

Strategies and Policies to Dealing the Challenges and Use of Industry Based on IT in Indonesia

T Rahajoeningroem^{1,*} and A Ruffyanto²

¹Department of Electrical Engineering, Universitas Komputer Indonesia, Jl. Dipatiukur 112-116 Bandung, Indonesia

²Pusat Teknologi Elektronika, BPPT

*tri.rahajoeningroem@email.unikom.ac.id

Abstract. The purpose of this study was to show the strategies and policies to dealing the challenges and use of industry based on IT in Indonesia. Increasing IT technology and its utilization encourage and challenge for government to work up a strategy or a national policy based on industry necessary that needed for minimalizing risk on economic and social aspects. In the midst of strategy, it is needed renewal reskilling workforce particularly digital reskilling for IT technology workers. In this proposal will be presented some references of policy that's in and will be done in some countries and writer's suggestion related with national policy so it can be implemented in Indonesia. One of the important thing, the national policy which made for an attempt to fasten the strategy implementation is the necessity of synergy consideration among existing stakeholder. The strategies that can be applied are focus on the improving, having financial efficiency, infrastructure, improve soft skills, and broaden social interaction. In order to achieve our goal to challenge the industry needed a collaboration of government, industry, educational and community based on IT.

1. Introduction

The term technology commonly be relevant to society's application of scientific knowledge to solve practical problems in industry or commerce. Industry, academia, and governments are flowing an enormous amount of effort into developing technology that will provide wildly increased capacity, allowing for super-high definition streaming of augmented reality; far more numerous, less costly connections, supporting a boom to the Internet of Things (IoT); and highly reliable connections, enabling critical communications and large-scale industrial automation [1]. By the current intense technology development needed a better relationship between IT and industry. Allowing industry to lead the development of new technologies merit the investment. If productivity growth and employment creation are driven partially by the level of investment in ICT and telecommunications, could have an impact on the economy.

According to Shi-lian Shan [2], the industry culture associated with internet technology by considering the connections to the market can provide better economic efficiency. This is supported by the widespread involvement of private capital and financial institutions in the culture industry. One method to deal with and enhance industry growth is to overcome the existing gap by filling the soft skills gap. Therefore, business skills should be part of their training at school and university. According to Elasaïd Munro [3], CEOs often perceive the importance of every client's input that outlines the progress



and progress of their business and provides a statement that the organization has provided a realization from school or university to the real business world. However, focus only in the individual to improve their skills is not enough. Our industry have to build a solid base in strategies and policies.

The purpose of this study was to show the strategies and policies to dealing the challenges and use of industry based on IT in Indonesia.

2. Methods

According to Joel R. Campbell [4], the information technology (IT) industry is one of the main ventures in the scientific discipline, and has gotten uncommon approach acknowledgment. On the other side, the strategies and policies is required to ensure that industry stays competitive in global markets. Policymakers need bring a renewed industrial policy strategy that brings together all existing and new horizontal and sector-specific initiatives into a comprehensive industrial strategy.

Ian Brown in [5] stated that government can encourage further standardisation through standards body participation. Some countries such China, Korea and India this policy already prioritized. In EU and USA, a significant amount of work has already been done on security and privacy issues. There will be stronger regulatory incentives for companies developing systems that process personal data to protect security and privacy by design [6]. Severe impact on investment and innovation can be a result of lack of regulation and policies.

In this paper the method that used was benchmarking. Benchmarking is a process commonly used in management or strategic management. Which an organization measures and compare its performance against similar activities with other organizations both internally and externally. From the result of benchmarking, an organization can obtain insight of the condition off other performance so that it can adopt best skills to achieve the desired target.

As defined by CompTIA in [7], the term technology commonly refers to society's application of scientific knowledge to solve practical problems in industry or commerce. In this report, CompTIA has created a framework for categorizing a technology with reference to five different groups. In the report, CompTIA has created a framework for categorizing a technology with reference to five different groups. Where each segment of the technology framework will contribute to economic growth and society. (See Figure 1).



Figure 1. The segment framework defined by CompTIA.

2.1. The issues of industrial policies

Every state government must have undertaken some form of industrial policy directed to promote industrial growth. The purpose of this policy is to improve the economic conditions from low productivity to be more productive and provide a high level of service. In addition, strategic and policy efforts in the industrial sector that are not relevant to the existing conditions will affect the economic conditions themselves.

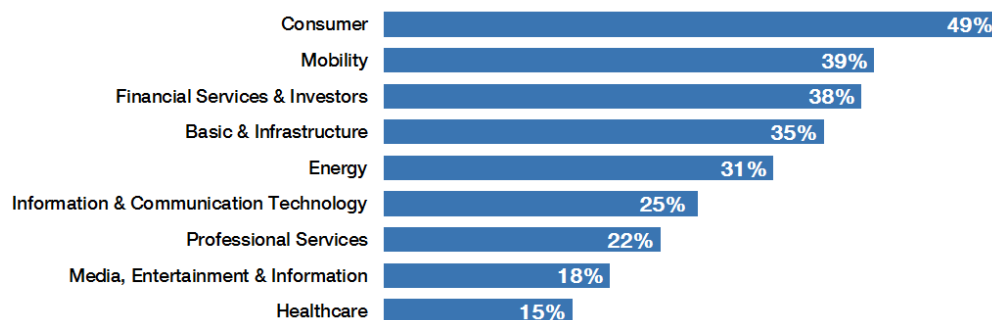
The market disappointment case is utilized to be primary factor to break down mechanical approaches. The objective is forestalling industrialization thus some type of government intercession, for example, an appropriation, is important to rectify that disappointment. In reality, the economies are loaded with impedance, for example, work advertise directions and vitality endowments. Governments need to improve the situation employment to distinguish the greatest twisting in the economy and work on amend them. They need to locate the greatest twisting that avoids industry reason. The

administrations need to consider if the greatest obstruction can be change in distinguishing the following greatest impedance to be tended to.

Other than the scientific issue, a continuous issue is that mechanical strategies are too effortlessly caught by politically capable gatherings who at that point transformed it for their own particular purposes. The imposing business model can make industry is not any more aggressive.

In a perfect world, women and men would appreciate a similar expert openings, share approach pay and feel similarly spoke to in the work environment. In any case, as most ventures, the media keeps on battling with sexual orientation fairness, in everything from making news that is for and about women to advancing equivalent measures of men and women to senior official positions. The point of sexual orientation equity in the working environment is to accomplish extensively break even with results for women and men, not really results that are precisely the same for all.

The World Economic Forums has analyzed the wage gap that presented in Figure 2. By asking respondents from each industry whether equally qualified female employees were paid less than men in the same role. Information and Communication Technology (IT Industry) has 25% gap. And the worst is in costumer industry that reach 49% [8]. (See Figure 2).



Source: World Economic Forum

Figure 2. The gender gap by industry.

The manufacturing industry has played an important role. The manufacturing sector is increasingly export-oriented and makes the country have a sustainable economy. The manufacturing industry is able to grow if government could prevent the structural problems of industry. It's necessary to emphasize the importance of a new perspectives in industrial policy. In general, industrial policies can be classified into sectoral and horizontal measurement. Sectoral efforts consist of a variety of measurement design to target specific industries or sectors in the economy. Horizontal efforts are intended to guide the overall performance of the economy and the framework of competition in which firms conduct their business.

2.2. Strategy and policy in industry from financial point of view

A good economic condition, stable and efficient should be a high priority of the government. Therefore, through existing mechanisms and carried out continuously, the government must improve or change the existing financial policy if it deemed necessary. The objectives of the financial policy are to obtain national economic stability, expand employment opportunities, reduce unemployment and avoid inflation. In general, financial policy can be divided into two segments, depending on the theoretical and on the amount of acceptance and expenditure available. For the theoretical dependent finance policy there are divided into several aspects. Some are functional, intentional and unintentional. Functional financial policy is to consider budgetary costs and expand employment opportunities governed by governments as they relate to national income. A deliberate financial policy is based on the economic problems occurring at that time by deliberately manipulating the existing budget. These conditions include changes in budgetary costs, development of taxation. Unintentional financial policies are meant to control the business level. In tight and critical conditions, this policy is made to encourage economic activity improvement. While under inflation conditions, this policy is made to reduce the activities and

costs incurred. In this condition there are several factors that need to be included in consideration. The government in this case needs to consider based on balance, surplus, deficit and dynamic.

2.3. Strategy and policy in industry from education point of view

Develop countries with great and stable economic condition usually have the policy to develop their human resources. The relation of human resources and economy is sometimes difficult to can't be proved with a mathematic analysis. The education policy should have to be the priority for some country such as Indonesia to balance the fast growing of technology. The government policy about the educational obligation such as the application of school for elementary student and followed by school fee exemption policy. The impact is the increase of primary school admissions. After investing in primary education, then to junior and high school.

According to Matleena Kniviila [9], the national economy of a country is determined by national education policy. The development of the national industrial sector is possible because of the availability of educated labor. Therefore, the important role of government in national education policy can influence the development of industry independently. This independent industry is possible if the country has graduates with intelligence and expertise and can be absorbed by industry.

In Indonesia, the attempt to improve industry infrastructure need the consideration of education system. Industry realize that have skilled and educated workforce is needed to increase competitiveness. The backbone of Indonesia's education policy focus on the finance, management and education systems.

2.4. Strategy and policy in industry from industry and sectorial point of view

IT industry is expected to be a leading sector for the growth of economy. The role of industry sectorial have the impact of increasing economy condition. The growth of industry in Indonesia is expected to develop and can compete with other countries. The government support for industrial development need to focus on the implementation of strategy and policy for pushing industry sectorial to growing up.

As an illustration obtained from [10] as shown in Table 1. A case study showing how different business models are construct have been transformed 90% using digital technology in order to alter its business relationships with customers on a functional architecture; 87% redefined the value, and 80% of it transformed the value they captured in the value architecture. Interestingly, only 33% transformed their value creations; and 43% have transformed their product offerings. These changes are reflected in a series of significant trends in the digital transformation of business models. (Table 1 in Appendix).

3. Results and discussion

3.1. Strategy and policy in Indonesia

Bappenas have same role with the ministry of the state secretariat. The function of Bappenas is to guide and prepare guidelines for all agencies and ministries in carrying out their tasks so that development planning can be more structured, strategic and comprehensive sectors. Creating a reliable, credible and proactive ministry to support the achievement of national and state goals is the vision of Bappenas. The mission of Bappenas are develop a quality plan for nation, monitoring and evaluating the performance of national development, reviewing and evaluating quality policies on development issues, coordinate effectively in the implementation of tasks.

Government utilize the increasing of technology especially in IT industry to resolve issues in Indonesia. IT is used to decrease poverty because could creating opportunity, community empowerment, capacity building and social protection. To achieve goals the effort we need to do are raise awareness of IT, mobilizing information, provide access to information, developing capabilities, raising partnerships and empowering local potential. The government effort is showed from the policy that have been done in Indonesia. The service of IT not only for strengthening domestic interconnectivity but also to support the improvement of the economy and the nation's competitiveness. Increasing the quality of IT also needs to be done.

The latest strategy policy of the ministry of finance is to encourage increased state revenues. The government will optimize tax revenue as well as better management of natural resources and state assets. The government will also strengthen the quality of state expenditure. The government also focuses on sustainability and financing efficiency.

The increase and develop of IT industry is chance to connect Indonesia into one. The ministry of People's Welfare play important role to. A well development of IT industry and support from government trough strategy and policy will create the welfare of a just society.

The ministry of Research, Technology and Higher Education encourage economic growth and competitiveness of the nation in the era of industrial revolution. The effort is showed in the policies such as Preparation of more innovative learning systems in universities such as adjustment of the learning curriculum, and improving students' skills in Information Technology (IT), Operational Technology (OT), Internet of Things (IoT) and Big Data Analytic data, integrating physical, digital objects and human beings to produce competitive and skilled college graduates especially in data literacy, technological literacy and human literacy aspects. In addition, the start of the Cyber University program, such as distance learning system, thus reducing the intensity of lecturer and student meetings. Cyber University is expected to be a solution for the nation's children in remote areas to reach higher education quality. Preparation of human resources, especially lecturers and researchers and engineers who are responsive, adaptive and reliable to face the industrial revolution.

In 2018, The Ministry of Manpower will synergize with the Ministry of Education and Culture, Ministry of Technology and Higher Education to build a superior workforce. This synergy to create a workforce that has the competence according to expertise. The reason, many workers on duty is not in accordance with the competencies they have. The education sector is needed to provide value to the workers. The desired competence includes three main aspects of spiritual, social and technical competence. In the development of scholarship, the Ministry of Manpower will conduct guidance based on religious and cultural values, such as work ethics, discipline, honesty, loyalty, dedication and responsibility. For social aspect, will be done communications communication competence, coordination, until team work.

The implementing policies by the ministry of Industry to pursue the growth of manufacturing industry. Increasing competitiveness and productivity, especially the increase of export value and added value per workforce through the improvement of technical efficiency, improvement of science and technology mastery or innovation, improvement of mastery and implementation of new product development by domestic industry. Collaborate to enhance competitiveness and investment attractiveness in the industrial sector of the country. The use of the latest technology to promote quality improvement, efficiency and productivity, and the provision of facilities in the form of finance incentives.

3.2. The suggestion of strategy and policy

Growth of industrial tend to thorough and sustainable. Government need a strategy plan to face revolution of industry. The focus is to encourage the Indonesian workforce to continue to learn and improve its skills to understand the use of internet of things technology or to integrate internet capabilities with production lines in the industry. The implementation of vocational education that links and matches between high school and industry, this program also prepares ready-to-use skilled laborers in the industry. The use of digital technology to boost productivity and competitiveness for small and medium industries. Programs about digital technology will provide benefits for the industry such as implements of Big Data, Autonomous Robots, Cyber security, Cloud, and Augmented Reality. All it takes is technological innovation through startup development by facilitating business incubation sites. Efficiency in economic is needed because that's related to maximizing of all resources in the process of increasing IT industry. Besides that, infrastructure and leadership are strategies that often forgotten but need consideration. Having a good strategy and management will increase the quality and can face the challenge. Developing industry need nature resources, human resources and technology. Besides that, innovation and creativity will increase the growth of the industry. The requirement of infrastructure,

policy, regulation and finance must be fulfilled. In order to achieve that needed a collaboration of government, industry, educational and community based on IT.

4. Conclusion

Increasing IT technology is a challenge of government to have plan a strategy and policy to make financial, education will maximize the growth of industry and lead to a better state. The strategies that can be applied are focus on the improving, having financial efficiency, infrastructure, improve soft skills, and broaden social interaction. In order to achieve our goal to challenge the industry needed a collaboration of government, industry, educational and community based on IT.

References

- [1] Brake, Doug, 2016 “5G and Next Generation Wireless: Implications for Policy and Competition,” *Information Technology & Innovation Foundation* 1 -22.
- [2] Shan, Shi-lian, 2014 “Chinese cultural policy and the cultural industries,” *City, Culture and Society* **5** 115-121.
- [3] Munro, Ealasaid, 2017 *Building soft skills in the creative economy: Creative intermediaries, business support and the ‘soft skills gap* (Elsevier Poethics, Scotland) 14-25.
- [4] R. Campbell, Joel, 2015 *Becoming a Techno-Industrial Power: Chinese Science and Technology Policy* (Issues in Technology Innovation, New York) 1-15.
- [5] Brown, Ian, 2015 *Regulation and the Internet of Things* (GSR discussion paper, United Kingdom) 1-34.
- [6] The UK Government, *Public consultation on the evaluation and the review of the regulatory framework for electronic communications networks and service* (Department for Culture Media & Sport, United Kingdom) 1-36.
- [7] IT Industry Outlook 2016 (New York : CompTIA).
- [8] The World Economic Forum 2017 *The Global Gender Gap Report* (World Economic Forum, Europe).
- [9] Kniivilä, Matleena, 2009 *Industrial development and economic growth: Implications for poverty reduction and income inequality* (Industrial Development for the 21st Century, Finland) 2009, 295-332.
- [10] Li, Feng, *The digital transformation of business models in the creative industries: A holistic framework and emerging trends* (Cass Business School, University of London, UK) 1-10.

Appendix

Table 1. The digital effect on industry.

	30 Mini Case Studies		
	Automate	Extend	Transform
<i>Value Proposition</i>			
Product offering	3 (10%)	14 (47%)	13 (43%)
Market segment	2 (7%)	12 (40%)	16 (53%)
Revenue model	5 (17%)	7 (23%)	18 (60%)
<i>Value Architecture</i>			
Value sensing	1 (3%)	3 (10%)	26 (87%)
Value creation	5 (17%)	15 (50%)	10 (33%)
Value distribution	1 (3%)	9 (30%)	20 (67%)
Value capture	1 (3%)	5 (17%)	24 (80%)
<i>Functional Architecture</i>			
Product innovation	2 (7%)	10 (33%)	18 (60%)
Infrastructure management	2 (7%)	16 (53%)	12 (40%)
Customer relations management	1 (3%)	2 (7%)	27 (90%)

	50 Main Case Studies		
	Automate	Extend	Transform
<i>Value Proposition</i>			
Product offering	32 (64%)	17 (34%)	1 (2%)
Market segment	32 (64%)	18 (36%)	0 (0%)
Revenue model	37 (74%)	10 (20%)	3 (6%)
<i>Value Architecture</i>			
Value sensing	24 (48%)	20 (40%)	6 (12%)
Value creation	40 (80%)	9 (18%)	1 (2%)
Value distribution	26 (52%)	20 (40%)	4 (8%)
Value capture	32 (64%)	12 (24%)	6 (12%)
<i>Functional Architecture</i>			
Product innovation	34 (68%)	12 (24%)	4 (8%)
Infrastructure management	30 (60%)	19 (38%)	1 (2%)
Customer relations management	25 (50%)	20 (40%)	5 (10%)