

Talent mapping: a strategic approach toward digitalization initiatives in the banking and financial technology (FinTech) industry in Indonesia

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Abstract

Purpose – The development of information technology is highly influential to all sectors, including the financial industry. Various transformations are made in overcoming the dynamics of technological advancements, including the mapping of human resources. This study is conducted in the banking industry and companies operating using financial technology (FinTech) in Indonesia. This study aims to identify talent competencies needed in the future, based on current conditions and future needs, through mapping talent in the banking and FinTech industries.

Design/methodology/approach – This study provides empirical evidence about the mapping of talent management with eight basic competencies. It uses a mixed-method, explanatory sequential with survey approach in the first phase and focus group discussions (FGD) in the second phase. The questionnaire is distributed to 309 respondents who are the specific decision-makers in this industry. Meanwhile, the FGD is conducted twice at different times with academics and practitioners, human resources and talent managers. This research used analytic hierarchy process as a tool for data processing.

Findings – This study provides current competency positions and future needs in the banking and FinTech industries in Indonesia where it found a lot of competence segregation. It also discovered three priority competencies for dealing with Industry 4.0, which included relating and networking, adapting and responding to change and entrepreneurship and commercial thinking.

Practical implications – This study is valuable for decision-makers and regulators; these results can be used to find new competencies and talents to develop existing human resources. Also, these results can be used as a basis for policy-making related to the Industrial Revolution 4.0.



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Originality/value – This study provides new insights on talent mapping in the banking and FinTech industries as a strategic approach in the digitalization era. In addition, this research also adds knowledge related to Industry 4.0 as a result of industry developments in the digitalization era.

Keywords Banking industry, Digitalization, FinTech, Human resource management, Industry 4.0, Talent mapping

Paper type Research paper

1. Introduction

Economic digitalization has an impact on public lifestyle patterns. The involvement of disruptive innovation has massively changed human behavior. Technological innovations have shifted the way consumers obtain the needs for goods and services, from conventional methods to online platforms. This shift leads to the elimination of those business people who are unable to innovate in technology. The development of information technology has a domino effect that changes the nature of production to infinity and encourages the process of collaboration and economy sharing. This allegedly eliminates the existing market, yet can have an impact on inclusion, especially in the financial industry. The effects of financial inclusion can provide a wider space for the public, thus increasing access to financial services by changing the composition of the financial system such as transactions, services and access points available, so as to reduce economic inequality in society.

Based on the results of the [PricewaterhouseCoopers \(2018\)](#) banking survey, the bankers argued that technological transformation is still considered a major driver in the banking industry. This is in line with Deloitte's identification of the banking industry, which has a short period of change with a large degree of impact (short fuse, big bang) ([Deloitte, 2015](#)). Thus, the banking industry will face the greatest impact of technological change and other new digital competitors in the financial markets and revolutionize conventional business. The banking industry has a large amount of data that includes transaction data, underwriting and customer credit ratings, credit cycles and economic cycles. The banking data are unique assets that allow for the application of artificial intelligence (AI). According to an analysis done by the [McKinsey Global Institute \(2017\)](#), the use of AI is most likely for product personalization and fraud identification services. There are challenges related to human capital in the use and development of AI in the banking industry. The automation process in the development of cognitive technology, and AI will cause traction/friction; thus, banks need to redefine some job descriptions and divide tasks for human capital and machines, or develop hybrid technology models that encourage increased human capital performance.

Financial technology, called FinTech, has a large impact on every aspect of financial services, and revolutions throughout the financial industry through virtual change ([Goldstein, Jiang and Karolyi, 2019](#)). FinTech integrates finance and technology, provides a variety of innovative business services and leads the global economic revolution ([Hsueh and Kuo, 2017](#)). The implementation of FinTech in financial inclusion practices will encourage social welfare and economic growth in various countries ([Hua et al., 2019](#)). In recent years, FinTech has developed very rapidly globally, including in Indonesia. The business pattern of the company through digital service offerings has also changed. Indonesia is a country with a high growth rate of FinTech as a result of it entering various business sectors, including payment systems, investments and online loan funds ([Nugroho, 2019](#)). Bank Indonesia (BI) divides FinTech into four categories, peer-to-peer (P2P) lending and crowdfunding; market aggregators; risk management and investment; and payment, clearing and settlement. One of the service innovations developed by the FinTech industry is P2P lending, which provide money lending services to individuals or small- and medium-

sized companies through online services that match lenders and borrowers directly on the website (Hsueh and Kuo, 2017). The P2P lending platform allows lenders and borrowers to find each other via the internet, on a platform that provides a credit mechanism and risk management (Hsueh and Kuo, 2017).

The rapid growth of FinTech in Indonesia was marked by an increase of 97.6% in the number of loans disbursed in 2019 and an increase of 59.2% in the number of borrowers. The total cumulative loan amount by 2019 was IDR44.8tn, while the total payment transaction was IDR47.1tn (Wijaya, 2019). The total accumulated lender accounts in 2019 were 588,766 entities, and the total accumulated borrower accounts were 14,359,918 entities (Financial Services Authority, 2019). The rapid growth of the FinTech industries can provide a variety of solutions for the needs of the Indonesian people in accordance with their lifestyles. All FinTech companies in Indonesia are under the auspices of the Indonesian FinTech Association (AFTECH), which operates in the sector of digital payment systems, online loans, digital financial innovation, insure tech, equity crowdfunding and others. However, the developments of these technologies have not been accompanied by adequate human resources. AFTECH's Director of Public Policy, Ajisatria Suleiman, said that Indonesia lacked human resources for the FinTech industry in the future (Merdeka.com, 2018), including the ability to analyze characteristics related to people's behavior and expenditure and management of big data to develop new FinTech products that fulfill the public's needs. Ng and Kwok (2017) suggested key steps to resist cybersecurity affected by FinTech through the current and future talent training related to this sensitive topic. A poor understanding of FinTech harms the availability of FinTech talent pipelines in the market. The shortage of professionals at FinTech has also raised issues at the international level (Investigating the Global Talent FinTech Shortage, 2017).

The demand for financial talent is growing rapidly. The talents in a company are those employees who have competence and potential that will bring progress to the organization currently and in the future (Wahyuningtyas and Anggadwita, 2017). Industrial needs not only refer to professional talents in finance and economics but also the integration of financial knowledge, technology, innovation and the ability to sustainably develop FinTech, thus becoming competent to work in the current digital era. Various innovation services from the FinTech industry show that innovative talent is needed in the industry in the form of innovative thinking and practical abilities (Liu and Qi, 2018). The company considers talents as a very important asset in a strategy to drive the business one step ahead of their competitors. The development of employee skills will benefit the organization (Dalal and Akdere, 2018; Grant, Maxwell, and Ogden, 2014; van Zyl, 2013). By redesigning the system and model of talent development, the human capital unit can encourage companies to become dynamic ones. The McKinsey Global Institute (2017) identifies skills that are no longer needed in the future, such as basic cognitive skills and physical and manual skills. Meanwhile, following the development of technology, the financial industry has identified several skills that will be needed in the future, such as technological skills, social and emotional skills and higher cognitive skills.

An understanding of the talents and competencies in the FinTech company is considered very important (Goldstein, Jiang and Karolyi, 2019); thus, this study tries to fill the gaps that occur in the limited academic research available in this field. Therefore, this study aims to identify the talent competencies needed in the future through talent mapping in the banking and FinTech industries based on current conditions and future needs. The results of this study will contribute to the government as policymakers in banking and FinTech to formulate strategies for preparing talents in the FinTech field.

2. Literature review

2.1 *Human resources management for Industry 4.0*

Industry 4.0 has brought about transformational and massive changes in all layers of industrial structure, including the dynamics of workforce capabilities for digital economy requirements. Organizations must ensure their productivity and competitiveness in the Industrial 4.0 era by developing future workforce competencies. Some researchers have previously stated that automation in Industry 4.0 will eventually replace most of the functions of human labor, some others claim that it is not possible to massively replace human labor with automation because digital systems will only be used to help human labor (Autor *et al.*, 2015; Autor and Handel, 2013; Frey and Osborne, 2013).

Organizational performance and competitiveness highly depend on how its employees are managed (Hecklau *et al.*, 2016). Human resource management has an important role in the activities of hiring and managing people in the organization (Ganschar *et al.*, 2013). According to Armstrong *et al.* (2005), human resource management (HRM) is a strategic approach directed at employee effectiveness and high commitment development and quality workforce to achieve organizational goals. They stated that the aims of HRM development are:

- to improve the effectiveness and performance of individuals/groups;
- to improve the effectiveness and organizational performance of individuals/groups;
- to develop knowledge, skills and competencies; and
- to increase the potential of HR and personal growth.

Meanwhile, according to Watson (2009), HRM is the management of human resources with the aim of helping the organization grow. Therefore, the HR function in the organization changes all the time. These changes can be caused by internal and external factors. According to Palmer *et al.* (2017), the external factors include the development of new technology and changes in customer preferences. The consequence is the need for a change in HR management. HRM has a vital function in developing employee capacity; according to Hecklau *et al.* (2016), the three main functional areas of human resource development can be defined as personal development (competence), team development (collaboration) and organizational development (structure and process).

The development of information and communication technology (ICT) has played an important role in the evolution of HRM (Thite and Kavanagh, 2009). This influence has a wider scope than the use of information technology systems (Hempel, 2004); thus, the role of HRM needs to be redefined and also transformed. According to Thite and Kavanagh (2009), this has implications for the demand for new competencies in human resources. Competence is a personal trait or set of habits that leads to more effective or superior job performance (McClelland, 1973). According to Klemp (1980), competence is “a person’s basic characteristics, which results in effective and/or superior performance in work.” Competence is a skill and ability, things you can do, obtained through work experience, life experience, learning or training (Spencer and Spencer, 1993). Meanwhile, the definition of competency according to Bartram (2005) and Prifti *et al.* (2017) is “a set of behaviors that play an important role in delivering the desired results or outcomes.”

2.2 *Talent mapping and competencies*

Talent management is an organizational activity in attracting, selecting, developing and managing employees in an integrated and strategic manner (Scullion and Collings, 2011) so that employees can contribute to the development, sustainability and success of the organization (Collings and Mellahi, 2009). Talent development is an important component of the overall talent

management process (Novations, 2009; Cappelli, 2009). Organizations tend to make significant investments in talent development activities, so talented employees have the competence to successfully implement business strategies (Garavan *et al.*, 2012). Talent refers to individuals who have the skills, intelligence and abilities that make certain actions possible at a higher level (Karacay, 2018). Talent mapping is defined as a comprehensive process for analyzing current and future talent needs by matching current and future organizational goals and resources (Murphy, 2007). A talent map is an organizational roadmap for balancing and aligning talent resources to achieve success (Abi Abdallah, 2015). By using talent maps, organizations can see how they can better use employee talents to improve overall organizational productivity and profitability.

Currently, companies need talented employees to achieve superior and competitive organizational performance; however, the identification of strategic competencies has changed following the development of Industry 4.0, which encourages the use of digitalization in all aspects of business processes. The focus of talent development practices has gradually shifted by integrating external and internal sources (Piore, 2002). Transforming the work environment in Industry 4.0 changes the job profile and therefore requires employees to be equipped with various competencies (Kagermann *et al.*, 2013; Smit *et al.*, 2016). Work profiles that require tertiary education will have increased significance, while the workforce will largely be replaced by automated processes (Kagermann *et al.*, 2013). The definition of competence for Industry 4.0 is needed to successfully pass the transformation to Industry 4.0 (Richter *et al.*, 2015; Jaschke, 2014; Richert *et al.*, 2016).

Ellström and Kock (2008) stated that there are two ways of defining competencies. The first is related to the implications for human capital that can be translated as performance. Secondly, competency is defined as aspects needed for specific tasks. Human resource (HR) competencies help organizations to be competent because the values of HR professionals comprise of ideas, programs and initiatives, which benefit businesses (Ulrich *et al.*, 1995). Various studies on competence are based primarily on three approaches that were developed independently (Delamare-Le Deist and Winterton, 2005). The behavioral approach focuses on attributes that go beyond cognitive abilities, such as self-awareness, self-regulation and social skills (McLelland, 1973; Boyatzis, 1982). The functional approach focuses on competency as a requirement for successfully fulfilling a task by limiting the period of competence for the skills and the know-how required to perform the task (Frank, 1991; Miller, 1991). A holistic/multi-dimensional approach describes competencies as a collection of individual and organizational competencies needed to achieve the desired results (Straka, 2004). This study focuses on individuals as a key factor in the banking industry and FinTech, by analyzing a broad spectrum of competencies for individuals not only at functional but also at the level of behavior.

2.3 The competencies model

There are various perspectives and approaches to see the phenomenon of competence. The competency model is a behavioral job description that explains a combination of knowledge, skills and certain characteristics needed to produce an effective performance in the organization (Litauniece, 2011). According to Grzelczak, Kosacka and Werner-Lewandoswka (2017), the composition of all competency groups (social, personal and professional) includes knowledge, skills, abilities and personality. Meanwhile, Bell, Lee and Yeung (2006) revealed that core competencies consist of four aspects, which include business knowledge, HR expertise, change management and technology expertise. Furthermore, Delamare-Le Deist and Winterton (2005) distinguish competencies based on practice and label. The behavioral approach (USA) emphasizes individual characteristics and the use of behavioral competencies to develop superior performance. The function approach (UK) focuses on the functional competence in the

work environment and a multi-dimensional and holistic approach (France, Germany, Austria) refers more to the analytic concept of competence.

Meanwhile, [Kreitshtstein \(2017\)](#) created a competency model in digital banking, including legacy competencies, which are competence-related to legacy functions; shared competencies, where competence is played by advanced players; and emerging competencies, which is competence affected by current or upcoming trends. The results of the research done by [Grzelczak, Kosacka and Werner-Lewandoswka \(2017\)](#) in Poland found there are several employee competencies for various types of business activities, including interdisciplinary thinking and action, the process of knowledge growth, participation in innovative processes, problem-solving, personal responsibility for decision-making, social skills and communication, leadership, the ability to work process coordination, complexity of the scope of work and the ability to cooperate/interact with machines. Organizational performance and competitiveness depend on the management of employees. [Fabian et al. \(2017\)](#) holistically reduced employee core competencies for Industry 4.0. In the category of technical competencies, the desired competencies comprise state-of-the-art knowledge, technical skills, process understanding, media skills, coding skills and understanding information technology (IT) security.

CEB Inc. (2020), a global technology company that provides services for businesses around the world, offers the SHL Universal Competency Framework (UCF) ([Bartram, 2005](#)) as a foundation for building competency models. The framework consists of three hierarchical levels, with the first level being called the “Big Eight” as it describes eight core competency factors that support job performance. The eight competency groups were followed by 20 competency dimensions that divided these eight groups into additional categories. This framework offers a general perspective on competencies, where competency models for concrete topics can be developed ([Prifti et al., 2017](#)). Meanwhile, [Prifti et al. \(2017\)](#) adapted the SHL UCF in their study for competency needs in industry 4.0. [Table 1](#) shows the competency model that was built based on the results of the study of [Prifti et al. \(2017\)](#).

Dimensions		Core competencies	
1	Leading and deciding	1	Deciding and initiating action
		2	Leading and supervising
2	Supporting and cooperation	3	Working with people
		4	Adhering to principles and values
3	Interacting and presenting	5	Relating and networking
		6	Influencing
		7	Presenting and communication information
4	Analyzing and interpreting	8	Writing and reporting
		9	Applying expertise and technology
		10	Analyzing
5	Creating and conceptualizing	11	Learning and researching
		12	Creating and innovating
		13	Formulating strategies and concepts
6	Organizing and executing	14	Planning and organizing
		15	Delivering results and meeting customer Expectations
		16	Following instructions and procedures
7	Adapting and coping	17	Adapting and responding to change
		18	Persuading
8	Enterprising and performing	19	Achieving personal work goals and objectives
		20	Entrepreneurial and commercial thinking

Table 1.
The dimensions and competencies of human capital in Industry 4.0

Sources: [Bartram \(2005\)](#); [Prifti et al. \(2017\)](#)

The industrial era 4.0 requires the development of new digital skill sets for the workforce that will ultimately change the way and where people work (Beechler and Woodward, 2009; Guthridge *et al.*, 2008). At present, automation and AI are changing the nature of work in the industry. Technology has an impact on various aspects, including the economy, business and society. At the same time, technology also has an impact on changes in the demand for future workforce skills and how work is organized within the company, as more people interact with machines in the workplace (McKinsey Global Institute, 2018). According to the McKinsey Global Institute (2018), there are five skills needed in the era of automation and AI, which include: physical and manual (general equipment operation and navigation, inspecting and monitoring), basic cognitive (basic data input and processing; basic literacy, numeracy and communication), higher cognitive (creativity, complex information processing and interpretation), social and emotional (entrepreneurship and initiative-taking, leadership and managing others) and technological (advanced IT skills and programming, basic digital skills).

In this study, most of the competencies determined were not new, but certain combinations of competencies presented for Industry 4.0 were relevant to be applied to the banking and FinTech industries. At present, there is a clear separation between competencies that must be possessed by employees from various disciplines so that in the future, there are no differences in competencies possessed from various disciplines, which will differentiate only in a few aspects of domain knowledge (Prifti *et al.*, 2017). This study elaborates on the competency model developed by Bartram (2005) and Prifti *et al.* (2017) by proposing eight competency dimensions consisting of 20 core competency factors.

This study focuses on the banking and FinTech industries because Industry 4.0 impacts the use of technology in the economic and business sectors, and society. Thus, there is a change in the demand for labor skills to come and how the work is organized in the company. The banking and FinTech industries rely heavily on the automation process and AI. Financial services have been at the forefront of digital adoption, and banking and FinTech are likely to become one of the sectors with the most extensive labor transition in the coming years, with significant implications for skills change (McKinsey Banking Annual Review, 2017). An AI system that includes artificial neural networks will allow smarter predictions regarding risk assessment and management for loan guarantees and fraud detection (McKinsey Global Institute, 2018). The potential use of AI is also significant in marketing and sales, where developing technology enables personalization of product targeting for customers. Based on the 20 core competency factors, we divided into five main skills (McKinsey Global Institute, 2018) (Table 2). This division is based on the definitions and characteristics of each core competency factors.

3. Methodology

This research used a combination of sequential explanatory design methods, which combines quantitative and qualitative research methods in sequence. A sequential explanatory design starts with a quantitative stage and continues with a qualitative stage to explain in-depth the related results of the quantitative stage (Creswell and Creswell, 2018). In this study, quantitative research was conducted to obtain measurable quantitative data that was descriptive in nature to showcase the current state of competence. After obtaining the results of quantitative data processing, the study moved on and obtained qualitative data, which has the role of proving, deepening, expanding or weakening the quantitative data obtained at an early stage.

The variable operation in this study includes eight competency dimensions: leading and deciding, supporting and collaborating, interacting and presenting, analyzing and interpreting, creating and conceptualizing, organizing and executing, adapting and coping and enterprising and performing (Bartram, 2005; Prifti *et al.*, 2017). These eight dimensions are divided into 20 sub-competencies, which would be measured and mapped based on current conditions and

Table 2.
Skills based on
competencies of
human capital in the
banking and FinTech
industries

Skills		Core competency	
1	Social and emotional skills	1	Leading and supervising
		2	Working with people
		3	Adhering to principles and values
		4	Relating and networking
		5	Influencing
		6	Learning and researching
		7	Adapting and responding to change
		8	Persuading
		9	Achieving personal work goals and objectives
		10	Entrepreneurial and commercial thinking
2	Higher and cognitive skills	1	Deciding and initiating action
		2	Creating and innovating
		3	Formulating strategies and concepts
		4	Planning and organizing
		5	Delivering results and meeting customer Expectations
3	Basic cognitive skills	1	Presenting and communication information
4	Technological skills	2	Writing and reporting
		1	Applying expertise and technology
5	Physical manual skills	2	Analyzing
		1	Following instructions and procedures
Sources: Bartram (2005); Prifti <i>et al.</i> (2017); McKinsey Global Institute (2018); own elaborations (2019)			

future expertise needs. The 20 sub-competencies will be divided into five skills in talent mapping, including social and emotional skills, basic cognitive skills, technology skills, high cognitive skills and physical and manual skills (McKinsey Global Institute, 2017).

3.1 Data collection

The data collection methods in this study include three stages. Stage 1 is a survey method using a closed questionnaire distributed to 400 companies in Indonesia to see the current conditions and availability of the talent and competencies of FinTech. The respondents who filled out the questionnaire are employees who are in the top management positions in the company. A total of 309 respondents participated in filling out the questionnaire. Table 3 shows the profile of respondents who participated in this study.

Stage 2 is FGD 1, which is an in-depth interview with a group of practitioners in the field of FinTech who are considered to sufficiently understand the conditions and developments of the banking and FinTech industries in Indonesia. It is an attempt to obtain qualitative data. FGD 1 was held at the Financial Services Authority Office in Jakarta, Indonesia, in October 2019, to clarify the results of the questionnaire survey in Stage 1 and to identify future talent needs. A total of 40 informants participated in FGD 1 from various banking and FinTech industries in Indonesia, Financial Services Authority Institutions and academics.

Stage 3 is FGD 2, which is an in-depth interview with a group of practitioners and consultants in the field of HR who are considered to sufficiently understand the availability and development of the talent needs of the banking and FinTech industries in Indonesia in the future. FGD 2 was also held at the Financial Services Authority Office in Jakarta, Indonesia, in November 2019, and there were 30 informants who participated in this activity. This FGD 2 was done to clarify the results of FGD 1, specifically those about the talent needs in the future.

				Talent mapping
No.	Characteristics	Total	(%)	
1	<i>Gender</i>			
	Male	62	20.06	
2	Female	247	79.94	
	<i>Age</i>			
	≤ 25 years	6	1.94	
	26–30 years	11	3.56	
	31–40 years	72	23.3	
	40–50 years	121	39.2	
	≥ 50 years	99	32	
3	<i>Education background</i>			
	SMA	2	0.65	
	Diploma (D1/D2/D3)	3	0.97	
	Bachelor degree (S1)	149	48.22	
4	Master degree/doctoral degree (S2/S3)	155	50.16	
	<i>Industry</i>			
	Banking industry	253	81.9	
	Financial and technology (FinTech) industry	56	18.1	
5	<i>Tenure</i>			
	≤ 2 years	18	5.82	
	3–5 years	2	0.65	
	5–10 years	65	21.03	
	10–20 years	71	23	
	≥ 20 years	153	49.5	

Table 3.
Respondents profile

3.2 Data analysis

The data analysis techniques in this research include descriptive analysis, analytic hierarchy process (AHP) and talent mapping. The descriptive analysis technique, which is used to determine the extent of respondents' ratings of the employee's current competency level for the 20 core competency factors used, is used. The data were analyzed using the rank order, which is to calculate the magnitude of the results of the assessment and the value of the interpretation classification range for each indicator.

AHP is a method related to complex decision-making that helps determine priorities based on a certain hierarchical arrangement. In this research, an assessment of the relative importance of each sub-competency determines the highest priority that plays a role in the situation. AHP is implemented in three steps: first, calculating the criteria weight vector; second, calculating the score matrix for each choice; and third, ranking each choice.

The mapping of the current conditions of core competency factors is based on the workforce skills executive map developed by [McKinsey Global Institute \(2018\)](#). This map divides the area into four quadrants as seen from the "Perceived importance of skill today" and "Expected future skill need." These four quadrants comprise Quadrant I, defining important but declining; Quadrant II, defining limited and declining; Quadrant III, defining limited but growing; and Quadrant IV, defining important and growing. The results of the current competency conditions were obtained from the processing of the questionnaire data and the results of FGD 1. Meanwhile, the results of FGD 2 would clarify the results of FGD 1, and the conditions of each competency in the future to produce a mapping of competency needs, which is also indicated by the measurement of bubble size through relative working hours of each competency. The bubble size formulation is as follows:

$$Bubble\ Size = Relatif\ working\ hours \times \sum worked\ hours/year$$

Note: The total calculation of working hours is based on the number of worked hours in a year after deducting the number of standard leave in one year.

4. Findings

Figure 1 shows the competencies mapping from distributing the questionnaire to the respondents. It depicts that physical manual skills in the form of following instructions and procedures are included in the competence of limited but growing (Quadrant III). Basic cognitive skills in the form of presenting and communication ability, and writing and reporting are included in the competence of limited and declining (Quadrant II). Technological skill in the form of applying expertise and technology is in Quadrant II that shows the competence of limited and declining. Meanwhile, analyzing, which is also a technological skill, is in Quadrant IV with the competence of limited but growing. Higher cognitive skills are spread in between Quadrants I and II. Leading and supervising, which are social and emotional skills, are located in Quadrant II with the competence of limited and declining, while the rest are concentrated in Quadrant IV with the competence of important and growing.

The implementation of FGD I was conducted by inviting the academics and practitioners. This FGD 1 was conducted to map human capital competencies in the current banking and FinTech industries and the level of importance and future needs of human capital competencies using AHP (Figure 2).

Figure 2 depicts that physical and manual skill in the form of following instructions and procedures shifted to the competence of limited and declining (Quadrant II). Meanwhile, basic cognitive skill in the form of presenting and communication ability, and writing and reporting remain limited and declining competencies (Quadrant II), but with a smaller circle.



Figure 1.
The competencies of human capital in the current FinTech industry based on respondents' mapping

Notes: Yellow (Social and Emotional Skill); Green (Higher and Cognitive Skill); Blue (Basic Cognitive Skills); Grey (Technological Skill); Orange (Physical Manual Skill). The size of the circle shows the level of importance of human resource competencies and the estimated relative working hours

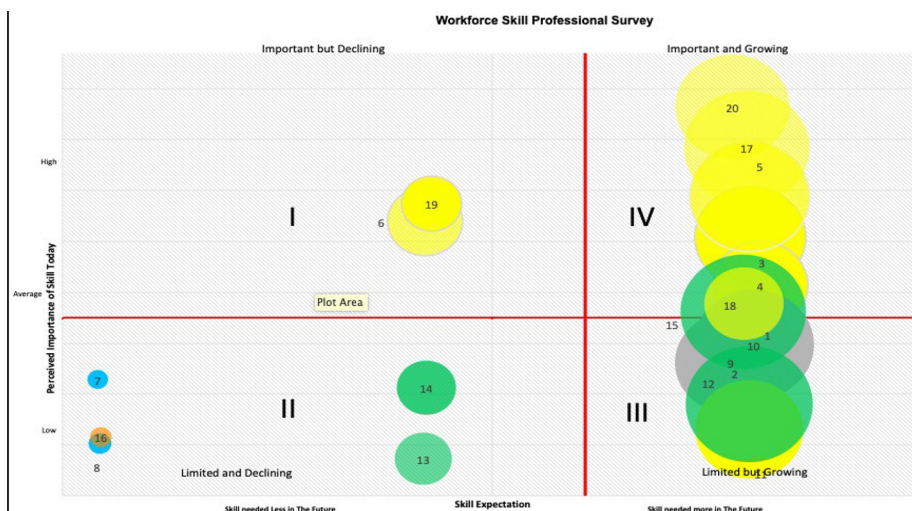


Figure 2.
Future competencies
in human capital
expectations in the
banking and FinTech
industries based on
FGD1

Technological skill in the form of applying expertise and technology, and analyzing is in Quadrant III that shows the competence of limited but growing. Also, leading and supervising, as social and emotional skills, are in Quadrant III with the competence of limited but growing. Entrepreneurial and commercial thinking shifted from Quadrants I–IV, while the rest are concentrated in Quadrants III–IV.

The results of the human capital mapping were enhanced by conducting FGD 2 with experts (Figure 3).

The results of FGD 2 revealed that the social and emotional skills, which include the competence of relating and networking, adapting and responding to change and entrepreneurial and commercial thinking remained in the competence of important and growing (Quadrant IV). The competence of working with people also remains in the competence of important and growing (Quadrant IV), but it has a smaller circle. This shows that less relative time spent at work requires this competency. The competence of leading and supervising remains in the competence of limited but growing (Quadrant III), but with a bigger circle. Meanwhile, the remaining core competencies show a small circle in Quadrants I and II, which shows that these core competencies are not the focus of the banking industry and FinTech in the future.

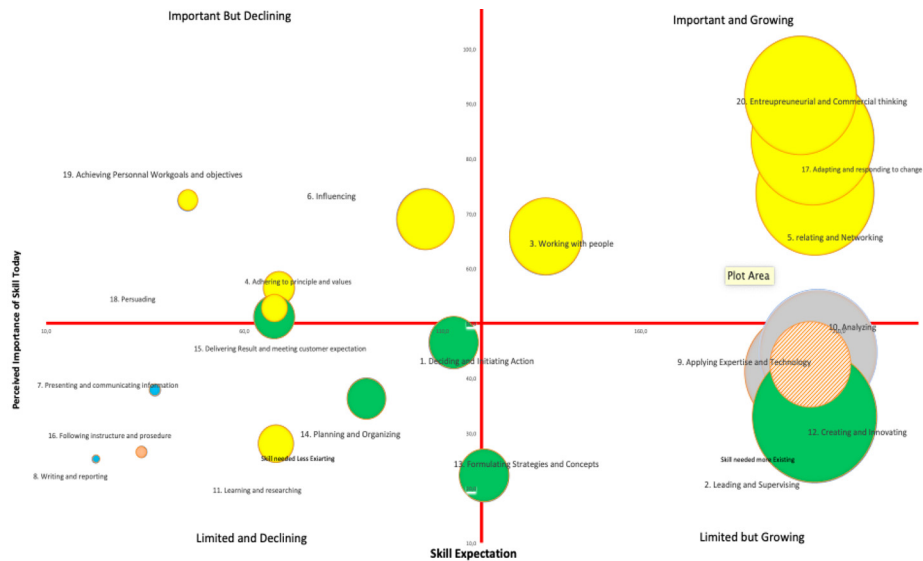
Table 4 shows that based on the results of the study, the level of importance and future needs of human capital competencies for talent in the banking and FinTech industries are sorted by importance as follows: entrepreneurial and commercial thinking, adapting and responding to change, relating and networking, analyzing and working with people. The informants are experts in the industry, and they believe that these competencies are in accordance with future needs in dealing with Industry 4.0.

5. Discussion

5.1 Quadrant I. Important but declining

The results of this study attempt to map talent competencies in the banking and FinTech industries. In Quadrant I, with the competency level of important but declining, we found social and emotional skills, which include the core competencies of adhering to principles and values, influencing, persuading and achieving personal work goals and objectives. The

Figure 3.
Future competencies
in human capital
expectations in the
FinTech industry
based on FGD 2



adhering to principles and values competency is associated with respect for ethics and environmental awareness. Current business conditions are in an ecosystem where rules and ethics are well regulated, but these competencies tend to decline with technological changes that affect people's attitudes and lifestyles. Thus, this competency is considered important but has declined in practice. Influencing is a competency that means being able to negotiate in providing the best alternative solutions, understanding the needs of others and managing emotions properly. Based on the Millennial Indonesia Report (IDN Research Institute, 2019), the millennial generation is demographically predicted to dominate various work positions in Indonesia where this generation is relatively more detailed, fastidious and very careful in deciding things. Thus, the influence competency is still needed in the future, but with a declining trend. The decline of this competency is caused by a shift in the behavior of consumers who prefer to read and watch product reviews through online media before deciding on a product. Thus, the ability to influence is more effectively carried out indirectly or through a media platform, so this ability is still considered important.

Persuading is a competency that means adapting and coping. Persuading is an indicator of the work–life balance. According to Sirgy and Lee (2018), the work–life balance is defined as the life balance between work and family divided into two dimensions, which include the role of HR and minimum conflict. Berk and Gundogmus (2018) stated that the achievement of a work–life balance will improve the employees' commitment in the organizations. Based on the results of the FGD, the indicator of work–life balance in HR is still considered an important variable but is starting to decline. This is indicated by the job characteristics and organizational support, which are predictors of the organization, which have been implemented well by the banking industry and FinTech. Some job characteristics that help achieve a work–life balance include a decrease in work requirements deemed to reduce work expectations (Greenhaus and Beutell, 1985; Kopelman *et al.*, 1983; Whiston and Cinamon, 2015), reduction of time pressure at work (Whiston and Cinamon, 2015; and Bulger and Fisher, 2012) and more work autonomy to increase HR freedom in making decisions (Bulger and Fisher, 2012). Meanwhile, organizational support in the flexibility of work arrangements can reduce the level of role conflict and improve

Skills	Weight	Core competency	Weight	Relative weight	Ranking	
1	Technological skill	202.3	Applying expertise and technology <i>Analyzing</i>	41.2 <i>44.7</i>	199.8 <i>217.0</i>	6 <i>4</i>
2	Social and emotional skill	130.19	Leading and supervising <i>Working with people</i>	42.4 <i>65.8</i>	148.4 <i>133.2</i>	9 <i>5</i>
			Adhering to principles and values <i>Relating and networking</i>	56.4 <i>73.8</i>	57.1 <i>217.0</i>	12 <i>3</i>
			Influencing <i>Learning and researching</i>	68.9 <i>28.1</i>	105.1 <i>64.7</i>	8 <i>17</i>
			<i>Adapting and responding to change</i> Persuading	83.4 <i>52.8</i>	225.5 <i>47.6</i>	2 <i>15</i>
			Achieving personal work goals and objectives <i>Entrepreneurial and commercial thinking</i>	72.4 <i>91.5</i>	36.2 <i>205.5</i>	13 <i>1</i>
3	Higher and cognitive skill	119.06	Deciding and initiating action <i>Creating and innovating</i>	46.5 <i>33.0</i>	90.4 <i>228.4</i>	10 <i>7</i>
			Formulating strategies and concepts <i>Planning and organizing</i>	22.3 <i>36.2</i>	91.4 <i>71.1</i>	16 <i>14</i>
			Delivering results and meeting customer Expectations <i>Following instructions and procedures</i>	51.1 <i>26.5</i>	75.2 <i>19.5</i>	11 <i>19</i>
4	Physical manual skill	34	Presenting and communication information	37.9	20.6	18
5	Basic cognitive skills	30	Writing and reporting	25.3	13.6	20

Table 4.
Skills, core
competency and
weighting

work and family balance (Allen, Shore, and Griffeth, 2003; Allen and Shanock, 2013; Beauregard and Henry, 2009; Gálvez, Martínez, and Pérez, 2011).

Based on the results of the study, the competence of achieving personal work goals and objectives is also included in Quadrant I. The goal-setting theory is one of the most widely used theories in a variety of psychological practices and corporate organizations (Spector, 2000). Latham and Locke (1991) stated that personal goals consciously limit human behavior. The more intensely the employees are involved in achieving their goals, the more committed they will be in the workplace, which leads to their best performance. Employee participation in setting goals will form a better understanding of a job. The banking and FinTech industries are bound by rigid and supervised regulations; therefore, job descriptions can be well explained and understood, and the achievement of personal work goals can be measured.

Higher and cognitive skills that are indicated by competencies deliver results and meet customer expectations are between Quadrants I and II. In the future, this competency is important and still needed, but with a declining trend. The competency to understand customer needs and build closeness with customers is urgent, as management orientation, it is still considered important and necessary. The wave of automation has an impact on reducing total working hours in back-office work positions, so the need for workers using basic cognitive skills is likely to decrease sharply in this sector (McKinsey Global Institute, 2018). In addition, the decline occurred due to changes in the lifestyle of people who tend to use technology to provide feedback on the products or services they use through social media platforms. According to the IDN Research Institute (2019), the main behavior of the millennial generation in Indonesia is internet addiction, as they spend at least 7 h accessing the internet every day. Thus, the conventional method of receiving feedback to identify consumer characteristics is no longer effective. However, system changes can be made through the use and processing of unstructured big data from customers through big data analysis. Thus, the role of information technology must be optimized in providing customer data, so an analysis can be performed on various customer data. Based on this, the company can set a strategy to build closeness with its customers.

5.2 Quadrant II. Limited and declining

In Quadrant II with limited but declining competency levels, we found several skills with each of the core competencies: higher and cognitive skills, which include competencies for deciding and initiating action, and planning and organization; social and emotional skills, which include learning and research competencies; basic cognitive skills, which include the competence of presenting and communicating information and writing and reporting; and physical and manual skills that include competencies in following instructions and procedures. Meanwhile, competencies formulate strategies and concepts (higher and cognitive skills) are between Quadrants II and III. Deciding and initiating action becomes a competency that begins to decline in the banking and FinTech industries because it does not focus on who makes and implements decisions but on the decision-making process, where each situation requires different decisions (Ulrich-Schad *et al.*, 2016). Planning and organizing competencies highlight the ability to manage work with the principle of limited resources (cost, human and time). The ability to manage risk in every decision taken is also part of this competency. Although, in the future, the need for this competence will diminish; in certain conditions, it is still needed. Learning and knowledge management are competencies in developing and enhancing knowledge for the benefit of the organization. In the Industrial Revolution 4.0, technological advances affected all aspects where information could be obtained easily, so the learning and research process is no longer needed dominantly. Thus, this competency is no longer a top priority, and this has an impact on reducing competence.

Figure 3 shows that three competencies have smaller circles including presenting and communicating information, following instructions and procedures and writing and reporting.

This shows that these competencies are considered to have a low importance and not a priority for the company in the future. Presenting and communicating information is the ability to make presentations and effective communication in presenting the information. The conventional method of using paper sheets and one-way communication has become ineffective because of the paradigm shift in using technology as a tool that facilitates and provides added value in presenting the information. One example is webinars or virtual conferences that allow sending audio, visual and textual information without space and time restrictions while still facilitating interactive processes to ensure active audience involvement. Thus, in the future, this competence is still needed, but in limited quantities and with a declining trend.

The study results show that the competency of following instructions and procedures has a limited and declining in the future. Based on studies from [McKinsey Global Institute \(2018\)](#), automation and AI change the need for work skills until 2030 for physical and manual types, which will be reduced by 14%. In the Industrial Revolution 4.0, creativity and innovation are needed more, because humans are no longer workers, but engineers ([Loufrani-Fedida and Missonier, 2015](#)). Meanwhile, the writing and reporting competence is the ability to express facts in writing and make reports that are easily understood so they can be used as learning media. Technological developments have taken over the role of humans in reporting. Various applications and software are available for processing data sets, automatically conducting analyses and presenting comprehensive conclusions that can be directly used as consideration in decision making. The competence of formulating strategies and concepts highlights how to set business strategies and manage highly complex businesses. These limited talent conditions will create a competition between the banking and FinTech industries in getting the right talent.

5.3 Quadrant III. Limited but growing

In Quadrant III, with the competency level of limited but growing, we found the competencies leading and supervising, creating and innovating and applying expertise and technology. Meanwhile, the competence of analyzing is between Quadrants III and IV. The competency of leading and supervising is included in social and emotional skills. The development of digital technology requires competence in leading and supervising the process of development; digital leadership is still limited and will increase in the future. The process of ongoing technology disruption adds to the acceleration of changes in this competency. The competence of creating and innovating is included in higher and cognitive skills. The banking and FinTech industries have rigid business processes where the most important aspect is how they obey the rules and being able to manage the business safely. Thus, innovative, creative and critical thinking are required competencies. Applying expertise and technology is a technological skill competency that requires a variety of skills, such as modeling, big data analysis, statistics and programming. Technology disruptions in the Industrial Revolution 4.0 era have a significant impact on business growth, especially in the banking and FinTech industries. According to Corner (1991), applying expertise and technology is a unique and valuable corporate resource. Thus, this competency is limited but growing. The competence of analyzing begins to experience a shift to Quadrant IV, even though the majority is still in Quadrant III. This shows that this competency will continue to grow. This competence consists of problem-solving skills and realizing that change is important and unavoidable.

5.4 Quadrant IV. Important and growing

In Quadrant IV, with important but growing competency levels, we found social and emotional skills, which include core competencies for working with people, relating and networking and entrepreneurial and commercial thinking. At present, the competence of working with people is needed by various companies, including the banking and FinTech

industries. It includes the ability to establish and expand networking and collaboration. The competence of relating and networking consists of compromise, creating business networks and maintaining customer relationships. The ability to build good relationships with others will encourage employee and customer loyalty to the organization. In addition, it has an impact on creating positive word of mouth about the organization. Meanwhile, the ability to build networks is very important and continues to grow because it can help organizations identify new opportunities in very dynamic environmental conditions.

The competence of adapting and responding to change includes the ability to work in interdisciplinary and cross-cultural environments, flexibility, agility, adaptability and the ability to change mindsets. The ability to adapt in an increasingly competitive work environment will be able to increase the ability to collaborate effectively, respond to dynamic external environments and enhance responses to consumer needs, so as to improve individual performance and drive business performance. The ability to adapt to change can increase an individual's ability to think and understand circumstances quickly (agility) in increasing innovation and productivity. This will have an impact on increasing the company's ability to face increasingly competitive business competition in the era of globalization, so it will determine the success of a company in the future.

The wave of technological change in the Industrial Revolution 4.0 has an impact on the number and composition of resources in the company, including expertise in the production process where the work requires having an entrepreneurial spirit (Shane, 2003). The entrepreneurial spirit is the key to innovation. Entrepreneurial practice will encourage HR to take risks and initiatives that often require creativity and innovation so they can bring value to the company. The entrepreneurial spirit can be interpreted as a tool to build ideas or add value in business activities. Sarasvathy *et al.* (2008) stated that it can be measured using education levels and work experience. Meanwhile, Capelleras *et al.* (2018) showed that HR require a more realistic view of the possibility of future business growth in the face of international markets. Thus, this competency can facilitate access to a larger network.

6. Conclusions and recommendations

The advancement of FinTech is a challenge for the banking and FinTech industries. It is not merely about technological readiness but also about human capital, considering that the latest technology will produce unfavorable results if it is not in accordance with the competencies of human capital. This research uses eight dimensions, which were classified into 20 human capital core competencies in the banking and FinTech industries. Based on the findings of this study, social and emotional skills dominate Quadrant IV with a significant increase in demand. The banking and FinTech industries adopt technological advances that have an impact on increasing the needs of workers with well-adjusted social and emotional skills – skills that are far from machine mastery (McKinsey Global Institute, 2018). Social and emotional skills will become premium, because some professions that require human interaction continue to employ people, and creativity, problem-solving and leadership are increasingly important. The core competencies in this study emphasize the importance of employee competencies to successfully overcome the transformation of Industry 4.0 (Prifti *et al.*, 2017). Behavioral competence will be the most important employee competency in the banking and FinTech industries. Quadrant III shows that technological skills that include competencies applying expertise and technology and analyzing have limited and increasing demand. Technological skills are essential for highly automated and digital economic growth; people with these skills will become a minority. However, there is also a significant need for everyone to develop basic digital skills for the new era of automation (McKinsey Global Institute, 2018), including competency in leading and

supervising and formulating strategies and concepts. Meanwhile, the remaining core competencies show a small circle in Quadrants I and II, which shows that, in the banking and FinTech industries, these core competencies are increasingly important, limited and declining in the future.

Based on these findings, the study is expected to be used as a guide for the banking and FinTech industries in focusing on increasing the competencies needed by the company. This is a necessary strategy to face the current digital era. Additionally, further studies can be carried out by measuring the success of the competency improvement program conducted by the banking and FinTech industries.

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No.	Variable	Dimensions	Indicators	Skills
<i>Entrepreneurship</i>				
1	Leading and deciding	Deciding and initiating action	Decision-making	Higher cognitive skills
2	Supporting and cooperation	Leading and supervising Working with people	Taking responsibility	Social and emotional skills
			Leadership skills	
3	Interacting and presenting	Adhering to principles and values Relating and networking	Team work	
			Communicating with others	
			Respecting ethics	
			Environmental awareness	
			Compromising	
4	Analyzing and interpreting	Influencing Presenting and communicating information Writing and reporting Applying expertise and technology	Creating business network	Basic cognitive skills
			Maintaining customer relationship	
			Negotiating	
			Emotional intelligence	
			Presentation and communication ability	
5	Creating and conceptualizing	Analyzing Learning and researching Creating and innovating	Targeted/technical communication	Technological skills
			Literacy	
			Extract business value from social media	
			Mobile technologies	
			IT architecture	
			Economics	
			Service orientations	
			Understand and coordinates workflows	
			Business process management	
			Business change management	
			Predictive maintenance	
			Modeling and programming	
			Big data analysis	
			Statistics	
			Problem-solving	
			Cognitive ability	
			Lifelong learning	Higher cognitive skills
			Knowledge management	
			Innovating	
			Creativity	

(continued)

Table A1.
Research
instruments

Table A1.

No.	Variable	Dimensions	Indicators	Skills
6	Organizing and executing	Formulating strategies and concepts	Critical thinking	Physical and manual skills
			Change management	
		Planning and organizing	Business strategies	
			Managing complexity	
		Delivering result and Meeting customer expectations	Project management	
			Planning and organizing work	
7	Adapting and coping	Following instructions and procedures	Management ability	Social and Emotional Skills
			Customer orientations	
		Adapting and Responding to Change	Customer relationship management	
			Legislation awareness	
		Adapting and coping	Individual responsibility	
			Work in Interdisciplinary Environment	
8	Enterprising and performing	Persuading	Competency	Social and Emotional Skills
			Flexibility	
		Achieving personal work goals and objectives	Agility	
			Adaptability and ability to change Mindset	
		Entrepreneurial and commercial thinking	Work–life balance	
			Self-management and organization	