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ANALYZING JAKARTA KINI PLATFORM USING THE UTAUT 2 MODEL

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ABSTRACT

Jakarta Kini (JAKI) platform provides a seamless digital experience for various government services of DKI Jakarta, such as reporting/complaints, monitoring and accessing important information. This research aims to analyze the use and acceptance of JAKI using the Unified Theory of Acceptance and Use of Technology (UTAUT) 2 model, which consists of the variables Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, Habit and Trust as the main variable. Along with Age and Gender as moderator variables. Data was collected from 400 respondents who had used the JAKI platform. The sampling method uses non-probability sampling and convenience sampling. The Partial Least Squares (PLS) technique is used to interpret and analyze the data using SmartPLS 4 software. Based on the analysis of this research, five direct variable relationships have a positive and significant effect. Habit and Trust variables positively and significantly affect Behavioral Intention and Use Behavior in using the platform. In moderate variables, only one variable has a significant effect. Age moderates the effect of Effort Expectancy on Behavioral Intention in using the platform.

INTRODUCTION

Jakarta Kini (JAKI) application is a product from Jakarta Smart City (JSC) which is part of the Communication, Informatics and Statistics Office of Provincial Government DKI Jakarta. It provides a seamless digital experience to access various government services of DKI Jakarta, such as reporting/complaints, monitoring and reading important information.

The significant role of the JAKI platform is important for further analysis. Especially in terms of the use of features on this platform by citizens and their acceptance. Despite the high number of downloads on the JAKI platform, it is also followed by a high number of uninstalls on the JAKI platform (JSC, 2022).

The model used in this study is the Unified Theory of Acceptance and Use of Technology (UTAUT) 2 which studies and understanding acceptance of technology use in consumer contexts (Venkatesh et al., 2012). The UTAUT 2 model is an update version of UTAUT which was also developed by Venkatesh et al. Several variables in the UTAUT 2 model include Effort Expectancy, Facilitating Conditions, Hedonic Motivation, Habit, Performance Expectancy, Price Value and Social Influence which are the main variables. While the moderate variables are Age, Gender and Experience (Venkatesh et al., 2012).

The UTAUT model is a popular model and is widely used in technology acceptance research (Williams et al., 2015). One of the studies on the adoption or use of technology using the UTAUT model is the research of El-Masri & Tarhini (2017) who conducted a study of the various main

factors that drive the adoption of an e-learning system by university student in developed country (United States) and developing country (Qatar). The research extends the model by adding Trust as an external variable.

The UTAUT model is a good model to use in cross-cultural contexts and for use with translation languages other than the original language (Oshlyansky et al., 2007). The UTAUT 2 is proven to produce substantial improvements in explaining the use of technology, namely 52%, compared to UTAUT which is 40% (Chang, 2012).

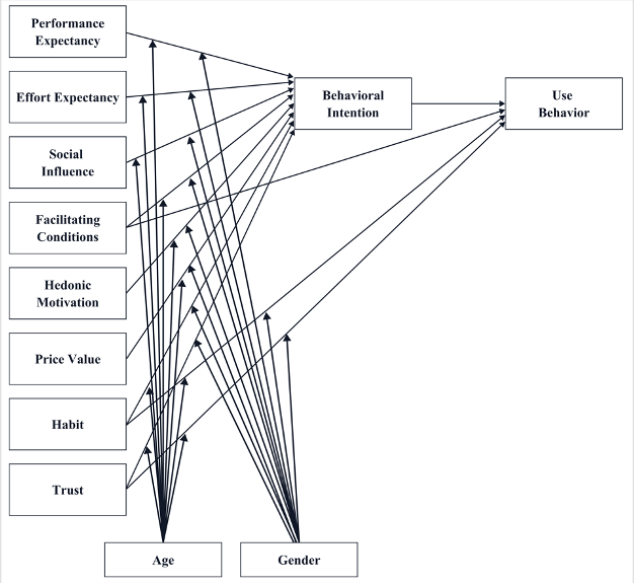

Figure 1. Conceptual Model

The research aims to analyze the use and acceptance of JAKI using the Unified Theory of Acceptance and Use of Technology (UTAUT) 2 model, which consists of the variables Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, Habit and Trust as the main variable. In addition, along with Age and Gender as moderator variables. The contribution of this research is to provide a comprehensive analysis of the use and acceptance of JAKI using the UTAUT 2 model. The study aims to identify the factors that influence the acceptance and use of JAKI by analyzing the variables in the UTAUT 2 model. The hypothesis that the authors compiled in this study is as presented in the Table 1 below.

Table 1. Hypothesis

Variable Relationship	Hypothesis
Direct	H1: PE has a significant and positive influence on Behavioral Intention (BI) on the use of the system. H2: EE has a significant and positive effect on Behavioral Intention (BI) on the use of the system.

	H3: SI has a significant and positive influence on Behavioral Intention (BI) on the use of the system. H4: FC has a significant and positive influence on Behavioral Intention (BI) on the use of the system. H5: FC has a significant and positive influence on Use Behavior (UB) on system use. H6: HM has a significant and positive influence on Behavioral Intention (BI) on the use of the system. H7: PV has a significant and positive influence on Behavioral Intention (BI) on the use of the system. H8: HA has a significant and positive effect on Behavioral Intention (BI) on the use of the system. H9: HA has a significant and positive influence on Use Behavior (UB) on system use. H10: TR has a significant and positive influence on Behavioral Intention (BI) on the use of the system. H11: TR has a significant and positive influence on Use Behavior (UB) on system use. H12: BI has a significant and positive influence on Use Behavior (UB) in using the system.
Indirect	H13: Age moderates the effect of the main variable on BI in system use H14: Age moderates the effect of the main variable on UB in system use H15: Gender moderates the influence of the main variables on BI in system use H16: Gender moderates the influence of the main variables on UB in the use of the system.

METHOD

The population in this research referred to the Jakarta Kini (JAKI) platform's users. Based on Jakarta Smart City (JSC) data, there are more than 1.5 million users as of June 14, 2022. This research uses a non-probability convenience sampling method to collect primary data via an online questionnaire from 400 respondents who had already used JAKI.

SEM-PLS (Partial Least Squares) technique is used to interpret and analyze the data using SmartPLS 4 software. The research performs an outer model to evaluate the relationships between observed variables and their corresponding latent variables. Loading factors, Average Variance Extracted (AVE), Composite Reliability, and Cronbach's Alpha are observed to evaluate construct validity and reliability.

The research performs an inner model to understand causal or predictive relationships among the latent variables. R-square and Path Coefficient are observed using a bootstrap algorithm with 0.05 significance level (α) and two-tailed test type. Predictive Relevance is observed using the

PLSpredict algorithm (Shmueli et al., 2016). The rule of thumb for both the inner and outer models is stated in Table 2.

Table 2. Rules of Thumb

Outer Model	Parameter	Rules of Thumb
Construct Validity	Loading Factor	Loading Factor > 0.5
	Average Variance Extracted (AVE)	AVE > 0.5
Construct Reliability	Composite Reliability	Composite Reliability > 0.70
	Cronbach's Alpha	Cronbach's Alpha > 0.70
Inner Model	**Parameter**	**Rules of Thumb**
Predictive Relationships	R-squares	R-squares > 0.5
	Predictive Relevance	Predictive Relevance > 0.35

Source: Ghozali (2015), (Hair et al., 2010)

The last step of data analysis is to test the hypothesis with T statistics and P values and compare it with the stated criteria in Table 2. If the T statistic (T-value) exceeds the critical value of 1.96, the null hypothesis (H0) is rejected. If the P value is less than the significance level (α) of 0.05, then the null hypothesis (H0) is rejected. The critical value of 1.96 is based on the T-Distribution Table of Critical Values.

Table 3. Null Hypothesis Rejection Criteria

Criteria	H0
T statistics > 1.96	Rejected
P value ≤ 0.05	Rejected

Source: Ghozali (2015)

RESULT AND DISCUSSION

Respondent Characteristics

Based on the results of collecting survey data from 400 respondents who are users of the JAKI application, there are 306 respondents who belong to the Millennials or Gen Y age group with an age range of 26-41 year. The Millennial age group dominates by 76.5% of all respondents. The next age group is Gen Z (9-25 year) with a percentage of 11.75% of all respondents or as many as 47 respondents. The position of the next age group is Gen X (42-57 year) with a percentage of 11.25% of the total respondents or as many as 45. There is only a 0.5% difference in the percentages of the Gen Z and Gen X age groups.

Female respondents were slightly more numerous with a percentage of 52.25% or as many as 209. Male respondents with a percentage of 47.75% or as many as 191 of all respondents. Characteristics based on the gender of the respondents can be said to be balanced between women and men. Detailed respondent characteristics are as follows in Table 4.

Table 4. Respondents Characteristics

Characteristics	Response Frequency (%)
Gender	
Male	47.75
Female	52.25
Age Group	
Gen Z (9-25 year)	11.75
Millennials/Gen Y (26-41 year)	76.5
Gen X (42-57 old)	11.25
Boomers (58 year and above)	2
Domicile	
DKI Jakarta	95
Outside DKI Jakarta	5

Outer Model

Loading factor/outer loadings show convergent validity, which means that the higher the value of the outer loadings of an item in a variable indicates that these items unite in the same variable (Indrawati, 2015). The loading factor value is at least 0.5 to show that the item on a factor has convergent validity (Hair et al., 2010). Based on Table 5, all items have a loading factor/outer loading value > 0.5 and comply with the rules of thumb criteria.

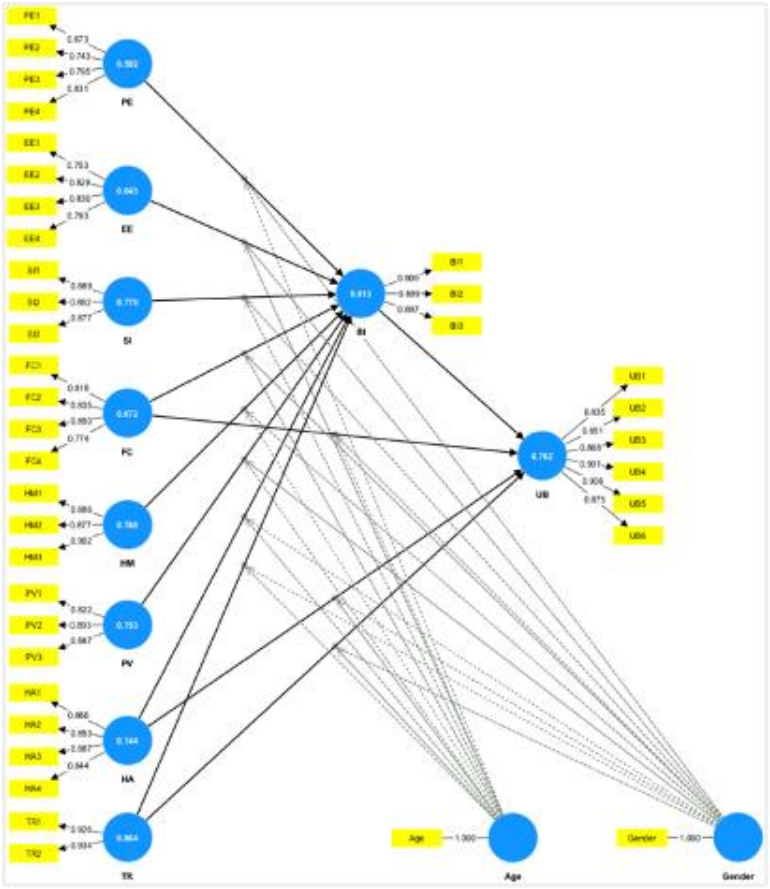

Figure 2. Outer Model

Table 5. Loading Factor/Outer Loadings

Item	Outer Loadings	Item	Outer Loadings
BI1 <- BI	0.909	PE1 <- PE	0.673
BI2 <- BI	0.899	PE2 <- PE	0.743
BI3 <- BI	0.897	PE3 <- PE	0.795
EE1 <- EE	0.753	PE4 <- PE	0.831
EE2 <- EE	0.829	PV1 <- PV	0.822
EE3 <- EE	0.83	PV2 <- PV	0.893
EE4 <- EE	0.793	PV3 <- PV	0.887
FC1 <- FC	0.818	SI1 <- SI	0.889
FC2 <- FC	0.835	SI2 <- SI	0.882
FC3 <- FC	0.85	SI3 <- SI	0.877
FC4 <- FC	0.774	TR1 <- TR	0.926

HA1 <- HA	0.866	TR2 <- TR	0.934
HA2 <- HA	0.853	UB1 <- UB	0.835
HA3 <- HA	0.887	UB2 <- UB	0.851
HA4 <- HA	0.844	UB3 <- UB	0.868
HM1 <- HM	0.886	UB4 <- UB	0.901
HM2 <- HM	0.877	UB5 <- UB	0.906
HM3 <- HM	0.902	UB6 <- UB	0.875

Average Variance Extracted or AVE is interpreted as a value that indicates whether a set of items that measure these variables are unified or not. And whether it has convergent validity or not (Indrawati, 2015). The AVE value of more than 0.50 indicates that the item in a variable has sufficient convergent (Ghozali & Latan, 2015). All items in this study have an AVE value of > 0.5 and comply with the rules of thumb criteria.

Table 6. Construct Validity & Reliability

Variable	AVE	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)
BI	0.813	0.885	0.886	0.929
EE	0.643	0.815	0.822	0.878
FC	0.672	0.838	0.845	0.891
HA	0.744	0.886	0.89	0.921
HM	0.788	0.866	0.866	0.918
PE	0.582	0.759	0.771	0.847
PV	0.753	0.836	0.842	0.901
SI	0.779	0.858	0.859	0.914
TR	0.864	0.843	0.845	0.927
UB	0.762	0.937	0.938	0.951

Reliability is defined as the level of trust, the level of reliability, the level of consistency, or the level of stability of the results on a measurement and is a characteristic of the instrument as a good measure. The Alpha Cronbach technique is the most commonly used calculation technique (Indrawati, 2015). Cronbach's Alpha coefficient with a minimum of 0.70 indicates that the questionnaire has fairly good reliability (Hair et al., 2010).

All Cronbach's alpha and Composite Reliability values have a value of more than 0.70 and it can be concluded that these results have a fairly good level of reliability and match the rules of thumb criteria.

Inner Model

The author performs R-squares and Predictive Relevance assessments using Partial Least Squares (PLS) 4 software with the PLS-SEM algorithm. The Predictive Relevance assessment uses the PLSpredict algorithm (Shmueli et al., 2016) to retrieve Q-squares values. Figure 4 shows the graphical output of Smartpls 4 for the inner model which shows the Path Coefficient and R-squares values for the construct values.

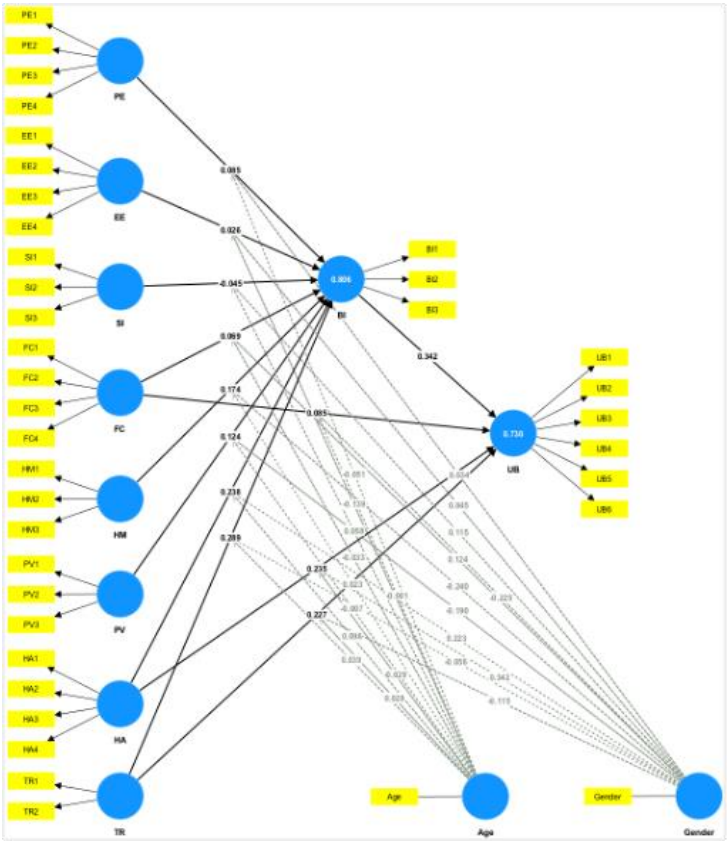

Figure 3. Inner Model

Based on the results in Table 6, the R-squares value in this study is > 0.5 so that it meets the rules of thumb criteria. And because the value is more than 5.0, it can be said that the model is strong (Ghozali 2015). The Q-squares value is > 0.35 so that it also meets the rules of thumb criteria.

Table 7. Construct Validity & Reliability

Variable	R-square	R-square adjusted	Q^2predict
BI	0.782	0.777	0.770
UB	0.718	0.716	0.674

Based on the results in Table 7, the SRMR (Standardized Root Mean Square Residual) value is <0.08, so it meets the rules of thumb criteria described in Chapter 3 and can be categorized as good fit.

Table 8. Model Fit

	Saturated Model	Estimated Model
SRMR	0.046	0.048
d_ULS	1.561	1.738
d_G	0.927	0.994
Chi-square	2097.807	2311.054
NFI	0.830	0.813

Hypothesis Testing

Henceforth the author tests various hypotheses that have been determined by paying attention to the T statistics (T-value) test and P values on the Path Coefficient report menu on the SmartPLS 4 software. T-values and P values in Table 8 were generated using the SmartPLS 4 software with the bootstrapping algorithm with settings of 5000 samples, 0.05 significance level (α) and two-tailed test type.

The significance level (α) used in calculating the T-value is 0.05 (5%). The choice of a significance level (α) of 0.05 (5%) was to strike a balance between avoiding too many Type I errors (false positives) and allowing the possibility of detecting potentially significant effects.

Table 9. Path Coefficient & Result

Variable	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result
PE -> BI	0.085	0.083	0.059	1.443	0.149	Not supported

EE -> BI	0.026	0.037	0.068	0.383	0.701	Not supported
SI -> BI	-0.045	-0.052	0.080	0.563	0.573	Not supported
FC -> BI	0.069	0.066	0.089	0.767	0.443	Not supported
FC -> UB	0.085	0.077	0.074	1.143	0.253	Not supported
HM -> BI	0.174	0.171	0.106	1.651	0.099	Not supported
PV -> BI	0.124	0.130	0.100	1.245	0.213	Not supported
HA -> BI	**0.238**	**0.246**	**0.113**	**2.109**	**0.035**	**Supported**
HA -> UB	**0.235**	**0.241**	**0.117**	**2.003**	**0.045**	**Supported**
TR -> BI	**0.289**	**0.276**	**0.096**	**3.012**	**0.003**	**Supported**
TR -> UB	**0.227**	**0.222**	**0.105**	**2.168**	**0.030**	**Supported**
BI -> UB	**0.342**	**0.344**	**0.090**	**3.811**	**0.000**	**Supported**

Degrees of freedom (df) in this study resulted from the formula df = n - 1. Where n is the number of samples. So that df is 400 - 1 = 399. Degrees of freedom (df) is 399. With a significance level (α) value of 0.05, two-tailed test type and degrees of freedom (df) of 399, a critical value of 1.96 is obtained based on T -Distribution Table of Critical Values.

Based on the results from Table 8, there are five variable relationships that match the criteria for statistical T and P values to reject the null hypothesis (H0). So that the author conclude:

1) The Habit Variable (HA) has a positive and significant influence on Behavioral Intention (BI) on the use of the system (H8).
2) The Habit Variable (HA) has a positive and significant influence on Use Behavior (UB) on the use of the system (H9).
3) The variable Trust (TR) has a positive and significant influence on Behavioral Intention (BI) on the use of the system (H10).
4) The variable Trust (TR) has a positive and significant influence on Use Behavior (UB) on the use of the system (H11).

5) The Behavioral Intention (BI) variable has a positive and significant influence on Use Behavior (UB) in using the system (H12).

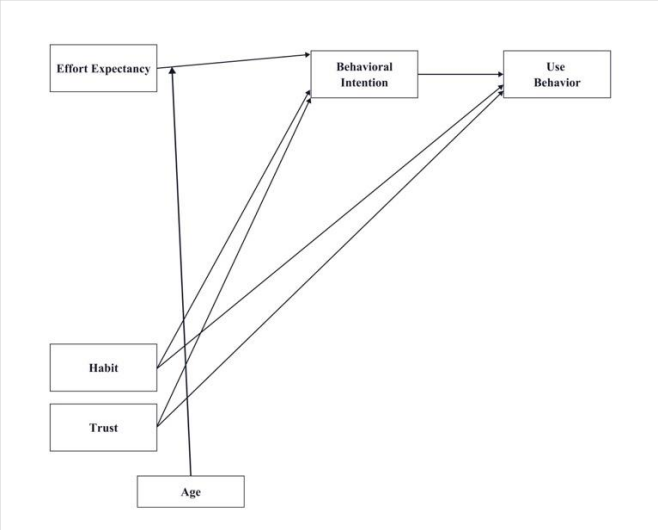

Figure 4. Accepted Hypothesis

Based on the results of the path coefficient for the moderate variable, there is one moderate variable relationship that is in accordance with the T statistic criteria and the P value to reject the null hypothesis (H0) according to the conditions described. So that the writer can conclude that Age moderates the effect of Effort Expectancy (EE) on Behavioral Intention (BI) in using the system (H15).

CONCLUSION

Habit can be interpreted as how far an individual has a tendency to perform behavior automatically based on experience or learning from previous events. Based on the analysis of this study, Habit (HA) has a significant influence on Behavioral Intention (BI) and Use Behavior (UB) on the use of JAKI. So that the hypothesis H8 and H9 are accepted.

Previous research with acceptance of the hypothesis of the effect of Habit on Behavioral Intention and or Use Behavior includes Merhi et al., (2019) where the hypothesis of the positive influence of Habit on Behavioral Intention was accepted in the Lebanese and English samples. And Castanha et al., (2023) where the hypothesis of the positive influence of Habit on Behavioral Intention is accepted.

Trust was added in this study because it is an important factor that influences technology adoption Al-Gahtani, (2016). Based on the analysis of this study, Trust (TR) has a significant effect on Behavioral Intention (BI) and Use Behavior (UB) in the use of JAKI. So that the hypothesis H10 and H11 are accepted. Previous studies with the acceptance of the hypothesis of the effect of Trust on Behavioral Intention and/or Use Behavior included in the study of Ayuning Budi et al., (2021) and in the study of Merhi et al., (2019) where the hypothesis of the positive effect of Trust on Behavioral Intention was accepted in the Lebanese sample and England.

Behavioral Intention can be interpreted as the level of desire to use the system on an ongoing basis. Use Behavior can be interpreted as the behavior of using a system (Venkatesh et al., 2003). Behavioral Intention (BI) has a significant effect on Use Behavior (UB) in using JAKI. So that the H12 hypothesis is accepted. Previous research with acceptance of the hypothesis of the effect of Behavioral Intention on Use Behavior includes Zaenudin & Tricahyono (2022) where the hypothesis of the positive influence of Behavioral Intention on Use Behavior is accepted. And Indrawati & Yosan Al Azim, (2022) where the hypothesis of positive and significant influence of Behavioral Intention on Use Behavior is accepted.

It is concluded that gender does not moderate the effect on all relationship variables. So all hypotheses related to gender moderation are rejected. As for previous research with all gender moderation hypotheses rejected, this is research Castanha et al., (2023). The Age variable moderates the effect on the relationship between Effort Expectancy and Behavioral Intention. So that the H15 hypothesis is accepted.

This research is expected to contribute insight into the analysis of technology adoption, especially in the digital government and smart city services sector. However, this research is not free from limitations such as the use of the convenience sampling method where the method used does not fully represent the demographics and characteristics of JAKI users. In this study, the characteristics of respondents based on age were dominated by Millennials (26-41 year) of 76.5% of all respondents. Then 11.75% from Gen Z (9-25 year) and 11.25% from Gen X 42-57 old). This distribution is expected to be closer to the demographics of JAKI users using other methods. In future research, it is also possible to carry out multi-group analysis where each age group can be tested and analyzed so as to produce more in-depth insights.

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