Journal of ENVIRONMENTAL Treatment Techniques

J. Environ. Treat. Tech.
ISSN: 2309-1185
Journal weblink: http://www.jett.dormaj.com

What is the impact of industry 4.0 to Green Supply Chain?

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Received: 29/05/2019 Accepted: 02/10/2019 Published: 30/02/2020

Abstract

The development of the Industrial Revolution 4.0 brought consequences for increasing high response and demands for transparency from the company. The green management concept that is based on the environment helps improve the performance of the organization's environment, minimizes waste, costs efficiency and integrates thinking into the supply chain. The purpose of this study is to produce a green supply chain management framework and to know the impact of the existence of industry 4.0. This study uses an explanatory qualitative approach by collecting data through the stages of interviewing and observing the event organizers. The research object was conducted at 2 (two) management event companies in Jakarta, namely Alphabet and New Diamond Putra. The results of the research at the two event management companies, illustrate that there was a significant impact on the 4.0 industrial revolution on the implementation of green supply chains, especially in event organizers. The impact consists of new transformations directed at change and collaboration from green-based suppliers/vendors, smart event management supported by smart operational indicators, smart logistics, smart data, smart warehouses, and event decor. Delivery products that are based on creativity and innovation are needed by consumers so as to produce sustainable synergy for the company. Technology support, the internet of things and service (IoT) also fundamentally changes the outlook for different lives for companies and consumers.

Keywords: Industry 4.0, Green paradigm, Supply chain, even organization

1 Introduction

The emergence of Industry 4.0 implies a new paradigm that considers most managerial approaches. The impact of these changes is of course with the number of companies engaged in manufacturing that have switched to using automation systems, meaning the role of human labour operators and increasing the role of human labour who have high competence. There is one thing that stands out most in this era of change, namely the world must respond to these changes in an integrated and comprehensive way by involving all stakeholders, both global political actors, from the government sector to the private sector, academics, companies, and of course the wider community (Tribunews, 2017). The global economy is currently at the height of major changes compared to the emergence of the First, Second and Third Industrial Revolution.

In the tourism sector, there is an increase, this can be seen in the table below, in a report released by BPS showing that foreign tourists visiting 2018 experienced a significant increase compared to the number of visits in December 2014, 2015, until 2017. Now we are soon entering into a stage of the industrial revolution called the Industrial Revolution 4.0. (14). Sung (2018) referred to in his article about the McKinsey survey of firms that provide a surprising result. The McKinsey survey (March 2017) of 300 leading companies in Southeast Asia showed that 9 out of 10 respondents believed in the effectiveness of Industry 4.0. and almost no one doubts it. The challenge for event organizer companies is to prepare supply chains that are integrated with technology. The short-term challenge in this regard is preparing Supply Chain, Internal and external Logistics (Supply Chain and Logistics) supporting the Industry 4.0 era, in order to meet the speed of the "demand" (Demand). (Ketum ALFI Yukki N Hanafi, 2018). Supply chain & Logistics management 4.0 makes technology disruption so fast and makes existing companies out of their comfort zone.

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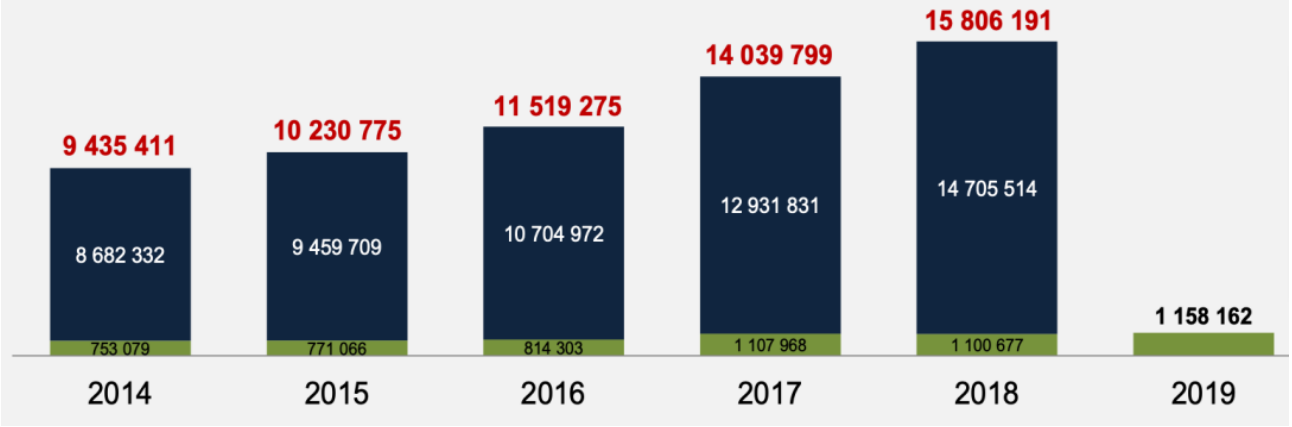
Table 1: Number of Foreign Tourist Visits, 2014-2019

Tahun	Bulan											
	Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sep	Okt	Nov	Des
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2014	753 079	702 666	765 607	726 332	752 363	851 475	777 210	826 821	791 296	808 767	764 461	915 334
2015	771 066	833 000	827 069	787 282	838 030	858 359	860 703	895 420	905 806	861 505	820 669	971 866
2016	814 303	888 309	915 019	901 095	915 206	857 651	1 032 741	1 031 986	1 006 653	1 040 651	1 002 333	1 113 328
2017	1 107 968	1 023 388	1 059 777	1 171 386	1 148 588	1 144 001	1 370 591	1 393 243	1 250 231	1 161 565	1 062 030	1 147 031
2018	1 100 677	1 201 001	1 363 339	1 300 277	1 242 588	1 318 094	1 540 549	1 511 342	1 370 842	1 294 463	1 157 483	1 405 536
2019	1 158 162											



So that the follow-up is adaptation readiness to new technologies, where humans will further optimize the functions of strategic intelligence and assisted artificial intelligence (Artificial Intelligent/AI), Internet of Thing (IoT) to obtain high-scale production and meet increased efficiency. Talk about an event organizer, an activity that has a wide range and has a very important role, namely helping to realize the goals expected by the owner of the fund (commonly referred to as a client), starting from the process of creating concepts, site preparation, licensing, supporting equipment, artist & talent, documentation, up to the course of the event and if necessary, the publication of the event in the mass media. In the era of industrial revolution 4.0, the role of event organizers experienced a shift that was significant in terms of utilization and growth of technology that could not be dammed so that the service industry such as event organizers experienced adjustments in the form of increased effectiveness and efficiency.

However, different views of the revolution 4.0 era associated with supply chain management are predicted to uproot the work that is often done by humans because it will be replaced by a machine. (Business Economics, 2018). That is a real challenge with the existence of 4.0 or fourth generation supply chain management, thus narrowing employment opportunities for humans. Its presence made the disruption of technology present so fast and threatened the existence of existing companies and had to leave the comfort zone. There is a need to revolutionize the company in making things and providing services now. In Indonesia, at the end of 2017, there were many financial institutions, such as many local banks that made reductions in the workforce. This is because they are unable to follow or cannot compete with technology. The bank's front office workers who previously addressed customer problems have now been replaced by ATMs (Automated Teller Machines) and mobile banking or internet banking. So with the existence of disruptive technology, this will make a big change and will gradually turn off traditional business.

The research question in this paper is what is the impact of the existence of industry 4.0 on the implementation of green supply chain management? The purpose of this paper is to produce a green supply chain framework and analyze the impact of industry 4.0 so that sustainable corporate goals will be achieved.

2 Literature Review

2.1 What is industry 4.0

The term industrial 4.0 first appeared in 2011 in Hannover, Germany. This revolution was created to mark the fourth industrial revolution, a new paradigm made possible by the introduction of the Internet of Things (IoT) into manufacturing and Service environments. Industry 4.0 targets the incorporation of information technology with a new era industry that is cost-effective, energy-efficient, high-efficiency equipment, sharing data through operating systems and software that can communicate with each other with internet connectivity. The main element of industry 4.0 is the Internet of Things (IoT). The presence of Industry 4.0 will provide benefits in terms of increasing productivity, efficiency, flexibility and a high level of product customization for the industrial world.

Figure 1:

Industry 4.0 requires research stages that are long enough to produce mature concepts and concrete results (Roser, 2015). The development and progress of technology produce a variety of new things, namely:Technology & language. A language translator tool, automatically and directly the tool can translate from "whatever" to "whatever" language with Voice to Voice technology. Technology & transportation. Mr Elon Mus k discovered the concept of Hyperloop, this transportation moves equal to the speed of sound and faster the average speed of an aeroplane. In 2017, in the United States, the Hyperloop prototype was successfully created. Technology & exploration into the new world. In the coming years, it is estimated that humans have been able to fly out of space. This can be witnessed how large companies have designed it there, such as SpaceX (owned by Elon Musk), Blue Origin (owned by Jeff Bezos), and Virgin Galatic (owned by Richard Branson).

2.2 Green supply chain management

Green supply chain management is defined as the coordination of supply chains in a form that integrates environmental concerns and considers inter-organizational activities. So Green Supply Chain Management (GSCM) aims to suppress and minimize environmental damage caused by industrial activities, or service companies so that these environmental events are translated into supply chain management. Green supply chain management focuses on the acquisition, production, and distribution to enhance profitability, competitiveness, and the resilience of suppliers, manufacturing systems, distribution centres, and retailers in the short and medium terms through improved green performance (1, 7). Benefits of green supply chain initiatives include the ability to cost-effectively plan distribution routes with suppliers and customers; maximize capacity and move full containers; consolidate multiple customer orders and eliminate expedited and extra shipping costs for on-time delivery while honouring customer delivery dates (3, 6).

Implementing supply chain management usually begins with the manufacturer integrating internal processes. Further, the company tries to integrate external suppliers. Finally is integrating the external distributors. Green supply chain management has focused on the role of the supply chain with regard to its impact on the present natural environment as well as to the generation of any future environmental change (Reid & Sander, 2011).

Furthermore, green energy management, reduction of greenhouse gas emissions, water conservation or processing, waste reduction, reduced packaging / increased use of biodegradable packaging, product and packaging procurement practices (9, 10). Example of implementing a green supply chain is the Samsung Company. In 2007, the Samsung Company started the Recycling Direct Program, in which Samsung collaborated with suppliers and distributors to pick up the remaining electronics. Samsung provides hundreds of locations for consumers to submit unused electronic products (Samsung branded goods or non-Samsung ones). This program succeeded in recycling 7 million kilograms of used electronic goods. Another company that applies the green supply chain concept is Hewlett Packard with HP's Supply Chain Social and Environmental Responsibility Policy. The HP Company is committed to its suppliers around the world to care about the environment as a component that feels the impact of manufacturing pollution. The initial purpose of adopting lean and green types of waste, lean techniques and reducing environmental impact through the utilization of green practices. Such practices extend beyond the organization to include inbound and outbound logistics along with reverse logistics (13).

2.3 Even an organization

Event Organizer is the manager of an activity (Organizing Events). Every activity held aims to gain benefits on both parties, both the organizers and those present at the event.

The event organizer is a service intended for the purpose of people to organize a well-organized event. In every Event Organiser, there must be people who understand the organization of events ranging from A to Z. Usually, experience and flight hours are high. (2). According to Goldblatt (Goldblatt, 2013): Event Management is a professional activity of gathering and meeting a group of people for the purpose of celebration, education, marketing, and reunion, and is responsible for conducting research, designing activities, planning and coordinating and monitoring to realize the presence activities.

Judging from the types of events held, Event Organizer can be categorized into (Wikipedia, Indonesia, 2018):

- One Stop Service Agency: Even a large organizer capable of organizing various types of events up to an international scale.
- MICE: Short for Meeting, Incentive, Convention, Exhibition). Even Organizer which specializes in organizing events in the form of meetings.
- Brand Activation; is an Even Organizer that specifically helps its clients to promote in order to increase sales, increase brand recognition among consumers, by interacting directly with their target market.

- Music and Entertainment: Even Organizer which specializes in entertainment, especially music.
- Wedding Organizer: Even Organizer that specializes in helping clients hold weddings.
- Birthday Organizer: Even Organizer which is an expert at making birthday parties including for children.
- Personal Organizer: Special Organizer that moves to hold private parties, especially for the rich.
- Indonesian Event Organizer Community, a media promotion event for events and various events.
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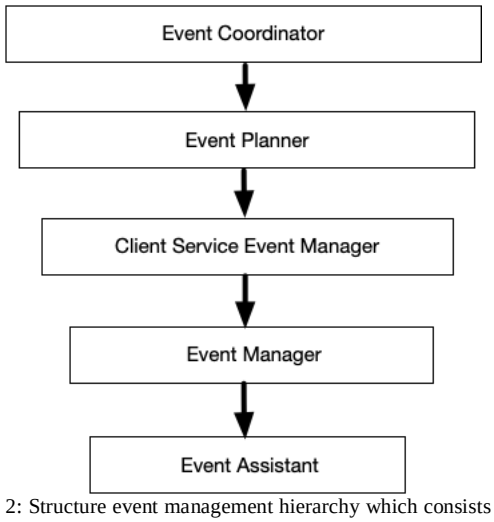

Figure 2: Structure event management hierarchy which consists of an event coordinator whose task is as the project coordinator of an event. An event planner is a person whose profession is the planning of social events. Event managers have the duty to monitor and organize an event that can have a positive impact on the target audience. Event Planner works in order to ease the Event Planner's workload. The duties and responsibilities of the Event Planner are mostly dependent on the tasks that are delegated by the Event Planner. (https://www.jobhero.com)

Even Organiser Company usually has several parts. These parts include marketing, administration, finance and Even Organiser technical parts. The marketing department has the task of finding clients for its EO companies. Furthermore, the administration section has the task of taking care of all the administrative systems needed. The finance department is in charge of managing finance from the financial side as well as the accountant of the Even Organiser Company. Furthermore, for the task of the technical part of the Even Organiser is organizing the event to be held. The Production Manager is responsible and coordinates all technical production activities and prepares a technical production plan as thoroughly as possible. Element-Element Events are:

1. Why: Relates to the objectives to be achieved in this event, especially in meeting the needs and desires of the audience
2. Who: Relates to each person who will be involved in this activity, also relates to the target, age group, gender, education, and lifestyle
3. Where: Regarding the venue for the event that is most appropriate for the target audience, this has an influence on the atmosphere of the performance atmosphere that will be held to influence the emotions of the audience
4. When: Relates to the most appropriate time for organizing the event and also considers the flexibility or leniency associated with time for research and preparation
5. What: Regarding how to package this event so that it is attractive to the target audience, consisting of the name or type of program, the content of the program and the elements needed (5).

3 Methodology/Materials

This study used a descriptive qualitative method approach. According to Sugiono in his book, the qualitative research method is a research method based on the philosophy of positivity, used to examine the conditions of natural objects, where researchers are key instruments, sampling of data sources conducted by purposive, collection techniques with triangulation, data analysis is qualitative, and qualitative research results more emphasis on the meaning of the generalisation (17). Bogdan and Taylor (in 11) suggest that qualitative methodology is a research procedure that produces descriptive data in the form of written and oral words of the observed persons and behaviours.

The object of this research is two companies engaged in event organizers in Jakarta, namely Alphabet Event Organizer and New Diamond Putra. Alphabet Event Organizer is a company that has been established since 1996 and is engaged in catering and marriage. While New Diamond Putra is a company engaged in wedding organizer since 1990.

Sources and data collection in this study through observation to companies, documentation, and structured interviews with key managers in the company. The structured interviews in this study were conducted intensively and repeatedly and the informants were free to give answers. Structured interviews are designed in the same way as questionnaires, except that they are not written questions submitted but oral questions made by an interviewer who records respondents' answers. The sampling technique in this study was purposive sampling and snowball sampling. Purposive sampling is a technique of determining samples with certain considerations. While snowball sampling is a sampling technique of data sources that initially have a small amount, the length becomes large. This is done because there are many small data sources that have not been able to provide satisfactory data, then look for other people who can use the data source (17).

4 Results and Findings

Based on the research question of this study, "what is the impact of the existence of industry 4.0 on the implementation of green supply chain management?", The results of the study's authors in this study that the existence of Industry 4.0 has a very important and strategic role in the company. In the digitized era it also encouraged developments in the small and medium industrial sectors.

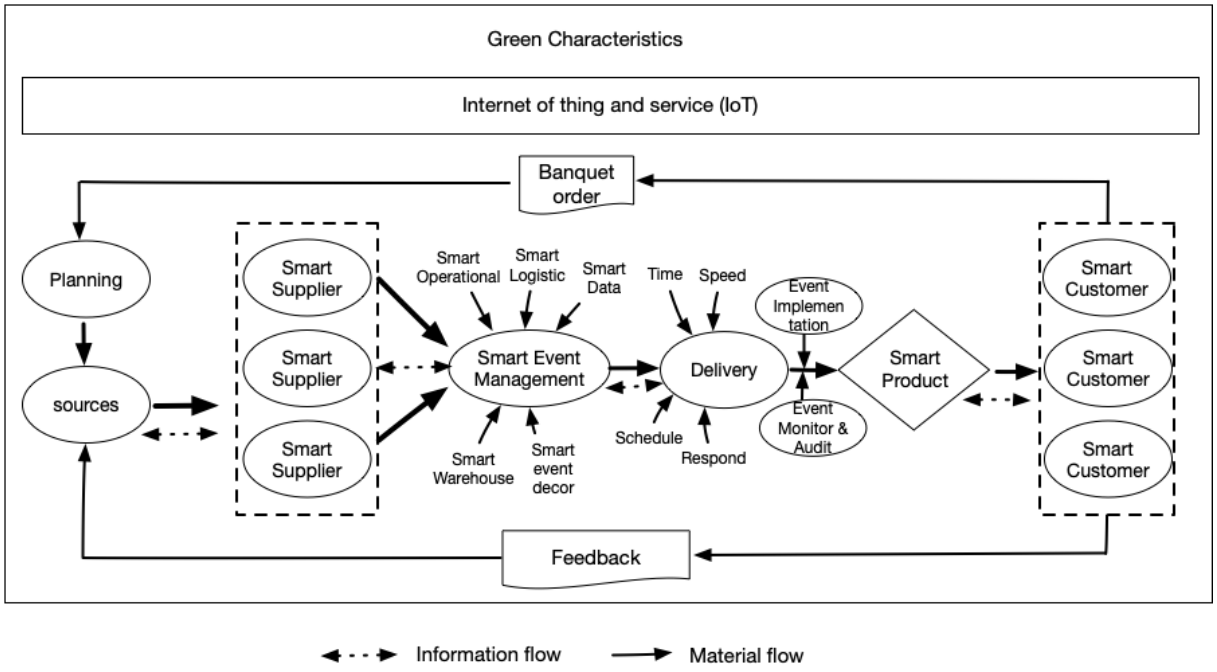

Figure 3: Green Supply Chain Event Management in the Industry 4.0

These developments are characterised by (i) the use of a combination of information technology networks in the production process in small and medium industries, between suppliers of event organisers supported by indicators such as smart operations, smart logistics, smart warehousing, smart data and smart decor so that they will produce smart products to provide satisfaction to consumers; (ii) increasing the effectiveness and competitiveness of post-automation and robotisation industries; (iii) increased productivity and product quality; and (iv) reducing the risk of workplace accidents and waste reduction and contamination with humans.

From this description, the author produces a green supply chain event management in the industry 4.0 framework shown in figure 3. The basis of the green supply chain is the integration of environmental management and supply chain management to control damaging impacts on the environment in the product life cycle through information sharing and integrated cooperation. In green supply chain 4.0, one of the things that must be explored is the orientation on customer satisfaction and needs.

4.1 Internet of Think and Service (IoT)

The role of information in the green supply chain is very important. Information consists of data and analysis related to inventory, transportation, facilities, and customers throughout the supply chain. The information provides management with the opportunity to make supply chains more responsive and efficient. Information is potentially the biggest driver of supply chain performance. Components of decisions regarding information are (4).

Currently, in the industrial era 4.0 all companies, especially event management, are included in the internet-based information technology era. Internet of Things or commonly known as abbreviation IoT is a concept that aims to expand the benefits of internet connectivity that is connected continuously. Basically, IoT refers to objects that can be uniquely identified as virtual representations in an Internet-based structure. In warehouse operations, IoT can assist in the management of occupational health and safety aspects, such as sensors installed in Material Handling Equipment (MHE) that can be connected to a device that will provide information if MHE travels at a speed beyond the boundary and or crashes into something. complete with location information, hours and drivers. In the aspect of inventory accuracy, IoT can help calculations with a high degree of accuracy also not involving a lot of human power. As with the use of sensors contained in each racking that can provide information on the number of products contained in the racking in real-time (15).

4.2 Smart Supplier/Vendor

The Supply Chain Management Strategy is the main backbone and plays a very important role in the operation of event management. The coverage of smart vendors/suppliers plays an important role in determining product quality, costs, product development, and access to finance for companies. Quality of products and services, as a determinant of customer satisfaction, one of which depends on the quality of selected suppliers. Quality supplies certainly make it easier for companies to produce quality products and services as well so that they will have an impact on the company's performance management events and on competitors.

4.3 Smart Event Management

In the event management is also an important thing, because good management will be one factor in an event to be successful and consumers become satisfied. The important role of management in event management is to clarify the role of each division, for example, what is the role of the logistics

division? What is the role of the operational part? what is the role of Big Data division? What is the role of the decor division? So it is necessary to have a clear role and focus in managing an activity, without any good organization regarding tasks between divisions, of course, the functions of each division will overlap.

In every Event Organiser, there must be people who understand the organization of events ranging from A to Z. Usually, experience and flight hours are high. Skill is already qualified and have a sense and feeling sensitive to potential problems that usually arise in the world of Event Organiser. Anything related to the technical event of his position is held by a Production Manager. Stage, Light system, Sound System, Front of House, Security, tents, electricity, and others. Production Manager has several people who act as his right hand. There is a right hand handling the stage, or lighting, or sound system, or security/security, or electricity and others. Coordinate is the keyword in this division. Positions under Production Manager such as; Assistant Production Manager, Traffic Management Officer, Administration Officer (Production Finance Officer), Production Finance Officer (arranging everything related to production finance), Venue Coordinator (set everything related to venue / event location), Security Coordinator (arranging everything related to event security), Stage Coordinator (set everything related to stage), Lighting System Coordinator (arrange everything Something related to lighting), Vendor Coordinator (arranging everything related to vendors / suppliers etc.), General Support Coordinator (regulates all the general things related to production). (Sutawidjaya, Conference on Interdisciplinary Business and Economics Research, Osaka, Japan, 2017)

4.4 Delivery

Delivery stage, the stage where the company is ready to launch products to consumers. The processes involved include handling orders from customers, choosing a shipping service company, handling warehousing of finished products and sending bills to customers.

At this stage of Event Organizer, activities must prioritize quality and not profit. The consumer has proven the quality of the work of the Event Organization, then on another occasion, the Event Organizer will also be used again. In addition, other parties will have the ability to become a new client. (Sutawidjaya, Conference on Interdisciplinary Business and Economics Research, 2017).

4.5 Smart Consumer

The industrial era 4.0 made changes to consumer behaviour from before the digital age.

This group in choosing products always pay attention to the values given by a product. Consumers in this group pay attention to the benefits obtained when compared to the prices or costs incurred. Smart Consumers need commitment in smart products that are produced by event organizer companies, smart consumers need more clear or accurate information so that consumers can track information on the existence of goods and the range of services provided by event organizer companies.

5 Conclusion

Environmental pollution is a major problem that has the potential to cause the extinction of mankind on earth if it is not immediately addressed. For this reason, a green supply chain framework is needed which is expected to provide ideas or ideas for event management companies in making long-term decisions so that sustainable corporate goals will be achieved.

At present, the development of the event management industry which tends to increase and the increasing consumer awareness of the environment and the issue of an environmentally sound industry concept has forced the industry to adapt to the green industry concept in every business process, which later developed into GSCM.

The industrial revolution 4.0 took a big leap in the industrial sector especially in companies engaged in service companies such as event management, where information and communication technology was fully utilized. In order to be able to compete, companies must be able to adopt this Industry 4.0 and prepare the right strategies in all departments. The past year has shown a gradual transition from the Supply Chain Industry to an environment-based green supply chain that is controlled by tech-driven. This means that there has been a rapid change in technology in the form of the Internet of Things (IoT), Artificial Intelligence or Artificial Intelligence (AI), Automation, Robots, and Big Data which directly affects logistics personnel and operating procedures.

So the author's analysis of 2 (two) event management companies that exist in Jakarta, (New Diamond and Alphabet) then with the presence of the industrial revolution 4.0 is very helpful in improving the performance of the company. Even the rapid advancements in the Industrial Age 4.0 with Big Data, Artificial Intelligence (AI), and the Internet of Things, how to transact will be very fast and efficient in the future besides it will provide more capabilities for vendors / suppliers to visualise potential problems, find solutions alternatives, and understand the impact of company event management decisions to improve operational reliability to a new level, so that all problems will be avoided early.

Acknowledgements

The author expresses many thanks to the management of the New Diamond, Jakarta event organizer and the event organizer Alphabet Management in Jakarta, which has helped many writers in providing the data needed in writing this article.

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