A Pilot Study of Technology Adoption: An Analysis of Consumers' Preference on Future Online Grocery Service

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Abstract. *The huge number of smartphone users in Indonesia is the main reason that most of new online retailers choose to develop mobile application-market based grocery. However, online grocery goes through sluggish rate of development due to minimum level on adoption of technology by consumers. The most barriers in adopting this technology are difficulties in transaction, late deliveries, incomplete information, and difficulties with site navigation and complex procedure also security in money transaction. Through literature review, this study attempts to go further to elaborate mobile application online grocery features that can be applied to promote an increasing online grocery service adoption. Based on the finding, the best combination features which more likely support customers to perceived convenience in using online grocery service is mobile application that contain nutritional quality information, allows customers to search the product by its attribute, provide order status tracker that allows customers to trace their groceries and provide cash on delivery service as payment method.*

Keywords: *Online grocery service, mobile application features, mobile technology adoption, technological change, consumer behavior.*

1. Introduction

ICT has fundamentally transformed most of industries to be e-business and transformed customers to be e-shoppers (Macgragor and Vrazalic, 2005). Online commerce and electronic grocery (e-grocery) enable business development to ensure flexibility and prompt market response in an increasing competitive environment, this new form of business can be considered as service innovation (Alba et. al., 1997; Aldin, Brehmer, & Johansson, 2004). Service innovation combines the introduction of new product and the introduction of new process for making delivering goods and services that elevated service offering to client (Greenhalgd & Rogers, 2007; Agarwal & Selen, 2011).

Service delivery technology has become important operating element of this new way of business (Oliveira and Martins, 2011; Thulani et. al, 2011). Previous research reveals that online purchase for food remains a niche market because of several obstacles such as the requirement to significant change in

purchase behavior (Robertson, 1967; Mintel 2007). In online grocery, especially fresh products and meats, customers found disadvantages since they cannot use their sensory, when consumers purchase a grocery product, they really depend on sensory examination such as touching, smelling and feeling to determine the freshness or appropriateness of the product, online purchase also diminish physical activity and the pleasure of bargaining while shopping (Darian, 1987 ; Tauber, 1972, Verhoef & Langerak, 2001).

Purchase grocery by online also has certain issues that become inhibitor to adoption of technology such as difficulties in transaction, late deliveries, incomplete information, difficulties with site navigation and complex procedure also security in money transaction (Elliot & Fowell, 2000 ; Kaufman-scarborugh & Lindquist, 2002; Hansen, 2005). Technology adoption defines as the choice to acquire and use new invention or innovation (Hall & Khan, 2003).

In spite of lower adoption rate of online grocery technology by customers, conventional retailers and start-ups slowly starting to enter the online market in recent years. Several Indonesian start-ups has developed online grocery which their main products is fresh product such as vegetables, fruits, meats and fisheries. Web-market based also mobile application-market based has become their choices to enter this industry. We can mention several brands that has been entered the industry within this 2 years such as Limakilo.id, Sayurbox.com, Tukang Sayur, Sayur Mayur, and Nyayur, multinational start-up also joined this industry by their mobile application grocery such as Happyfresh. Most of them choose mobile application-market based to reach customers, or use both web-market and mobile application, Sayurbox.com is the only online grocery that use only web-market.

The huge number of smartphone users in Indonesia maybe is the main reason that most of those new online retailers choose to develop mobile application-market based grocery. In 2016, 65,9 millions people using smartphone in Indonesia and will increase to 91,9 millions in 2020. Currently, Indonesia has already become the third-largest smartphone market in Asia-Pacific region. It estimated that 57 percent of all smartphone users in Indonesia purchase goods and service online (Indonesia-investment, 2016; eMarketer, 2016; Statista, 2017). In this huge number of opportunity, download rate of those mobile applications only reach five hundreds downloads within 2 years. It indicates that e-tailers go through sluggish rate of development due to minimum level on adoption of technology by customers, compared with the download rate of mobile application from another e-tailers industry such as e-tailers which selling lifestyle product, fashion, and make up that can reach up to ten thousands within same years.

The literature of innovation states that the success of innovative products and services relies on perceived characteristics of the innovation such as relative advantage, compatibility, complexity, divisibility, and communicability (Rogers, 1983). Verhoef and Langerak (2001) suggested that consumers' perceptions of relative advantage, compatibility, and complexity can occur at the pre-purchase stage while divisibility and communicability occur at the pre-purchase stage and suggested online retailers should design simple ordering and fulfillment procedure also accommodate simple procedures that are convenient to consumers. Previous study pertaining to adoption of online grocery technology has set out factors that triggered adoption of this technology, Muhammad, Sujak and Rahman (2016) suggested efficiency, system availability, fulfilment and privacy as variables that should be consider in develop online grocery, temporal perspective and lifestyle change also have positive relationship with online shopping.

Lim, Widdows, and Hooker (2009) focused on the characteristics of online grocery, they mention that effective presentation of product information, good e-business quality, ability to personal interaction are positively related to adoption of e-grocery technology. Much research highlighted detail information of products as main factors, Lim and Dubinski (2004) stated that support and choice helpers are key interactivity dimension of e-commerce also a variety of merchandise and reliability in online transaction are the characteristics that triggered adoption of these technology.

Much in previous study has explored the characteristics and the inhibitor factors of online grocery which can influence the adoption of this technology, but research in mobile application that focusing on the features of e-grocery to promote the adoption of its technology is rarely found. The features of e-grocery consider as important tools to attract consumers to try the service innovation first. Customers will adopt the technology if they believe that by using this technology would save physical and mental effort and

improve their job performance (Legris Ingham, & Collerette, 2003; Chuttur, 2009). Accordingly, this study attempts to go further to elaborate mobile application online grocery features that can be applied to promote an increasing online grocery service adoption. The findings of this study are used to propose sustainable development of online grocery retailers.

2. Literature Study

Intention to adopting technology
There are three type of innovation: continuous, dynamically continuous and discontinuous. A continuous innovation is a minor technological advancement requiring no changes in existing consumer behavior. A dynamically continuous innovation is a new product representing major technological advantages that do not basically change existing consumer behavior, while a discontinuous innovation is a major technological advance leading to new behavioral pattern among consumer behavior (Robertson, 1967). Online grocery is considered as discontinuous innovation since customer should change their behavior toward purchase the products (Robinson, Dall'Olmo Riley, Rettie, & Rolls-Willson, 2007; Lim, Widdows and Hooker, 2009). Marketing strategies for a discontinuous innovation should be consider the main motivation from customer. Costumers' main motivation on online grocery shopping is convenience and time saving (Morganosky & Cude, 2002). The consumer adoption process focuses on the mental process through which an individual consumer passes from first hearing about the online grocery service to final adoption (Verhoef & Langerak, 2001).

Much research failed to produce reliable measurement that could explain acceptance or rejection of technology. However, in 1985 Fred Davis proposed the technology acceptance model (TAM) by relying on previous work by Fishbein and Ajzen (1975) who proposed the theory of reasons action

(TRA). TAM has been the only one which attract more attention of the Information System community, while the development of theory in technology acceptance is remain continue (Chuttur, 2009).

TRA proposed prior beliefs and evaluation are related to person's attitude towards behavior, which mean a person's positive or negative feelings about doing the actual behavior. Furthermore, normative beliefs and motivation also proposed and have relationship with subjective norm. Subjective norm can be defined as person's perception towards people who considered as their important people think about the person when he or she perform certain behavior (Chuttur, 2009).

Ten years later, Davis adapted the model in order to develop the technology acceptance model (TAM). This model examines the causal linkage between two key beliefs and the behavioral attitudes and intention of users. A key purpose of TAM is to provide a basis for tracing the impact of external variables on internal beliefs, attitudes, and intentions. It suggests that perceived ease of use, and perceived usefulness are the two most important factors in explaining system use (Legris et. al., 2003). Perceived ease of use can be defined as the level of individual believes that by using a certain system would be less physical and mental effort, while perceived usefulness refers to the level of individual believes that by using a certain system would improve their job performance (Legris et. al., 2003; Chuttur, 2009).

The extended model of TAM is TAM2 that proposed by Venkatesh and Davis (2000). TAM2 accommodate social influence and cognitive instrumental which are additional key determinants of perceived of usefulness in TAM. Social influence category include :
• Social norm refers to the influence of peers on whether they should perform the behavior in question.

- Voluntariness which consider whether the usage intention is a mandatory or non-mandatory usage.
- Image refers to the effect of using technology and the status of an individual.
- Experience refers to the increasing in the system experience may subside subjective norm effect.

Cognitive instrumental category include :

- Job relevance can be define as the performance of the given system in doing relevance task.
- Output quality refers to the assessment from individual while using a technology.
- Result demonstrability relates to the tangibility of the result of using the technology.

The TAM2 in a few years latter was redevelop by Ventakesh (2003) through consider the external influence which the original TAM does not consider. The additional external factors in UTAUT model are facilitating conditions and social influence. Facilitating condition refers to the level of individual trust regarding to what extent organization and technical infrastructure can support the use of technology, while social influence more similar to subjective norms which consider their peer belief to the importance of using the new technology. The UTAUT model also add performance expectancy that similar to perceive of usefulness and effort expectancy that similar to perceived ease of use in original TAM.

While TAM2 only explores the perceived of usefulness, perceived ease of use is explored in TAM3. This model developed by Ventakesh and Bala (2008). The additional constructs include :

- Computer self-efficacy refers to the level of belief of an individual has the ability to perform a task.
- Perception of external control relates to the individual belief regarding the compatibility of organization and technical support for the technology.
- Computer anxiety refers to the level of fear while using a new technology.
- Computer playfulness can be defining as the basic motivation from individual for using a new technology.
- Perceived enjoyment refers to individual belief to feel satisfied in its own right while perform activity using the given system.
- Objective usability is the level of effort required to complete specific task by using a novel technology.

The advancement era of mobile technology led to the development on the technology acceptance model. Mobile technology acceptance model developed by Ooi and Tan (2016) which also adopt original TAM with perceived ease of use and perceived usefulness. More constructs in MTAM include:

- Mobile perceived compatibility refers to the mobile innovation can accommodate and enhance past experiences, needs, value and behavioral patterns.
- Mobile perceived financial resources refer to individual beliefs that he or she has sufficient financial resources to use the new technology.
- Mobile perceived security risk refers to the level of fear associated with mobile transaction.
- Mobile perceived trust refers to psychological expectation that others part will be sincere while doing mobile transaction.

Table 1.
Summary of Technology Acceptance Model

No	Technology acceptance model	Attribute
1.	TAM (Davis, 1985)	Perceived ease of use Perceived usefulness
2.	TAM2 (Venkatesh and Davis, 2000)	Social influence : subjective norm, voluntariness, image and experience Cognitive instrumental process : job relevance, output quality and result demonstrability
3.	TAM3 (Venkatesh and Bala, 2008)	General beliefs about technology : computer self-efficacy, perception of external control, computer anxiety, computer playfulness, perceived enjoyment, objective usability.
4.	UTAUT (Venkatesh et al, 2003)	Peformance expectancy, effort expectancy, social influence and facilitating conditions.
5.	MTAM (Ooi and Tan, 2016)	Mobile perceived compatibility, Mobile ease of use, Mobile perceived financial resources, Mobile usefulness, Mobile perceived security risk, Mobile perceived trust

In related to online grocery technology, Rogers (1983) specify his research on the characteristics of online grocery that influence rate of its adoption. The characteristics are :

- Perceived relative advantage refers to the degree to which consumers perceive online grocery shopping to be superior to in-store shopping.
- Perceived compatibility refers to the degree to which consumers' perceive online grocery shopping can fulfill their shopping needs.
- Perceived complexity refers to the degree to which consumers find online grocery shopping difficult to understand.
- Perceived divisibility refers to the degree to which online grocery shopping can be tried on a limited basis.
- Perceived communicability refers to the degree to which the benefits of use of online grocery shopping are observable or describable to others

Previous Research in Online Grocery Service
E-commerce refers to commercial transactions between and among organizations and individuals by using internet and the Web where exchange of value

(money) between organizations and individuals occurs in return for product and services (Laudon and Laudon, 2014). The benefits of e-commerce can be experienced by sellers and customers. Sellers are easier to offer their products and services to a larger number of customers than in conventional market channel and customer can find and choose wider range of product, and easily compare several product for the best value at the best price. E-commerce also enable better direct communication between sellers and customers that led to possibilities optimization of supply a better product and reduce inventory levels (McIvor, Humphreys, & Huang, 2000; Murtaza, Gupta, & Carroll, 2004; Cagliano, 2015). E-commerce can be a strategy to enhance performance of business operation through speeded up the order, delivery, and payment process, so that operating cost will be reduce while increasing customer service (McIvor, et. al., 2000; Tarofder, Marthandan, Mohan, & Tarofder, 2013).

In the beginning, most of e-commerce using a personal computer connected to the internet. While several wireless mobile alternatives such as smartphones and tablet computers have

emerged, e-commerce transaction take place using m-commerce technology. In Indonesia, m-commerce is one of new channels to implement online grocery service. Online grocery is called e-tailers, e-tailers sells physical products directly to consumers or to individual business (Laudon & Laudon, 2014).

A mobile application is a digital infrastructure where seller can offer their product and service to wide range of customer. Customers evaluates this infrastructure through their experience, perceive convenience is the main motivation of customers in adopt online grocery service, while perceive in complexity which is mean customer find ease of use promote customers to convenience in using this technology (Wolfinbargar & Gilly, 2003; Lim, Widdows, & Hooker, 2009; Laudon & Laudon, 2014). Therefore, providing features which most required by customer might be a solution to promote an increasing mobile application grocery adoption.

Adapted from Rogers' research about characteristics that influence consumer adoption of online grocery technology, Verheor and Langarek (2001) suggested three characteristics that more likely to consider by customer in prior stage or before using this technology, there are perceived relative advantage, perceived compatibility and perceived complexity. Perceived relative advantage and compatibility positively influence the intention to adopt online grocery technology, while perceived complexity negatively influence the intention to adopt this technology. Perceived convenience emerged as a potential factor in specify consumers' perceive relative advantage and compatibility. Convenience is the biggest motivation for online grocery shoppers. Convenience is closely related to reducing physical efforts and time consuming, but physical intangibility aspect can be a factor that increase consumers' hesitation while shopping grocery online because the needs of physical examination is cannot be fulfilled (Verhoef & Langarek, 2001; Lim, Widdows, & Hooker, 2009). Thus, availability of full information enable

consumers to indirectly experienced important products attributes at the pre-purchase stage. (Lim, Widdows, & Hooker, 2009).

Perceive inconvenience also can be triggered due to the limitation to physically interact with salespeople's. Previous studies shown the positive effect of salespeople's performance on customers' satisfaction (Grewal & Sharman, 1991). Customer service in online shopping service should be responsive, provide compensation service, and available to contact (Zeithaml, 2002). Although, physical interaction is restricted in online shopping service, availability of interactivity dimension by seller is remain important because of sometimes customers cannot solve the problem by themselves (Lim, Widdows, & Hooker, 2009).

In choosing market channel, easiness to find and get the products also availability of products are factors that consumers consider as important factors. (Rozhan, Mohd Hafizuddin, & Noorlidawati, 2013). The attractiveness of online shopping is enabling consumers to save their time in finding and comparing alternative of products (Bell, et. al., 1998). In physical store setting, layout of the store, product merchandise, and sign system are designed to help consumers find their needs, while in online store, application design which easy-to-search positively can enhance consumers' confidence in using online shopping store (Baker, Parasuraman, Grewal, & Voss, 2002). The simpleness is a key to help shaping customers' perceptions that online grocery technology is rather user friendly (Verhoef & Langarek, 2001). Accordingly, optimization navigability of the application can be a possible way to avoid perceive complexity from consumers.

Muhammad, et. al. (2016) mention safety on money transaction is a very important when do online shopping. Online payment system takes advantage of wireless and communication technologies since it allows payment to be made via SMS message, WAP

online billing, PIN number trans mission, Mobile Web, direct-to-subscriber bill and direct to credit cards transaction through mobile phones that require credit card details

or debit card number, it can be an inhibitor to customer perceived convenience in using online grocery service (Kim, Mirusmonov, and Lee, 2010).

Tabel 2.
Previous Studies and Position of the Study

No	Author	Findings	Gaps
1	Lim, Widdows, Hooker (2009)	Delineate a significant transition of e-fulfillment strategies among grocery retailers.	The study not elaborate the feature of online groceries or mobile grocery application, while current study focus to elaborate feature of mobile grocery application to promote adoption of these technology
2	Muhammad (2009)	Hesitation in doing payment and difficulties in contacting the seller are the factor that prevent customer to using e-commerce	The study investigate how e-grocers develop their e-fulfillment strategies to satisfy product-specific customer needs for grocery hopping on the internet, while current study focus to elaborate feature of mobile grocery application to promote adoption of these technology
3	Verheof and Langerak (2001)	Consumers' perception of the relative advantage and compatibility of electronic grocery shopping positively influence their intention to adopt electronic grocery shopping	The study focus on the motivation of consumer to adopt e-grocery service, while current study focus on mobile grocery application features
4	Lim and Dubinsky (2004)	Evaluative criteria that consumers use when selecting e-tailers : - Merchandise - Convenience - Interactivity - Reliability - Promotions - Navigation The most noticed by customer for evaluating the web commerce are merchandise and interactivity	The study focus on the evaluation criteria that customer use in the post period of using online commerce, while current study focus on the feature of mobile grocery application that important for customer in the prior period of using mobile grocery application

Attributes and attributes level
The biggest motivation of customer in using online grocery service is convenient aspect. Convenience can be achieved by reducing such risks which have been explained by previous research such as physical intangibility aspect that prevent the needs of physical

examination during selecting process, confusion while finding the products, hesitation in doing payment, and difficulties in contacting the seller when facing problem (Bell, et al., 1998; Zheitaml, 2002; Baker, et al., 2002; Lim, Widdows, Hooker, 2009; Muhammad, et. al., 2016). In theory of

technology adoption, according to Davis (1985) there are two aspect of system that influence its adoption, perceived usefulness and perceived ease of use. When individual believes that his/her perfomance would be better when using a certain system it indicates that he/she perceived usefulness of this system, while perceived ease of use is fulfilled when the individu believes that by using certain system would be save their physical and mental effort. In theory of characteristic by Rogers in 1983 which specified by Verheof and Langerak (2001) the technology would be more adopted in prior stage of using the technology by user when the technology has characteristic that can make users perceived relative advantage it refers to feel the better experience than using previous technology, perceived compatibility when users feel that their needs has been fulfilled and inhibit users to perceived complexity. Conveniece can be achieved when the technology offers relative advantage, compatibility and incomplexity (Veheof & Langerak, 2001; Lim, Widdows, & Hooker, 2009).

In designing mobile application that can fulfilled those characteristics, this study try to generate features to support perceived convenience by customers. First, the barriers in physical examination. Detail information of the product particularly for fresh products is a substitution of physical examination which usually do by customer while shopping in physical store. Through information, customer can experience indirect physical examination to evaluate product attributes (Verhoef & Langarek, 2001; Lim, Widdows, & Hooker, 2009). This aspects would be consider as assistance to fulfill the needs of physical examination while selecting process, which can help customers to perceived compatibility. The quality, safety, and production attributes of fresh food have become emerging issue since consumers put more attention to it. Lim, Widdows, and Hooker (2009) suggested to deliver quality, e-tailers should providing full nutritional quality. Product safety and production attributes are attributes from the products that cannot be

ensure by direct experience. Product safety closely related to chemical residual percentage or whether the product is organic or not, while production information is related to place of origin (Wirth, Stanton, & Wiley, 2011).

Secondly, much of Indonesia's online consumers are afraid to shopping online because they afraid of fraud probability if they cannot directly meet the sellers (Internet Service Provider Association, 2013). It can be a triggered to customer perceive inconvenience toward adopt online grocery shopping. There are several choices of payment modes which commonly used by online customer in Indonesia, such as manual bank transfer, cash on delivery (COD), and credit card. Most of population choose manual bank transfer while credit card the least use of payment mode (Singapore Post, 2014).

Third, the confusion while finding the products. In online shopping, customers are expect to less their search cost. Search cost on the internet refers to internet connection time, actual time and effort taken for the users to search e-tailer's product, and time to download information in online store (Gupta & Chatterge, 1997). When customers found delaying in downloading of information, they likely to give up online shopping (Weinberg, 2000). Thus, e-tailer's should provide the fastest way to consumers to get the purposed information or product. It would support customers to perceived relative advantage and usefulness. There are two ways of navigation, first, consumers navigate through a hierarchy of departments and stop when they found a specific department, and second, the consumers can requesting by product attribute (such as price) then choose between several similar products (Benn, Webb, Chang, & Reidy, 2015).

Fourth, the difficulties in contacting the seller when facing problem. Interactivity dimension on the online store refers to the existence of two-ways communication between sellers and customers which can access in anywhere at

any time (Blatteberg & Deighton, 1991). This aspect would be helpful to support customers in perceived ease of use also inhibit perceived of complexity while using this technology and enhanced overall experience because (Liu & Shrum, 2002). Finding from previous research found that the most interactivity aspect frequently used by consumers is customer support. Online customer support allows customers to get service related-information. The online customer support facilities that usually provide by web-based online commerce are personal helper via live chat facilities and online communities via social network (Truel & Connelly, 2013), while most of mobile application based online grocery especially in Indonesia basically not provide the interaction facilities feature on their mobile application. Most of mobile grocery application provide phone number or email address for customer service facilities that usually use for after purchase problem, also social media address that basically not for customer service facility but for marketing and promotion activities although usually customer also use it as a media to report complains or ask the availability of the product. Accordingly, in this study, there are three proposed interactivity features, as follow: personal-choice helper, online communities and order status tracking. Although order status tracking not included in customer support facilities that most provide by online commerce but order status tracking features can be consider as one of interactivity dimension since it provides actual information regarding waiting duration to get the products. This feature can help to customers become more tolerant and perceive convenience (Weinberg, 2000; Benn, et. al., 2015).

Table 3.
The Differences between Previous Attributes and Attribute levels and Current Study

No	Factor	Attribute	Lim and Dubinsky (2004)	Current Study
1	**Merchandise**		√	x
		Product information	√	√
		Variety of merchandise	√	x
2	**Interactivity**		√	√
		Customer-support	√	x
		Personal choice-helper	√	√
3	**Reliability**		√	x
		Good reputation	√	x
		Security	√	x
		Privacy	√	x
4	**Navigation**		√	√
		Time to get to home pages	√	x
		Time to download web pages	√	x

There are some differences in the use of attributes and attributes level between previous study by Lim and Dubinsky (2004) and the current study. First, merchandise which provide by e-tailers can be different from what conventional market provide because in digital media, e-tailers can provide as much as they want because they do not have to pay attention to physical space limitation (Lim & Dubinsky, 2004). The types of merchandise can be product information and brand. The focus of this study are mobile grocery application that sell fresh product such as vegetable, fruit, meats and fishery, so

that the merchandise type such as brand is not much relevant especially for Indonesian customer. They do not put much attention on brand of the fresh products. The information regarding quality, safety, and production attributes of fresh food have become issues that customer more concern about than the brand of the fresh product itself. Accordingly, this study directly put information as a factor, after that, generate it to be the attributes that represent the quality, safety, and production.

The second is interactivity dimension. The current study also proposed interactivity dimension as one of a factor but mention a different attribute. Based on previous study by Truel and Connelly (2013), customer support can be divided to two different forms, as follow, in personal helper via live chat media and online communities via social network media. Accordingly, in this study the two forms of customer support consider as attribute levels that represent interactivity factor. The another attribute level that proposed in this study is order status tracker that not mention in previous study. Order status tracker can be a critical issue especially for fresh products since the products are perishable product which customer put more attention to the freshness of the product (Wirth, et. al., 2011).

Thirdly, the current study not consider reliability dimension as one of factors. The reliability in the previous study refers to information regarding company and this dimension is the third most important criteria consumer consider (Graphics, Visualization, & Utilization Center, 1998 ; Lim & Dubinsky, 2004). Although information regarding company consider as the third most important factor in evaluating online commerce service, security and privacy gaining more attention among online commerce customers (Bellman, Lohse, & Johnson, 1999). The security and the privacy that customer concern about are more about the transaction system. When online customer made a transaction using credit card, they hesitated to release their credit card information. This is also the problem for

Indonesian customers (Singapore Post, 2014). Hence, instead of using reliability as an attribute, the current study directly posits payment modes dimension as one of attributes with three attribute levels namely manual bank transfer, cash on delivery, and credit card. All the three attributes are the payment modes that common use in Indonesia.

The last dimension is navigation dimension. This current study also proposed navigation as one of attributes but with different attribute levels. Previous study proposed time to get to homepage and time to download web pages as attributes and the result shows customers stated that this dimension is necessary but insufficient (Lim & Dubinsky, 2004). Accordingly, this study proposed two ways of navigation, hierarchical navigation and request by product attribute as attribute levels to know which more sufficient for the customer.

3. Methodology

Conjoint Analysis Basic Concept
Conjoint analysis has emerged as one of the major tools for uncovering consumer perceptions (Cattin & Wittink, 1982; Holbrook, 1981; Haggerty, 1985). The conceptual model of conjoint analysis is rather straightforward, this approach differ in the way preferences are obtain from respondents for a set of hypothetical choice alternatives. Conjoint methods are intended to reveal the principal preference function of a product in terms of its attributes (Rao, 2013). The most fundamental concept in conjoint analysis and the conceptual basis for measuring value is the utility of the attributes. Utility is as subjective judgment of preference unique to each individual. In conjoint analysis, researcher must identify all of the important factor that could affect preference, called attributes. Each attributes have possible values defines as attribute levels. These values enables the researcher to then describe an object in term of its levels on the set of factors characterizing it (Hair, Anderson, Tatham, & Black, 1999).

Data Collection
Due to this study only a pilot project, so the sample for this study only 30 of woman, with age range 21 - 31 years old from two big city in Indonesia, Bandung and Jakarta. Today, beauty and baby products are the most popular items sold online, it indicates that woman still dominate in purchase activity. Grocery items, especially vegetables, fruits and fresh food items are daily needs of customer that most of all purchase by woman more specifically by mother. According to statistical data, woman within 21 – 31 year old are the most online shoppers (Indonesia-investment, 2016; eMarketer, 2016). That is why the author choose woman in age range 21-31 year old as a sample.

Conceptual model
This study conducted using the conjoint analysis, which in preliminary stage this study used literature review to formulate the attributes and attribute levels that will be used. Then for the main study, the data collection

collected by using questionnaire from sample survey.

Data Preparation
The attributes and attribute levels are the first thing to define in conducting conjoint analysis. In this study the attributes and attribute levels are determined based on the literature review. These attribute and attribute levels are the features in mobile application for online grocery that enhance perceived of convenience and superiority.

Second step is to design the combination of attributes and attribute levels. The attributes and attribute levels combination was determine using orthogonal design by IBM SPSS 23 and resulted in 22 combinations (see Appendix 1). This combination need to be rated by the respondents using 5 likert scale in the questionnaire to determine which combination most satisfying and less satisfying by consumers.

Table 4.
Attributes and Attribute Levels

Attributes	Attribute Level
Information features	• Nutritional quality • Chemical residual percentage • Place of origin
Payment transaction features	• Manual bank transfer • Cash on delivery (COD) • Credit card
Navigation features	• Hierarchical navigation (product divided into certain departments) • Requesting by product attributes
Interaction dimension features	• Personal-choice helper • Online communities • Order status tracker

4. Findings and Discussion

The most important attribute to the respondent is the payment transaction

features (33.4%). The second most important feature is information features (27.3%), followed by interactivity dimension features (26 %), and search navigation features (13.3%).

Table 4.
Utility Score

		Utility Estimate	**Std. Error**
Information	Nutritional quality	.161	.048
	Chemical residual percentage	-.124	.048
	Place of origin	-.037	.048
Payment	Manual bank transfer	-.124	.048
	Cash on delivery	.265	.048
	Credit card	-.140	.048
Navigation	Hierarchical navigation	-.056	.036
	Request by product attribute	.056	.036
Interactivity	Personal-choice helper	.003	.048
	Online communities	-.069	.048
	Order status tracker	.066	.048
(Constant)		3.556	.036

All of the attributes are statistically significant. The Table 2 shows the utility scores and their standards errors for each attribute levels. Higher utility scores indicate greater preference. The most preferred combination features has nutritional quality information, cash on delivery payment method, search navigation features by using request by product attribute and order status tracker as interactivity dimension feature. This combination is represented by combination number 18.

Information Feature
Of the three information features, respondents indicated a higher preference (0.161) for information of nutritional quality. Chemical residual percentage has a lowest score (-0.124), indicating that respondent not put much attention on chemical residual percentage information during pre-purchase stage of fresh product in online store. Although all of the attribute levels are reflected of important information for consumers, as mention by Wirth, et al., (2011) that consumers' attention to the quality, safety and productions attribute of food have become increase, this study shows nutritional quality is the main important information. It indicates that nutritional quality information can be a substitute to the physical examination during pre-purchase stage of fresh product in online store.

Payment Transaction Feature
Payment is one of the risk that consumers take when purchase product online (Katawetawaraks & Wang, 2011). In this study, payment transaction feature is the most important attribute considered by respondents, while cash on delivery is the payment mode that mostly choose by respondent. When purchasing product in online store, trust is one of the most critical issue since consumers cannot meet the seller physically (Prasad & Arysri, 2009).

Accordingly, customers more likely to choose cash on delivery method because they do not have to give their personal information regarding credit card number or another personal information that can make them feeling unsecure. In Indonesia, this payment mode is rather preferred by online customer since only a few of online customer is using credit card (eMarketer, 2017 & Singapore Post, 2014).

Navigation Feature
The result for navigation feature shows that this attribute has the lowest score of importance (13.3%). However, respondents put more attention to navigation mode that allow them to request by product attribute than product divided to certain departments. When products divided in certain department,

customer still have to look down through the page to find the proposed product. At the same time, the main attractiveness of online grocery shopping is simpleness that allows customers to save their time and physical effort (Bell, et al., 1998; Verhoef & langerak, 2011), so that availability search tools that allows customers to search by product attribute really contibute in customers to perceived easiness in online grocery.

Interactivity Dimension Feature
The interactivity dimension has high enough score in the level of importance (26,05%). In this study, the result shows, the most preferred interactivity dimension feature is order status tracking with utility score 0.066. Order status tracker features was not consider as interactivity dimension that commonly provide by online commerce in the previous studies but the result of this study shows that this feature is the most important interactivity dimension for customer if they adopt mobile grocery service. Order status tracker feature can solve the problem of feeling uncertainty while waiting the product arrived (Weinberg, 2000; Benn, et. al., 2015). Online communities feature consider as the most unimportant features that should be added in mobile grocery application. It maybe because customer ussualy using another application such as social media application to contact or get in touch with the developer when they have problem after the purchase or before the purchase.

5. Conclusions

The purpose of this study is to elaborate features on mobile application grocery that can be applied to promote an increasing online grocery service adoption. In this paper, author purposed four attributes and eleven attributes levels, first attribute is information features with attribute levels nutrition quality, chemical residual presentation, and place of origin; second, payment transaction features with attributes levels, manual bank transfer, cash on delivery and credit card; third, search

navigation features with attribute levels hierarchical search and request by product attributes; and the last is interactivity dimension features with attribute levels, personal-shopping helper, online communities, and order status tracker. The conjoint analysis was conducted to elaborate the combination of features in mobile application online grocery that most preferred by customer.

The result suggests that the best combination features which more likely support customers to perceived convenience in using online grocery service is mobile application that contain nutritional quality information, allows customers to search the product by its attribute, provide cash on delivery service as payment method and provide order status tracker that allows customers to trace their groceries. Certainly, the result of this study should be re-tested with more sample since this study only a pilot study.

However, the result of this study can show us that by reduce the disturbance feeling in using mobile grocery service through provide more interactivity dimension can be one of the factor that support the adoption level of mobile grocery service. This paper elaborated features that can help to increase online grocery service adoption based of customers' motivation in prior using its technology. Future research might consider the period after using online grocery service, to enrich elaboration in mobile application features to promote sustainability in using this service.

References

Alba, J., Lynch, J., Weitz, B., Janiszewski, C., Lutz, R., Sawyer, A., & Wood, S. (1997). Interactive home shopping: consumer, retailer and manufacturer incentives to participate in electronic grocery shopping. *Journal of Marketing*, 6, 38-53.

Aldin, N., Brehmer, P.-O., & Johansson, A. (2004). Business development with electronic commerce: refinement and

repositioning. *Business Process Management Journal,* 10 (1), 44-62.

Baker, J., Parasuraman, A., Grewal, D., & Voss, G. (2002). The influence of multiple store environment cues on perceived merchandise value and patronage intentions. *Journal of Marketing,* 66, 120-141.

Bell, D. R., Ho, T. H., & Tang, C. S. (1998). Determining where to shop : fixed and variable cost of shopping. *Journal of Marketing Research,* 35, 352-369.

Bellman, S., Lohse, G. L., & E.J. Johnson. (1999). Predictors of Online Buying Behavior. *Communications of the ACM,* 42(12), 32-38.

Benn, Y., Webb, T. L., Chang, B. P. I., & Reidy, J. (2015). What information do consumers consider, and how do they look for it, when shopping for groceries online ?. *Journal of Appetite,* 89, 265-273.

Blattberg, R. C., & Deighton, J. (1991). Interactive marketing : exploring the age of addessability. *Sloan Management Review,* 31(1), 5-14.

Cagliano, C. A., De Marco, A., Rafele, C., Bragagnini, A., & Gobbato, L. (2015). Analysing the diffusion of a mobile service supporting the e-grocery supply chain. *Business Process Management Journal,* 21(4), 928-963.

Cattin, P., & Wittink, D.R. (1982). Commercial Use of Conjoint Analysis. *Journal of Marketing* (46:3), Summer, 44-53.

Chuttur M.Y. (2009). *Overview of the Technology Acceptance Model: Origins, Developments and Future Directions.* Indiana University, USA. Sprouts: Working Papers on Information Systems, 9(37).

Darian, J.C. (1987). In-homeshopping : are there consumer segments?. *Journal of Retailing,* 63, 163-186.

Emarketer. (2016). *Breaking down Indonesian smartphone habits by age.* Retrieved from https://www.emarketer.com/Article/Breaking-Down-Indonesian-Smartphone-Habits-by-Age/1014225, in April 23, 2017.

Elliot, S., & Fowell, S. (2000). Expectations versus reality : a snapshop of consumer experiences with internet retailing. *International Journal of Information Management,* 20, 323-336.

Geuens, M., Brengman, M., & S'Jegers, R. (2003). Food retailing, now and in the future: a consumer perspective. *Journal of Retailing and Consumer services,* 10(4), 241-251.

Grewal, D., & Sharma, A. (1991). The effect of salesforce behavior on customer satisfaction: an interactive framework. *Journal of Personal Selling & Sales Management*, 11(3), 13-23.

Gupta, S., & Chattergee, R. (1997). *Consumer and corporate adoption of World Wide Web as a commercial medium, in Peterson, R.A. (Ed),* Electronic Marketing and the Consumer, Sage Publications, Thousand Oaks, CA, pp. 123-138.

Hair, J., Anderson, R.E, Tatham, R.L, & Black, W.C. (1999). *Multivariate Data Analysis (Fifth Edition ed.).* Prentice-Hall International, Inc.

Hagerty, M.R. (1985). Improving the Predictive Power of Conjoint Analysis: The Use of Factor Analy-sis and Cluster Analysis. *Journal of Market-ing Research* (XXII), 168-184.

Hall, I. B. H., & Khan, B. (2003). *Adoption of new technology.* Department of Economic, UCB. UC. Barkeley, pp. 1-20.

Holbrook, M.B. (1981). Integrating Compositional and Decompositional Analyses to Represent the Intervening Role of Perceptions in Evaluative Judgements. *Journal of Marketing Research* (XVIII), 13-28.

Hand, C., Riley, F. D., Harris, P., Singh, J., & Rettie, R. (2009). Online grocery shopping: the influence of situational factors. *European Journal of Marketing,* 43 (9/10), 1205-1219.

Indonesia-investment. (2016). *What do Indonesians do with their smartphone internet?.* Retrireved from http://www.indonesia-investments.com/news, in April 23, 2017.

Indonesia-investment. (2016). *E-commerce Indonesia: What do Indonesian consumer buy online?* Retrireved from

http://www.indonesia-investments.com/news, in April 23, 2017.

Katawetawaraks, C., & Wang, C. L. (2011). Online Shopper Behavior : Influences of Online Shopping Decision. *Asian Journal of Business Research,* 1(2).

Kaufman-Scarborugh, C.K., & Lindquist, J. D. (2002). E-shopping in a multiple channel environment. *The Journal of Consumer Marketing,* 19(4/5), 333-350.

Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behaviour,* 26(3), 310-322.

Laudon, K. C., & Laudon, J. P. (2014). *Management information system, Chp. 10: E-commerce, digital market, digital goods.* 13th ed. Pearson Education Limited.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Journal of Information and Management,* 40, 191-204.

Lim, H., Widdows, R., & Hooker, N. H. (2009). Web content analysis of e-grocery retailers: a longitudinal study. *Int Journal of Retail and Distribution Management,* 37(10), 839-851.

Lim, H., & Dubinsky, A. F. (2004). Consumer's perceptions of e-shopping characteristics: an expectancy-value approach. *Journal of Services Marketing,* 18(7), 500-513.

Liu, Y., & Shrum, L. (2002). What is interactivity and is it always such a good thing? Implications of definition, person, and situation for the influence of interactivity on advertising effectiveness. *Journal of Advertising,* 53-64.

MacGregor, R. C., & Vrazalic, L.(2005). *Role of small-business strategic alliances in the perception of benefits and disadvantages of e-commerce adoption in SME.* In M. Khosrowpour (Ed.), Advance Topic in Electronic Commerce (Vol. 1). London: Idea Group publishing.

McIvor, R., Humphreys, P., & Huang, G. (2000), Electronic commerce: re-engineering the buyer-supplier interface,

Business Process Management Journal, 6(2), 122-138.

Mintel. (2007). *Food Retailing* – UK, November 2007, Mintel International Group Limited, London.

Morganosky, M.A., & Cude, B.J. (2002). Consumer demand for online food retailing: is it really a supply side issue?. *International Journal of Retail & Distribution Management,* 30(10), 451-458.

Muhammad, N. Z., Sujak., H., & Rahman, Abd. S. (2016). Buying groceries online : the influences of electronic service quality (eServQual) and situational factors. *Procedia Economics and Finance,* 37, 379-385.

Murtaza, M.B., Gupta, V., & Carroll, R.C. (2004). E-marketplaces and the future of supply chain management: opportunities and challenges. *Business Process Management Journal,* 10(3), 325-335.

Oliveira, T., & Martins, M.F. (2011). Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation,* 14(1), 110–121.

Ooi, K-B, & Tan, G.W-H. (2016). Mobile technology acceptance model: an investigation using mobile to explore smarphone credit card. *Exper System with Applications,* 59, 33 – 46.

Prasad, C., & Aryasri, A. (2009). Determinants of shopper behavior in e-tailing: An empirical analysis. *Paradigm,* 13(1), 73-83.

Rao, V.R. (2013). *Applied Conjoint Analysis, ch. 2.* Springer-Verlag Berlin Heidelberg.

Robertson, T.S. (1967). The process of innovation and the diffusion of innovation. *Journal of Marketing,* 31(1), 14-19.

Robinson, H., Dall'Olmo Riley, F., Rettie, R. & Rolls-Willson, G. (2007). The role of situational variables in online grocery shopping in the UK. *The Marketing Review,* 7, 89-106.

Rogers, E.M. (1983). *Diffusion of innovations.* The Free Press, New York, NY.

Rozhan, A.D., Mohd Hafizuddin, Z., Noorlidawati, A.H. (2013). Marketing channels for fresh vegetables and fruits in

Malaysia. *Acta Horticulturae*, 1012, 1371–1378.

Singapore Post. (2014). *Indonesia 9 eCommerce Facts*. Singapore Post Limited.

Statista. (2017). *Number of smartphone user in Indonesia from 2011 to 2021*. Retrived from https://www.statista.com/statistics/2667 29/smartphone-users-in-indonesia, in April 23, 2017.

Truel, O., & Connelly, C.E. (2013). Too busy to help: Antecedents and outcomes of interactional justice in web-based service encounters. *International Journal of Information Management*, 33, 674-683.

Tarofder, A.K., Marthandan, G., Mohan, A.V., & Tarofder, P. (2013). Web technology in supply chain: an empirical investigation. *Business Process Management Journal,* 19(3), 431-458.

Tauber, E.M. (1972). Why do people shop?. *Journal of Marketing,* 36, 46-59.

Thulani. D, Njanike, K., Manomano, C., & Chiriseri, L. (2011). Adoption and use of sms/mobile banking services in Zimbabwe : an exploratory study. *Journal of Internet Bank Commer,* 16(2), 149–167.

Venkatesh, V., & Davis, F.D. (2000). A theoretical extension of the technology acceptance model: four longitudinal field studies. *Management Science,* 46(2),186-204.

Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly*, 27(3), 425-78.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, 39(2), 273-315.

Verhoef, P.C., & Langerak, F. (2001). Possible determinants of consumers' adoption of electronic grocery shopping in The Netherlands. *Journal of Retailing and Consumer Services*, 8(5), 275-85.

Weinberg, B. D. (2000). Don't keep your internet customers waiting too long at the (virtual) front door. *Journal of Interactive Marketing,* 14(1), 30-38.

Wirth, F. F., Stanton, J. L., and Wiley, J. B. (2011). The relative importance of search versus credence product attributes : organic and locally grown. *Agricultural and Resource Economics Review*, 4(1), 48-62.

Wolfinbargar, M., & Gilly, M.C. (2003). eTailQ: dimensionalizing, measuring and predicting etail quality. *Journal of Retailing,* 79, 183-98.

Zeithaml, V.A. (2002). Service excellence in electronic channels. *Managing Service Quality,* 12 (3),135-8.