Disruptive Innovation Service Oriented Framework: A Case Study of Transportation in Indonesia

*Muharman Lubis[1], Arif Ridho Lubis[2] and Etri Ernovianti[3]
[1]*Telkom University, Jalan Telekomunikasi No. 1, Bandung, Indonesia*
[2]*PoliteknikNegeri Medan, JalanAlmamater No. 1, Medan, Indonesia*
[3]*Universiti Utara Malaysia, Sintok, Kedah, Malaysia*

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Abstract: The rapid progress in every related IT field give tremendous impact on the changing pattern life in the social community. Indonesia as the one of most populated countries have significant influence on technological progress along with the growing number of start-up that launched and introduce to the market. In addition, some of them focus on delivering various services in transportation, which have purposes to reduce waiting time and payment cost. Therefore, some incumbents and certain group of people claim that this start-up do more harm to the market than to bring benefits. On the other hand, there is also problem in term of the regulation, which no regulation governing the use of start-up of transport capital, caused by the government's current transport regulations. Thus, the need for synergies from all stakeholders associated with the innovation should be encouraged to allow the healthy competition and atmosphere in the community. This study will explore the current trends and characteristics of innovation, focused on disruptive innovation to develop framework to maintain business process run well without creating conflict that bring disaster to the harmony of the existing community.

SCIENCE AND TECHNOLOGY PUBLICATIONS

1 INTRODUCTION

ICT has evolved exponentially in this following years especially after dotcom bubble disaster and multiple cases of starting up rising to multinational company. Previously, Internet utilization seemed to be dominated by top business actors who have strong resources in the field of ICT but through the high availability and accessibility of information create shortcut to introduce new innovation to offer service or product. Therefore, digital gap and digital divide can be occurred to accept the innovation in the society due to the lack of human resources, low infrastructure readiness and small Internet bandwidth. Historically, several first mover companies who became the pioneer in utilizing internet got tremendous benefits such as dominating the market demand, determine the direction of innovation, increase the sales quickly and reduce the production cost compare to the competitor. However, only small number of them can survive to face rigorous completion and the quick change of demand such as Amazon, Apple and Google while the others have gone bankrupt for example Atari, Kodak and Geocities. Arguably, these result is derived from the differences in concern for attempting to encourage innovation to all division and unit in order to improve product or service quality and customer satisfaction in multiple attributes or aspects. However, it should take a note that innovation is not sufficient to maintain business longevity without integrating with the company strategy, the readiness, employee motivation and business vision. Therefore, learning from the failure of incumbents that is failed to control the market, can provide general insight on how innovation work. Meanwhile, various studies related to innovation has been begun in this following year create other focus field such as social-preneur, techno-preneur, intra-preneur and entrepreneur.

Indonesia has many respected techno-preneur such as AchmadZaki (Bukalapak), Ferry Unardi (Traveloka), Jason Lamuda (Berrybenka), ShintaBubu (Bubu.com), AlamandaShantika (former Vice President of Gojek), AuliaHalimatussadiah (Kutukutubuku.com), Diajeng Lestari (Hijup.com),

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Nadine Makarim (gojek) and Cynthia Tenggara (Berrykitchen.com). Therefore, to protect the sustainability of economies, disruptive innovation are supposedly welcome to maintain the equilibrium and to reduce the gaps of the customer perception towards the intrinsic value of technological innovations and the business objective in regard to transform some component of non-consumers into consumers oriented (Brad, et. al., 2016). In fact, it creates complex problem that damage the economic atmosphere in individual and national level. One sector that got the spotlight is transportation which is a major component of the living system of the social community. On the other hand, population density in a country greatly affects the ability of transportation in serving the needs of society. The provisions of Act No. 22 of 2009 Chapter 5 Paragraph (1) stated "*The State is responsible for Traffic and Road Transport and its guidance is carried out by the Government*". For the minimum service standards of road-based mass transport, the minister of transportation has arranged the framework in the Constitution No.22 of 2009 paragraph (3). Therefore, the transportation law is still not in accordance with the desired expectations to accept the innovation as there are the disputes between city transports combined with Taxi Company challenged the legitimacy of application-based firm.

One development of start-up itself can be seen in transportation for example is Go-Jek, Grabtaxi, Uber, Bajaj App and so on. In addition, the use of startup especially transport has been practiced by several neighbourhood countries such as Singapore, Malaysia, Thailand and Australia. In Indonesia, the citizen appreciate the appearance of this alternative as it bring more benefits compare to incumbent's service. Furthermore, over time, there have been many disputes with conventional transportation demanding that start-up based transportation companies follow the standard of transportation. These occurred because there are some gaps in communication, synergy and harmonization between stakeholders to support the rising case of start-up based transport, such as commission of Ministry of Informatics and Ministry of Transportation. Government also has not established a legislation policy to regulate start-up based transportation companies using black plates or private vehicles. The health competition is where each of the actors is not trying to find faults against their rival but trying to correct his own mistake by offering competitive advantage or added value in their service or product. Thus, the government should consider the mediating framework to anticipate the disruptive innovation which bring unfairness to the market considering its growth that is very rapid while the economic culture in Indonesia cannot be left in the hand of liberal approach.

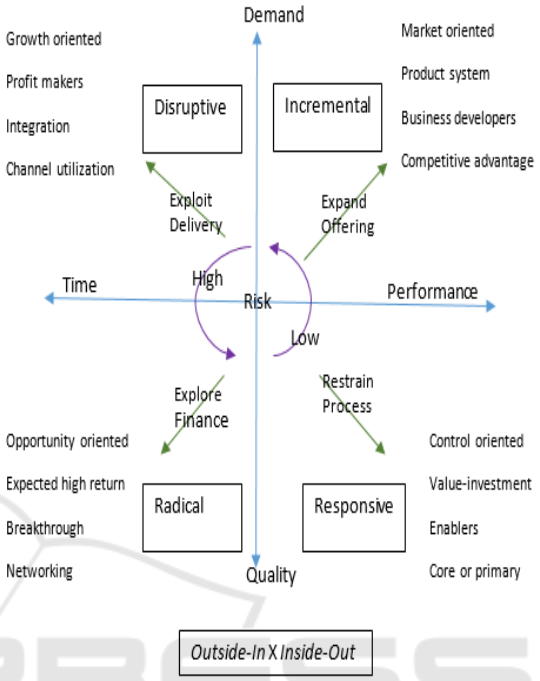

Figure 1: Categorization of Innovation Type.

In his book, Christensen mentioned that user is eager to find out those who have capability to support their objective as fast as possible and measure its successes based on three criteria, which are transparency level, delivery convenience and represents value match cost. Meanwhile, technological enablers provides routine solutions to problem and disruptive business model in affordable way are two necessary conditions to increase the business scale (Christensen, et. al., 2016). Technological developments have an enormous influence on the direction of change and innovation, with the high demand for efficiency and effectiveness of causing producers to need to innovate (Hamid & Maulana, 2017). In short, there are several characteristics to determine the classification of innovation that corporation should consider, such as incremental innovation have low risk to obtain and it has purposes to expand and offer the increases in term of productivity and collaboration by providing competitive advantages, focus on performance of product system and demand from customers. By understanding the differences, the corporation can decide the proper strategies they

utilize to sustain their capabilities and capacities in competing with other corporation and start-up to develop so called healthy ecosystem, without necessary breaking the harmony by monopolizing the industry or maintain the status quo.

2 LITERATURE REVIEW

2.1 Online Transportation Services

With the rapid advancement of technology, the integral part of smartphones use becomes daily routines in every aspects. As mobile commerce grow rapidly, the company need to clearly understand consumer perception and acceptance by considering the critical factors that determine the successful adoption IS project (Wu and Wang, 2005). Meanwhile, in computing devices and virtual worlds, individuals need to identify every possible approach to create new set of boundaries, constraints and limitations in order to negotiate several interests and components to obtain benefits in specific spaces (Lubis, et. al., 2017). As the newest service innovation in mobile commerce, online transportation provides several benefits such as driver and customer can know each other's location accurately, customer can see the driver and vehicle information and customer can easily find transportation to commute to other place with more efficient time compare to previous mechanism (Farin, et. al., 2016). Therefore, there are challenges in optimizing the characteristic of m-Commerce such as the development of device for cost effective placement, maintenance and desirable energy scavenging. Other challenges is related to verify and validate the reading consistency and suitable standardization of a huge number of sensors used ubiquitously, algorithms and protocols for processing and investigation of data developed (Albishi, et. al., 2017). The development of m-commerce is considered more potential than e-commerce due to the exponential growth of mobile device in Indonesia with around 326.3 million SIM-card registered in 2016, an amount that exceeds the total population of Indonesia (Septiani, et. al., 2017).

The need for online transport service is influenced by various factors such as cost, quality of service, income, psychological factors and ownership of the mode of transportation used (Narayanaswami, 2017). If used to be conventionally managed and sole proprietorship, new taxi motor business is now emerging as a commercial enterprise, providing public transportation services and professionally managed (Sriyanto, 2017). In Indonesia, several TNC such as Go-Jek, Uber and Grab find difficulty because their business process conflicted with certain legal status and issues. According to Indonesian Ministry of Transportation, TNC have violated the Regulation No.22/2009 on Road Transport Traffic. It stipulates that the transport companies without the required permit to transport people, no required verification and validation of vehicle testing, not using vehicle ID for public transport and the driver does not have the required driver's license for public transport are considered a violation. The Indonesian government requires all mobile service application to work in partnership with rental car or the registered taxi companies. Therefore, TNC have helped set up joint partnership with the drivers, while mobile serviced based firm such as Go-Jek, has developed its own company called PT Panorama MitraSarana in aligning with the need of their application (Nurhidayah&Alkarim, 2017).

The policies issued by government will bring either good or bad situations for all business and is impossible to be fit and please all interest, but entrepreneurial should be encouraged to avoid the accumulated long-term problems (Sari, 2015). On the other hand, price promotion has an effect on repurchasing intentions for non-traditional ojek through perceived value (monetary and non-monetary) and thus affects transportation mode preferences consecutively (WollenbergandWaty, 2017). Meanwhile, comparison study between Grab and Gojek, indicated that positive user experience, task success and earning in Gojek compare to Grab although there is no different in term of happiness of user (Chan, et. al., 2017). With the appearance of direct tariff when ordering, then the customer will be easier to know how much cost to be prepared. In contrast to taxi drivers, where they often set the tariff is too high and must be bargained for some time just to come down, which obviously takes time and cost (Sriyanto, 2017). Changes made are expected to add value to the product by simplifying the production process (Hamid, 2017).

2.2 Disruptive Innovation Management

Might still fail in response to new competition because there is no attempt to re-purpose the capabilities of technological advantages and recognize the constraints imposed by legacy obligation by calculate the value of winning, consider working collaboratively and achieve new market expansion (King, 2017). Although a

disruptive technology is the essence of what causes an incumbent to fail and exit the market but it is not the origins causes as the existing technology could not able to compete with the performance to satisfy the consumers (Tan andHenten, 2006). Interestingly, the theory of disruptive innovation presents some intriguing inconsistencies for management scholar but the core concepts remain widely misunderstood (Christensen et. al., 2016).

When first introduced, disruptive innovation tend to be inferior on accepted performance in almost all dimensions compare to incumbent services or products, yet offer a novel combination of new attribute that attract to small portion of group of customers, which want cheaper prize, more accessible or more convenient kind of service (Markman & Waldron, 2014). In addition, current customers and established business models depended on the investments of incumbent in new innovations to improve the capabilities of their product and service. The attempt to deliver added value to current business activity felt unattractive to current incumbent while be attractive for entrants who find opportunities to satisfy small fragment of customers because of fewer competitors' rival. Consequently, incumbents are typically not motivated to develop their own disruptive innovations that promise lower margins, target smaller markets and introduce inferior products and services that their existing customers cannot use (Christensen et. al., 2016). On the other hand, the disruptors find the chance to improve the performance of their primary objective is to grow or build intangible branch and digital assets. Unfortunately, large and successful corporation are not capable of breakthrough innovation, which their internal process are built in such a way that they always choose the more predictable scenario, losing the real picture of the future (Vertakova, et. al., 2016). Therefore, the adoption of innovation will be influenced by the characteristic of the innovation and the success of the information system (Soemantadiredja, et. al., 2015). Therefore, to carry out progressive IT related research on the topic of disruptive, it is important to understand different type of disruptive, which are disruptive technology innovation (DTI), disruptive business model (DBM) and disruptive new market (DNM) (BaiyereandSalmela, 2013). A disruptive technology is probably the outcome of a substitute product as the result of radical innovation that has been rejected or neglected due to high risk or corporate failed to see its opportunities (Tan andHenten, 2006).

3 RESEARCH METHOD

Researchers investigate disruptive innovation trend in the context of Indonesia through article report in newspaper, journal and article paper. To analyse the trend to balance between demands and expectations, this study propose analytic review on various aspects based on design problems and issues using PACT (people, activities, context and technology). The qualitative model was used by having four stages, which are analysis of preferences and assessment needs. It is really important to start up to back to earlier IT function as enabler or solver for their daily life, also develop the system in which customer satisfy with the collection features to offer. In addition, identification of barriers and design of requirement should be conducted to find alternative solution and provide win-win solution. Commonly, the disruptive innovation from respected company have the tendency to transform their business core into non-bank financial tech corporation to be survived because they do not have large assets and high number of employee to be handles. Unfortunately, it creates economic problems to the society in the long term because of the high inflation that is extremely difficult to handle that lead to currency value or declining purchasing power.

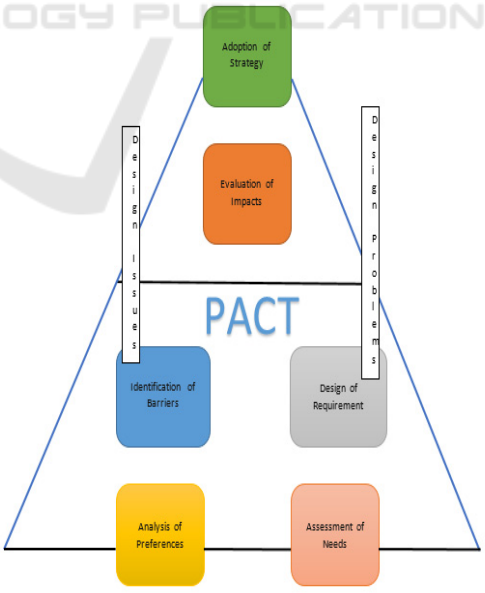

Figure 2: Qualitative Model of Investigation Service Oriented Framework.

After the impacts evaluation, the proper adoption strategy should be developed in relation to customer acceptance and community readiness. Indeed, this four processes should be conducted as equal to the importance of environmental effect analysis (AMDAL) to avoid the construction development bring disaster to ecological lifecycle. Meanwhile, the model also implies that different set of criteria are required depending on the client type, which can be divided into four tiers. The first tier contains contextual factors that affect the customers. Particularly, environmental incidents and the appearance of multiple emerging markets may affect clients' needs. The second tier contains the perspective of clients' needs and preferences, which constitutes the basis of the analysis. The third tier emphasizes the distinct constraints, which mostly the potential client face several barriers in regard to consumption mechanism where existing client possess saturation levels. Consequently, the fourth tier that focuses on effects, unfold the results of the constraints such as overexposed, emerging drivers, preference changes and non-consumption attributes (Reinhardt and Gurthner, 2011).

4 DESIGN PROBLEMS AND ISSUES

In short, there are six core principles of value added that disruptive innovation should take to avoid conflict to incumbent and increase the longevity to survive in the era of technological advancement, which bring many pioneers of innovation goes bankrupt because cannot deal to the trend changes. Commonly, organization take advantages on their inherit skill and experience from their structure and system to control and manage operational and technical process comprehensively. Thus, profit oriented and revenue driven become the primary priorities in developing competitive advantages to attract and serve customers, which should be maintained strictly to balance the competition in the market, which do not harm others in the large scale but encourage for the improvement. In this context of online transportation, the disruptive innovation can be developed through 6 (six) values design as follow:

Value Proposition: One of customers' preferences is the value of service or product offered by the company, thus proper timing and user satisfaction is really important to create customer loyalty and brand recognition.

Value Perception. Every customer might consider value differently, which depend on several integrated factors such as culture, religion and norm. Those values are reflected under their life pattern involving even the eating or sleep order. Understanding the user behaviour is one step to identify user experience.

Value Expansion. In each innovation, there are several barriers that deter the implementation. Therefore, the regulation is the critical solution to bridge gaps between expectation, demand and request to avoid conflict.

Value Expression. The requirement specification should consider the platform that allow flexibility and availability of providing idea, solution, suggestion and recommendation ubiquitously by increasing the platform visibility, so the collaboration discussion can be optimized as the design thinking need time to be fruitful.

Value Creation. Efficiency is the service-oriented goals while satisfaction is the outcome-based that corporation go forward in developing the application system. Therefore, company should not focus only on profit but also encourage ethics and respect to customer to anticipate negative impact.

Value Summation. Adoption strategy should highlight the customer acceptance and readiness as the problems depend on the certain event turn points. Thus, ensuring the user curiosity by establishing the joint partnership with academician can maintain the quality of service under radar.

This study utilized 12 criteria in PACT to analyse preferences while the design problems is related to the needs assessment, which are risk mitigation, learnability, exclusivity, manoeuvrability and flexibility, multiple path, physical movement, bandwidth, information visualization, good overview, digital receipt, intimacy and appeal aspect, and lastly difficulty to access the system. Meanwhile, The barriers are derived from design issues namely inoperability, brand avoidance, limitation of the application, sustainability and survivability, recovery plan, misconception and misdirection, product requirement and infrastructure resources, scheduling issues, conventional architecture, consumer perception, language barriers and posture sizes. Thus, through understanding those preferences, needs and barriers, the company or developer can develop the design requirement by make list of priorities involving must, should, could and would have. Importantly, the organization should define and develop the domain of service level, know the ethical dimension and decide firm-level drivers of customer's protection and train the

employee to appreciate the value of customers' data more than the others (Lanier and Saini, 2008). Any breaches of security should be treated as a disciplinary issue that follow appropriate measurement by organization (Rosmaini, et. al., 2018).

Table 1: Detail Problem and Issues in Design based on PACT Criteria.

No	Criteria based on PACT	Design Problems (Identify, Current Situation, Solving)	Design Issues (Predict, Future Condition, Anticipate)
1	Input-Output Channel	*Risk mitigation* is conducted through increasing the number of supplier or partner and reduce the supply chain network reduction, which might depend excessively by customer satisfaction.	*Inoperability* of assets and employee work under disruptor company have high risk in term of economic losses as customer loyalty based on solely on price war.
2	Mental Model	As customer want the *learnability* of application is improved due to suggestion and complaint, the big data analysis have difficulty to distinguish between insightful idea and tricky statement.	The generation will have gaps based on specific trend they engage upon during their life, so certain religious or cultural value might give bad impression to the service provider in long term lead to *brand avoidance*.
3	Social Differences	Value creation will depend more on the *exclusivity* offer by company to provide proudness and euphoria in using the service and product, as well as classify certain status or category in the society, which create friction and conflict.	Innovation must have catalyst and trigger, as disruptor goes high to the top, they should maintain status quo, which often fail to fully deliver on their promise to improve due to *limitation of the application*.
4	Safety-Critical	Difficult to do *maneuverability* and *flexibility* as the business process depend mutually to application performance and quality, which easily got distracted by customer complaints.	The company can increase the growth of the company through expanding the coverage of service by do partnership, but the debt will haunt the *sustainability* and *survivability* of company.
5	Cooperative -Complex	Possibility of *numerous paths* in service delivery, open the high risk of loss in term of partner investment while high traffic can reduce the customer expectation of required time to arrive in destination on time.	The *recovery plan* cannot be conducted based on feasibility as employee and partner commitment cannot be trusted and often lacks of reactivity and decision-makers based on context-specified.
6	Temporal Aspect	It is crucial to proactively control the operation of *physical movement* on service delivery to handle disruption and priorities to comply with promise and satisfaction of users.	The evaluation of application performance solely based upon the service quality deliver to the customer through partner, which have high tendency to acquire *misconception* and *misdirection*.
7	Physical Circumstanc	There is no other choice to	Single isolation

	es	access the application except mobile device to detect the signal or transmission over a wide *bandwidth* and limited to the available quota of service providers and customers.	system that avoid integrated functional elements and technology feature can disrupt flow and process to meet *product requirements* and *infrastructure resource* in meeting consumer satisfaction.
8	Organizational Context	*Information visualization* on specifying the quality nature of problem from statistical data without considering much on data quality in regard to magnitude and structure of data such as driver background or request.	The *scheduling issues* is decomposed in several sub-problem on how to maintain the coherence of local solution of each sub-problem while dealing with their dependencies in coordination with every components or interacting agents.
9.	Social Context	The result of delivery service should provide *good overview* over the current condition or situation, which accommodate customer satisfaction and driver expectation to facilitate the improvement.	As practitioners of *conventional architecture* that has a long established tradition or design pattern have been reluctance to learn new system due to differences in pattern and direction.
10	Data & Media Characteristic	*Digital receipt* can be accessed through email only while intangibility problem	As the digital became relevant in delivering the service to customer, the
		remains as possible viewpoint are normally limited to specific recognized place.	*perception* on the scale might not reflected in practical way accurately.
11	Communication Channel	Face to face discussion or conversation has been replaced by computer mechanism, which reduce several *human aspects* in interacting each other like appeal and intimacy that can lead to the consumer trust and loyalty.	*Language barriers* can make huge differences even though only small details as consumer and service provider are very sensitive to slightly different in selecting words.
12	Physical Differences	There is certain deterrents from disability people to have access over the application, at certain point the color blind or people with eyesight issues have also difficult to differentiate icon, label and color.	The different *posture size* in relate to weight and height could be problematic in near future as the customers are limited to use certain type of product continuously.

5 CONCLUSION

This research focuses on the role of customer analysis in the process of creating disruptive innovations that bridging gaps between incumbent and current regulation. In addition, when company investigate customer's behaviour, further parameters have to be considered in terms of determining the disruptive potential of an innovation, which provide solution to specific problem in certain customer segments. The determination of market parameters, the information collection and analysis about new technologies, the assessment of distribution channels and a competition analysis are other important steps that are required for the success of disruptive innovations adoption strategy. Moreover, the weight

requirements that were proposed in the assessment model could be added with other component in PACT because it is very unlikely that all of these factors are equally important. Accordingly, the research was limited on six aspects of disruptive innovation based on initiative and characteristic from literature reviews, such as preference analysis, need assessment, barrier identification, design requirement, impact evaluation and strategy adoption. Further analysis on disruptive should accommodate the result of logical initiation of stage analysis with case study in comparing several disruptor in specific context.

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