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# Examining the effect of radical innovation and incremental innovation on leading e-commerce startups by using expectation confirmation model

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## Abstract

The purpose of this study is to compare the effect of strategic entrepreneurship through different innovation approach between two leading digital multi-sided platform (MSP) e-commerce startups, Bukalapak, that use incremental innovation approach, and Shopee that use radical innovation approach to face the business challenge during Covid-19 pandemic. Using structural equation modeling (SEM) with the partial least squares method, the researchers use an extended expectation confirmation model (ECM) from a customer point of view to analyze the effect of the innovation efforts. A questionnaire was distributed to people who purchased a Bukalapak or Shopee online shopping application during the covid pandemic with the purposive sampling method. Finally, the analysis was performed with a total of 300 samples from Bukalapak and Shopee users. The results show that confirmation positively impacts perceived enjoyment, satisfaction, and customer engagement in both Bukalapak and Shopee cases. The results also show that perceived enjoyment and satisfaction engagement positively impact continuance intention as the manifestation of innovation. However, in the Bukalapak case that performs incremental innovation, the customer engagement is insignificant on continuance intention, while it is significant in the Shopee case that performs radical innovation. This study suggests enabling the customers to engage more in an e-commerce platform through a radical innovation approach by providing services beyond e-commerce scope (ex: mini-game, gamification activities, etc.) will likely lead to favorable responses and lasting relationships.

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*Keywords:* Strategic entrepreneurship; radical innovation; incremental innovation; confirmation; perceived enjoyment; satisfaction; customer engagement; continuance intention; multi-sided platform

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## 1. Introduction

The outbreak of the Covid-19 pandemic, specifically in Indonesia since early March 2020, made the Government of Indonesia implemented the physical distancing to inhibit the spread [1]. Thus, it changed the way people do daily business. One of the options is online shopping using e-commerce [2], which increased up to 300% on e-commerce applications for buying and selling essential and necessities goods [3]. During the containment of the pandemic, e-commerce has increased around 130 percent from the same period in 2019, which is Shopee Apps [4]. Besides, the director of SnapCart, Astrid Wiliandry, mentioned Shopee Apps became superior compared to other e-commerce as Shopee provides more attractive product ranges, competitive prices, and more features to increase the users' experience and engagement the app [5].

In contrast, Bukalapak, as one of Indonesia's unicorn-labeled digital MSP startups, experienced a dropped in user consumption to 12.5 percent. Thus, there is no guarantee that the app's performance will always be similar even though engaged in the same area. Therefore, this study compares the effect of strategic entrepreneurship through different innovation approaches between two leading digital MSP e-commerce startups: Bukalapak and Shopee. Bukalapak uses an incremental innovation approach by focusing on enhancing e-commerce services. Shopee uses a radical innovation approach by offering a wide range of entertainment services on top of their e-commerce platform. The researchers use an extended expectation confirmation model (ECM) from a customer point of view to analyze the effect of the innovation efforts.

A user experience is vital in measuring the quality of e-commerce. The customer needs an understandable and learnable service also an enjoyable user experience [6][7]. Enjoyment is seen as an inherent motivation to ensure the adoption of technology-based services or products. One of the dimensions allows the development of flow experience in human-computer interaction [7]. Moreover, the success of a mobile app may depend on the ability to give people something that adds a value of engagement [8]. In addition, to better realize the technology-based services or products advantages, it is substantial in understanding how people use emerging technologies such as e-commerce [9][10]. Finally, the long-term viability of an information system relies more on the *continuance intention* [11]. Therefore, this study will examine Bukalapak and Shopee e-commerce, especially in the user experiences using the Expectation Confirmation Model (ECM).

ECM is one of the contributing research studies designing and testing the theoretical information systems (IS) continuity model to differentiate between IS acceptance and continuity behavior [12]. ECM pays attention to factors that influence consistency and retention since the long-term success and viability of an IS are determined not merely by initial use alone but by continuous use [13]. *Continuance intention* is described as how much an individual is currently making a conscious effort to continue using a mobile phone to purchase products or services in the future [14][15]. The ECM briefly said that the *continuance intention* to utilize IS precedes three constructs: expectation confirmation, perceived usefulness, and satisfaction. It explained that confirmation of any technology's utilitarian value, perceived usefulness, leads to satisfaction, and the user intends to continue to apply this specific technology [16][17]. The current study proposes a modified ECM that includes *perceived enjoyment*, *satisfaction*, and *customer engagement*.

Digital retailers with strong online reputations usually improve their websites' social and competitive environment to increase enjoyment and boost acceptability when using a website [18]. *Perceived enjoyment* concentrates on the intrinsic motivation that emphasizes the use and represents the delightful, pleasure, and inherent satisfaction of using a device [18]–[20]. Besides *perceived enjoyment*, *satisfaction* indicates a positive, neutral, or negative attitude about using computer applications [21]–[23]. Eventually, satisfied users plan to continue using the IS, while unsatisfied users intend to leave the service; however, they cannot discontinue use due to mandatory use [24]. Concerning social media facilities and interaction, customer engagement creates a customer's physical, cognitive, and emotional presence [25] [26]. Creating an atmosphere that requires more engage consumers can produce higher profits in the long term [14] boost the firm's long-term reputation, and indirectly contribute to the firms' business success through the new customers.

In addition, ECM states that the actual usage of ISs would confirm or refutes initial expectations [22]. The confirmation process is dynamic, in which people who interact with a technique constantly evaluate their user experience, compare the experience with their previous expectations and produce either confirmations or disconfirmations [22], [27], [28]. This means that users may experience cognitive dissonance if it is not confirmed.

On the other hand, users can partake in the same cognitive process to alleviate the dissonance in mobile shopping [7]. Related to the practice of using the technology [7], [29], [30]. This concept refers to the user's assumptions that their expectations are compatible with the actual output of ISs [22].

## 2. Hypotheses development

### 2.1. *The influence of confirmation on perceived enjoyment, satisfaction, and customer engagement*

An improvement in confirmation could be an efficient solution to minimize the displeasure with the benefit. One of the key determinants is *perceived enjoyment*, and it has been shown that *perceived enjoyment* is significantly determined by their confirmation [30]. ECM states that the actual usage of ISs would confirm or refutes initial expectations such as *perceived enjoyment*, for instance, when users do not have definite initial perceptions [22]. A study by [7][31] claimed that confirmation had a positive impact on *satisfaction* as the expected benefits of using the information systems were achieved. Users may not be concrete about their initial perception of customer engagement due to uncertainties. However, their understanding of customer engagement has changed when they experience and confirm their expectations [32]. Thus, confirmation has a relationship to customer engagement, although indirectly through perceived usefulness and *satisfaction*.

H1: *Confirmation influences perceived enjoyment*

H2: *Confirmation influence satisfaction*

H3: *Confirmation influence customer engagement*

### 2.2. *Perceived enjoyment, satisfaction, and customer engagement influence continuance intention*

A study by [33] shown that *perceived enjoyment* is one of the critical factors affecting continuity. Furthermore, [34] found a valid connection between users' *perceived enjoyment* and *continuance intention*. [10] has performed a longitudinal survey to test a model and explains why people are still playing online games that demonstrate the relationship between *perceived enjoyment* and *continuance intention*. *Satisfaction* is the main driving factor in perpetual behavior and the most powerful predictor of *continuance intention* [27]. Moreover, a high user *satisfaction* level would be strongly intent on continuing to use or spend more time on the application [35]. Finally, high levels of customer engagement with certain mobile apps more likely create favorable consumer attitudes, resulting in the continued use of mobile apps [8]. Consumers will be likely to act without extensive decision-making on previously learned behavior patterns. Several studies indicate that customer engagement has a relationship to *continuance intention* as the manifestation of innovation outcome [36][37].

H4: *Perceived enjoyment influences continuance intention*

H5: *Satisfaction influence continuance intention*

H6: *Customer engagement influence continuance intention*

## 3. Research method

### 3.1. *Data collection and sample*

This study collected 300 respondent's data, where each for Shopee customers and Bukalapak customers has 150 respondents through an electronic survey using purposive technique sampling. These respondents are Bukalapak and Shopee e-commerce applications customers who do transactions at least once during pandemic Covid-19. The detailed information about respondent's data can be seen in Table 1 below. Surprisingly, based on gender, Shopee online application dominated by female respondents while Bukalapak dominated by male respondents.

Table 1. Demographic data.

Characteristics	Shopee		Bukalapak	
	Total	Percentage sample = 150	Total	Percentage sample = 150
<i>Gender</i>				
Male	54	36%	89	59.3%
Female	96	64%	61	40.7%
<i>Age</i>				
16 years old and below	2	1.35%	14	8.7%
17-30 years old	134	89.3%	131	87.3%
30-40 years old	14	9.3%	6	4%
<i>Education level</i>				
Primary school	2	1.3%	1	0.70%
Junior high school	7	4.7%	14	9.3%
Senior high school	63	42%	97	64.7%
Bachelor degree	75	50%	38	25.3%
Master degree	3	2%	0	0%
<i>Occupation</i>				
Student	100	66.7%	77	51.3%
Employee	26	17.3%	48	32%
Entrepreneur	18	12%	21	14%
Others	6	4%	4	2.6%
<i>Expenditures</i>				
Below Rp. 250,000	41	27.3%	50	33.3%
Rp. 250,000-500,000	22	14.7%	29	19.3%
Rp. 500,000- 750,000	16	10.7%	23	15.3%
Rp. 750,000-1,000,000	8	5.3%	2	1.3%
Above Rp. 1,000,000	63	42%	46	30.7%

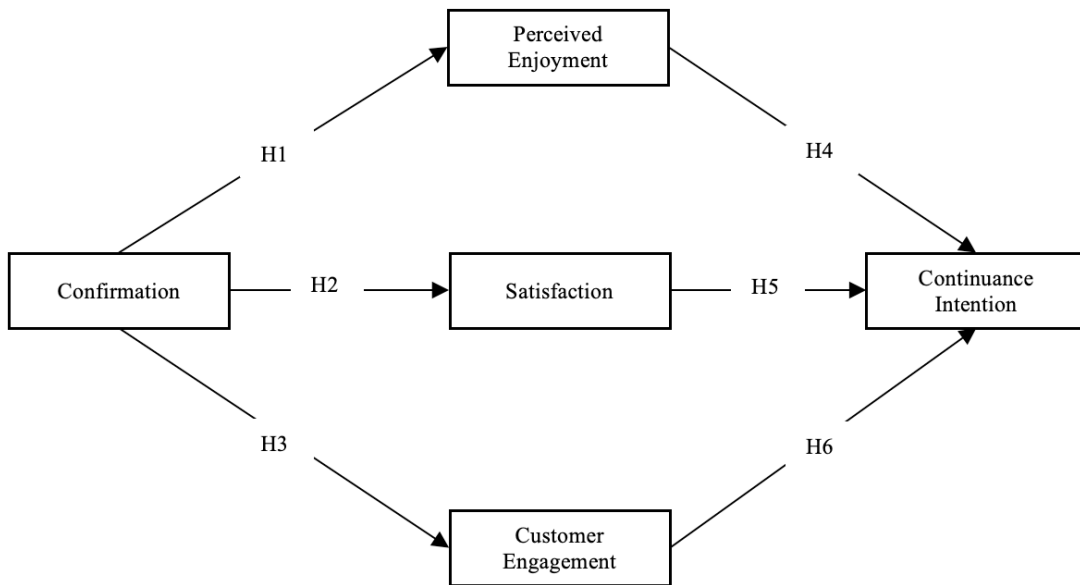


Fig. 1. Research model.

3.2. Measurement

This research uses the Structural Equation Modelling - Partial Least Square (SEM-PLS) method of analysis. The measurements of constructs are based on the previous studies' results (see Table 2). PLS requires validity and reliability on its outer and inner models to test the hypotheses [38]. This study used Likert-type seven scales and as PLS outer model requirements.

Table 2. Validity and reliability result.

Variable	Shopee			Bukalapak		
	AVE	CR	CA	AVE	CR	CA
<i>Confirmation</i>	0.741	0.945	0.930	0.682	0.928	0.907
<i>Perceived enjoyment</i>	0.744	0.946	0.931	0.689	0.930	0.910
<i>Satisfaction</i>	0.763	0.951	0.938	0.644	0.915	0.889
<i>Customer engagement</i>	0.726	0.941	0.924	0.736	0.943	0.928
<i>Continuance intention</i>	0.821	0.965	0.956	0.627	0.929	0.908

### 3.3. Data analysis

This study tested loading factor and Average Variance Extracted (to test the convergent validity), internal composite reliability (to test reliability), and test the cross-loadings to test the discriminant validity [39]. Based on the results presented in Table 2, this study has passed the requirement of outer model to test the validity and reliability result [38]. PLS required that standardized loading factor must be greater than 0.5 [40], while composite reliability (CR) must be exceeded 0.6 [38], then average variance extracted (AVE) must be greater than 0.5 [38][41].

### 3.4. Goodness of fit index

The Goodness of fit index (GoF) is useful in data comparisons and works best in group comparisons (i.e., varying the data while keeping the model constant) [42]. In addition, the GoF can provide answers to questions about how well different subsets of data can be explained by a specific model. Goodness-of-Fit index (GoF) of the model was assessed by determining the geometric mean of two types of R<sup>2</sup> values' averages of the communality and the average R<sup>2</sup> of the endogenous latent variable. GoF can be valuable to survey how well a PLS model can clarify various arrangements of information. According to [42], The formula to measure the GoF would be seen as follow:

$$Q^2 = 1 - (1 - R1^2)(1 - R2^2) \dots (1 - Rp^2) \tag{1}$$

According the formula (1), there are three classifications of the GoF index including small (0.1 < GoF = 0.25); medium (0.25 < GoF = 0.36), and large (GoF > 0.36) [43]. The Q<sup>2</sup> of this study for the Shopee online application is 0.797 and for Bukalapak online application is 0.610. Therefore, the two models have large Goodness of fit index and valid to be used in the PLS model globally [44].

## 4. Result and discussion

This study employs Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS software as the analysis tool. PLS-SEM fit to test the early stage of theory development [45] and maximize the endogenous latent constructs [46]. After the outer model fulfills the requirements, this study can test all latent variables' relationships [38]. To test the relationships between latent variables and the structural model or inner greater than t-value of 1.96 and its path coefficients [46] in Table 3.

The results of this study for Shoppe e-commerce conclude that confirmation influences *perceived enjoyment* (T-value= 28.236), confirmation has an influence on *satisfaction* (T-value = 28.773) and confirmation has influence on *customer engagement* (T-value=15.878). It is concluded that H1, H2, and H3 are supported for Shopee e-commerce. The result of *perceived enjoyment* influences *continuance intention* (T-value= 3.107). *Satisfaction* influences *continuance intention* (T-value=2.067). However, *customer engagement* influences *continuance intention* (T-value=4.047). It concludes that H4, H5, and H6 are accepted.

The result for Bukalapak online application concludes that confirmation influences *perceived enjoyment* (T-value= 40.573), confirmation has an influence on *satisfaction* (T-value = 31.086) and *confirmation* has influence on *customer engagement* (T-value=20.901). It is concluded that H1, H2, and H3 are supported for Bukalapak e-commerce. The result of *perceived enjoyment* influences *continuance intention* (T-value= 2.430). *Satisfaction* influences *continuance intention* (T-value=12.219). However, *customer engagement* does not influence *continuance intention* (T-value=0.794). It concludes that H4 and H5 are accepted. Hence, H6 is rejected.

Table 3. Statistical result of the structural model.

Hypotheses	Shopee			Bukalapak		
	Path coefficient	T-Value	Result	Path coefficient	T-Value	Result
H1 <i>Confirmation</i> → <i>perceived enjoyment</i>	0.872	28.236	Supported	0.855	40.573	Supported
H2 <i>Confirmation</i> → <i>satisfaction</i>	0.884	28.773	Supported	0.862	31.086	Supported
H3 <i>Confirmation</i> → <i>customer engagement</i>	0.797	15.878	Supported	0.779	20.901	Supported
H4 <i>Perceived enjoyment</i> → <i>continuance intention</i>	0.280	3.107	Supported	-0.321	2.430	Supported
H5 <i>Satisfaction</i> → <i>continuance intention</i>	0.230	2.067	Supported	0.938	12.219	Supported
H6 <i>Customer engagement</i> → <i>continuance intention</i>	0.437	4.047	Supported	0.106	0.794	Not Supported

The significant level of p=0.05 (T stats ≥ 1.96)

The result of the analysis found that hypothesis 1, which *confirmation* influence *perceived enjoyment* both Bukalapak and Shopee case were accepted [7], [22], [33]. It was proved that people tend to enjoy using a mobile app once their expectations were confirmed. Hypothesis 2 which *confirmation* influence *satisfaction* both Bukalapak and Shopee case were supported. This finding is consistent with prior research [47]–[49]. Initial expectations regarding IS usefulness (performance, benefits, satisfaction, etc.) must be confirmed. Lastly, *confirmation* was found to influence *customer engagement* in both Bukalapak and Shopee cases positively and supports hypothesis 3. [32] stated that cognitive dissonance phenomena may occur if perceptions of usefulness are not confirmed. *Customer engagement* occurs during the post-purchase period before acceptance.

The finding of Hypothesis 4 shows that *perceived enjoyment* influences *continuance intention*. The result is also supported by [50]–[52] that the experience over *continuance intention* of e-commerce apps helps renew the *perceived enjoyment* of IS. Users might need to purchase their products using the e-commerce apps as they are enjoying the experience. The finding of hypothesis 5 shows that *satisfaction* was a significant influence on *continuance intention*. The role of *satisfaction* as authorized in this research has been validated in many studies in IS [53]–[55]. *Satisfaction* in the ECT construct results from an assessment of comparative performance and a key determinant of the behavior after adoption [30]. If users are satisfied with online shopping applications based on past user experience, a high level of trust will be established, and e-commerce apps will be used [21].

The finding of hypothesis 6 shows that *customer engagement* significantly influenced the *continuance intention* in Shopee case, however, insignificant influence in the Bukalapak case. This result was supported by other researches [26][36]. ECommerceIQ mentioned that many Bukalapak users complain about the uncomfortable shopping experience on e-commerce among other e-commerce sites [56]. In particular, the *customer engagement* that has developed over the interactions with the company and other users has been shown will affect the *continuance intention* in online environments. Compared to Bukalapak, Shopee provides a unique experience to their users with entertainment features in-app games to encourage users to spend more time in the apps and continue shopping [57].

Directing further examination by proposing *perceived enjoyment*, *satisfaction*, and *customer engagement*, this study utilized VAF (Variance Accounted For) test. As recommended by [41], if the value is over 80 percent, it represents full mediate. Meanwhile, if the VAF value is between 20 percent – 80 percent, meaning that it partially mediates, and no mediation role if the value shows below 20 percent. Table 4 demonstrate that the VAF value in Shopee and Bukalapak gives an alternate outcome. Bukalapak shows no indirect correlation between *confirmation*, *customer engagement*, and *continuance intention* (-227%), while *perceived enjoyment* and *satisfaction* give a strong correlation among *confirmation* and *continuance intention* (69% and 117%). In the meantime, VAF for Shopee reveals that all the mediating variables give a forceful result between *confirmation* and *continuance intention*.

Table 4. VAF test.

	Shopee		Bukalapak	
<i>Confirmation</i> → <i>perceived enjoyment</i> → <i>continuance intention</i>	0.872 x 0.280	0.244	0.855 x -0.321	-0.274
<i>Confirmation</i> → <i>continuance intention</i>		<u>-0.022</u>		<u>-0.118</u>
		0.222		-0.392
<b>VAF for confirmation</b> → <i>perceived enjoyment</i> → <i>continuance intention</i>	<b>0.244 / 0.222</b>	<b>1.099</b>	<b>-0.274 / -0.392</b>	<b>0.698</b>
<i>Confirmation</i> → <i>satisfaction</i> → <i>continuance intention</i>	0.884 x 0.230	0.203	0.862 x 0.938	0.808
<i>Confirmation</i> → <i>continuance intention</i>		<u>-0.022</u>		<u>-0.118</u>
		0.181		0.690
<b>VAF for confirmation</b> → <i>satisfaction</i> → <i>continuance intention</i>	<b>0.203 / 0.181</b>	<b>1.121</b>	<b>0.808 / 0.690</b>	<b>1.171</b>
<i>Confirmation</i> → <i>customer engagement</i> → <i>continuance intention</i>	0.797 x 0.437	0.348	0.779 x 0.106	0.082
<i>Confirmation</i> → <i>continuance intention</i>		<u>-0.022</u>		<u>-0.118</u>
		0.326		-0.036
<b>VAF for confirmation</b> → <i>customer engagement</i> → <i>continuance intention</i>	<b>0.348 / 0.326</b>	<b>1.067</b>	<b>0.082 / -0.036</b>	<b>-2.277</b>

### 5. Conclusion, implication, and further research

This study compares the effect of strategic entrepreneurship through different innovation approaches between two leading digital MSP e-commerce startups, Bukalapak, which uses an incremental innovation approach, and Shopee, which uses radical innovation approach to face the business challenge during the Covid-19 pandemic. The results show that Shopee's radical innovation has an impact on *customer engagement* and *continuance intention*, even though *confirmation* on *perceived enjoyment*, *satisfaction*, and *customer engagement* has a lower t-value than Bukalapak. Bukalapak's incremental innovation, on the other side, has a higher t value for confirmation on *perceived enjoyment*, *satisfaction*, and *customer engagement*. However, *perceived enjoyment* has a negative influence on *continuation intention*, and *customer engagement* has no significant influence on *continuation intention*.

The researchers use an extended expectation confirmation model (ECM) from a customer point of view to analyze the effect of the innovation effort. However, The ECM clarified that during the Pandemic era, confirmation of any technologies by *perceived enjoyment*, *satisfaction*, and *customer engagement* is insufficient to ensure continuance retention. A company should also add a variety of innovations, such as providing a wide range of entertainment services, as e-commerce markets are among the fastest growing industry during the Pandemic.

In this study, confirmation affecting *perceive enjoyment*, *satisfaction*, and *customer engagement* in both Bukalapak and Shopee cases. *Confirmation* plays a role in shaping expectations for post-adoption that consist of a set of beliefs [27]. This study also shows that *perceived enjoyment*, *satisfaction*, and *customer engagement* influence *continuance intention* in the Shopee case were supported, yet, *customer engagement* variable in the bukalapak case is the only variable that was not valid. In addition, this result proved the reason for Bukalapak user consumption decreasing while Shopee increased. It was proved that *perceived enjoyment*, *satisfaction*, and *customer engagement* play critical roles in influencing intention to continue using e-commerce apps.

This research provides several notable theoretical contributions. First, this study contributes to the current literature by developing a new model combining the ECM model. *Perceived enjoyment* and *customer engagement*, which covers the *continuing intention* of users to use e-commerce apps in the post-adoption process as the manifestation of both radical innovation and incremental innovation. Thus, the findings show the advantage of radical innovation over incremental innovation regarding customer *continuing intention*. Secondly, this study represents an important step in understanding the intention-behavior of e-commerce apps by comparing 2 cases: Bukalapak and Shopee. And thirdly, this study reveals that the difference in using mobile shopping apps between Bukalapak and Shopee cases is customer engagement. The empirical results show that the theoretical model proposed can be more efficient in explaining the continued use in general and the online environment.

In addition to theoretical implications, this study also has significant practical implications for various players in e-commerce apps. From the perspective of Bukalapak and Shopee customers, the current study results ensure the value of *perceived enjoyment*. Increasing the level of *perceived enjoyment* will increase the level of willingness of customers to accept e-commerce. Furthermore, retailers may develop strategies for prioritizing customer experiences based on insights from *customer engagement* assessments. Allowing customers to engage more in online transactions, such as effectively addressing their queries, will likely lead to favorable responses and lasting relationships.

It is recommended for future research to add more variables that impact *continuance intention*, such as perceived value [47]. Perceived value often plays an influential role related to e-commerce apps. While users perceive the value from products or services, the intention to purchase will increase. Another variable to be added is perceived risk, which can be a barrier to adoption and lead to a greater readiness to buy on mobile shopping applications by reducing risk perception among users [58]. For business, the researcher obtained that the different influencing factor between Bukalapak and Shopee case is *customer engagement*. As reported from Iprice, Shopee is the leader in the Southeast Asian e-commerce market because of its increasing user interaction on the app [59]. The series of innovative user engagement and entertainment features as the radical innovation effort presented by Shopee include Goyang Shopee, Shopee Quiz, Shopee Cut, Shopee Lucky Prize, Shopee Feed, Shopee Catch, and Shopee Live. Moreover, designing a more enjoyable shopping app that offers a hassle-free shopping experience would help the user's intention [60].

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