

# ICT Facilitates Sharing Economy: A Study on Uber and Airbnb Value Propositions

Maznah Mohd Zin<sup>1</sup>, Naaiman Bintaman<sup>2</sup>, Jamaludin Ibrahim<sup>3</sup>

Department of Information Systems, Kulliyah of Information and Communication Technology,  
International Islamic University Malaysia, 53100 Kuala Lumpur, Malaysia

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**Abstract:** Information and Communication Technology (ICT) has placed major impacts on our activities, tasks and professions. With the versatility of today's technology and ICT devices that can make things available just at our "finger tips" or just "within a click", some might find their days are always brighter and some do not. Big Data and Internet of Things contribute to the digital tsunami that has flooded our "clouds", causes the influx of information for everybody to make use of it. As a consequence, almost all sectors, institutions and individuals are struggling to take advantages of this digital technology. Nowadays, many businesses prospered or defeated as a result of the digital technology. This paper will focus on sharing economy, the sustainability drivers and how ICT facilitates sharing economy business model. Further, the paper discusses the value propositions of the sharing economy companies: Uber and Airbnb. These two companies are then compared in terms of their value propositions of the Business Model Canvas to see how applications of ICT are adopted in delivering values to customers and supply chain and in accordance with the five pillars of sharing economy.

**Keywords:** Information and communication technology, collaborative consumption, sharing economy, Value Propositions, Platform, Uber, Airbnb.

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## I. INTRODUCTION

Sharing Economy is defined as "an economic system in which assets or services are shared between private individuals, either free or for a fee, typically by means of the Internet" [1] and is often to be used interchangeably with collaborative consumption. Despite arguments that sharing economy is distinguishable from collaborative consumption, both forms of collaborative practices pose similar risks for users. "You are now what you can access and not what you have" play significant role in sharing economy [2]. Generally, the terms are not contradicting but evolutionary, depends on scopes and inclusivity level of sharing practice [3]. The emergence of peer-to-peer markets has introduced a new way of supplying goods and services that was traditionally served by long-established businesses [4]. Sharing economy may include "redistribution, mutualisation and shared mobility" [5]

Sharable goods comprise about 25% of household expenses and ranks number 3 in household waste. Household expenditure can save up to 7% and the waste could be reduced by 20% if sharable platform is efficiently applied [5]. Economies see sharing practice as a means to balance resources and consumer needs [3]. The number of users in sharable goods and sharing practice has increased after people could gain cheaper access for more services, have seen their community members face-to-face, and discover alternative source of income [2].

The activities of sharing economy can be categorized into platforms such as recirculation of goods, increased utilization of durable assets, exchange of services, and sharing of productive assets. Recirculation of goods was pioneered by eBay

and Craigslist back in 1995, driven by the heavy acquisition of cheap imported used items, reduction in the transaction cost by sophisticated software, and crowdsourcing of reputational sellers from buyers that eliminate the feeling of doing transaction with the unknown people. The second category was innovated by Zipcar and is characterized by intensively assisting the use of durable goods and assets such as products or property that are underutilized. Service exchange was originally introduced in the United States to aid the unemployed by trading service on time basis [6] with the five core values: Asset that everybody owns and will share with others; Redefining work to reward, recognize and honor that work; Reciprocity that ensures each other build the world we all will live in; Social networks to build community by sinking roots, building trust and creating networks; and Respect “where people are in the moment, not where we hope they will be at some future point” [7]. The last type of platform, which has been in the United States for more than three hundred years, focuses on sharing assets or space primarily not for consumption but for enabling production. Peer-to-peer University is a platform under the sharing durable assets category [6].

There are five pillars of sharing economy: digital platforms that spare capacity and demand; transactions that offer access over ownership; more collaborative forms of consumption; branded experiences that drive emotional connection; and understanding economy based on trust [8].

## II. SUSTAINABILITY DRIVERS OF SHARING ECONOMY

The change in customers' requirement, markets, technologies, and structures help shape the sharing economy business models. The most important factors that boost the sustainability of sharing economy are social, economic, environmental and technological drivers. Social responsibility plays a significant role in maintaining stable social systems, and depends on growing population and saving resources to analyze the patterns and trends in consumer behaviours. The economic sustainability of sharing economy depends on the sufficient and stable growth of income that drive people to involve in the access over ownership. Characteristics of environmental drivers to sharing economy includes: stable biological and physical systems; decreased in the production of goods in order to sustain the collaborative consumption; and quality of the shared goods. The fourth driver, i.e. the technology, affects almost all important aspect of sharing economy business models. It is assumed that sharing economy will potentially change global and local economies toward sustainability and will link economic, environmental and social issues in future business environment [3]

## III. ICT DRIVES SHARING ECONOMY

Although sharing practice has been prevalent in the previous eras, the innovative elements of the practice comprise of the online platforms together with the sophisticated smartphone application that simply connects users [2]. The sharing economy is the latest example of the internet's value to consumers as it drives the business models [4]. The technology driver is also powered by the ubiquity of social networking and real time technologies that enable hosting online markets that further induces sustainability and growth in sharing economy. The online technology benefits the sharing economy in delivering “highly targeted, very personal goods and services at the right time and location” [3].

Nowadays, the phenomenon of sharing practices have become more prevalent in the world with the development of information and communication social technology that “easily connects strangers, supports peer-to-peer collaboration [9], increases incentives to cooperate, acquires information about the past and present, and predicts future behavior of participants involved in sharing practices” [2].

### A. *ICT Connects Strangers:*

Since the invention of the web, many experiences have been transferred to computer screen and people perform activities online. These activities had discouraged people from seeing each other and impede their ability to discover the opportunities within their neighbourhood. As the web was developed to allow a deeper level of human communication, regardless of location, people are more frequently interacting with each other again.

Virtual relations such as chats, forums and social networks are new forms of sociability and social interaction enabled by the Internet [10]. This new form of social interaction is categorized as “hyperpersonal” communication that occurs when

“users experience commonality and are self-aware, physically separated, and communicating via a limited-cues channel that allows them to selectively still present and edit; to construct and reciprocate representations of their partners and relations without the interference of environmental reality.” [11] In present day, this type of communication has involved acquaintances or unknown users that share their concerns, motivations and passions [10].

Nowadays, people are using technology to share information that impacts their decisions in real life. Since civilization was built based on collaboration then people naturally embrace the sharing economy or collaborative consumption with the assistance of the advance in technology.

### ***B. ICT Supports Peer-to-Peer Collaboration:***

Initially, digital technology was innovated based on the government and business needs and later developed to meet requirements of business into consumer products. After more than a decade, the radical digital innovation, such as social media, mobile technology and GPS technology, was driven by the needs of consumers rather than government and businesses [9]. The technologies that have been placed in the hands of consumers together with the proliferation of internet-based platforms have allowed disintermediation business channels and sharing of excess resources at a cheaper price [12].

There are three components in a peer-to-peer technology: the platform as a marketplace that assists peers in their exchange of goods and services; the entrepreneur that supplies goods and services on the platform, typically an individual or small business; and the consumer as an individual who wants to buy, rent, or consume. Peers comprises of both entrepreneurs and consumers. Typically, the platform also mediates the payment from the consumer to the entrepreneur and receives commission from either the entrepreneurs or the consumers [9].

The soaring development of peer-to-peer platforms has been made possible by the innovations of technology and the flexibility of supply-side. Technology innovations allure and expedite the market entry for suppliers, make the lists of customers easily accessible, and lower the transaction cost and expenses. With the supply-side flexibility, service providers can opt to make their selves visible or not in the platform just by swiping on an app. Besides, suppliers of goods and services may conveniently add and remove their items on the list of products that are on sale [4].

### ***C. ICT Increases Incentives to Cooperate:***

Collaborative consumption or sharing economy requires cooperation from all users or individuals to share their local resources in order to achieve synergy [13]. It is expected that the joint resources produce better utilization results than the sum of total individual utilization. It is the sole responsibility of individuals to cooperate or not, causing the system to be inefficient and infeasible. Since collaborative consumption incurs cost such as bandwidth, storage, processing, memory, and energy, lack of contribution among peers may cause others to be disinterested to participate in the platform [13].

The same synergy is also required in a peer-to-peer system. Incentive for cooperation is required to discourage non-cooperative users from gaining benefit from others' resources [14]. Among existing schemes are the “enhancement of the quality of service, boosting scalability, strategic mobility of the entities and new induced uncooperative behaviours.” The incentive mechanism has been designed to encourage cooperative behaviour, but to avoid penalizing the clients for their uncooperative behaviour. The incentive patterns can be classified as trust based or trade based [13].

In trust based incentive patterns, the trusted consumers will be granted their request without having to remunerate the providers. There are two types of trust based incentive: collective incentive, “the incentive for cooperation in a collective stems from being member of the same collective” of entities that share mutual trust and unconditional cooperation; and community incentive, good reputation is required in order to consume services of other entities within a community. Trade based incentive requires the explicit remuneration such as barter trade and bond based patterns. The first type of trade based incentive remunerates the provider by simultaneously providing a service in return, while the latter pays the providers by handing over a bond. In both case, consumers are responsible to provide the remuneration [15].

***D. ICT acquires Data and information about the past and present, and predicts the future:***

Data plays an important role in supporting the sharing economy [16]. There is vast amount of data available as a result of participants voluntarily sharing and disclosing their data on the available platforms [16]. Businesses can easily reach many consumers and switch to different geographical areas to better immerse in consumers' daily life. "Communities helped market research to step to a higher level and are enormously popular in the industry" [17]. Freelancing, co-working, car sharing, peer-to-peer lending, fashion, and sharing resources are examples of sharing economy businesses that would be impossible to be successful without leveraging a platform and a foundation of big data. These businesses have been able to figure out how to effectively manipulate the proliferation of big data into competitive advantage [18] and services that assist people anytime and anywhere they need rather than merely representing new way of thinking or new services. The manipulation of data would involve algorithms that have been programmed to process the available raw data into useful information and knowledge [19]. Data analytics is applied to quickly analyze and anticipate needs, cloud services is used to scale data and applications up or down depending on demand, and sophisticated algorithms have been developed to extract, analyzed and connect datasets [16].

The applications of Big Data, data mining, data analytics, cloud services, and sophisticated algorithms have resulted not only in broader and deeper analyses of the past and current patterns, trends and demands in businesses, but also have led to a better prediction of the future. With the provision of the prediction for future market, growth, and demand, data has become the key to the ease with which startups can enter the economy [16]. "The convergence of these phenomena has given rise to the increasingly widespread business application of data science" that supports and guides the process of extracting information and knowledge from data [18].

## IV. CASE STUDY

***A. Uber:***

Initially, Uber was known as "UberCab" which was founded in 2009 by Travis Kalanick and Garrett Camp. Uber uses its platform with Application Program Interface(API) that can connect passengers and drivers across borders, cultures, and languages on smartphones [20]. The company claims to have made cities more accessible, offered more options and reliability for passengers, and opened more income opportunity for drivers [21]. Uber also stated on its website that "Whether it's a ride, a sandwich, or a package, we use technology to give people what they want, when they want it." Uber app introduces the flexibility in money making for all genders, finds way to strengthen local economy for cities, enhances ease of getting access to transportation, and promotes safe and comfortable journey on the streets [20]. In 2015, Uber value was worth about \$50 billion [22].

**Uber Value Propositions:**

Based on Figure I, Uber value propositions are divided into customer and driver categories in order to cater the two different types of customers in Uber business model. Customer value propositions include: minimum waiting time; prices lesser than the normal taxi fares; cashless ride; can see the Estimated Time of Arrival (ETA) and track the cab on map. On the other hand, the driver value propositions comprise: additional source of income; flexible working schedule and can work part time; easy payment procedure; drivers get paid to be online even without any request for ride.

***1) Customer:***

All customers need to do is just push the button to have a car to arrive then wait to be picked up. In order to reduce or eliminate the waiting time, Uber has developed its platform to let customers plan and schedule their trips in advance. The advanced platform has allowed traveller to book the Uber driver 30 minutes to 30 days prior to their exact rides in order to grant customers reassurance that the drivers will be there when they are ready to leave. Users will be provided with a 15-minute window right after tapping on the UberX in the Uber app. Customers may enter the date, time, location, and destination of their trip, and are given the chance to make changes to the details for up to 30 minutes ahead of the pickup time. As long as the driver is not yet on the way to pick up the customer, cancellation will not be penalized. Moreover, reminders will be sent to customer 24 hours and 30 minutes before the ride. When the driver is on the way some information, including whether surge pricing is in effect, will be received by customers and if customers disagree to pay the surge pricing they may opt to cancel the ride without any penalty through the 5-minute window [23].



**FIGURE I: UBER BUSINESS MODEL CANVAS [24]**

Normally, the charges by taxis are categorized into two: per mile when moving, and per minute when idling. Whether the car is moving or not, Uber charges riders per mile and minute. Based on sample trip analysis result, Uber rate is cheaper than taxi rate. If Taxi/Uber ratio is over 1, it means that the cab charges are more expensive than that of Uber. Even with surge pricing the Uber charge is still lower compared to that of taxis [23].

Cashless ride is another value that drives customers to join Uber platform especially when they do not have cash on hand. Customers can pay using the Uber platform that can be accessed through Uber app for iPhone or Android. Just by tapping the “Payment” button then followed by “Add Payment”, customers can fill in their credit or debit card information or just tap the “scan your card”. After the trip, a “Pay Now” button initiates customers to enter their authentication and customers are given time to settle the payments before their next ride with Uber. Soon after the payment has been made Uber will send the receipt to the customer registered email address. Additionally, Uber also accept payment via PayTM Wallet [20]. After a trip begins, Uber app provides an estimated time of arrival (ETA) that inform customer the approximated time they are supposed to arrive at their destination. Due to a variety of external factors that might cause traffic problem or detour, the ETA is sometimes not that accurate. Before making a request, customer can see how long nearby drivers will take them to the destination based on the time shown in the black SET PICKUP LOCATION bar. After the trip starts, the app will continually update the ETA for the rest of the journey until the vehicle arrives at the customer intended destination [20].

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## 2) *Drivers:*

Based on survey and administrative data, it appears that the platform has attracted drivers to become Uber partners mainly due to the flexible working hours, the way Uber compensate the drivers and less variation between earnings per hour and the number of working hours. The majority group of Uber drivers comprises of those who already have jobs prior to joining Uber platform, either as full time or part time employees. The drivers continue working with their prior employers, mainly because of the platform's ability to provide drivers with the convenience of setting their own working hour. Another factor that allures driver into joining Uber is drivers are able to smooth the fluctuations in their income [25].

Based on a survey result conducted in the year of 2014, 91% of the drivers agreed to the reason that they joined Uber to get extra income for the family, 87% wanted to be their own superior who could set their own working hour, 85% preferred to be partners with Uber for the flexibility of schedule to spend time for life and with the family, and 74% were confident that Uber gave them stable income [25].

Uber drivers are charged 25% fee on all fares to pay for: the services they use on the platform, the transfer and collection of fares, the commission for the credit cards, and the cost pertaining to the distribution of invoices to clients. The drivers' income is paid weekly or monthly and is also affected by the number of hours the drivers stay online. Payments are transferred directly into the partners' bank account, and the payment statement is also sent to the drivers with information such as cash fare, card fare, miscellaneous and trip adjustment. Moreover, drivers are also paid for the time they spent online even without any request for rides [20].

## B. *Airbnb:*

Airbnb was founded in 2008 by Joe Gebbia, Brian Chesky, and Nathan Blecharczyk as a "trusted community marketplace for people to list, discover, and book unique accommodations around the world — online or from a mobile phone or tablet." Airbnb platform has connected people to the unique travel experiences with variety of offering in terms of price, spaces and affordability. The platform of Airbnb has provided a two sided market place where hosts can easily monetize their rooms and reveal their excess space to millions of world population. On the other side, travelers can book their choices of accommodations from local hosts and at the same time save money and have a chance to interact with local people in the community. The world-class customer service and the escalating number of its guests have become factors that boost Airbnb service demand [27]. In 2015, the market value of Airbnb was worth about more than \$25 billion [28].

### **Airbnb Value Propositions:**

Based on Figure II, Airbnb value propositions are divided into guest and Host categories in order to cater the two different types of customers in Airbnb business model. Host value propositions include: earn money by renting the space; get insurance for the leased property; and get free photo shoot for property listing through photographers. On the other hand, the guest value propositions comprise: stay at homestay instead of hotel; and cheaper rental price compared to hotel.

#### 1) *Hosts:*

Peer-to-peer platform provides more earnings to owners of the property, that are the hosts in the Airbnb case, who provide the listings [4]. The owners of the space may start joining Airbnb by creating a listing that shows people how their places look like. The listing is like a profile page that hosts can put the information, description, photos and prices of their property to be rented by the guests. By browsing the listing, guests can get a sense of the place or space that they are going to stay at. The host is in the control of the house and are free to set the time when they want the house to be available for renting and also to set rules to be followed by their guests. Airbnb has prepared a platform with tools and resources that will assist guest from getting their home ready and choosing a price, to understanding the responsibilities

under local laws. After guests have confirmed the booking and hosts received messages, hosts plan on how the guests may check in to the house such as by meeting face-to-face, providing a door code or any other preferred methods. Some hosts welcome their guest by offering breakfast. Hosts automatically receive payments 24 hours after their guests check in. Payments are done by services such as Paypal, direct deposit, or international money wire. Airbnb provides free listing for the hosts and charge them 3% fee on each reservation. Sign up entitle hosts to “get access to tools to set a price” that become a factor “in travel trends and prices for similar places.” [27]

Another reason that attracts hosts to let their house is the Host Guarantee offered by Airbnb in order to protect hosts and their homes. The Host Guarantee is automatically included in the service at no extra charge and covers any accidental damages to the house and stuff [27].

Airbnb offers a free photography service for all new hosts in order to attract guests, to get more bookings and to boost the sales. The professional images are important features that lead to more earnings for hosts and Airbnb due to the ability of the photos to convey visual message to guests on how the place looks like and also give them the imagery feeling of the space. This free service depends on the availability of photographers in the area of the hosts locations. Guests will quickly know whether they are eligible for the service just by clicking the “click here to see if you qualify for this free service” button. Airbnb detects the location of guests’ listings and inform them whether the photography service is available or not. Eligible hosts will directly be able to book the photographers on the page at no extra charge. Within 7 days of the request, the photographers will contact the hosts via Airbnb messaging system and will set appointments and discuss anything pertaining to the photo shoot [30].

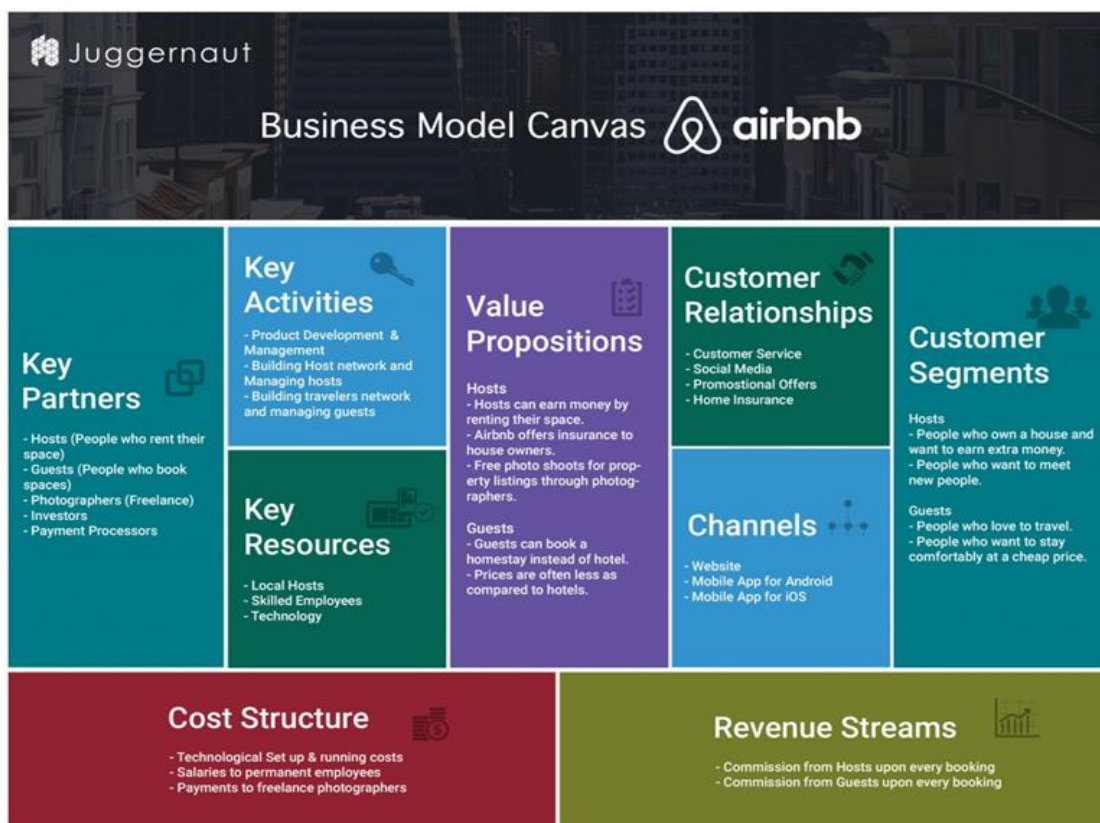


FIGURE II: AIRBNB BUSINESS MODEL CANVAS [29]

## 2) Guest:

One of the interesting advantages of Airbnb lies on the scattered geographical area of the listings such as urban or rural, cities or villages, and other demographic characteristics either crowded or quiet locations. According to Airbnb, more than 70% of the property listings are located outside the main hotel districts [4]. Guests may find authentic local experiences [31] or adventurous experience within their renting space or farther away [27], and can have a chance to live in variety of spaces such as unique house, tree house, or even a yurt [4].

Based on a study, it is discovered that people stay longer at accommodation mediated by Airbnb platform for the cheaper prices it offers. Some customers admitted that they would not have spent their vacation in San Francisco if there was no Airbnb, and this acknowledgement has brought a compelling reason for the San Francisco authorities to reconsider the positive economic impact of Airbnb [32]. A result of another study also revealed that hotels in the Airbnb area have reacted to the Airbnb lower prices by decreasing the price of their rooms despite the negative consequences on the revenue, and at the same time increases the competition in the accommodation industry [4].

## V. ANALYSIS OF UBER AND AIRBNB

The analysis is done by comparing Uber and Airbnb characteristics found in their value propositions with the five pillars of sharing economy and how ICT facilitates sharing economy.

Both Uber and Airbnb hold the five pillars of sharing economy: digital Platforms that spare capacity and demand; transactions that offer access over ownership; more collaborative forms of consumption; branded experiences that drive emotional connection; and understanding economy based on trust. Uber platform matches extra cars, vans and other vehicles with people who need rides, while Airbnb matches the spare rooms, apartments, houses and other types of accommodation with people who are searching for places to stay. The Uber customers do not own the vehicles, and Airbnb guests do not own the places they stay at. Instead, Uber business model lets the customer have rides in vehicles owned by the drivers, whereas, Airbnb business model have the customers pay for the time they spent at the listings rather than buying the property. Uber provides ride sharing service that relies on customers trusting stranger to have comfortable rides. Travellers who stay at Airbnb listings are provided with the ability to make connections with local hosts and personalized tips are given at no extra charge. The value of a brand in both Uber and Airbnb services lie in the social connections that they promote in their business models. Those values are the comfortable ride in Uber cars and the unforgettable experience Airbnb guests undergo through their stay at their own preferable places and environments. Before their first bookings, the customers of Uber and the guests of Airbnb might have never met their drivers and hosts respectively. But, what enables them to have confidence that they will be safe riding with strangers or staying in someone else house is trust [8].

The next comparison is carried out by matching the features found in Uber and Airbnb value propositions with the ways ICT facilitates sharing economy.

Both the trust that the customers have on the Uber drivers, and the trust that Airbnb guests have on their hosts have successfully connected people with someone they have never known before. The peer-to-peer platforms of Uber and Airbnb have successfully enabled the customers and the supply side of both companies to interact with each other in the process of riding Uber cars or lodging the Airbnb properties. Besides, Uber drivers are given incentive to be online by paying them even there is no request for rides. Referral programs launched by Airbnb have encouraged people to invite their friends to become part of the hosts' community and spread the word-of-mouth about Airbnb to attract more guests to stay at Airbnb listings. Uber platform collects customers and drivers' data by the time they sign in to join Uber [27]. Extensive data collection has been practiced by Uber through the Uber app especially data regarding drive-partners' trip, the price of the rides, and the amount of time taken for the trips [25] to be used to balance the supply and demands for the current and future rides. Airbnb also accumulates details about their listings, hosts and guests. The data collected by Airbnb is then used for analysis and predictions of the future bookings [4].

The analysis result is depicted in FIGURE III.

Ways ICT facilitates sharing economy	Uber	Airbnb	Five Pillars of Sharing Economy	Uber	Airbnb
Connects Strangers	Yes	Yes	Digital Platforms that spare capacity and demand	Yes	Yes
Supports Peer-to-Peer Collaboration	Yes	Yes	Transactions that offer access over ownership	Yes	Yes
Increases Incentives to Cooperate	Yes	Yes	More collaborative forms of consumption	Yes	Yes
Acquires Data and information about the past and present, and Predicts the Future	Yes	Yes	Branded experiences that drive emotional connection	Yes	Yes
			Understanding economy based on trust	Yes	Yes

FIGURE III: COMPARISON OF UBER AND AIRBNB PLATFORMS



## VI. CONCLUSION

Sharing economy has been in practice back long time ago in human daily lives and activities, but lately the model has been enhanced and becomes one of the business strategies for competitive advantage. Among factors that contribute to the sustainability of sharing economy are social, economic, environmental and technological drivers. From the study it is concluded that ICT facilitates the sharing economy business model. Businesses that are based on collaborative consumption follow the five pillars of sharing economy: digital platforms that spare capacity and demand; transactions that offer access over ownership; more collaborative forms of consumption; branded experiences that drive emotional connection; and understanding economy based on trust. The phenomenon of sharing practices have become more prevalent in today's world due the development of information and communication social technology that mediates the communication between customers and suppliers regardless of their locations, races, genders and economy status. The peer-to-peer technology on both platforms of Uber and Airbnb technology has made the interaction between customers and supply side possible and more personal. The incentive offered by the platforms also attracts more customers and suppliers to help maintain the sustainability of sharing economy business model. With the prevalence of big data, Internet of Things (IoT) and Data Science, businesses can collect data and information about the participants in their platforms and later leverage the available information to predict the future trends and demands in the industries. Since civilization was built based on collaboration then people naturally embrace the sharing economy or collaborative consumption with the assistance of the advance in technology.

## REFERENCES

- [1] Oxford, "Sharing Economy," 2017. [Online]. Available: [https://en.oxforddictionaries.com/definition/sharing\\_economy](https://en.oxforddictionaries.com/definition/sharing_economy).
- [2] S. Ranchordas, "Does Sharing Mean Caring? Regulating Innovation in the Sharing Economy," *Minnesota Journal of Law, Science & Technology*, vol. 16, no. 1, p. 414, 2015.
- [3] A. d. A. Daunoriene, "Evaluating Sustainability of Sharing Economy Business Models," *Procedia- Social and Behavioral Science*, vol. 213, pp. 836-841, 1 December 2015.
- [4] G. D. P. J. B. Zervas, "The Rise of the Sharing Economy: Estimating the Impact of Airbnb on the Hotel Industry," *Journal of Marketing Research*, 2014.
- [5] Demailly, Damien, *The Sharing Economy: Make it Sustainable*, IDDRI, 2014.
- [6] J. Schor, "Debating the Sharing Economy," *Great Transition*, October 2014. [Online]. Available: <http://greattransition.org/publication/debating-the-sharing-economy>.
- [7] TimeBanks. [Online]. Available: <http://timebanks.org/>.
- [8] PWC, "The Sharing Economy: Consumer Intelligence Series," *PriceaterhouseCooper*, Delaware, 2015.
- [9] A. Sundararajan, "Peer-to-Peer Businesses and the Sharing (Collaborative) Economy: Overview, Economic Effects and Regulatory Issues," in *The Power of Connection: Peer-to-Peer Businesses*, 2014.
- [10] M. C. G. B. J. R. S.-R. Zapatero, "Interpersonal communication in the web 2.0. The relations of young people with strangers," *Revista Latina de Comunicación Social*, 68. La Laguna (Tenerife): Universidad de La Laguna, pp. 436-456, 2013.
- [11] J. B. Walther, "Computer-Mediated Communication: Impersonal, Interpersonal, and Hyperpersonal Interaction," *SAGE Journals*, vol. 23, no. 1, 1996.
- [12] M. Andersson, "Peer-to-Peer Service Sharing Platforms: Driving Share and Share Alike on a Mass-Scale," in *Thirty Fourth International Conference on Information Systems*, Milan 2013, 2013.
- [13] X. Shen, *Handbook of Peer-to-Peer Networking*, New York: Springer, 2010.
- [14] K. Lai, "Incentives for Cooperation in Peer-to-Peer Networks," *Semantic Scholars*, 2010.

- [15] P. Obreiter, "A Taxonomy of Incentive Patterns," in 5th International Workshop, AP2PC 2006, Hakodate, Japan, May 9, 2006, Portugal, 2008.
- [16] H. Maycotte, "How big data is driving the sharing economy," 2017. [Online]. Available: <http://www.techpageone.co.uk/business-uk-en/big-data-driving-sharing-economy/>. [Accessed 7 May 2017].
- [17] T. D. Ruyck, "PREDICTING CONSUMER BEHAVIOR IN ONLINE COMMUNITIES VIA ARTIFICIAL INTELLIGENCE," 24 April 2017. [Online]. Available: <http://www.insites-consulting.com/market-research-online-communities-a-match-made-in-heaven/>.
- [18] F. a. F. T. Provost, "Data Science and its relationship to Big Data and data-driven decision making," Journal of Big Data, vol. 1, no. 1, pp. 51-59, February 2013.
- [19] B. Marr, "The Sharing Economy - What It Is, Examples, And How Big Data, Platforms And Algorithms Fuel It," 21 October 2016. [Online]. Available: <https://www.forbes.com/sites/bernardmarr/2016/10/21/the-sharing-economy-what-it-is-examples-and-how-big-data-platforms-and-algorithms-fuel/#7c5afe0e7c5a>. [Accessed 07 05 2017].
- [20] Uber, "Uber," 2016. [Online]. Available: <https://www.uber.com/>.
- [21] C. B.-v. a. D. M. H. Burken, "Complexities and Dilemmas in the Sharing Economy: The Uber Case," in The 18th Annual International Conference Dilemmas for Human Services: Organizing, Designing and Managing, 2015.
- [22] C. Myers, "Decoding Uber's Proposed \$50B Valuation (And What It Means For You)," Forbes, 13 May 2015.
- [23] M. Blunden, "Uber now lets passengers book a ride one month in advance," Uber now lets passengers book a ride one month in advance, pp. <http://www.standard.co.uk/news/transport/uber-lets-passengers-book-a-ride-one-month-in-advance-a3329056.html>, 25 August 2016.
- [24] D. Oakley, "The Uber Business Model Canvas," 27 January 2016. [Online]. Available: <http://businessmodel.guru/wp-content/uploads/2016/01/Uber-Business-Model-Canvas.png>.
- [25] J. V. & K. A. B. Hall, "An Analysis of The Labor Market for Uber's Driver-Partners In The United States," NBER Working Paper Series, p. Working Paper 22843, November 2016.
- [26] S. Silverstein, "These Animated Charts Tell You Everything About Uber Prices In 21 Cities," 17 October 2014. [Online]. Available: <http://www.businessinsider.my/uber-vs-taxi-pricing-by-city-2014-10/?r=US&IR=T#IRYW1IHqTxdIA3bG.97>. [Accessed 17 May 2017].
- [27] Airbnb, "About Us," 2017. [Online]. Available: <https://www.airbnb.com/about/about-us>. [Accessed 2017].
- [28] S. A. O'Brien, "'Crazy money' - Airbnb valued at over \$25 billion," CNN, 27 June 2015.
- [29] 2015. [Online]. Available: <http://nextjuggernaut.com>.
- [30] D. Papineau, "How to Get Free Airbnb Photography & Double Your Income Overnight," 2016. [Online]. Available: <http://www.airbnbsecrets.com/airbnb-photography/>. [Accessed 1 May 2017].
- [31] D. Guttentag, "Airbnb: disruptive innovation and the rise of an informal tourism accommodation sector," Current Issues in Tourism, vol. 18, no. 12, pp. 1192-1217, 2 September 2015.
- [32] S. a. L. H. S. Cannon, "How Uber and the Sharing Economy Can Win Over Regulators - HBR," Harvard Business Review, 13 October 2014.