction, the Indonesian banking industry must understand the demands and needs of its customers. Oshodin et al. (2017) explain that due to the improvement of technologies enables the firm to create an application or product in a customer-centric manner to fulfill the needs and demands of the customer and the changes in the customer preference in using a digital product.

In the case of Indonesia, it is reported that the mobile penetration rate stands at the level of 150% with the mobile subscriptions reaching 388.04 million people by the year of 2016 alone (Frost & Sullivan, 2018). By the level of the mobile penetration rate alone, it is expected for the Indonesian banking industry to facilitate a better medium for their customers to conduct digital transactions. And yet, the fintech firms have the capability to produce a better digital product compared to the conventional banks; furthermore, there is an information and knowledge gap on utilizing the latest technology to provide a financial and banking product digitally between the fintech firm and the conventional banks (Davis, et al., 2017; Omarini, 2018). In short, the Indonesian banking industry needs to produce an application or a digital product that has the same or exceed the quality of the digital product produced by fintech firms. Based on the report and the previous research, it can be indicated that for the Indonesian banking industry to be able to capitalize the changes in the trend on conducting digital transactions, then the Indonesian banking industry must adapt to the changes and the shifting of preference of its user on regarding the demands of digital transactions.

In simple terms, the Indonesian banking industry is forced to cope with the sets of challenges that arise from the rapid development of technologies; to be precise, the challenges faced by the Indonesian banking industry are the emergence of fintech firms

and the changes of digital culture or preference in their customer on conducting digital transactions. If the Indonesian banking industry able to capitalize on the changes and understand the needs of its customers regarding the demand for digital transactions, then the Indonesian banking industry will be able to become a favorable medium for its current and potential customers in conducting digital transactions.

Based on the introduction above, the primary objectives of this research are to investigate the pattern of changes in the digital culture on conducting digital transactions and providing solutions for the Indonesian banking industry to be able to cope with the challenges from the emergence of fintech firms. With the addition of finding the set of challenges or obstacles faced by the Indonesian banking industry in the digital era and determined the future state of the Indonesian banking industry if those challenges are handled correctly or not.

2 LITERATURE REVIEW

In this section, it is provided with the literature regarding the difference between the conventional banking industry and the fintech industry, especially in the context of Indonesia. Furthermore, it is also included in the literature on the matter of impact due to the rapid development of technology in the banking sector.

2.1 Conventional Banking Industry vs. Fintech Industry

The primary differences between conventional banking with the fintech industry are solely lying to the implementation of technology in their financial and banking products. To be precise, in regards to fulfilling the demand for digital products to conduct digital transactions by the current and potential customers. With the addition of the nature of the industry, it is known that the fintech industry has the nature of the "highly-innovative industry"; meanwhile, the conventional banking industry has the nature of the "highly-regulated industry." In other words, for the conventional banking industry, all the banks must follow the regulations that are applied by the government or standards to conduct any banking activities; on the other hand, the fintech industry has greater flexibility to implement their innovation in technology to their activity to produce a high-quality product. In which, the fintech industry has a competitive advantage against the conventional banking industry in the aspect of technology utilization and has increased the level of competition

with conventional banks (Románova & Kudinska, 2017).

Furthermore, the fintech industry has a diverse product in its application on fulfilling the demand for digital banking and financial services (Davis, et al., 2017). The diversity in the product created by the fintech firms increases the possibility of the customers to acquire and use the product easily; in which, the product can be obtained via the internet. In the case of the conventional banking industry (also known as the incumbents), for every digital product created by the incumbents, it must be validated and checked by the regulators before the public could access it. In other words, the regulators check the digital product produced by the banks to see if the incumbents meet the criteria and the regulation applied in the banking sector. Due to the strict regulations and rules that the incumbents have to follow, the fintech firms are able to capitalize the gap within the expectations and the demand of the banking customer and the fintech firms are able to create a product that specifically designs to fulfill the demand with superior advantage in digital product compared to the incumbents.

According to the report published by Price Waterhouse Coopers (2017) which involving 1,308 respondents globally regarding the challenges faced by the fintech industry and the incumbents, it is found that the main challenges in the fintech industry are focuses in the three areas, which are (1) regulatory uncertainty, (2) differences in management and culture and (3) the differences within the business models; meanwhile, in the case of the incumbents, the main challenges are focuses on (1) information and technology (IT) security, (2) regulatory uncertainty and (3) the differences in management and culture.

The overall percentage regarding the challenges between the two industries is presented in Table 1.

Table 1. The Challenges Between the Fintech Industry and Conventional Banking Industry

Aspect	Fintech		Incumbents	
	2016	2017	2016	2017
IT security	28%	27%	58%	63%
Regulatory uncertainty	48%	53%	54%	59%
Differences in management and culture	55%	56%	40%	41%
Differences in the business model	40%	49%	35%	31%
IT compatibility	34%	39%	34%	40%
Differences in the operational process	36%	25%	24%	12%
Differences in knowledge/skills	33%	36%	24%	19%
Required financial investment	16%	4%	17%	9%

Source: PriceWaterhouseCoopers (2017)

Based on Table 1, it is shown that there is a high degree of differences in challenges faced by both industry, especially in the case of the different management and culture. Based on the difference, the fintech industry and the conventional banking industry has an entirely different nature in fulfilling

the demand of digital transactions of its customer. To be precise, the fintech industry has create six disruptions to the conventional banking industry: namely (1) the pace of technological innovation and adoptions, (2) the disintermediation of financial services, (3) industry convergence, (4) low cost and low barriers of entry, (5) borderless platform and (6) the democratization of investment and financial services (Brummer & Gorfine, 2014). In simple terms, the fintech has a different culture and management style with the conventional banking industry and capitalize on the benefits of the development of technologies to gain competitive advantages against the conventional banking industry.

2.2 The Impact of Technology in the Banking Sector

The impact of the rapid development of technologies is not only focused on the emergence of the fintech industry, but it also affects the regulators and nations on how to handling the usage of new technology in the banking and financial sector. Furthermore, the impact of the advanced technology is caused by the combination of three factors, namely (1) regulations, (2) technological, and (3) economic factors (Zavolokina, et al., 2016).

In regards to the regulations, due to the rapid development of technology and its implementation in the banking and financial sector, regulators are forced to make regulations that can ensure every company (fintech and conventional banks) to be prudent. In which, these companies are forced to make necessary changes to operate within the law, especially regarding the code of conduct and regulations in the matter of providing financial and banking services to the public. In the case of Indonesia, the regulations that are applied to the fintech industry are only focused on the area of (1) lending and borrowing via the internet and (2) the use of electronic money (Iman, 2018). In which, the Indonesian regulators still lack regulations to control any other type of fintech activities which are operated in Indonesia, such as cryptocurrencies and blockchain.

In terms of technological factors, the incumbents are forced to adapt to the latest technology that can be implemented to increases the quality of their services in regards to fulfilling the needs and demands of digital transactions of their current customers. However, due to the nature of highly regulated characteristics within the banking industry, the incumbents must first be checked and validated by the regulators to ensure their digital product meets the specified standards. Meanwhile, the fintech industry has used technological breakthroughs to provide

better services or features within the application to fulfill the demand for digital services of its customers. In which, there are clear relationships between the technologies as an input for the fintech industry to have a transformation in conducting its business (Zavolokina, et al., 2016). Furthermore, the fintech industry does not have the same conventional relationship as the incumbents and its customers, in which the fintech industry is capable of using codifiable information to maintain the relationship with its customers (Vives, 2017). In other words, the fintech industry is capable of noticing the needs of its customers in conducting digital transactions.

Finally, in terms of the economic factor; the economic conditions forced the fintech industry and the conventional banking industry to find the gaps or areas of improvement to find the state of stability, in the sense of financial and non-financial state. In the case of fintech firms, the economic conditions encourage the fintech firms to find the gaps in the banking and financial services provided by the conventional banks and compare them with the expectations level of their customers. By taking this step, the fintech firms can capitalize on the weakness within the conventional banks to provide better digital services. And, the due to the advancement of technologies and the flexibility of those technologies, the fintech industry is able to adopt and implement the necessary technologies to implementing maintain an adequate standard to meets the criteria of its current and potential customers.

3 METHODOLOGIES

In regards to fulfilling the objectives of this research, the determination of the future state of the Indonesian banking industry and its challenges are analyzed using an action research method. Action research is defined as a scientific process in a specific problem, in which this process is used to improve the practice or an understanding given in the problem (McKernan, 1988; Sagor, 2000).

In other words, the action research method is used to understand the gap between the fintech industry and incumbents; this step was taken to provide solutions for old players to overcome the challenges that arise from the fintech industry. Furthermore, the action research method is also used to analyze the impact of changing preferences in digital culture in connection with the rapid developments in technology occurring in the financial and banking sectors.

In terms of understanding the incumbent's views in the Indonesian banking industry in the digital era, especially in terms of the impact of technological

advances in the banking sector; The questionnaire used in this study took a sample of the population of Commissioners and Directors of the Bank as digital service practitioners in Indonesia, consisting of Commissioners, CEOs, and Directors whose main tasks and functions are related to IT. More precisely, this questionnaire has presented the views and opinions of the Indonesian Banking Executives, and they acted as a "Panel of Experts."

To find IT challenges in Indonesian banking in the future, then as an analytical tool, the multivariate regression approach is applied. Multivariate regression analysis was applied to predict any changes in the dependent variable in response to changes in the independent variable (Hair, et al., 2014). This approach was taken to understand how incumbents view IT challenges in the future for Indonesian banks, especially in prioritizing the application of IT systems in order to meet the demands of their customers. Furthermore, with the answers given by the expert panel, we can uncover the incumbent's priorities for any aspect of the technological approach in the digital age. And this method is also used to find the nature of the relationship between the dependent and the independent variables. Hence, the regression formula used in this study is given as follows:

$$Y = \alpha \pm \beta X$$

Based on equation (1), the impact of IT is presented as Y, and the priority of implementing the IT to meet the demand of its customer is presented as X1. The equation (1) can be determined in which technology the incumbent uses to meet the criteria of its customers in conducting a digital transaction using the financial services provided by the conventional banks. Furthermore, it could map which technologies the incumbents prioritize in order to cope with challenges rises from the emergence of the fintech industry and the shifting of preference of its customers in the digital era.

One of the research that is using an action research approach in the banking sector is conducted by Becker et al. (2010). Becker et al. (2010) found that banks were dissatisfied in terms of their general-purpose business models, especially in the case of the documentation approach taken by banks that are still considered traditional. Where the traditional approach taken by banks has an indication of the inefficiency and deficit of information in the bank, Becker et al. (2010) stated that banks could use business process modeling language using semantic process building blocks to identify weaknesses in the bank and evaluate the processes within the bank to be improved. The results of this study indicate a variety of actions. Specifically, the semantic modeling

language can be used in designing a system that can give the capability for the traditional banks in improving its effectiveness in process-oriented analysis in their operational activities.

Also, the action research approach is used in the research conducted by Sudiyatno et al. (2012), it was found that there was a negative effect on financial leverage in terms of company performance, (2) positive effect on financial leverage on firm value, (3) incentive managers had a positive influence on company performance and value, (4) capital expenditure was found to have positive influence on company performance even though it has a negative influence on company value and (5) company performance has a positive influence in terms of company value. Based on the findings of Sudiyatno et al. (2012), it is recommended that companies make policies to maximize the use of debt in their capital expenditure activities, with the addition of increased management efforts in order to increase company values.

Furthermore, the multivariate regression analysis is used to enrich the analysis of the action research approach in order to understand the nature of the specified dependent and independent variables. Also, the usage of multivariate regression analysis has been performed in numerous research, such as Sufian & Chong (2008) and Vintillã & Nenu (2016).

In the research conducted by Sufian & Chong (2008), the multivariate regression analysis is applied to analyze the return on asset (ROA) in response to the internal factors and external factors of the Philippines' financial institutions. The variables used by Sufian & Chong (2008) to represent internal factors are total assets, non-interest income, total overhead expense and the book value of stockholder; on the other hand, the external factors are presented with money supply growth, market capitalization, annual inflation rate, and gross domestic product. Sufian & Chong (2008) found that the size of the bank, credit risk, and expense preference behavior have negatively related to the bank's profitability; meanwhile, the non-interest income and capitalization are positively related to the bank's profitability. Based on the findings of Sufian & Chong (2008), it is suggested that the bank-specific determinant variables are statistically significant to the banks' profitability, even though the non-interest income and capitalization have a positive impact on the bank's profitability.

In terms of the research conducted by Vintillã & Nenu (2016), multivariate regression analysis is implemented in order to analyze the ROA and return on equity (ROE) in response to the quick ratio, current ratio, leverage, cash conversion, effective tax rate, and working capital; in which the object of the research is the companies listed on the Bucharest

Stock Exchange. Based on the findings, it is found that the variables used in the research of Vintillã & Nenu (2016) are statistically significant; furthermore, it is found that there is a negative relationship between liquidity and firms' financial performance. Based on the findings, it is indicated that the decrease in the aspect of liquidity can be excluded as a risk factor for the Romanian companies.

Based on the explanations regarding the methodologies used in this research, these methodologies are used to fulfill the research objectives. To be precise, these methodologies are used to determine the challenges faced by the incumbents, analyze the changes of preference in the digital culture, and to provide solutions that can be used by the incumbents to cope with such challenges.

4 FINDINGS

In this section, the methodologies that already explained in section 3 are applied in order to fulfill the objectives in this research. The findings of this research and its analysis are given as follows:

4.1 Multivariate Regression Analysis

Based on the research conducted, it is found that the IT impact in response to the implementation of IT in order to fulfill the demand and criteria of its customer in conducting digital transaction are moving in a positive manner; in other words, the impact of IT is directly related to the level of implementation of IT by the incumbents. The regression equation from the multivariate regression analysis is presented in equation (2).

$$Y = -.801 + 1.067X' \quad (2)$$

Based on the equation (2), the regression analysis shows that the impact of IT is dictated by the movement of the implementation of IT applied by the incumbents. In other words, the degree of implementation of IT determined the scale of IT impact the incumbents may have in their banks, especially in regards to fulfilling the demand and criteria of its customers in conducting digital transactions by using the financial services provided by the banks.

Furthermore, the linear regression presented in equation (2), the regression has a p-value of 0.027. In which, the linear regression of equation (2) is statistically significant to analyze the movement of the IT impact in response to the IT implementation of banks in order to the meet the criteria and expectations of its customers. In terms of the

implementation of IT, it is found that the p-value of the variable stands at the level of 0.027 (where the p-value of the variable are below the 0.05 or 5% threshold); in which, the variable of IT implementation is statistically significant to describe the movement of the IT impact to the incumbents.

And finally, in terms of the correlation of the IT impact and the implementation of IT stands at the level of 0.765 or 76.5%. The correlation value indicates that the IT impact and the implementation of IT has a positive relationship between one and another. In other words, if one of the variables increases, then the other variable has the tendency to be increasing as well and vice versa.

4.2 Action Research Analysis

In regards to the findings using the research action method, the steps of action research are conducted by the process defined by Sagor (2000). The analysis of the challenges faced by the conventional banking sector (especially for the Indonesian banking sector) using an action research approach is given as follows. In accordance with the phenomenon of the emergence of the fintech industry, the fintech industry is capable of producing a better application for its customers in terms of using the application for conducting digital financial and banking services. In which, these applications created by the fintech firms consider better than the conventional banking sector due to the rapid development and implementation of its product. As Románova & Kudinska (2017) explains, the fintech firms is categorized into two groups, which are (1) by become the partner for the conventional banking sector in order to produce a digital banking and financial for its customers or (2) by creating an application for its customer to conduct a digital financial and banking services which are already provided by the conventional banks. Furthermore, due there is a gap between the digital product produced by the conventional banks and the expectations of its customers in terms of digital services, the fintech industry are able to complete the gaps by creating a product the customers, in which the customers did not acquire in the application created by the conventional banks (Zavolokina, et al., 2016). By noticing the gap between the customer's expectation and the product created by the incumbents, the fintech industry is capable on capitalizing the opportunity by creating a product with better quality and services compared to the incumbents due to greater flexibility in implementing its innovation to its product than the conventional banking sector.

In terms of the changes of preferences in the digital era, Das et al. (2016) explains that there are four disruptions in Indonesia that already happen in

regards to the rapid development and advancement of technology, which are (1) mobile internet, (2) cloud technology, (3) internet of things and (4) big data and advanced analytics. Because of these disruptions, the customers of the banking industry are expected to have digital services that enable them to conduct their digital transactions as smooth and seamless as possible. In other words, the trends that already happened in Indonesia is that every digital transaction can be completed just by using their smartphones or mobile phones. Furthermore, according to the Australian Trade and Investment Commission (2018), the number one reasons the Indonesian customers conducting digital transaction in 2016 (especially in their purchasing activity in the e-commerce market) is due to the practicality factor; in which there are 63% of the respondent engaging in the digital transactions due to the practicality it provides.

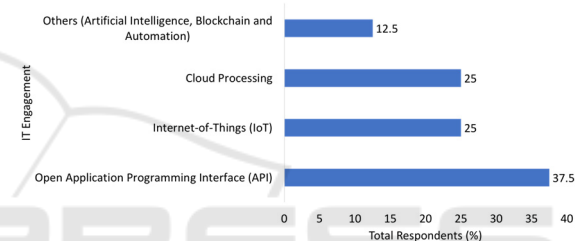


Figure 1. Indonesian Conventional Banks' IT Engagement

Based on that trend, the incumbents use different approaches in fulfilling the demands and the needs of their customers. Specifically, it is found that (1) 37.5% of total respondent is engaging in the implementation of open application programming interface (API), (2) 25% of total respondent are engaging in the implementation of internet of things (IoT) and (3) 25% of the total respondent are engaging in the implementation of cloud processing. To simplify the findings above, Figure 1 is presented as an overview regarding the Indonesian banks' IT engagement in fulfilling the demands and the needs of its customers. Furthermore, it is found that 62.5% of the total respondent believes that it is crucial to collaborate with the fintech firms to improve their implementation of IT in order to meet the criteria of its user. Meanwhile, 50% of the total respondent is considered the implementation of big data analytics to be important in findings the needs of its customer; in which the conventional banks may have the opportunity to produce an application or system to fill the needs of its customers.

Furthermore, it is indicated that all of the incumbents have different priorities in regard to the implementation of IT in order to fulfill the criteria and the demands of its customers. Also, some of the

incumbents believe it is essential to collaborate with the fintech firms in order to produce digital services that meet the preference of its customer in conducting the digital transaction; in which, some of the incumbents working together with the fintech firms in order to fill the gaps that exist in the digital era. Also, it is found that not all the incumbents prioritize the same technology in their business in order to cope with the challenges that arise in the digital era; to be precise, in regards to the emergence of fintech and the changes in the preference of its customer.

In regards to the challenges faced by the Indonesian banking sector due to the emergence of the fintech industry and the changes of preference in conducting a digital transaction, the Indonesian banking industry is faced with several problems relating to the implementation of technology in the digital era. Some of the problems that are identified using the action research approach are: (1) the incumbents are still in struggle to produce an application or digital financial and banking services that have the same quality (or better) with the application with the fintech firms, (2) the incumbents are restricted in the implementation of the new technology and implementing its innovations due to the nature of the industry itself (which are a “highly-regulated industry”), (3) there are gaps between the digital product produced by the incumbents and the expectations of its customer (in which, these gaps are capitalized by the fintech industry to provide digital and financial services where the incumbents are not able to provide to its via technology implementation) and (4) due to the rapid development of technology, the banks are needed to provide a better security to protect theirs and customers data from any cybersecurity threats that may occurs in any given time (especially to the data that are used by the incumbents to implements the new technology in their digital services for its customer).

Based on the explanations on the challenges faced by the incumbents, the challenges faced by the incumbents are oriented on the approach to utilize their technology to understand and fulfill the demands, the criteria, and the preferences of its customers in conducting digital transactions. In simple terms, the incumbents should either learn from its competitors (in this case, it is the fintech industry) in regards to provide better applications for its customer in doing digital transactions or by examining the needs of its customers in regards to the trends that already taken place in this digital era.

4.3 Solutions

Based on the challenges that explained in section 4.2, several approaches or solutions can be applied by the

incumbents to cope with these challenges (in regards to the changes of preferences of its customers and the emergence of the fintech industry). It is identified that conventional banking customers in need of an application or software that can make their digital transactions easier. On the other hand, every customer has their own preferences or criteria in conducting digital transactions. In which, the Indonesian conventional banks should prioritize the necessary technologies in order to improve the effectiveness of their application in fulfilling the needs and the criteria of its customers in conducting digital transactions or banking activities.

In this regards, some of the solutions are: (1) the incumbents could collaborate with the fintech firms in developing their own digital financial and banking product to fulfill the demand and the criteria of its customers, (2) the incumbents could create or develop their digital banking and financial services using the customer-centric approach in order to obtain the information of the needs of its customer and the incumbents could prioritize which technology to be implemented to meets the criteria, (3) the incumbents should have an adequate security to protect the banks and its customer data in the digital era (especially on the data which are used to facilitate the customers digital transactions) and (4) the implementation of technology by the incumbents should focus on the aspect of practicality (in which, the application has the characteristic of seamless and easy-to-use feature) to be able to keep up with the trend that are already taken places.

Following the result of the regression analysis presented in equation (2), the incumbents should prioritize the technologies that are needed by its customers. By prioritizing the technologies based on the criteria and the demands of its customers, the incumbents are able to keep up with the trends in conducting digital transactions. Furthermore, by prioritizing the technology to be implemented based on the trends, the incumbents are able to develop their digital product using the customer-centric approach to maximize the performance and the quality of their product to meet the criteria and the expectations of its customers and the trend in the digital culture.

5 CONCLUSIONS

Based on the analysis using the multivariate regression analysis, it is found that the impact of IT in response to the implementation of IT in the Indonesian conventional banks is statistically significant. Furthermore, the impact of IT is dictated by the implementation of IT to fulfill the demands of its customers. Meanwhile, in regards to the analysis

using correlation analysis, it is found that the impact of IT with the IT implementation in terms of meeting the criteria and the expectation of its customers in conducting digital banking activities is found to be positively related. Thus, the more frequent the conventional banks implementing new technologies, then the impact of IT will be increasing as well and vice versa.

In terms of findings using the action research analysis, it is found that the incumbents are faced with the following challenges: (1) the incumbents are in struggle to create an application or digital services that have the same quality with the product created by the fintech firms, (2) the incumbents are restricted in implementing their new technology because to the nature of the "highly-regulated industry" in the conventional banking sector, (3) there are still an existing gaps between the product created by the incumbents and the expectations of its customer and

(4) due to the rapid development or advancement of technologies that are taken places, the incumbents are needed to provide protection to the cybersecurity threats that may occur at any given time.

As for the changes in the preferences of the conventional banks' customers, the majority of the respondents in this research are engaging in the development of open API within their system. In which, this open API system is improved to facilitate better integration between the software and the web-services product that is created by the conventional banks in facilitating the digital banking activities of its customer. Also, some of the respondents are focusing on other aspects of IT, such as artificial intelligence, cloud processing, and IoT. Hence, these engagements are also focusing on the improvement of the user's experience of its customers while using the application created by the Indonesian conventional banks.

In regards to the solutions that can be applied by the incumbents to cope with identified challenges from the action research analysis, the solutions are given as follows: (1) the incumbents should collaborate with the fintech firms in developing or creating their digital product to meet the criteria and the expectations of its customers, (2) it is advisable for the incumbents to develop their digital financial and banking services using a customer-centric approach to obtain the information regarding the trend that already taken places in the digital era, (3) the incumbents should have an adequate security on protecting the banks and its customers data from the cybersecurity threats due to the rapid development of technologies and (4) it is advisable for the incumbents to develop or create a digital product that is focused on the aspect of practicality to enhance the experience of its customers.

The findings, the challenges and the solutions in this research are in line with the research conducted by Brummer & Gorfine (2014) and Zavolokina et al. (2016) in terms of the emergence and the impact of the fintech industry, with the additions of the changes in the preference of customers in the digital era. In simple terms, the challenges created are due to the advancement of technologies, and the fintech industry is capable of noticing and capitalizing the gap between the digital banking product created by the incumbents and the expectations of its customers to produce a better-quality application compare to the conventional banks.

Finally, the limitation of this research is that it only focuses on the perspectives of the Indonesian conventional banks in the digital era. Specifically, the perspectives in this research are only using the expert panels of individuals that are operated in the banks that are classified into the category of Book four banks in terms of the impact of IT and its implementations in Indonesia. Based on the conclusion and the explanations above, the future research regarding the role of IT in the Indonesian banking industry and the fintech industry will be including the perspectives of the incumbents and the fintech in regards to the implementation of technologies that can be used in creating an application or digital product that can meet the criteria and fulfilling the needs of the needs of its customers in Indonesia.

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