

# *The Increasing Role of the Information Technology in Sharing Economic Activities*

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**Abstract** - The era of industrial revolution 4.0 has driven technological innovations that have disrupted or altered fundamental impacts on people's lives, so that the integration of human work with information technology and the economy is raising; and encourage automation systems in all process activities. Information technology continues to grow marked by the emergence of industrial revolution era 4.0. Disruption resulting from the rapid development of information technology causes the activity of sharing economy also increased. Based on the results of comparative analysis in this research, the utilization of information technology engages an important role to increase the goals of sharing economy.

The development of information technology is marked by the increase of internet and smartphone users and social media, which is an independent variable, is directly proportional to the increasing growth of sharing economy activities such as e-commerce and online transportation, especially in Indonesia. The large role of information technology and social media to sharing economy activities, shifting urban lifestyle and creating successful startup unicorn in Indonesia, namely Go-Jek, Traveloka, Tokopedia, and Bukalapak.

**Keywords** - Industrial Revolution 4.0, Information Technology, Internet, Social Media, Sharing Economy.

## **I. INTRODUCTION**

Technology is used as an effort to improve the competitiveness of regions / cities with the management of smart economy [1]. This effort must be made to realize ecosystems that support the economic activities of the community in harmony with the leading economic sector that is adaptive to the changes that occur in this information age, as well as improve the financial literacy of the community through various programs including realizing the less cash society. This target can be realized by building industrial ecosystem (industry), improving the welfare of the community (welfare), and build the ecosystem financial transactions (transactions)[2].

The era of industrial revolution 4.0 has driven technological innovations that have disrupted or altered fundamental impacts on people's lives, so that the

integration of human work with information technology and the economy is raising; and encourage automation systems in all process activities. Technological developments such as mobile, social media and digital platforms, big data, open data, internet of things (IoT) and blockchain [3], accelerate the spread of social innovations such as co-creation, crowdsourcing, and sharing economy [4], thus providing a space for an attractive model where citizens can collaborate in the provision of services regardless of government and local government, as well as helping municipalities and citizens to improve how the city works. Big data and machine learning techniques are also used to provide personalized products, reduce corporate risk, can offer better pricing, and resulting in substantial profit [5].

Sharing economy is a new economic model outside the paradigm of mass production and consumption, thus into a

new paradigm of capitalism. Growth in sharing systems is driven primarily by ICTs, together with the emergence of social networking systems, which facilitate relationships between peers who are eager to share their possessions. The main concept of a collaborative sharing system is that easy to get value from untapped potentials and utilized by the owner, like goods and services. Not only the enterprise, have customers also power to share goods and services. Thus, with the explosion of ICTs based platforms, the sharing economy is expected to effectively solve these social problems, and social enterprises can apply the principle of economic sharing to develop their business model [6].

The era of collaborative economy evolved as triggered by social, mobile / mobile, and payment systems. According to Owyang et al. the three collaborative economic drivers of societal, economic, and technological (moving) relationships towards peer-to-peer sharing are well documented [7]. Based on previous research stated that the development of information and communication technology greatly affect fundamental changes to people's lives, social behavior in lifestyle and online shopping. It is this fundamental change that increases the growth of the creative economy industry by utilizing the sharing economy, so that every local government needs to pay serious attention to how to utilize its regional resources to create a creative economy. Thus the welfare of the community will increase because of the efficient market that produces new products, services, and business growth.

In this research, researchers described the factors and the role of information technology on the development of sharing economy activities or collaborative economy in Indonesia. Based on the results of research, information technology, such as internet and smartphone, is the main driver that raise the expansion of sharing economy activity especially with the emergence of four unicorns from Indonesia.

#### *A. The Thinking Framework*

The previous research stated that Prof Schawab (2017) explained the 4.0 industrial revolution has essentially changed human life and work. Different from the previous industrial revolution, the fourth generation industrial revolution has a wider scale, scope and complexity. The birth of digital technology is the peak of industrial revolution that has a massive impact on human life worldwide. The fourth generation industrial revolution encourages automation systems in all process activities. The raise of the massive internet technology not only connect

millions of people around the world but also has become the basis for trade transactions and transportation online.

According to Prof Rhenald Kasali in [8], “disruption means not only the phenomenon of today change but also reflects the meaning of the phenomenon of the future change. The era of industrial revolution 4.0 has driven technological innovations that have disrupted or altered fundamental impacts on people's lives, so that the integration of human works with information technology and the economy is raising; and encourage automation systems in all process activities”.

The era of industrial revolution 4.0 resulted in fundamental change (disruption), so that the growing information technology is utilized to create a new model economy that is sharing economy. The transformation of Korean industry towards Industry 4.0 be success because Korea did various things that need to be done. The Korea strategies can be example for another country : the first step are improving and outlining the strategies set by the central government to build economic and social systems that can respond to changes flexibly, next step establishing some kind of operational system to maximize the effectiveness of initiatives and policies; then concrete and workable actions for the transition to economic and social systems that can accommodate innovative change, and the fourth step shall build infrastructure to lead all initiatives (Sung, 2017). Indonesia also has an integrated roadmap to implement a number of strategies to enter the industry era 4.0, called Making Indonesia 4.0, are : improving the competence of human resources through link and match programs between educational and industry, preparing five manufacturing sectors that will be piloted to strengthen the fundamental of industrial structure of the country, availability of resources and abundant supply of internet network infrastructure with large bandwidth and wide coverage, and availability of data center with sufficient storage capacity, secure and affordable, availability of modern logistics infrastructure , and employment policies that support the needs of the industry in accordance with the character of Industry 4.0 [9].

#### *B. Sharing Economy*

Some movers have increased sharing economic activity and a number of startups to promote asset sharing behavior. The development of information technology, the economic model also changes to a collaborative economy or a sharing economy where ownership and access are shared between companies, startups, and the community. According to [10], sharing economy, both in global and local contexts, involves

peer-to-peer exchange of tangible and intangible resources, including information.

The three phases of the evolution of market relations driven by new technology are the era of brand experience (the web) as the first phase where the internet makes information widely accessible, but the ability to publish it remains in the hands of the media and companies. The next phase is the era of customer experience (social media) where new tools empower customers to publicize themselves. The third phase is the era of collaborative economics (social, cellular, payment systems). An era triggered by social, cellular, and payment systems where customers have the power to share goods and services. [11].

The characteristics of sharing economy are Online collaboration, Social commerce, online sharing, and consumer ideology [12]. Online collaboration has characteristic where the platform focuses on collaboration, for example, open software projects can be collected and facilitated. It is a peer-to-peer platform where content generation is highly distributed and decentralized. A condition that is the result of organic growth and strong user self-organization [13]; [14]. Social commerce, is a characteristic where users continue to be motivated to use and engage through social networking sites (SNS). SNS and social commerce have a similarity because they both involve peer-to-peer interaction on social media, but social commerce includes trade features [15], [16]. The characteristic of online sharing in the SNS context is the concept of sharing information, such as status updates, links, or photos. However, e-commerce systems increase customer dependency and have facilitated the distribution of goods and services through information technology [17],[18], such as CC platforms such as Couchsurfing, Zipcar, Neighbourgoods, and Sharetribe. The next characteristic is consumer ideology, namely information technology is increasingly used as a means for further collective action in supporting the advancement of ideology or ideas [19]. For example, the social media network Twitter was used as a reporting tool during the Arab Spring [20] and the 2008 US presidential candidates campaigned widely through social media [21].

The phenomenon of sharing economy has different solutions and is divided into two groups when viewed from the microeconomic side, namely as a provider and type of interaction [22]. As a provider that is start-up and old company (incumbent). Start-up, innovation in sharing economy comes from startups, and creates a unicorn company [23] in [23]; a company that was founded a long

time ago (incumbent), also acts as a service provider in the field of sharing economy [24]. Types of sharing economy transactions are B2C, access to these resources in many cases by companies that provide value-added services to consumers [25]; C2C, this perspective considers the simultaneous role of service producers and consumers [26].

The driving forces for the emergence of organizations and business sharing economies include information technology and social media, social commerce, urban lifestyles and increased volatility in the cost of natural resources. Information technology and social media enable and facilitate networks, people and organizations to transact directly on a business scale [27]. This includes open data, ubiquity and cheap smartphones, and social media. This technology dramatically reduces friction in business models and stock-based organizations. Social trade is trade that is facilitated by social networks, and contributes to the emergence of sharing economy. People are more likely to buy a product because of the social influence exerted by a colleague on a particular product purchase decision [12]. The involvement of social media encourages and promotes the sharing economy and social trade because it impacts not only encourages people to buy similar products and try similar things, but also encourages people to seek group agreements on similar products. For example, certain forms of social commerce are consumers' self-coordination of group agreements to pursue economic benefits [16]. The results show that participation in the sharing economy is motivated by many factors such as sustainability, the enjoyment of activities and economic benefits [12].

Urban lifestyles that occur in crowded cities create a series of new problems that can be overcome by the sharing economy. "Unlike information or technology-based companies from previous generations, company sharing depends on the mass of providers and consumers who are close enough to each other or other facilities that make their platforms work [28]. Uber, Gojek and Grab, which are companies online transportation, bringing people who live in one public area and transporting them to another area online drivers will pick up passengers who must be relatively close distance urban settings inherently force people to live and work in close proximity. This means that the number of people going to and from the same destination will increase. Online companies are aware of this and create business formats to take advantage of new urban arrangements. Increased volatility in natural resource costs, increased welfare across developing countries coupled with population growth increasingly burdening natural resources and has causing cost spikes and market volatility. This has

increased pressure on traditional producers to look for alternative designs, production and distribution that will stabilize the projected costs and smoothness of expenditure. In this context, the circular economic approach has attracted the interest of many global corporate actors.

According to Felländer et al., sharing economy driven by digitalization and involves a peer-to-peer exchange of tangible and intangible resources, including information. Sharing assets is always a part of social organization, and over the last decade, some impellent has increased the activity of it and a number of startups reinforce this behavior. The share economic drivers: 1. Increased penetration of internet and smartphone are the main accelerators; 2. Technological advances in areas such as information technology platform and big data analytics. The creation of two-sided marketing platforms, or matchmaking, enables peer-to-peer communication (ie individual-to-individual communication rather than Communication Company to individual); 3. Reduce entry barriers for application creators and digital platform providers; 4. Increased ease of financial transactions that have been greatly facilitated due to advances in digital payment solutions; 5. Increased transparency. The share economic platform provides transparency about buyers, sellers, and products. Social media sites and social networks provide information about individuals, and the scoring system used by many of these services allows suppliers and consumers to rank each other, even in real time; 6. The financial crisis has been the driving factor of the sharing economy. The crisis has caused many people to find alternative sources of jobs and income, shared economies allow individuals to make money on tangible and intangible assets; 7. The pattern of consumption decreases [10].

According to [27], information technology and social media are the main drivers in the development of sharing economy. Likewise expressed by [10] that the prime mover of the development of the sharing economy due to the increasing penetration of internet and smartphone, as well as the creation of marketing platform.

### *C. Information Technology and Social Media*

According to Ajuntament (2013), technology allows to create more efficient and sustainable urban mobility, environmental sustainability, friendly business and attractive capital, social integration and cohesion, communication and closeness with the community,

knowledge, creativity and innovation, transparency and democratic culture, and comprehensive access to culture, education and health. [27] Stated that information technology and social media are the main drivers in the development of sharing economy. Likewise expressed by [10] that the prime mover of the development of the sharing economy due to the increasing penetration of internet and smartphone, as well as the creation of marketing platform. Teknik big data dan *machine learning* juga digunakan untuk menyediakan produk yang dipersonalisasi dan mengurangi risiko perusahaan, serta dapat menawarkan harga yang lebih baik seperti yang telah digunakan oleh ZhongAn, sebuah perusahaan asuransi online inovatif, sehingga menghasilkan laba yang besar [5].

The digital economic platform is emerging and raising in number. Outside Indonesia there are companies like Amazon, Facebook, Google, and Uber [29], while in Indonesia there are Tokopedia, Bukalapak, Grab and Gojek that create online structures that enable various human activities. These digital platforms vary in function and structure. Google and Facebook are digital platforms that offer search and social media, but they also provide the infrastructure in which other platforms are built. Amazon and tokopedia are markets (market place). Tokopedia as well as Amazon Web Services provides the infrastructure and tools that other people can use to build more platforms. Uber, Grab and Gojek are using the new cloud tools available to force deep changes in various existing businesses. Together they provoke reorganization of various markets, work arrangements, and ultimately value creation and capture. Berkembangnya teknologi Web 2.0 mendorong penggalangan dana melalui online [30], able to create a platform for private crowdfunding where the most focused activity is around entrepreneurial projects [31].

Social media is a group of Internet-based applications that build the foundation of ideology and Web 2.0 technology, and which enables the creation and exchange of user generated content [13]. Web 2.0 is a new phase of web development, allowing users to communicate, participate, share, interact, and collaborate with each other. There are 3 main elements that build social media, namely content, community and network, and Web 2.0 [32] (Figure 1). According to a study conducted for 1356 social media marketers, there are at least 7 benefits of social media marketing [33] such as generating business exposure, etc.

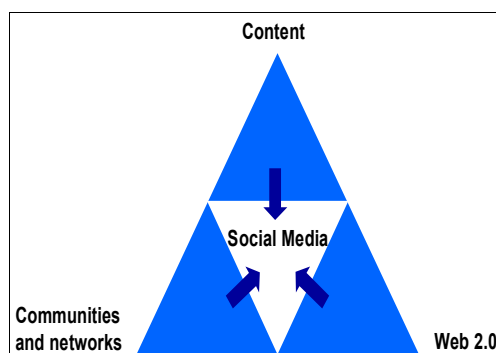


Figure 1. Social Social Media. Source:[32]

### III. RESEARCH METHODS

The type of research conducted is a comparative descriptive study, where researchers will describe the results of data comparative analysis derived from survey results (primary data) with supporting data from previous surveys, as well as linking it with previous research.

The primary data is collected from a questionnaire that distributed via email amounted to 50 respondents with purposive sampling technique. The secondary data sources got from institutional surveys APJII and DailySocial.id. Variables in this research are independent variables and dependent variables. The independent variables are the users of internet, smartphone, and social media. The dependent variables are e-commerce and startup. After that, researcher compared the primary with secondary data, so get the final results of research.

### IV. RESULT ANALYSIS AND DISCUSSION

The internet and smart phones are the main accelerators and drivers of economic sharing. The penetration of internet and smartphones worldwide has raised rapidly over the past two decades. As like as in Indonesia in the last 5 years have increased very rapidly. By 2017, Indonesia's population is 262 million, of which 143.26 million (54.68%) of the population are internet users in Indonesia. In the range of 2013 to 2017, the highest increase of the internet users was 2015 to 2016, which increased by 22.5 million (Figure 2) [34].

Based on data obtained from APJII in 2016, smartphone users of 63.1 million inhabitants (47.6%); in 2017, the internet users have raised to be 63.26 million people (44.16%) from 143.26 million. while according to [35], in 2017 there are 177.9 million. Judging from APJII data there is an increase in Indonesian population using smartphone,

means liner increase with the raise of internet users. The statement of survey results stating too that the internet and smartphone users have increase.

Based on APJII data in 2016, the most often accessed by internet users is social media amounted 97.4%. In 2017, social media has decreased to the second place, because internet users most often do chatting that is equal to 89.35% [34]. In 2016, APJII does not separate social media and chats in its surveys, so if grouped as information sharing then social media still experience being in the first position. The 2017 APJII survey results are in line with DailySocial.id's data where chatting (WA also ranks first), and social media in second place (Facebook). Based on survey conducted by researchers, the most frequently accessed social media is Instagram of 33.3%.

In the South East Asia, Indonesia is the largest internet user, however in Indonesia, the use of the Internet in the economic field is not as big as social media. The e-commerce transactions are online purchases of 32.19% and 16.8% selling online, but the growth of economy sharing such as e-commerce and online ride every year is increasing. Unicorn Indonesia startup company is engaged in online ride and e-commerce. Predicted in the future, the activity of sharing economy such as e-commerce and online travel is raising. Significant improvement in sharing economy activity in 2017, is influence of due to the issuance of the Financial Services Authority (OJK) regulation through POJK No. 77/POJK01/2016, as the basis for the rules of borrowing and borrowing services based on information technology. The types of P2P has been increasingly specialized in accordance with existing market segment. Such as, the use of P2P in Agriculture segment, Micro Small and Medium Enterprises (MSMEs), as well as business distributors are increasingly exist today.

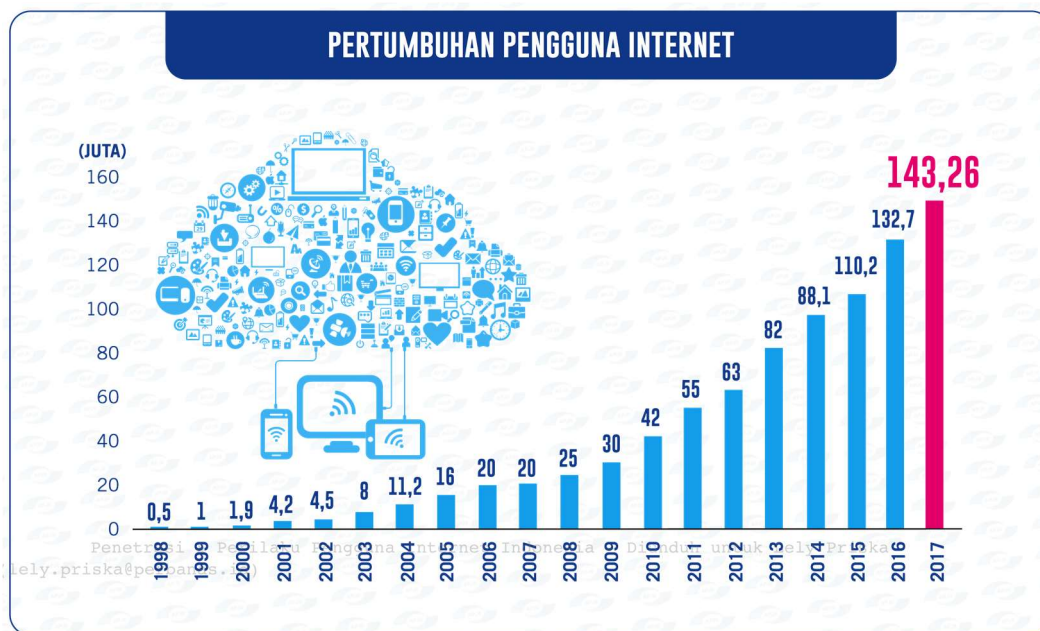


Figure 2. Growth of Internet Users in Indonesia. Source: (Asosiasi Penyelenggara Jasa Internet Indonesia (APJII) & .Teknopreneur, 2017)

The raising in online shopping (ecommerce) has increased from \$ 5.5B (2015) to \$ 10.9B (2017) and is even predicted to rise significantly to be 88.1B (2025 ). Startup growth for transportation in SE Asia area also increased in 2015 by \$ 2.5B to \$ 5.1B (in 2017) and 2025 predicted by \$ 20.1B [35]. Sharing economy in Indonesia can be seen in the following table (Table 2).

Nowadays, start-ups in Indonesia are growing rapidly. In fact, some of which are included in the 'unicorn' range, ie start up with valuations above US \$ 1 billion or around Rp 13 trillion. Indonesia already has four unicorns, namely Go-Jek (Online ride/transportation), Traveloka (online travel), Tokopedia, and Bukalapak (market place).

Table 1. The Comparison of use of the Social media

| Indicator                                                            | Sources             |                  |                                       |
|----------------------------------------------------------------------|---------------------|------------------|---------------------------------------|
|                                                                      | DailySocial.id 2016 | APJII 2017       | Researcher                            |
| Utilization of social media as information dissemination (lifestyle) | 70.0%               | 87.16%           | 38.1%                                 |
| Social media is the most widely used for information dissemination   | Facebook (45.0%)    | Facebook (54.0%) | Instagram (33.3%)<br>Facebook (28.6%) |

Table 2. Sharing economy is seen from the peer to peer exchange of resources

| Asset                        | Example                       | Actor: International                                             | Actor: Indonesia                             |
|------------------------------|-------------------------------|------------------------------------------------------------------|----------------------------------------------|
| <b>Tangible</b>              | Transportation                | Uber <sup>[10]</sup><br>Lyft <sup>[10]</sup><br>Car2Go<br>Airbnb | Gojek<br>Grab<br>Uber                        |
|                              | Property <sup>[10]</sup> Food | DeskNearMe<br>EatWith                                            | Gofood<br>Zomato                             |
| <b>Intangible: Financial</b> | Crowdfunding                  | Kickstarter<br>Indiegogo                                         | Kitabisa.com                                 |
|                              | P2P lending                   | LendingClub<br>Prosper                                           | Doku                                         |
| <b>Intangible: Services</b>  | Professional Personal         | Innocentive<br>oDesk<br>TaskRabbit                               | Yuna - Fashion Matchmaker<br>UpworkIndonesia |

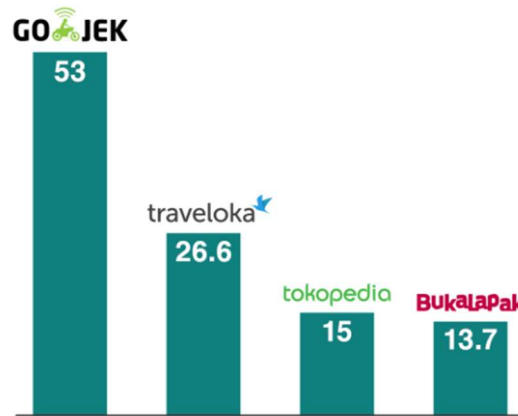
Source :[10]

The popularity of Go-Jek and being the most frequent online transporter, has led some big companies to inject funds into the company. Go-Jek was first crowned as a unicorn after financing around US \$ 550 million, around Rp 7.5 trillion, in August 2016 from a consortium of eight investors led by Sequoia Capital and Warburg Pincus LLC, two top US investment firms, Google's global technology-based digital company, automotive companies PT Astra International Tbk and Djarum Group, so that this injection of funds makes Go-Jek the unicorn with the highest valuation in Indonesia. The change in Go-Jek's business model, from a previous transportation application, to a payment system-based company, has made more investors to inject funds. Valuation 4 unicorn startup Indonesia can be seen in Figure 3 below. Ajuntament's statement that technology makes it possible to create more efficient and sustainable urban mobility, friendly business and attractive capital, integration and social cohesion, communication and closeness with society, knowledge, creativity and innovation (Ajuntament, 2013), in harmony with research results analyze comparative data obtained both primary and secondary data.

Utilization of information technology is characterized by increasing internet users and smartphones and social media which an independent variable is resulting in the growth of sharing economy activities such as e-commerce and online transportation, especially in Indonesia. Information technology and social media is a driving force in the activity of sharing economy, so that the development of information technology and social media followed by the development of sharing economy activity, this is in line with the statement [27] and [10], [4]. Actor sharing economy, startup is growing rapidly even become unicorn in Indonesia such as Go-Jek, Traveloka, Tokopedia, and Bukalapak. Go-Jek is a startup in online transportation which also develops its wings in the field of payment system that is Gopay.

With different digital economy platforms, each of the above unicorns has proven that in the era of industrial revolution 4.0, the disruptions that occur produce creative ideas and have great opportunities by utilizing sharing economy or collaborative consumption.

### Valuasi tiap perusahaan dalam triliun Rupiah



Sumber: Kompas

BBC

Figure 3. Valuation Indonesia Unicorn

Source: <https://www.bbc.com/indonesia/majalah-43058059>

## V. CONCLUSIONS AND LIMITATIONS

Information technology continues to grow marked by the emergence of industrial revolution era 4.0. Disruption resulting from the rapid development of information technology causes the activity of sharing economy also raised. Based on the proceeds from comparative analysis in this research, the utilization of information technology engages an important role to increase the goals of sharing economy.

Especially in Indonesia, the development of information technology is marked by the increase of internet and smartphone and social media users, which is an independent variable, is directly proportional to the increasing growth of sharing economy activities like start-ups are growing rapidly, as well e-commerce and online transportation.

The large role of information technology and social media to sharing economy activities, shifting urban lifestyle and creating four successful startup unicorn in Indonesia, namely Go-Jek, Traveloka, Tokopedia, and Bukalapak. The growing payment system also affects the rapid increase in the activity of sharing economy, so for further research should payment system can be analyzed.

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