



Analysis of industry 4.0 development strategy in the fisheries sector (Literacy study in several cases in Indonesia)

Shafira Nurul Hudani¹, Iwang Gumilar², Achmad Rizal³, Asep Agus Handaka Suryana⁴

¹ Social Economy Departement, Faculty of Fishery and Marine Science, Padjadjaran University. Jl. Raya Bandung Sumedang, Jatinangor, West Java, Indonesia

^{2,3,4} Teaching Staff at Faculty of Marines and Fisheries, Padjadjaran University, Departement of Fisheries, Faculty of Marines and Fisheries, Padjadjaran University, Jl. Raya Bandung – Sumedang Km 21, Jatinangor Jatinangor, West Java, Indonesia.

Abstract

Development strategies are carried out to increase knowledge and abilities in maintaining and developing a business. The presence of the Industrial Revolution 4.0 in line with the development of information and communication technology has led to increasingly fierce business competition, thus demanding business people to be more creative and innovative in conducting their business, especially in the fisheries sector which is included in the priority sectors in the Industrial Revolution Era 4.0. This research was carried out starting from August 2019 until August 2020. The research method used was a literacy study. Data collection techniques with literature study and documentation study. The type of data used is secondary data, which is derived from books, theses, journals, and other literacy. Data were analyzed using qualitative descriptive methods. The research results show that the best strategy for the development of Industry 4.0 is to implement a business strategy, namely by maximizing the functional area to take the opportunity that exists.

Keywords: industrial revolution 4.0, development strategy, fisheries sector

1. Introduction

Indonesia is the largest archipelago country in the world which has around 17,058 islands with a coastline length of 81,000 km². Indonesia has a maritime area of around 5.8 million km² or around 75% of the total area of Indonesia consisting of territorial sea waters of 0.8 million km², Archipelago Sea waters of 2.3 million km², and the Economic Zone area Exclusive of 2.7 million km² [1]. Indonesia with the geographical condition of the sea area which is wider than the mainland has a large potential of marine resources, namely in the form of minerals and marine products. This is marked by the emergence of industries engaged in the fisheries and marine sectors.

The fisheries and marine sector in Indonesia has enormous potential to become a leading sector and a major driver of economic development. Capture fisheries production in Indonesia in the 2009-2017 period tended to increase, where the lowest capture fisheries production was in 2009 which amounted to 4,914,560 tons with a percentage of 9%. While the highest capture fisheries production was in 2017 which amounted to 7,071,453 tons with a percentage of 12.94% [2]. Abundant capture fisheries production is used to meet domestic needs and some is used for export.

The export value of fishery products in Indonesia tends to decrease during the period 2011-2015 [3]. This can be caused by various factors, the most important factor is the lack of added value in exported fishery products where the exported products tend to be in the raw form so there is a need for handling and processing in advance in fishery products to increase the value of Indonesian exports.

Industry system 4.0 is a new industrial stage where integration occurs so that it can help companies achieve higher industrial performance. The technical aspects of implementing industrial system 4.0 are handled by the use of

generic concepts of Cyber-Physical Systems (CPS) and the Internet of Things (IoT) to industrial production systems. The manufacturing process with the connectivity of Industrial 4.0 factory products can result in a reduction in production costs by 10-30%, logistics costs by 10-30%, and quality management costs by 10-20% [4]. This has caused many countries in the world to start moving towards industry 4.0, including Indonesia.

The Ministry of Industry of the Republic of Indonesia has launched a national agenda with the name "Making Indonesia 4.0" in 2016 as a roadmap or road map on Indonesia's strategy of wanting to lift its global export market share, to create more jobs and regain the glory of net exports, through achieving Net exports amounted to 10% of GDP in 2030. However, the national agenda that had been formalized directly by the President of Indonesia, Joko Widodo, was not yet listed in legislation contained in Indonesia. So there are still limitations in implementing.

Implementation of the industrial system 4.0 requires long-term aspirations for priority sectors. The priority sectors include the food and beverage sector, textiles and clothing, automotive, chemical, and electronics [5]. Fisheries are part of the priority food and beverage sector in the development of industry 4.0 in Indonesia. In implementing the industrial system, it is necessary to have an appropriate development strategy. Therefore, it is necessary to research the analysis of industry business development strategies 4.0 in the Fisheries Sector.

2. Method

2.1 Research Method

Method used in this research is the method of library study/library research. Library research (library research) is a series of activities related to library data collection methods,

reading and recording activities, and research data processing^[6]. Library research (library research) is carried out by collecting data sourced from books, journals, articles, and certain writings.

2.2 Types and Sources of Data

Data used in this research are secondary data. Secondary data is primary data that has been further processed and presented properly by the primary data collectors or other parties^[7]. Secondary data used in this research are thesis and journals from previous researches related to the research conducted

2.3 Sampling Method

Data collection techniques are the most important step in research because the main purpose of the research is to get data^[8]. The technique used in research is a literature study and documentation study. Literature study as a data collection technique by studying books, literature, notes, and reports relating to the problem being solved^[9]. Meanwhile, a documentation study is a data collection technique by collecting and analyzing documents in the form of text, images, and electronics^[10].

2.4 Analysis Method

The analysis used in this research is descriptive qualitative analysis. Qualitative descriptive analysis is an analysis used to describe a variable related to the problem under study without questioning the relationship between variables. Qualitative research is done because the researcher wants to explore phenomena that cannot be quantified that are descriptive such as the process of a work step, the formula of a concept, the notions of a diverse concept, the characteristics of an item and service, pictures, styles, procedures a culture, a physical model of an artifact and so on^[11].

3. Results and Discussion

3.1 The Fishery Industry

Strategy Strategy is a unified, broad and integrated plan that links the company's strategic advantages with environmental challenges, designed to ensure that the main objectives of the company can be achieved through proper implementation by the organization^[12]. A strategy is a process of determining the plans of the top leaders who focus on the long-term goals of the organization, accompanied by the preparation of a way and efforts on how to achieve these goals^[13]. Based on these definitions, it can be concluded that the strategy is an effort made to develop and increase strengths and minimize, even eliminate the company's weaknesses so that the company's goals can be achieved. Therefore, the strategy is very necessary presence in running a business, especially in the face of the Industrial Revolution 4.0.

The presence of the 4.0 Industrial Revolution in Indonesia requires business people to get involved in the global market (international market), which involves all places in the world and is not limited to one country^[14]. However, before engaging in global markets, it is important to pay attention to important factors that support business sustainability including the availability of capital, human resources, suppliers and supply availability, processing technology, and marketing technology.

3.2 Availability of Capital

Capital is one of the important factors that play a very important role in the sustainability of a business. One effort

in developing a business is to increase capital to increase production capacity so that demand can be fulfilled^[15]. Capital can be sourced from private property or loans.

At present, in the Industrial Revolution Era 4.0, there are quite a several companies *start-up* engaged in the fisheries sector financial sector with a *peer-to-peer lending* (P2P) system. P2P is a financial service that brings together lenders with loan recipients in the context of lending and borrowing funds for certain purposes which is done *virtually* with the help of the internet. For example, PT. Seva Kreasi Digital with the platform "DanaLaut".

DanaLaut is a *platform fintech*, which brings Borrowers and Lenders directly and becomes an intermediary who manages the loan receivable contract between the two parties and oversees payments. DanaLaut focuses on the marine economic sector and acts as an alternative source of funding for micro-businesses and communities that cannot be served by formal financial institutions such as banks.

DanaLaut only focuses on serving Eastern Indonesia, with locations in the Provinces of Maluku and Sulawesi. Currently, DanaLaut is in the process of expanding its network to other regions in Eastern Indonesia which are expected to be operational this year.

The lending-borrower system in DanaLaut is carried out with a *virtual account* (VA) system in the name of the registrant with a custodian bank that collaborates with DanaLaut, namely BNI Bank. This is done so that the funds that will be received by credible financial institutions, monitored, and registered with the Financial Services Authority (OJK) are then distributed to Borrower business partner borrowers.

3.3 Human Resources (HR)

The challenge faced by human resources in the Industrial Revolution Era 4.0 is the lack of integration of the use of the internet with production lines that utilize technology and information sophistication^[16]. In general, the quality of human resources in industries in Indonesia is still relatively low. Weaknesses of HR that can be found are HR who do not have experience in working (as happened in Esther Seafood Enterprises in the process of product delivery (delivery) where there is shrinkage of the product to the detriment of customers) and lack of interaction between leaders and employees^[17]. Then, another weakness of HR is that the employees employed do not have a high educational background^[18]. Also, they do not have experience working primarily in the fishing business sector. These weaknesses can be avoided by improving the human resource management system.

Human resource management (HRM) is part of management which includes planning, organizing, directing, and others. HRM handles human resources consisting of people who are ready, willing, and able to contribute to the goals of *stakeholders*^[19]. To improve the quality of human resources (employees/workers) can be done in various ways, namely developing through education and training where education is an activity in increasing general knowledge by increasing mastery of theory and skills in deciding issues related to the achievement of objectives, while training is an activity increased knowledge and ability to carry out certain jobs^[20]. Furthermore, development through promotion by changing the position or position of an employee is higher than the original state through several considerations. Then, development through transfer by moving an employee's workplace from one place to another without changing

positions and income, also without conditions.

3.4 Suppliers and Supply Availability (Raw Materials)

A supplier is an organization that provides input to companies such as raw materials, services, and labor [21]. A supplier is a group of organizations or individuals who have an important role in the success of a producer in his business [22]. Supplier selection is a strategic activity especially if the supplier will provide a supply item that is in crisis or will be used in the long term.

Problems related to the availability of raw materials are low availability [23], where the availability of raw materials is influenced by the relationship between the company and suppliers [24]. A good relationship between the company and the supplier will provide several benefits, namely the supplier provides a stable price (fixed) to the company and the supplier will only provide raw materials to the company he trusts. So this can affect the company's performance (Figure 1). The decrease in the availability of raw materials can be caused by the emergence of rival companies engaged in the same business and commodities so that the supplier does not only work as a supplier in one company but he also works as a supplier in other rival companies [25].

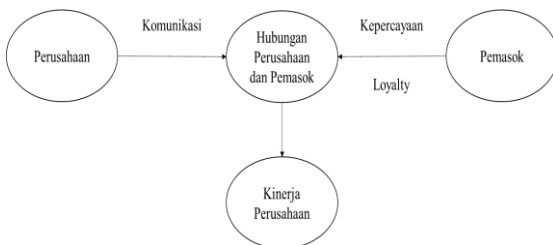


Fig 1: Company and supplier relationships.

3.5 Technology

The development of technology is very influential on the performance of an industry. The development of technology in production activities, especially in the processing of fishery products, there are currently three types, among others, as follows:

1. Cooling

Cooling is a fishery product processing technology that is used to preserve fishery products in the short term. In its activities *cooling* rely on water and ice in maintaining the quality of fishery products. Generally, technology is *cooling* used by fishermen who are at sea as temporary preservation during fishing.

2. Freezing

Freezing is a fishery product processing technology that relies on *freezing units* or *cold storage* to preserve fishery products in a fairly long period. One of the goals of cold storage is to extend storage life by cooling [26].

3. Canning

Canning is a technology for preserving fishery products that are hermetically packaged (impermeable to air, water, microbes, and other foreign matter) and sterilized with high temperatures to protect products from spoilage and damage or extend shelf life and as a form of diversification of fishery products.

3.6 Marketing Technology

Industry 4.0 is the *Internet of Things* (IoT) where data and services will change future production, logistics, and work

processes. In its implementation, the IoT uses the internet as the main foundation. The internet is a network system that connects internet users from various parts of the world to connect and exchange information [27]. The internet shows various aspects of the marketing function, works as a mechanism to build demand, direct consumers to purchase actions, fill orders, provide customer service, and also function as a multipurpose advertising media [28].

Along with the rapid development of information and communication technology, business competition is now getting tougher so that businesses are required to be more creative and innovative in marketing their businesses. However, the facts on the ground state that the business carried out in Indonesia has not utilized internet technology in its marketing activities. Companies become weak because they do not carry out special promotions (for example through mass media or electronics), they only rely on word of mouth promotions, and even do promotions at *counters* directly (face to face with consumers) [17]. Besides, the contract system with the buyer will also weaken the company because the company only focuses on distributors who contract with the company [29].

The development of technology is very influential on the performance of an industry. The rapid development of technology, modernity, ease of application, and access to it are among the attributes considered in conducting business in the industry. The Industrial Revolution Era 4.0 will foster digital-based business models, also changing the marketing system into digital marketing or *digital marketing*. *Digital marketing* is a marketing medium that is in high demand to support various activities undertaken [30]. *Digital marketing* is in great demand by business people because it can be done every time or *in real-time* and is global. Based on the results of the survey APJII (Association of Indonesian Internet Service Providers) in 2017 showed that 143.26 million people from the total Indonesian population of 262 million people (equivalent to 54.68%) used the internet, so this greatly opened up opportunities for business people to develop its market in the grip of technology *smartphone*.

Electronic commerce (e-commerce) is a trading system *online*. *E-commerce* is the process of buying, selling, or exchanging products, services, and information through a computer network [31]. *E-commerce* is a part of *e-business*, where the scope of *e-business* is broader, not just commerce but also includes collaborating with business partners, customer service, job openings, and others *online*. The presence of *e-commerce* provides several positive impacts including the following:

1. Facilitate the promotion of products and services in an interactive and real-time manner through direct communication channels via the internet,
2. Creating new distribution channels that can reach more customers in almost all parts of the world,
3. Reducing cycle times and administrative tasks (especially for international marketing) from ordering to product delivery.
4. More responsive and satisfying customer service, because customers can get more detailed information and respond quickly online,
5. Save costs and time in handling orders, because electronic ordering systems enable faster and more accurate processing.

In Indonesia *e-commerce* is always associated with

online *shopping*. *Online shopping* provides convenience for both businesses and consumers (the buyer), in addition to the efficiency of advertising costs, *online shopping* is also considered effective in promotion because the public currently relies heavily on the internet ^[28].

In addition to *e-commerce services*, businesses can use other internet-based services such as *cloud computing*. *Cloud computing* is the practice of using remote server networks on the internet to store, manage, and process data ^[32]. *Cloud computing* is a model that allows the use of resources (servers, networks, storage, applications, services, and others) that can be configured easily and minimize interaction with service providers (providers).

In Indonesia, there are already quite a several *startups* who utilize *cloud computing* in their business activities, such as DanaLaut which is a *platform* lending and borrowing for business funds under the auspices of PT. Seva Kreasi Digital, PasarLaut.com which is an online fish and seafood trading site under the auspices of PT. Aruna Jaya Nusantara, Indonesian Fresh Fish under the auspices of PT. Indonesian Fresh Fish, eFisheryFresh under the auspices of eFishery, and many more business actors who have implemented Industry System 4.0. Therefore, marketing is very important and crucial to its existence in the company in realizing the company's goals. Therefore, marketing is very important and crucial to its existence in the company in realizing the company's goals.

4. Conclusion

Based on the research results of the analysis of industry business development strategies 4.0 in the Fisheries Sector through a literature study, it can be concluded that the availability of capital, human resources (HR), suppliers and the availability of supply, technology, and marketing systems are the main keys in the formulation of industrial strategies that according to the Industrial Revolution Era 4.0. Besides, a strategy that can be carried out in facing the Industrial Revolution Era 4.0 is a business strategy with a focus on maximizing the functional area of the company.

5. Acknowledgment

The author would like to thank the teaching staff at the Faculty of Fisheries and Marine Sciences, Padjadjaran University who have helped in the research.

6. References

- Rizal A, Andriyani Y, Kusumartono FXH. A Strategic Environmental Assessment for Southern Coastal of West Java Province, Indonesia. *World Scientific News*, 2019; 137:188-209.
- Direktorat Jenderal Perikanan Tangkap. *Produksi Perikanan Tangkap Menurut Provinsi dan Subsektor (ton) 2000-2017*, 2020.
- Bonokeling DE. *Pengaruh Utang Luar Negeri, Tenaga Kerja, Dan Ekspor, Terhadap Produk Domestik Bruto di Indonesia Tahun 1986 – 2015*. Skripsi. Universitas Negeri Yogyakarta, 2016.
- Rojko Andreja. *Industry 4.0 Concept: Background and Overview*. *International Journal of Interactive Mobile Technologies*. 2017; 11(5):77-90.
- Kearney AT. *3D Printing: A Manufacturing Revolution*. Penerbit A.T. Kearney, Inc. USA, 2015.
- Mestika Zed. *Metode Penelitian Kepustakaan*. Jakarta: Yayasan Obor Indonesia, 2008.
- Wandansari ND. *Perlakuan Akuntansi Atas PPH Pasal 21 Pada PT. Artha Prima Finance Kotamobagu*. *Jurnal EMBA*. 2013; 1(3):558-566.
- Sugiyono. *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. PT Alfabet. Bandung, 2016.
- Nazir M. *Metode Penelitian*. Jakarta: Ghalia Indonesia, 2017.
- Sukmadinata N Syaodih. *Metode Penelitian Pendidikan*. Bandung: Remaja Rosdakarya, 2013.
- Satori Djam'an, Komariah Aan. *Metodologi Penelitian Kualitatif*. Bandung: Alfabeta, 2009.
- Yusanto M. Ismail, Muhammad Karebet Widjakusuma. *Menggagas Bisnis Islami*. Jakarta: Gema Insani, 2002.
- Rizal A. *Buku Ajar Manajemen Pemasaran di Era Masyarakat Industri 4.0*. Yogyakarta: Deepublish, 2020.
- Utomo YT. *Strategi Memasuki Pasar Global Studi Kasus Yanto Pottery Kasongan Bantul*. *Jurnal Az Zarqa*. 2017; 9(1):99-123.
- Aliyah Rizkia, Iwang Gumilar, Ine Maulina. *Strategi Pengembangan Usaha Pengolahan Abon Ikan (Studi Kasus Rumah Abon di Kota Bandung)*. *Jurnal Perikanan dan Kelautan*. 2015; 6(2):78-84.
- Hendriyaldi. *Revolusi Industri 4.0: Tantangan dan Peluang Manajemen Sumber Daya Manusia Untuk Meningkatkan Produktivitas Grand Hotel Jambi*. *Jurnal Manajemen dan Sains*. 2019; 4(2):240-248.
- Sianturi S Rezeki. *Analisis Strategi Pengembangan Usaha Esther Seafood*. Skripsi. Institut Pertanian Bogor, 2008.
- Asriningputri N, Ketut Dewi Martha Erli Handayani. *Strategi Pengembangan Industri Pengolahan Hasil Perikanan di Kecamatan Bulak Melalui Pendekatan Pengembangan Ekonomi Lokal*. *Jurnal Teknik ITS*. 2018; 7(2):2301-9271.
- Bukit Benjamin, Tasman Malusa, Abdul Rahmat. *PENGEMBANGAN SUMBER DAYA MANUSIA: Teori, Dimensi Pengukuran, dan Implementasi dalam Organisasi*. Yogyakarta: Zahir Publishing, 2017.
- Saelendra E. *Pengelolaan Dan Pengembangan Sumber Daya Manusia Pada PT. Istana Motor Indah*. *Jurnal AGORA*. 2014; 2(1):211-222.
- Solihin Ismail. *Manajemen Strategik*. Jakarta: Erlangga, 2012.
- Pujawan IN, Mahendrawathi. *Supply Chain Management*. Surabaya: GunaWidya, 2010.
- Aliyah Rizkia, Iwang Gumilar, Ine Maulina. *Strategi Pengembangan Usaha Pengolahan Abon Ikan (Studi Kasus Rumah Abon di Kota Bandung)*. *Jurnal Perikanan dan Kelautan*. 2015; 6(2):78-84.
- Dalimunthe M Adam. *Strategi Pengembangan Usaha Restoran (Studi Kasus: Restoran Seafood Pasir 7 Pasar Ikan Segar, Kampung Sawah, Kota Jakarta Selatan)*. Skripsi. Institut Pertanian Bogor, 2010.
- Santika DZ. *Strategi Pengembangan Usaha Perdagangan Lobster Hidup (Studi Kasus di PT. ASI Pudjiastuti Marine Product)*. Skripsi. Universitas Padjadjaran, 2019.
- Rahmat MR. *Perancangan Cold Storage Untuk Produk Reagen*. *Jurnal Imiah Teknik Mesin*. 2015; 3(1):16-30.
- Meranti Irwansyah. *Kajian Humas Digital: Transformasi Dan Kontribusi Industri 4.0 pada Stratejik Kehumasan*. *Jurnal Teknologi, Informasi dan Komunikasi*. 2018; 7(1):27-36.
- Wibowo B Setia, Diaz H. *Peluang Revolusi Industri 4.0*

- Bidang Pemasaran: Pemanfaatan Aplikasi Ecommerce, Sosial Media Instagram dan Digital Marketing terhadap keputusan Instant Online Buying Konsumen Generasi Millennial. *Jurnal Ekonomi dan Manajemen*. 2020; 3(2):86-99.
29. Sari I Anjang, Harsuko R, Nuddin H. Strategi Pemasaran Dalam Meningkatkan Volume Penjualan Pada PT Hatni (Hasil Alam Tani Nelayan Indonesia) di Desa Tlogosadang Kecamatan Paciran Kabupaten Lamongan Jawa Timur. *Jurnal ECSOFiM*. 2015; 3(1):15-26.
 30. Taken Smith K. Longitudinal study of digital marketing strategies targeting Millennials. *Journal of Consumer Marketing*. 2012; 29(2):86-92.
 31. Malau Yesni. Pemanfaatan E-Tailing Untuk Meningkatkan Penjualan Dan Daya Saing Padausaha Kecil Dan Menengah. *Jurnal Paradigma*. 2014; 16(2):21-31.
 32. Ghozali MI, Wibowo HS, Zaenal A. Cloud Computing Sebagai Strategi Optimasi Perluasan Target Pasar Usaha Kecil Menengah Dalam Menghadapi Revolusi Industri 4.0. *Jurnal Mantik Penusa*. 2019; 3(1):104-109.