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Impact Of Industrial 4.0 On Design Of Products And Services

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ABSTRACT: Industrial 4.0 is defined as the fourth industrial revolution. The wave of changes which includes interoperability, information transparency, technical assistance and decentralized decision. The industry waving into 4.0 that has been called the "smart factory" which computers and automation come together where robotics connected remotely to computer systems equipped with machine which can learning the algorithms to control the robotics with very little input from human operators. The companies must follow what trend the industry going to and reengineering the management in each department. Smart factory bring in the smart production would provide smart product and services. The wave of change in technology and physical process would impact the companies in kind of products and physical process which completely change in every steps of the way. Companies must catch up with the trends, demand and face the challenges upon the rapid growth of the industrial technology.

Keywords: Industry 4.0; design of products; services

INTRODUCTION

The fourth industrial revolution or in other names we called it as "smart factory". What exactly mean? So, to understand the terms, we have to take a look over how modern industry works. Accordingly, machines and products will communicate with each other and together driving the production line. There less manpower which mean wireless era where machines work to complete the manufacturing process; they revolutionized the production. Likewise, service section also has to catch up with the changes of the industry such less human sources for instance the companies provide more machines do-it-yourself or self-service. The companies must follow the trend in order to be competitive and high efficiency by revolutionized in every single thing in their companies.

Obviously people will keep questioning "how industry 4.0 impact on product and services?". So, this research aims to discover the impact of 4.0 revolution of industry towards products and of course engaging with physical process which less manpower in labor like services. Indirectly, this study also to know how companies makes problem solving due to facing the obstacles and barriers in kind of challenges. Therefore, this research will observe indirectly over the positive and negative sides of this new era and further.

1. LITERATURE REVIEW

1.1 Concept of industry 4.0 on Design Products and Services

Be it tangible products or intangible products (which is referred to as services), it will involve operation in order to process it. The end products or services will give some value to the customers, be it to the consumer directly or to other industry. The operation requires some tools in order to process the input (raw materials) to be the output (end products or services).

Innovation is required for any business to sustain their business and to ensure growth. The customer requirement which keep changing from time to time, where they are always looking for better products and services. On another perspective, manufacturers also need to be innovative in their operation tools and process that can optimize their operation cost.

Improvised-processes affecting one or more elements is called innovation. Service innovations do not simply refer to mere changes in the characteristics of the service delivery, but also relate to aspects such as service product distribution, client interaction and quality control in meeting customers' satisfaction. [1]

To give an example, Regal Marine remains to third largest boat producer in the world. The key secret for Regal Marine to be always have competitive advantage, is due to its product strategy. To do so, it does really care of the product design, which is based on customer requirement. Even for the boat rain cover, it uses CAD/CAM technology. This is to ensure of having faster results in getting the best design and production in meeting customer ever changing tastes. Its CAD system has also to ensure production efficiently in terms of cost optimization and time consumption. [2].

The automation and digitalising of the design for products and services are part and parcel of Industry 4.0. Industry 4.0 is originally popularly known in Germany, a country that is well known with highly technology production country. To the latest concept of Industry 4.0, it uses internet cloud and network to run the production and administration of the process, which involves right from processing of the raw materials up to the end products, distribution of products or delivering the services, stock monitoring etc, utilising the available information in more effective and efficient manner. [3]

Technologizing the business operation does not confine only to big players. In smaller scale of technology in digitalizing the operation, it is crucial also for small medium enterprises to innovate in the way they operate their business. According to the President of Malaysian Small Medium Enterprises (SME), the cost of labour is increasing. In order to sustain and grow, SME needs to export their products, increase their production while lower their cost. For this reason, he suggested SME players to go into automation. There are about 900,000 SME players to date. [4]

1.2 Impacts of industry 4.0 on Design Products

The changes of industrial revolution will affect the operation in most industries. Indirectly, that would make the managers to be more proactive in terms of their responsibility to manage whole team due to balancing the market demands, the trend and how they solve problems. Applying the new technology in company will always have the obstacles and barriers. Due to the changes, the data security issues may rise by integrating new systems and more access to those systems. So the managers must provide manpower who expertise in IT and must gaining their knowledge for standardizing the production line and secure the problems smart and efficiently. According to Rifkin 2014, this trend is zero marginal cost, which emphasizes connectivity in his anticipation of a collaborative economy that will replace the capital system in its current form – with the IoT as the main driver. [5]

Related to new technology, research center for manufacturing there also have to keep updating their technological research to innovate the product and be successful product of the future. Smart machine revolutionary smart products which makes company to be more competitive that would

pave the way for success. Smart products in industry demand less effort and experience for the user. Therefore, companies must be supportive in order to have competitive advantage and be a competitive groundbreaking technological research. Due to economic growth, Rabeh & Husam, 2017, they mentioned that this transformation positively will increase productivity and welfare, besides produce higher quality of products and services. [6]

Flanders Make research center also mentioned that the fourth industrial revolution is where the vehicles and machines involved to be more autonomous and efficient which makes new level of efficiency and more advance. Then, they actively exchange information with the surroundings, apply model based analytics and prevent accidents because they are multi-context adaptability with culture, weather and etc. All these changes will make companies rushing to keep following the trend of new era where they need to have a high degree of reliability and stability for successful cyber-physical communication that can be difficult to achieve and maintain. The companies must be able to continuously improving their performance to maintain the product effortlessly deployed all over the world.

According to Heizer [2], in designing products we have to take a look on product life cycles and strategy. Due to new wave of industrial revolution, the companies must give more training to the manpower to acknowledge the current technology especially on financial management. Regarding to this, they must be able to look forward to control and maintaining the integrity of the production process which managers must be able to well manage the finance; budgeting, controlling costs, keep activities and production lines on track, well manage supply chain and product-by-value analysis in order to make benefits must exceed the costs.

1.3 Impacts of industry 4.0 on Services

Services industry is part of economic activities that involve selling and buying of intangible objects. There is a price to be paid for the service required by the customers, where customer will enjoy or obtain the need but do not own anything in tangible. Examples are like hotel service, vacation service etc. In order to ensure the service is delivered effectively and efficiently in terms of time, facilities and conveniences, the process and information gathering need to be done efficiently. This is where digitalizing the process is needed.

Netflix uses Big Data and process it in split seconds by using the concept of Industry 4.0. While viewers are busy watching videos online, Netflix is attentively `watching' their entertainment need, very, very closely. Nestle has been decades being the industry leader, has set up a customer-driven new product innovation process for analyzing and providing processed data in order to grow new sellable market offerings while living up to its vision to make its services are timely delivered. Samsung, not much on the one-time product selling, rather it's passion for creating superb online customer experiences has made it a poster child for direct and digital marketing.

Emirates Airways, with the help of Industry 4.0 tools, become a lifestyle brand that changing the way it reached out to customers. Due to Emirates fully utilized the Industry 4.0, its business has increased tremendously. The Emirates Group operates across six continents and 144 cities with an 84,000 strong team comprised of over 160 nationalities. The secret of success? It's the Emirate Industry 4.0 has bring about on-board Information, Communication & Entertainment (ICE) system; an all-in-one communications device accommodating customer needs of surfing the internet, emailing or simply calling a land line while in the airplane; and exclusive lounges for its clientele.

These impact i.e. offerings have made Emirates to deliver its value proposition to its customers timely and conveniently & support its mission statement of committing to high standards.

2. FINDINGS AND DISCUSSION

2.1 Impacts of industry 4.0 on Design Products

In short, the fourth industrial revolution that occurred gave big impact towards designing products. This changes makes company systems actively and aggressively do change in order to follow the trend where we knew that this revolution applied wireless technology to control machines which its 100% depends on machines and vehicles that cooperate together production lines. So, the managers must cope the challenges from every angles and activities. The smart factory also required all industry to be more competitive and well manage to achieve goals of the products.

There also have positive and negative side in implementing the new technology. Positively, there encourage industry awareness and have a competitive advantage also be the first mover, gain more profits, produce smart products which have zero defect. Negatively, the new wave of industrial revolution may rise the unemployment rate in country because of lose jobs to the machines and vehicles that conducted or controlled by computer or systems. Therefore, the managers and authority must be able to look forward and do prediction in order to make prevention over the issues indirectly will improve their interpersonal skills and leadership.

2.2 Impacts of industry 4.0 on Services

Service industry is very competitive. It does not require big investment for fixed assets. It is very sensitive with customer satisfaction on their needs and wants. The players must be able to capture the information in the forms of Big Data, and to process it in split seconds in order to analyze and to assist for immediate decision making process. The impact of Industry 4.0 can be seen in some service players.

In the other hand, the service sector usually has specific way in kind of competing each other where they must look over prices, places, facilities, technology control and etc. Indirectly, they have to improve the character of culture, norms which related to the efficiency of the services. All these revolutions done by customer satisfaction or positive feedback from the society.

3. RECOMMENDATION

Concerning on this new wave revolution of industry, we belief that the companies must be more adaptable and competitive by hook or by crook to catered the problems and challenges in future. They also have to well manage the company systems, sales channels, logistics strategies, marketing approach, obstacles and barriers from each angle, consumer preferences and always do R&D to acknowledge the technology growth.

The companies must digitization the products and services which offer new brand that suits current culture. They must to look over innovation towards culture indirectly on products and services, product development continuum in order to generate new product and services. The company

systems involved more than designing products and services where there also have to well manage the management approach, keep working environment positive, IoT and etc. According to Brocklesby & Fisher, 2003, due to socioeconomic and environmental issues, the sustainability of livelihood also considered as innovative effort. [7]

The companies have to be more fast, seamless, entertaining, transparent and personal in order to produce smart products of the future. Regarding to be more competitive in designing products and services, the companies must be able to peronalized supply chain, there has to have digitally integrated stores, social commerce, digital CRM and customer analytic. They must keep the labor environment positive in order to conventionally mature which have a comfort-based experience.

4. CONCLUSION

Industry 4.0 or smart factory will give a great impact towards designing products and services either it comes with positive impacts or vice versa. This digital era would make transformation in industry improve the efficiency and makes possible to gather the information to analyzed data across the machines and systems, flexibility increase, provides smart production lines in order to get smart products of the future. This transformation may rise productivity and industrial growth also resetting the workforce profile indirectly change the culture of companies and regions.

5. Contribution Note

This work was a MBA class project. The first 2 authors wrote this work; Dr Shahryar was lecturer of the course who taught and advice the topic.

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