

## Competing Against Smart Machines

<https://www.cnnindonesia.com/longform/ekonomi/20220127/laporan-mendalam-melawan-kecerdasan-mesin/index.html>

English translation:

“Talking about it now brought all the memories back. It still saddens me,” said Abdoel Moedjib quietly. As his 52 years old voice cracked, holding back tears, he told me his story.

His memory flashes back to 2015 when he had to say goodbye to most of his workmates at Bank Danamon due to technological disruptions.

Then, the company’s business strategies in integrating technology into its daily operations resulted in a huge employee cut. In about five years time, the company went through more than 60 percent employees being cut - from 27,223 people down to only 8,926 people in 2020.

He said at its peak around 2008-2010, the micro-banking division that Moedjib led was contributed to around 1 trillion rupiah net profit each year, however it wasn’t enough for the company to spare them.

It had never crossed his mind that he had to say goodbye to the people he had spent over 15 years with.

According to Moedjib, there were three service lines that experienced job cuts the most. First, is the teller and customer service line. Second, the operational line from the accountant, bookkeeper, to analysts. Third, collection and clearing officers were replaced by tele-collection system dan *real-time gross settlement* (RTGS) system.

It was still fresh in his mind when he fought hard to keep his mate’s jobs. As the Union Head of Bank Danamon, he tried with all of the efforts he could - be it tripartite dialogue to demonstrating. Once, he was even reported to the police during his fight.

Despite all that, he had to swallow the reality that most of his workmates would eventually lose their jobs.

“It was to the point I told them, sadly, this is the end of our war against robotics, what we saw in Terminator was a reality we have to face. I said that to them with tears,” he said.

Moedjib agreed that digitalization makes banking transactions more efficient and effective. But he regretted the devastating impact that must be borne by workers like his peers.

Bank Danamon management did provide a re-skilling program to workers who wanted to continue their employment, he added. But he estimated only about 5 percent of affected employees could shift to new roles due to the limited job provided. Besides, only very few were capable of transitioning and mastering skill qualifications in new positions.

Looking at his experience, Moedjib believes the impact of digitalized transformation and the adoption of Artificial Intelligence has **had** the most impact on older workers like himself.

"The challenge for Gen X workers like me, whether to admit it or not, is that we are far behind with the various technologies that are currently being phased. In rough terms, we're illiterate in tech or just really clueless," he explained.

### **INFOGRAPHICS: The Fastest Sector Replaced by Robots**

Projected Employment conditions 2030 in Indonesia:

- 16 percent of total working hours are replaced by robots or automation
- 23 million workers replaced by technology
- Created 27-46 million new jobs, with 10 million of them new types of jobs

Sectors where technology is predicted to replace workers:

- Accommodation
- Construction
- Manufacture
- retail
- F&B
- Other jobs that are repetitive and predictable

Source: Mckinsey

Now, in order to survive, Moedjib had to compromise by taking a role below his qualifications and expertise. In his final years to retirement, he is now working as Small and Medium Enterprises (SME) Recovery Officer in which he is in charge of dealing with non-performing loans.

In his view, the current jobs that aren't going to be replaced by AI soon are one that requires a human touch, just like resolving non-performing loans.

Stories of shifting roles in the era of automation and digitalization like Moedjib is rather rare when looking at the pile of other gloomy stories. He said he had witnessed many of his peers have to step down to be ride-hailing drivers after accepting the so-called 'golden handshake' from the company.

Years had passed but to this day Moedjib still missed the good old times of having his mates around in his daily work routine. Now he mostly works alone and depends on digital systems. Though his work is more efficient and effective, there is something missing for him, whether it be listening to some work gossip or jokes at the end of a workday.

"A human is a human. Longing, sad, happy, these are feelings that we will not find anywhere else. When we work with technology... sure it is more timesaving in certain aspects, but it doesn't reciprocate those feelings," he said.

The technology adoption trend in the banking sector is believed to grow even more immense in the future. It is shown in the number of bank branch offices which continue to decrease. The Financial Services Authority (OJK) noted that 3,074 commercial bank branch offices had closed from 2015 to March 2021 due to an increase in digital transactions.

The closing of these branches also occurred in Danamon, a bank whose main focus is digital transformation. Heriyanto Agung Putra, Human Capital Director of Bank Danamon Indonesia claims to understand the worry that emerges due to the transformation process.

In the midst of threats front liners being replaced by technology, he claims that Bank Danamon equipped its staff with the knowledge and skills needed in the banking industry to prepare them to fill positions in other divisions.

"We also ensure that every employee who chooses not to continue to work at Bank Danamon in another division, gets appropriate compensation," he said in a written statement.

#### **4.0 Industry Transition**

Moedjib and thousands of his colleagues paint only a small portrait of the unpreparedness of the Indonesian workforce in transitioning to the industrial 4.0, an era that requires workers to upgrade skills from repetitive jobs to higher complexity jobs.

All repetitive work will eventually be easily replaced, whether by artificial intelligence or the hands of automated machines.

CEO of Menara Digital and Digital Expert Anthony Leong said automation and the usage of AI can be applied in various sectors and business lines. The level of adoption can be adjusted to the needs and complexity of the work required.

In his estimation, the adoption of technology can help companies save operational expenses in the range of 30-50%, figures that can be a great temptation for company leaders to invest their capital in technology development rather than human resources.

Not only for the giants, but he also said technology has already become part of micro-enterprises. In his illustration, stalls or warung that accept digital payments by utilizing the Indonesian Standard QR Code (QRIS) can be easily spotted around the cities.

Leong believes automation adoption will continue to grow by looking at its capability to create a more practical, efficient, and prompt work system. Not only in trade but with the technology adaptation, it is also embedded in social activities. As such, handing alms too can be done online.

In saying so, Leong also believes that not all jobs will be taken over by robots and AI. He said humans are still needed to solve complex problems and in-depth analysis. Therefore, according to him, current workers can't and must not be satisfied with only a bachelor's degree in hand. He said the qualifications needed to survive are even more complex.

"In the past, people only studied management and they were able to survive, but not now. Management skills must be able to combine society management and automation management. Any study must be integrated with digital and technology," he said.

#### **INFOGRAPHICS: Lack of Skills for Informal Workers**

Skills so often aren't found in formal education but through skill development programs such as advocacy. Unfortunately, the level of advocacy for Indonesian workers is also worrying.

- In 2021, only 13,28 percent of the workforce participated in certified training/courses at least once in their lifetime.
- Only 2,66 percent of the workforce had their training period in the last 3 years.

The most common types of training are:

- Sewing
- Computing/office application
- English
- Administration

Source: Central Statistics Agency (BPS)

One example of how vulnerable workers with limited skills are reflected in customer service. All but slowly and surely being replaced by chatbots.

The data collected from dozens of large corporations show that 80% of customer service jobs have been transferred to chatbots. CEO of Kata.AI, Irzan Raditya said this means a company that once contracted 100 workers, now only needs about 20 people to perform the same functions.

Raditya said the role of customer service in answering predictable general questions had been replaced by chatbots since up to 80 percent of the questions asked by customers are the same and repetitive.

According to him, the workers who are now needed are those who have high emotional intelligence to solve complaints and optimize services.

"I believe the advanced AI technology that we have now is still unable to replace the high-pressure risks and services that come from a customer service agent," he said.

On the bright side, there is an option for people to leave the boring jobs they don't like in the first place. For instance, the call centre industry has a high turnover rate being up to 30 percent. This means, in a year only 7 out of 10 people continue their jobs.

He admits that the picture of future employment is hard to be foreseen with it as technology continues to grow rapidly. Raditya believes that full automation has not yet occurred, even in some of the highest technologically advanced countries like the United States or China.

He explained that the development of the AI that is widely used today is still rather simple, only performing a single task. It's categorized as narrow intelligence. One example is the usage of Google Translate.

"AI has not been able to replace the role of humans. If we look at Iron Man, Terminator, it is still far away, Artificial General Intelligence where AI can completely replace humans and technology has not actually arrived yet," said Raditya.

Since the current development of AI has not yet reached a level that makes workers hostile to robots and AI, he believes workers shouldn't be afraid of being replaced by machines.

Instead of viewing technology as a threat, he optimistically sees humans better use technology as a tool to improve the quality of work and life.

## **The Problems of the Future Workforce and Employment**

Teng Teng, a scientist from the Institute for Strategy Technology and Organization at LMU Munich said the main challenge in the future is to shift low-skilled workers to do higher-skilled jobs. In doing so future employees have to be equipped with machine thinking and more decisive human thinking.

Unavoidable, digital transformation would change the fundamental future of organizations that urge employees to have skills and values that put them in a bargaining power against machines.

Thanks to machine learning, AI-powered technologies can do various human tasks - from retrieving information, coordinating logistics, handling inventories, preparing taxes, providing financial services, translating complex documents, writing business reports, prepare legal briefs to diagnose diseases and more.

Not only that, but AI also could perform the not so repetitive tasks in managerial roles and other higher-skilled professions.

Although AI is getting smarter and better at performing humans' jobs, Teng believes there is a limit in which humans can fill.

In this complicated world, we live in, we need people to work on unseen data and variables. Therefore, we do need higher-skilled workers who are able to work on strategic planning, and people who have the leadership skills who decide not only based on previous data but also their own professional experiences.

In order to adapt to new roles available, Teng said that future workers must be equipped with digital notions and skills, such as data analysis, basic programming, etc.

"Of course, soft skills such as communication and leadership will also play significant roles - the critical difference between humans and machines," he explains.

In every job, he assesses that AI can replace to some extent, but not entirely. For example, it can carry out the CEO's governance function, but not the leadership function.

"Let's think about Elon Musk and Steve Jobs. Motivating and inspiring was, and is, critical to their success. It isn't easy to imagine an AI that can encourage or inspire," he said.

### **Competing with Technology**

Research from Mckinsey predicted about 23 million workers in Indonesia can be replaced by technology by 2030. On the other hand, around 27-46 million new jobs will be created.

In an ideal scenario a massive shift will take place, with repetitive and low-skilled jobs performed by robots or machine, giving humans an opportunity to do creative and complex jobs.

But the problem is, looking at the level of the graduates, Indonesian workers are not the ideal group for future jobs. Central Statistics Agency (BPS) in 2021 recorded about 55.45% are junior high school graduates and below.

To address these challenges, intensive training for reskilling and upskilling is needed so that low-graduate workers won't be left behind.

## INFOGRAPHIC Comparison of Indonesian Workers Quality

### 2021

Elementary school graduates or below – 37.69 percent  
Junior school graduates – 17.76 percent  
High school graduates – 18.87 percent  
Vocational high school graduates – 12.86 percent  
Diploma graduates – 2.64 percent  
Bachelor's degree or above – 10.18 percent

### 2010

Elementary school graduates or below – 50.38 percent  
Junior school graduates – 19.07 percent  
High school graduates – 14.71 percent  
Vocational high school graduates – 8.2 percent  
Diploma graduates – 2.79 percent  
Bachelor's degree or above – 4.85 percent

Source: Central Statistics Agency (BPS)

IT expert and lecturer at the Institut Teknologi Bandung (ITB) Budi Rahardjo said the low quality of Indonesian human resources could create a threat from what was supposed to be an opportunity from technology adoption.

The reason is, the business world and the development of AI and robots can't wait. He said those who are not ready will naturally be eliminated and replaced by more qualified machines or foreign workers.

"Our quality is still lacking ... on the one hand it can be a threat. If we can't get Indonesians, it means the company has to hire foreigners," said Rahardjo.

In solving this problem, according to Rahardjo, vocational training could be the answer. Not only equipped skills needed for low education graduates, but vocational training can also be the answer of the mismatch between industry needs and university education.

With the rapid development of the technology industry, he said it was near impossible for educational institutions to catch up and constantly adjust the curriculum to suit the industry needs. What can be done is to teach basic principles which can then be developed through vocational training or internships in industry.

The problem is, the implementation of vocational education in Indonesia is still extremely low. Therefore he said prospective Indonesian workers must willing to learn on their own to tick the box.

He reminded that the rivals of future workers will not only be fellow Indonesians, but also workers from all over the world, aside from machines. Even now, there are many start-ups who choose to outsource talents in order to fulfil their needs.

Apart of the alarming homework for workers and industry, he mentions that the government also plays an important role. Not only preparing an education system that responds to challenges, the

government must also prepare adequate supporting infrastructure throughout Indonesia, ranging from fast and affordable internet to the availability of electricity. Not to mention providing enough supporting AI data and making sure it's safe from hackers.

### **INFOGRAPHICS: The Factors Blocking the AI Development in Indonesia**

1. Readiness of skilled workforce to develop and use artificial intelligence;
2. Readiness of regulations governing the ethical use and utilization of artificial intelligence;
3. Readiness of computing infrastructure and supporting data for artificial intelligence modeling;
4. Readiness of industry and public sectors in adopting artificial intelligence innovations;

Source: National Strategy for Artificial Intelligence, BPPT

On the other hand, he added that the community must not only be prepared to become workers, but also as independent entrepreneurs who are able to take advantage of technology. One of the simplest examples is by utilizing the marketplace and social media in marketing products.

Acting Director General of Higher Education of the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) Nizam claims the government was intensifying a few digitalization programs to answer future challenges.

First, the School Digitization Program by deploying 35,000 students in teaching campus programs, one of whose duties is to teach digital literacy - technological literacy.

Second, Program Kampus Merdeka (the Independent Campus Program), especially-micro credential programs, specific skills development certifications or certified internships in the technology industry.

"Micro credential programs train students from any major with the latest digital competencies, such as machine learning, deep learning, mobile apps development, cloud computing, cloud servers, big data analytics, cyber security, etc," Nizam explained.

He said that during the past year, the program has produced 15,900 graduates who have received 20 course credits and certificates from the world-class technology industry with selected projects promised to get funding to develop their start-ups.

And third, strengthen formal education in the field of information/digital technology. He said that currently there are 1,018 universities that organize 10,945 study programs in the field of digital science and technology, making a total of 800,000 students.

Nizam added that there are currently almost 200,000 graduates in the field of digital science and technology who are expected to bridge Indonesia's talent gap, which needs around 600,000 people annually.

"In addition, we encourage these study programs to collaborate with the industry, we invite professionals to also teach in the classroom, bring cases and projects from industry to be completed in classrooms and laboratories at universities," he explained.

## **INFOGRAPHICS: The Factors Blocking the AI Development in Indonesia**

Digital talents needs:

- 9 million people in 15 years, or
- in average 600,000 people per year

Graduates of the informatics study program:

About 100,000 people per year

Source: National Strategy for Artificial Intelligence, BPPT

### **Two Deciding Years**

The President of Indonesia, Joko Widodo or Jokowi stated that Indonesia doesn't have much time left. According to him we only have two deciding years to catch up in the field of technology, especially in cultivating digital talents. This is a requirement to do second to the goal to become a developed country by 2045.

Indonesia does have to run faster to catch up. It needs hard work from the government to improve infrastructure to regulations. Besides, workers are also required to put in extra effort, while companies must be proactive in providing internships and development programs for their employees.

Responding to the challenge of adopting this technology, the Ministry of Manpower (Kemnaker) claims that it has made several efforts aimed at improving the quality of Indonesian human resources.

"Vocational training is a solution to the low competitiveness of the workforce and unemployment in the era of digitalization & job mismatches," explained the Ministry of Manpower, in a written statement.

The Ministry of Manpower considers that vocational education has advantages that can answer the needs of job seekers. As such it provides a relatively short duration of training compared to tiered formal education, participants is not limited to a certain age, inclusive and applies to all groups.

"Even now, training is also provided for people with disabilities, for drug rehabilitation patients, and even for residents of correctional institutions."

## **INFOGRAPHICS: Indonesia's Weaknesses in the Digital Field**

Indonesia still has to work hard to reach the potential of the digital market, even in Southeast Asia, Indonesia is still lagging behind.

Five Weaknesses of Indonesia

1. Low internet bandwidth speed

Based on the Speedtest Global Index, as of 2021, it ranks 114th for internet speed.

2. Minimum number of internet users

Indonesia has a penetration rate of 76.8% of internet users or ranked 62nd in the world.

3. Ease of starting a business

Measured from the complexity of regulations to the level of business, Indonesia ranks 60th in the world.

4. High software piracy rate

Indonesia ranks 62<sup>nd</sup> in terms of combating software piracy.

5. Low rate of tablet ownership per household

Indonesia is ranked 59th in the world

Complete List of World Digital Competitiveness Ranking:

1. The United States of America
2. Hong Kong
3. Sweden
4. Denmark
5. Singapore
6. Switzerland
7. Holland
8. Taiwan
9. Norway
10. United Arab Emirates
15. China
18. Germany
27. Malaysia
38. Thailand
46. India
51. Brazil
53. Indonesia

Source: IMD

Although the problems faced are piling up and Indonesia is in hurry to catch up with the US, China, India, and the majority of countries in Europe, Budi is optimistic that the future of Indonesian workers will not be bleak.

He said there is still time to catch up. He emphasised that Indonesia also had ammunition to compete, from a large and young population, an equally large number of startups, to the open and adaptable character of Indonesians.

"Even though we were late and in a hurry, that doesn't mean we give up, but don't get me wrong, the US is in a hurry too. Technology is something that is developing rapidly but we see this is not only as a problem but also an opportunity," he concluded.