CHAPTER 4

FINDINGS, ANALYSIS, & DISCUSSION

4.1 Introduction

This chapter outlines the procedure and results of questionnaire development, reliability and validity testing, data collection, data processing, data analysis, and descriptive analysis. The questionnaire was created using Google Forms and successfully distributed to selected residents in the Greater Jakarta Area in February 2025.

The explanation of the results and data analysis began with data treatment, including handling missing values, outliers, and data assessment. Descriptive and inferential statistical analysis was conducted using SmartPLS 4. Subsequently, the measurement and structural models were applied for evaluation. Finally, the findings from hypothesis testing were presented.

4.2 Reliability Test

An initial set of 30 responses was analyzed as a pilot test to assess reliability and validity. The pilot test results confirmed the questionnaire's reliability and validity, with Cronbach’s Alpha values approaching 0.7 for FC and exceeding 0.7 for the other variables. The findings in Table 4.1 indicated that the questionnaire was generally well-accepted, clearly understood, and deemed appropriate. Following its validation, data collection continued until a total of 112 responses had been obtained.

Table 4.1 Results of the Reliability Test (Cronbach's Alpha)

Source: SmartPLS Indicators Report

Group	Item	Mean	STDEV	N	Cronbach's Alpha
Performance Expectancy (PE)	PE1	4.045	1.198	112	0.768
	PE2	3.330	1.448	112	
	PE3	3.741	1.328	112	
	PE4	3.438	1.321	112	
Effort Expectancy (EE)	EE1	3.696	1.281	112	0.838
	EE2	4.089	0.996	112	
	EE3	3.812	1.130	112	
	EE4	3.732	1.195	112	
Social Influence (SI)	SI1	2.955	1.391	112	0.725
	SI2	3.223	1.314	112	
	SI3	3.420	1.367	112	
	SI4	4.054	1.133	112	
Facilitating Condition (FC)	FC1	3.554	1.308	112	0.654
	FC2	4.054	0.981	112	
	FC3	4.098	1.000	112	
	FC4	3.330	1.410	112	
Interpersonal Service Quality (SQ)	SQ1	3.500	1.389	112	0.878
	SQ2	3.714	1.292	112	
	SQ3	3.679	1.311	112	
	SQ4	3.804	1.260	112	
Behavioral Intention (BI)	BI1	3.589	1.272	112	0.903
	BI2	3.268	1.395	112	
	BI3	3.384	1.318	112	
Use Behavior (UB)	UB1	3.312	1.356	112	0.874
	UB2	3.259	1.328	112	
	UB3	3.446	1.329	112	

4.3 Respondent Profile

The socio-demographic profile of the 112 respondents in Table 4.2 revealed key patterns in gender distribution, age, education, and income levels. Regarding gender distribution, 55.4% of the respondents were male (62 individuals), while 44.6% were female (50 individuals). This indicated a relatively balanced representation between men and women in the survey.

Age-wise, the majority of respondents (52.7%) fell within the 36-45 years old category, making it the most represented age group. The second-largest group was the 46-55 years old category (17%), followed by individuals aged 26-35 years (15.2%). Those aged 56 and above accounted for 11.6%, while the youngest age group, 18-25 years old, comprised only 3.6% of the total respondents. This age profile suggested that middle-aged individuals were more likely the most financially stable and actively dining out.

In terms of education, more than half (53.6%) held a bachelor's degree, making it the most common educational background. The second-largest group consisted of respondents with a master's degree (18.8%), followed by high school graduates (17.9%). Those with a college diploma made up 8.9% of the respondents, while only one person (0.9%) had a doctoral degree or above. This educational distribution suggested that the sample consisted primarily of highly educated individuals, which may have correlated with increased exposure to modern dining technology, higher digital literacy, and possibly a greater willingness to engage with self-service systems in restaurants.

Income distribution among respondents varied, with the highest proportion (24.1%) earning IDR 25,000,000 or more per month. Other significant income brackets included IDR 6,000,000 – 9,999,999 (19.6%), IDR 3,000,000 – 5,999,999 (17.9%), and those earning less than IDR 3,000,000 (17.9%). A smaller percentage of respondents fell within the IDR 10,000,000 – 14,999,999 range (10.7%) and the IDR 15,000,000 – 24,999,999 range (9.8%). This suggested a diverse range of financial backgrounds among the respondents, with a notable portion earning relatively high incomes.

Table 4.2 Demographic Characteristics

Socio-Demographic Variable		Number of Respondents	Percentage of Respondents (%)
Gender	Male	62	55.4%
	Female	50	44.6%
	Total	112	100.0%
Age	18-25 years old	4	3.6%
	26-35 years old	17	15.2%
	36-45 years old	59	52.7%
	46-55 years old	19	17.0%
	56+ years old	13	11.6%
	Total	112	100.0%
Education	High school graduate	20	17.9%
	College (Diploma)	10	8.9%
	Bachelor's degree	60	53.6%
	Masters degree	21	18.8%
	Doctoral degree or above	1	0.9%
	Total	112	100.0%
Income	Less than IDR 3.000.000	20	17.9%
	IDR 3.000.000 – 5.999.999	20	17.9%
	IDR 6.000.000 – 9.999.999	22	19.6%
	IDR 10.000.000 – 14.999.999	12	10.7%
	IDR 15.000.000 – 24.999.999	11	9.8%
	IDR 25.000.000 or more	27	24.1%
	Total	112	100.0%

4.4 Descriptive Statistics

Descriptive statistical analysis aims to provide a detailed overview of the main characteristics and variables within the dataset, highlighting potential relationships between them.

The measurements used in descriptive analysis include mean, standard deviation, kurtosis, and skewness. The mean represents the average value of the dataset, while the standard deviation indicates the variance or how widely the observed data is spread around the mean. Skewness measures the symmetry of the data distribution; if the data stretches toward the right or left tail, the distribution is considered skewed. The threshold of skewness is -2 to 2 (*Curran et al., 1996; West et al., 1995*). Kurtosis measures the degree of peakiness or flatness in a variable's distribution. It evaluates whether the distribution is excessively peaked or too flat. The acceptable threshold for kurtosis is -7 ≤ kurtosis ≤ 7 (*Curran et al., 1996; West et al., 1995*).

In this study, the measured variables were Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Interpersonal Service Quality (SQ), Intention of using SST (BI), and Actual use of SST (UB), each measured by multiple indicators. The descriptive statistical test result in Table 4.3 contained the detailed results of the Mean, Standard Deviation, Kurtosis, and Skewness.

Table 4.3 Descriptive Statistic Test Result

Source: PLS-SEM Report

Name	Mean	Observed min	Observed max	Standard deviation	Excess kurtosis	Skewness
PE1	4.045	1	5	1.198	0.328	-1.224
PE2	3.330	1	5	1.448	-1.532	-0.220
PE3	3.741	1	5	1.328	-0.888	-0.741
PE4	3.438	1	5	1.321	-1.279	-0.404
EE1	3.696	1	5	1.281	-0.871	-0.705
EE2	4.089	2	5	0.996	0.279	-1.116
EE3	3.812	1	5	1.130	-0.284	-0.901
EE4	3.732	1	5	1.195	-0.330	-0.898
SI1	2.955	1	5	1.391	-1.482	0.141
SI2	3.223	1	5	1.314	-1.440	-0.159
SI3	3.420	1	5	1.367	-1.430	-0.307

Name	Mean	Observed min	Observed max	Standard deviation	Excess kurtosis	Skewness
SI4	4.054	1	5	1.133	0.624	-1.265
FC1	3.554	1	5	1.308	-1.053	-0.579
FC2	4.054	1	5	0.981	0.808	-1.203
FC3	4.098	1	5	1.000	2.250	-1.559
FC4	3.330	1	5	1.410	-1.484	-0.238
SQ1	3.500	1	5	1.389	-1.403	-0.385
SQ2	3.714	1	5	1.292	-1.002	-0.660
SQ3	3.679	1	5	1.311	-1.034	-0.638
SQ4	3.804	1	5	1.260	-0.968	-0.709
BI1	3.589	1	5	1.272	-0.928	-0.639
BI2	3.268	1	5	1.395	-1.498	-0.171
BI3	3.384	1	5	1.318	-1.394	-0.290
UB1	3.312	1	5	1.356	-1.580	-0.086
UB2	3.259	1	5	1.328	-1.514	-0.094
UB3	3.446	1	5	1.329	-1.611	-0.173

The mean values ranged from 2.955 to 4.098, indicating a general tendency toward agreement with the survey statements. The standard deviation values ranged from 0.981 to 1.448, showing the degree of variation in responses. Lower standard deviations, such as in FC2 (0.981), suggested more consistent responses, while higher deviations like PE2 (1.448) indicated greater variability in perceptions.

Skewness values were mostly negative, indicating that responses leaned towards higher ratings (agreement). The strongest negative skew was seen in FC3 (-1.559), meaning many respondents strongly agreed with the statement. Kurtosis values were mostly negative, meaning that the distributions were flatter than a normal distribution, suggesting a wider spread of responses. However, FC3 (2.250) showed a peakier distribution, meaning most responses were concentrated around the mean.

For Performance Expectancy (PE), PE1 (4.045) and PE3 (3.741) had relatively high means, showing users believed self-service technology improved order efficiency. However, PE2 (3.330) was lower, implying customization might not have been as strongly perceived as a benefit. For Effort Expectancy (EE), the highest mean was EE2 (4.089), showing strong agreement that self-service technology was easy to learn. EE1 (3.696), EE3 (3.812), and EE4 (3.732) also indicated positive perceptions of ease of use.

For Social Influence (SI), the lowest mean in the table was SI1 (2.955), indicating that social encouragement to use self-service technology was not strong. However, SI4 (4.054) suggested that many associated it with modern dining habits. As for Facilitating Conditions (FC), FC2 (4.054) and FC3 (4.098) indicated that restaurants provided adequate support for self-service technology. However, FC4 (3.330) suggested that it might not have perfectly aligned with users' ordering preferences.

Then, on Service Quality (SQ), scores were mostly around 3.5–3.8, with SQ4 (3.804) indicating that staff approachability was a notable factor in ensuring user satisfaction. Finally, Behavioral Intention (BI) & Use Behavior (UB), with mean values around 3.2–3.5, suggested moderate adoption and intention to use self-service technology. However, the values were not overwhelmingly high, implying room for improvement in user engagement.

All measured dimensions in this research fell within the acceptable threshold range, indicating that the results were valid. The kurtosis and skewness values remained within their respective thresholds, confirming that the data distribution was appropriate and considered reliable.

4.5 Measurement Model Evaluation

This research applied PLS-SEM (Partial Least Squares – Structural Equation Modeling); the method was employed to evaluate the research, measurement, and structural models. The first step in evaluating PLS-SEM results

involved examining the measurement models, which differed for reflective and formative constructs. If the measurement models met the required criteria, researchers then needed to assess the structural model *(Hair et al., 2014)*. The following was an illustration of the high-order construct model used in this study (Figure 4.1).

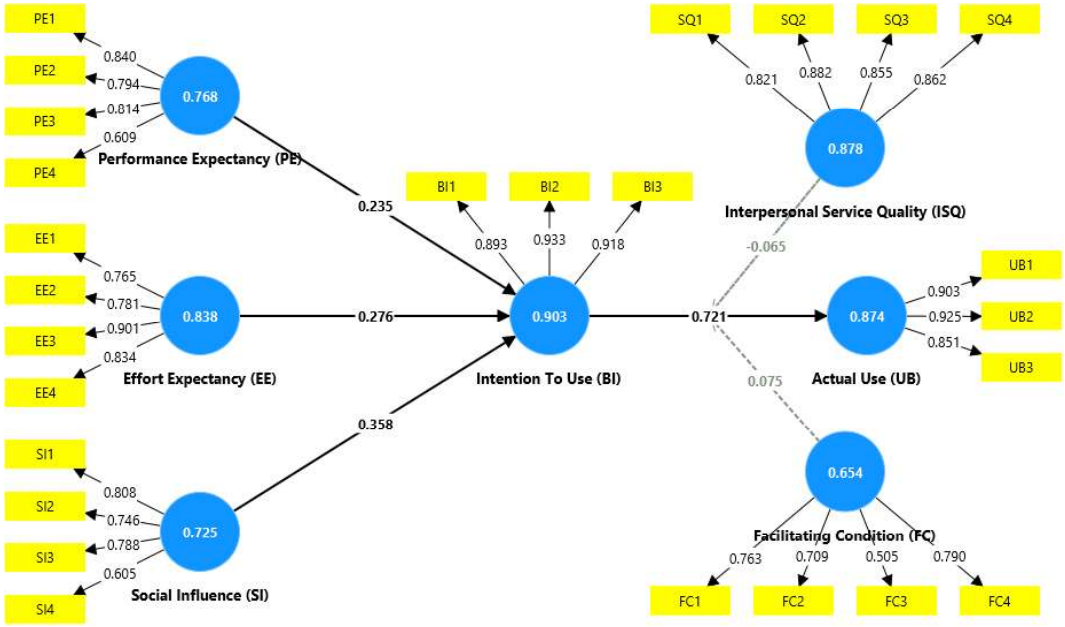

Figure 4.1 Research Model

Source: SmartPLS Model Report

The first to measure was Indicator Reliability, which was assessed using outer loadings. Loadings above 0.708 were recommended, since they indicated that the construct explained more than 50 percent of the indicator's variance, thus providing acceptable item reliability *(Hair et al., 2018)*.

The second step involved assessing Internal Consistency Reliability, typically measured using Composite Reliability (CR). Higher CR values generally indicated greater reliability. According to Jöreskog (1971), reliability values between 0.60 and 0.70 were considered acceptable for exploratory research, while values between 0.70 and 0.90 ranged from satisfactory to good, demonstrating that the construct items exhibited consistency. Cronbach's alpha was another measure of internal consistency reliability that assumed similar thresholds but produced lower values than composite reliability *(Hair et al., 2018)*.

The third step involved assessing the convergent validity of each construct measure. Convergent validity referred to the extent to which a construct effectively explained the variance of its indicators. The Average Variance Extracted (AVE) was the metric used to evaluate convergent validity for all items within each construct. To calculate AVE, the squared loadings of each indicator on a construct were summed and then averaged. A minimum acceptable AVE value was 0.50 or higher, indicating that the construct explained at least 50% of the variance in its associated indicators *(Hair et al., 2018)*.

The fourth step was to assess Discriminant Validity, which referred to the extent to which a construct was empirically distinct from other constructs in the structural model. It was assessed using the Fornell-Larcker Criterion *(Fornell & Larcker, 1981)* to ensure that the square root of AVE for each construct was greater than its correlation with other constructs. Another approach for assessing discriminant validity is the Heterotrait-Monotrait Ratio (HTMT) of correlations *(Voorhees et al., 2016)*. The HTMT was calculated as the mean value of item correlations across constructs (heterotrait-heteromethod correlations) relative to the geometric mean of the average correlations among items measuring the same construct (monotrait-heteromethod correlations). High HTMT values, usually above 0.9, indicated potential discriminant validity issues *(Henseler, Ringle, & Sarstedt, 2014)*, as they suggested that constructs might not have been sufficiently distinct from one another.

To complete the steps, analyzing Cross Loadings helped verify if indicators measured the correct constructs and ensured that latent variables were distinct. If an item loaded too highly on multiple constructs, it suggested overlap or misclassification, requiring adjustments in the model.

4.5.1 Validity and Reliability

The results of the first and second steps, Indicator Reliability and Internal Consistency Reliability, presented as follows:

Table 4.4 Construct Validity and Reliability Report

Source: SmartPLS Outer Loadings + Construct Reliability Report

Variable	Item	Outer Loading	Cronbach's alpha	Composite reliability (ϱA)	Composite reliability (ϱC)	Average variance extracted (AVE)
PE	PE1	0.840	0.768	0.802	0.851	0.592
	PE2	0.794				
	PE3	0.814				
	PE4	0.609				
EE	EE1	0.765	0.838	0.843	0.893	0.676
	EE2	0.781				
	EE3	0.901				
	EE4	0.834				
SI	SI1	0.808	0.725	0.743	0.828	0.549
	SI2	0.746				
	SI3	0.788				
	SI4	0.605				
FC	FC1	0.763	0.654	0.683	0.790	0.491
	FC2	0.709				
	FC3	0.505				
	FC4	0.790				
SQ	SQ1	0.821	0.878	0.880	0.916	0.731
	SQ2	0.882				
	SQ3	0.855				
	SQ4	0.862				
BI	BI1	0.893	0.903	0.911	0.939	0.837
	BI2	0.933				
	BI3	0.918				
UB	UB1	0.903	0.874	0.885	0.922	0.798
	UB2	0.925				
	UB3	0.851				

Outer loadings represented how well each survey item measured its intended construct. A high loading (above 0.70) indicated a strong correlation, while values between 0.60 and 0.70 were acceptable for exploratory research.

For Performance Expectancy (PE), PE1 (0.840) and PE3 (0.814) were strong, PE2 (0.794) was acceptable, but PE4 (0.609) was a little weak. Effort Expectancy (EE) had consistently strong loadings, ranging from 0.765 to 0.901, suggesting all items aligned well with the construct. For Performance Expectancy (PE), Cronbach's Alpha was 0.768 and Composite Reliability was 0.802, which were acceptable. Effort Expectancy (EE) had strong reliability, with Cronbach's Alpha at 0.838 and CR at 0.843, confirming internal consistency.

Social Influence (SI) was mostly reliable, with SI1 (0.808), SI2 (0.746), and SI3 (0.788) falling within the acceptable range. However, SI4 (0.605) was considered weak. Facilitating Conditions (FC) had mixed results: FC1, FC2, and FC4 were acceptable (above 0.70), but FC3 (0.505) was very low and was not recommended for inclusion in the research. Afterward, this indicator needed to be removed. Social Influence (SI) had a lower Cronbach's Alpha at 0.725, while its CR was 0.743, suggesting moderate reliability. The weaker loading of SI4 (0.605) could have impacted the results.

Facilitating Conditions (FC) had the weakest reliability, with Cronbach's Alpha at 0.654 and CR at 0.683. The low outer loading of FC3 (0.453) might have been the cause of significantly reduced internal consistency. Even though Cronbach's Alpha was lower than 0.7, this number was still acceptable because, according to Hair et al. (2018), reliability for exploratory research should have been a minimum of 0.60, while reliability for research that depended on established measures should have been 0.70 or higher.

Interpersonal Service Quality (SQ) and Behavioral Intention (BI) showed strong outer loadings across all items, indicating well-formed constructs. Similarly, Use Behavior (UB) performed well, with all values above 0.80. Interpersonal Service Quality (SQ), Behavioral Intention (BI), and Use Behavior

(UB) all demonstrated excellent reliability, with Cronbach's Alpha exceeding 0.85 and Composite Reliability above 0.90, confirming their strong measurement properties.

4.5.2 Convergent Validity

Convergent validity was assessed using the Average Variance Extracted (AVE), which measured the amount of variance captured by a construct relative to the variance due to measurement error. To establish convergent validity, the AVE value had to exceed 0.50 *(Hair et al., 2014)*, indicating that the construct explained more than half of the variance in its items.

Performance Expectancy (PE) had an AVE value of 0.592, Effort Expectancy (EE) has a strong AVE of 0.676, Social Influence (SI) had an AVE of 0.549, Interpersonal Service Quality (SQ), Behavioral Intention (BI), and Use Behavior (UB) all had excellent AVE values above 0.70, indicating strong construct validity. However, one of the variables, Facilitating Conditions (FC), had the lowest AVE at 0.491, meaning it failed to capture at least 50% of its variance. The very weak FC3 loading (0.505) is a probable cause for this.

To ensure that all the data remained valid and reliable, the FC3 indicator was removed from the dataset, and the result was re-evaluated. With this adjustment, Facilitating Conditions (FC) had an AVE value of 0.590, satisfying the recommendation of a minimum of 0.5 for AVE. With a valid AVE of 0.590, Composite Reliability (ϱC) of 0.812, and considering the exploratory nature of this variable, this model was considered consistent enough for this study, even with Cronbach's Alpha and Composite Reliability (ϱA) at 0.652. The updated result was shown in Table 4.5 below.

Table 4.5 Construct Validity and Reliability Updated Report

Source: SmartPLS Outer Loadings + Construct Reliability Report

Variable	Item	Outer Loading	Cronbach's alpha	Composite reliability (ϱA)	Composite reliability (ϱC)	Average variance extracted (AVE)
PE	PE1	0.840	0.768	0.802	0.851	0.592
	PE2	0.794				
	PE3	0.814				
	PE4	0.609				
EE	EE1	0.765	0.838	0.843	0.893	0.676
	EE2	0.781				
	EE3	0.901				
	EE4	0.834				
SI	SI1	0.808	0.725	0.743	0.828	0.549
	SI2	0.746				
	SI3	0.788				
	SI4	0.605				
FC	FC1	0.801	0.652	0.652	0.812	0.590
	FC2	0.718				
	FC4	0.783				
SQ	SQ1	0.821	0.878	0.880	0.916	0.731
	SQ2	0.882				
	SQ3	0.855				
	SQ4	0.862				
BI	BI1	0.893	0.903	0.911	0.939	0.837
	BI2	0.933				
	BI3	0.918				
UB	UB1	0.903	0.874	0.884	0.922	0.799
	UB2	0.925				
	UB3	0.851				

4.5.3 Discriminant Validity

To assess discriminant validity, we can apply the Fornell-Larcker Criterion. This is shown on Table 4.6 below.

Table 4.6 Fornell-Larcker Criterion Evaluation

Source: SmartPLS Fornell-Larcker Criterion Report

	PE	EE	SI	FC	SQ	BI	UB
PE	0.770						
EE	0.631	0.822					
SI	0.597	0.573	0.741				
FC	0.631	0.611	0.689	0.768			
SQ	-0.283	-0.365	-0.138	-0.148	0.855		
BI	0.623	0.630	0.657	0.611	-0.339	0.915	
UB	0.573	0.514	0.529	0.504	-0.175	0.727	0.894

The Fornell-Larcker criterion was used to assess discriminant validity, ensuring that each construct was distinct from the others. The diagonal values (bolded) represented the square root of the AVE for each construct, which should have been higher than any of the correlations in the same row or column. The off-diagonal values showed the correlations between constructs.

Values from the diagonal (Square Root of AVE) were: PE (0.770), EE (0.822), SI (0.741), FC (0.768), SQ (0.855), BI (0.915), and UB (0.894). Based on the results presented in the table, all of these were higher than any correlation with other constructs in the same row/column. This confirmed discriminant validity, indicating that the latent variables measured distinct constructs and were not excessively correlated with one another.

Additionally, we also tested for HTMT. The result of the test was shown in Table 4.7 below.

Table 4.7 Heterotrait-Monotrait (HTMT) Ratio

Source: SmartPLS Discriminant Validity HTMT Report

	PE	EE	SI	FC	SQ	BI	UB	SQ x BI
PE								
EE	0.771							
SI	0.817	0.725						
FC	0.897	0.810	1.007					
SQ	0.313	0.424	0.181	0.198				
BI	0.728	0.720	0.793	0.791	0.385			
UB	0.689	0.607	0.655	0.662	0.192	0.809		
SQ x BI	0.323	0.189	0.220	0.279	0.248	0.304	0.181	
FC x BI	0.089	0.180	0.190	0.024	0.280	0.067	0.038	0.048

Most of the HTMT values in the table were within the acceptable range, confirming that the majority of the constructs were distinct from one another. However, one notable exception was Facilitating Conditions (FC) and Social Influence (SI), which had an HTMT value of 1.007. This value exceeded the recommended threshold of 1.00, indicating that these two constructs were highly correlated and might not have been sufficiently distinct. This suggested a potential discriminant validity issue, meaning that respondents may have perceived FC and SI as overlapping concepts rather than separate constructs.

Other construct pairs, such as Performance Expectancy (PE) and Effort Expectancy (EE) (HTMT = 0.771), Social Influence (SI) and PE (HTMT = 0.817), and Behavioral Intention (BI) and Use Behavior (UB) (HTMT = 0.809), remained within acceptable limits, indicating sufficient discriminant validity among them. Additionally, constructs involving SQ (Service Quality) and the interaction terms (SQ × BI, FC × BI) all showed low HTMT values, further supporting discriminant validity across most of the model.

Table 4.8 Cross Loading Report

Source: SmartPLS Discriminant Validity - Cross Loading Report

	PE	EE	SI	FC	SQ	BI	UB	SQ x BI	FC x BI
PE1	0.840	0.638	0.491	0.555	-0.363	0.594	0.510	0.231	-0.112
PE2	0.794	0.450	0.434	0.404	-0.242	0.431	0.430	0.285	-0.002
PE3	0.814	0.410	0.407	0.458	-0.168	0.501	0.468	0.244	0.007
PE4	0.609	0.415	0.546	0.541	-0.027	0.346	0.328	0.109	0.119
EE1	0.503	0.765	0.486	0.395	-0.349	0.498	0.346	0.145	0.093
EE2	0.371	0.781	0.350	0.469	-0.232	0.473	0.470	0.181	-0.194
EE3	0.605	0.901	0.486	0.520	-0.287	0.536	0.487	0.129	-0.081
EE4	0.578	0.834	0.546	0.610	-0.329	0.556	0.390	0.115	-0.173
SI1	0.489	0.560	0.808	0.513	-0.237	0.581	0.470	0.180	0.088
SI2	0.440	0.306	0.746	0.512	-0.062	0.509	0.391	0.226	0.094
SI3	0.480	0.410	0.788	0.559	0.014	0.435	0.355	0.124	0.200
SI4	0.348	0.407	0.605	0.467	-0.090	0.389	0.332	-0.026	0.096
FC1	0.614	0.634	0.646	0.801	-0.247	0.581	0.411	0.200	-0.025
FC2	0.351	0.380	0.366	0.718	-0.052	0.349	0.397	0.119	-0.013
FC4	0.482	0.374	0.574	0.783	-0.025	0.472	0.346	0.200	0.008
SQ1	-0.268	-0.328	-0.054	-0.083	0.821	-0.188	-0.164	0.148	0.255
SQ2	-0.183	-0.310	-0.164	-0.134	0.882	-0.335	-0.131	0.229	0.211
SQ3	-0.232	-0.284	-0.133	-0.139	0.855	-0.300	-0.151	0.213	0.188
SQ4	-0.276	-0.324	-0.134	-0.155	0.862	-0.350	-0.145	0.205	0.243
BI1	0.523	0.532	0.511	0.520	-0.324	0.893	0.582	0.304	-0.122
BI2	0.545	0.555	0.616	0.563	-0.255	0.933	0.712	0.225	0.007
BI3	0.634	0.634	0.662	0.589	-0.351	0.918	0.690	0.263	-0.048
UB1	0.536	0.446	0.479	0.443	-0.168	0.669	0.903	0.164	0.051
UB2	0.529	0.444	0.511	0.480	-0.209	0.707	0.925	0.175	-0.001
UB3	0.468	0.498	0.423	0.427	-0.078	0.562	0.851	0.115	0.043
SQ x BI	0.288	0.171	0.184	0.224	0.231	0.286	0.171	1.000	-0.048
FC x BI	-0.016	-0.109	0.157	-0.014	0.264	-0.056	0.033	-0.048	1.000

Overall, most items demonstrated stronger loadings on their designated constructs, indicating that the majority of variables in the model were well-defined. For example, Behavioral Intention (BI), Effort Expectancy (EE), and Performance Expectancy (PE) items loaded well onto their respective constructs, confirming that these constructs were distinct. Additionally, Service Quality (SQ) items exhibited strong discriminant validity, as each item had its highest loading on the SQ construct with minimal cross-loadings.

However, there was a notably high loading between Facilitating Conditions (FC) and Social Influence (SI), which was also detected in the HTMT test (FC ↔ SI = 1.007). Several FC items, such as FC1 (0.646 on SI) and FC4 (0.574 on SI), loaded significantly onto Social Influence, while SI1 (0.513 on FC) and SI3 (0.559 on FC) loaded onto Facilitating Conditions. This suggested that respondents may have perceived FC and SI as overlapping concepts, leading to a lack of discriminant validity between them.

4.6 Structural Model Evaluation

The structural model illustrated the interaction between the independent and dependent variables, also referred to as the inner model. It represented the construction and path relationships within the structural model *(Hair et al., 2014)*. The structural model in PLS-SEM was evaluated based on its predictive capabilities, assessing how well it explained the variance in the endogenous variable.

4.6.1 Collinearity

Before assessing the structural relationships, collinearity had to be examined to ensure it did not bias the regression results *(Hair et al., 2018)*. Collinearity statistics played a crucial role in structural equation modeling (SEM) as they helped detect potential multicollinearity issues among predictor variables. Table 4.9 presented the collinearity statistics for the inner model, specifically

analyzing the Variance Inflation Factor (VIF) for each variable in relation to Intention to Use (BI) and Actual Use (UB).

A VIF value below 5 indicated that multicollinearity was not a significant concern, ensuring the stability and reliability of the model's parameter estimates *(Becker et al., 2015)*. Ideally, Variance Inflation Factor (VIF) values should have been close to 3 or lower to minimize collinearity concerns. If collinearity was identified as a problem, a commonly used approach was to develop higher-order models that were theoretically supported *(Hair et al., 2014)*. This helped reduce multicollinearity and improved the structural model's reliability.

Table 4.9 Inner Model VIF

Source: SmartPLS Collinearity Statistic (VIF) Report

	VIF
PE -> BI	1.927
EE -> BI	1.845
SI -> BI	1.725
FC -> UB	1.608
SQ -> UB	1.428
BI -> UB	1.967
SQ x BI -> UB	1.283
FC x BI -> UB	1.099

In this model, all VIF values were below 2, meaning multicollinearity was not a concern. The highest VIF was 1.967 for BI → UB, which was still well below the threshold of 5, indicating that Behavioral Intention (BI) was an independent and valid predictor of Use Behavior (UB). Other predictors, such as Performance Expectancy (PE) → BI (1.927), Effort Expectancy (EE) → BI (1.845), and Social Influence (SI) → BI (1.725), also showed low VIF values, confirming that they did not overlap excessively with each other.

For Use Behavior (UB), Facilitating Conditions (FC) → UB (1.608) and Interpersonal Service Quality (SQ) → UB (1.428) also had acceptable VIF values, indicating that these variables provided distinct contributions to the model. The interaction terms, SQ × BI (1.283) and FC × BI (1.099), had the lowest VIF values, showing that they did not introduce multicollinearity and could be interpreted independently.

Overall, the model had no multicollinearity issues, ensuring that the independent variables contributed uniquely to explaining Behavioral Intention (BI) and Use Behavior (UB). This meant that all predictors could be reliably used in hypothesis testing without concerns of redundancy.

The next measurement, the Outer Model VIF values, measured multicollinearity among indicators (survey items) within each construct. If a variable had a VIF > 5, it indicated that the indicator was highly correlated with other indicators in the same construct, which could have distorted measurement accuracy. A VIF between 1 and 3 was generally considered acceptable, meaning that the indicator provided unique and valuable information to its construct *(Becker et al., 2015)*.

Table 4.10 Outer Model VIF

Source: SmartPLS Collinearity Statistic (VIF) Report

	VIF
BI1	2.668
BI2	3.416
BI3	2.804
EE1	1.548
EE2	1.796
EE3	2.958
EE4	2.102
FC1	1.404
FC2	1.154
FC4	1.443

	VIF
PE1	1.739
PE2	1.713
PE3	1.659
PE4	1.248
SI1	1.561
SI2	1.439
SI3	1.751
SI4	1.386
SQ1	1.798
SQ2	2.763
SQ3	2.252
SQ4	2.413
UB1	2.576
UB2	2.916
UB3	2.009
FC x BI	1.000
SQ x BI	1.000

Based on the data from Table 4.10, most of the outer model VIF values were below 3, which suggested that multicollinearity was not a major issue. However, a few indicators had VIF values near and above 3, such as BI2 (3.255) and BI3 (2.804) → Behavioral Intention (BI), EE3 (2.958) → Effort Expectancy (EE), SQ2 (2.763), SQ4 (2.471) → Interpersonal Service Quality (SQ), and UB2 (2.916) → Use Behavior (UB).

These higher values suggested that some indicators within BI, EE, SQ, and UB were highly correlated with others in their respective constructs. While these values were not critically high (VIF > 5), they indicated some redundancy. This implied that researchers should have exercised caution when interpreting the relationships associated with these variables, as collinearity might have still exerted some influence on the results. Even if VIF values remained below the

critical threshold, some degree of multicollinearity could have affected the accuracy of estimated path coefficients.

4.6.2 Coefficient of Determination

The next step involved examining the R^2 value of the endogenous constructs. The R^2 value represented the proportion of variance explained in each endogenous construct, serving as a measure of the model's explanatory power *(Shmueli & Koppius, 2011)*. It was also referred to as in-sample predictive power *(Rigdon, 2012)*.

The R^2 value ranged from 0 to 1, with higher values indicating stronger explanatory power. As a guideline, R^2 values were interpreted as follows *(Henseler et al., 2010; Hair et al., 2011)*: 0.75 – Substantial, 0.50 – Moderate, and 0.25 – Weak.

Table 4.11 Coefficient of Determination (R^2)

Source: SmartPLS R-square Report

	R^2	R^2 adjusted
BI	0.555	0.543
UB	0.546	0.525

Table 4.11 presented the coefficient of determination (R^2) values for Behavioral Intention (BI) and Use Behavior (UB) based on the SmartPLS R-square report.

For Behavioral Intention (BI), the R^2 value was 0.555, meaning that 55.5% of the variance in BI could be explained by the predictor variables in the model. The adjusted R^2 value, which accounted for the number of predictors and prevented overfitting, was slightly lower at 0.543, indicating a stable model.

Similarly, for Use Behavior (UB), the R^2 value was 0.546, signifying that 54.6% of the variance in UB was explained by the independent variables. The

adjusted R^2 for UB was 0.525, slightly lower but still showing moderate explanatory power.

Overall, these R^2 values suggested that the model had a moderate ability to explain the variance in both Behavioral Intention and Use Behavior, implying that the predictors used in the study were fairly effective in explaining these dependent variables.

4.6.3 Effect Size (f^2)

The effect size (f^2) in structural equation modeling measured the impact of an external (independent) latent variable on an endogenous (dependent) latent variable within the model. It measured how much an independent variable contributed to explaining the variance of a dependent variable. While it had been adapted for use in SEM, f^2 was conceptually similar to R^2 (coefficient of determination) in regression analysis. Effect size values were interpreted as follows: $f^2 = 0.02$, Moderate effect: $f^2 = 0.15$, and Large effect: $f^2 = 0.35$ *(Cohen, 1988)*. A value below 0.02 was considered to have no effect.

A larger f^2 value indicated a stronger influence of the independent variable on the dependent variable, contributing more significantly to the explained variance in the model.

Table 4.12 F-square (f^2)

Source: SmartPLS f-square Report

	f^2
PE -> BI	0.064
EE -> BI	0.093
SI -> BI	0.167
FC -> UB	0.012
SQ -> UB	0.012
BI -> UB	0.589
SQ x BI -> UB	0.010
FC x BI -> UB	0.005

From the table, Performance Expectancy (PE) and Effort Expectancy (EE) had small effects on Behavioral Intention (BI), with values of 0.064 and 0.093, respectively. This suggested that while both factors influenced BI, their contributions were relatively minor. However, Social Influence (SI) had a moderate effect on BI, with an f^2 value of 0.167, indicating that social factors—such as encouragement from friends, family, or colleagues—played a significant role in shaping an individual's intention to use the technology.

In contrast, Facilitating Conditions (FC) and Interpersonal Service Quality (SQ) had very small direct effects on Use Behavior (UB), both with f^2 values of 0.012. This implied that neither factor substantially impacted how frequently users engaged with the system. The strongest predictor in the model was Behavioral Intention (BI) on Use Behavior (UB), with an f^2 value of 0.589, which qualified as a large effect. This finding suggested that an individual's intention to use self-service technology was the most significant driver of actual usage.

Regarding the moderating effects, Interpersonal Service Quality (SQ) and Facilitating Conditions (FC) showed minimal impact on the relationship between BI and UB. The interaction term SQ × BI → UB had an f^2 value of 0.010, while FC × BI → UB had an even smaller f^2 value of 0.005. These low values indicated that neither SQ nor FC significantly altered the impact of BI on UB, meaning that even if service quality or facilitating conditions improved, they did not strongly affect the likelihood of users engaging with the system.

In summary, the results highlighted that Behavioral Intention (BI) was the most critical factor in predicting system usage, whereas external factors like service quality and facilitating conditions had minimal influence. Social Influence (SI) also played a notable role in shaping BI, but other predictors, such as PE and EE, had only minor effects.

4.7 Hypothesis Test Results

Within the study's data analysis process, SmartPLS 4 was utilized as the final step to examine the hypothesized relationships. This was achieved by evaluating the path coefficients using bootstrapping computations. The bootstrapping method assessed significance by generating empirical t-values, which were considered significant if they exceeded the critical t-distribution value at the chosen significance level *(Hair et al., 2011)*.

For this research, both one-tailed and two-tailed tests were conducted with a 5% significance level, where the critical t-value was 1.645 for one-tailed and 1.96 for two-tailed. This meant that path coefficients with t-values greater than expected indicated statistically significant relationships within the model.

Table 4.13 Hypothesis Testing Result

Source: SmartPLS Bootstrapping Path Coefficients Report

	Path Coefficient (β)	Sample mean (M)	Standard deviation (σ)	T statistics (|β/σ|)	P values
Direct Effect					
PE -> BI	0.235	0.238	0.107	2.187	0.014
EE -> BI	0.276	0.271	0.095	2.912	0.002
SI -> BI	0.358	0.368	0.087	4.129	0.000
BI -> UB	0.725	0.707	0.116	6.247	0.000
Moderating Effect					
SQ x BI -> UB	-0.071	-0.063	0.085	0.834	0.405
FC x BI -> UB	0.053	0.069	0.077	0.682	0.495
Mediating Effect					
PE -> BI -> UB	0.170	0.169	0.082	2.072	0.019
EE -> BI -> UB	0.200	0.192	0.075	2.683	0.004
SI -> BI -> UB	0.260	0.260	0.073	3.552	0.000

4.7.1 Direct Effects

For the direct effects, all four relationships were statistically significant. Performance Expectancy (PE) → Behavioral Intention (BI) (β = 0.235, p = 0.014), Effort Expectancy (EE) → BI (β = 0.276, p = 0.002), and Social Influence (SI) → BI (β = 0.358, p = 0.000) all had p-values below 0.05, indicating that they significantly influenced Behavioral Intention (BI). Among these, Social Influence had the strongest effect, suggesting that encouragement from peers and social norms played a significant role in users' decision-making regarding self-service technology adoption. Additionally, Behavioral Intention (BI) → Use Behavior (UB) (β = 0.725, p = 0.000) was highly significant, confirming that BI was the strongest predictor of actual system usage.

4.7.2 Moderating Effects

In contrast, the moderating effects showed no statistical significance. Service Quality (SQ) × BI → UB (β = -0.071, p = 0.405) and Facilitating Conditions (FC) × BI → UB (β = 0.053, p = 0.495) both had p-values above 0.05, indicating that neither moderated the relationship between BI and UB. This meant that improvements in service quality or facilitating conditions did not significantly alter the strength of the relationship between users' intention and actual technology use.

4.7.3 Mediating Effects

The mediating effects in the results showed how Behavioral Intention (BI) acted as an intermediary between Performance Expectancy (PE), Effort Expectancy (EE), and Social Influence (SI) and the Actual Use of Self-Service Technology (UB). The results confirmed that BI significantly mediated the relationships between these three factors and UB. PE had an indirect effect on UB through BI (β = 0.170, t = 2.072, p = 0.039), implying that when users perceived self-service technology as beneficial, they were more likely to develop an intention to use it, which subsequently led to actual usage. Similarly, EE's mediation effect (β = 0.200, t = 2.683, p = 0.007) highlighted that ease of use fostered intention, which, in turn, drove actual behavior. SI exhibited the strongest

mediating effect (β = 0.260, t = 3.552, p = 0.000), reinforcing the idea that social encouragement and influence significantly enhanced users' intention, leading to increased adoption of the technology.

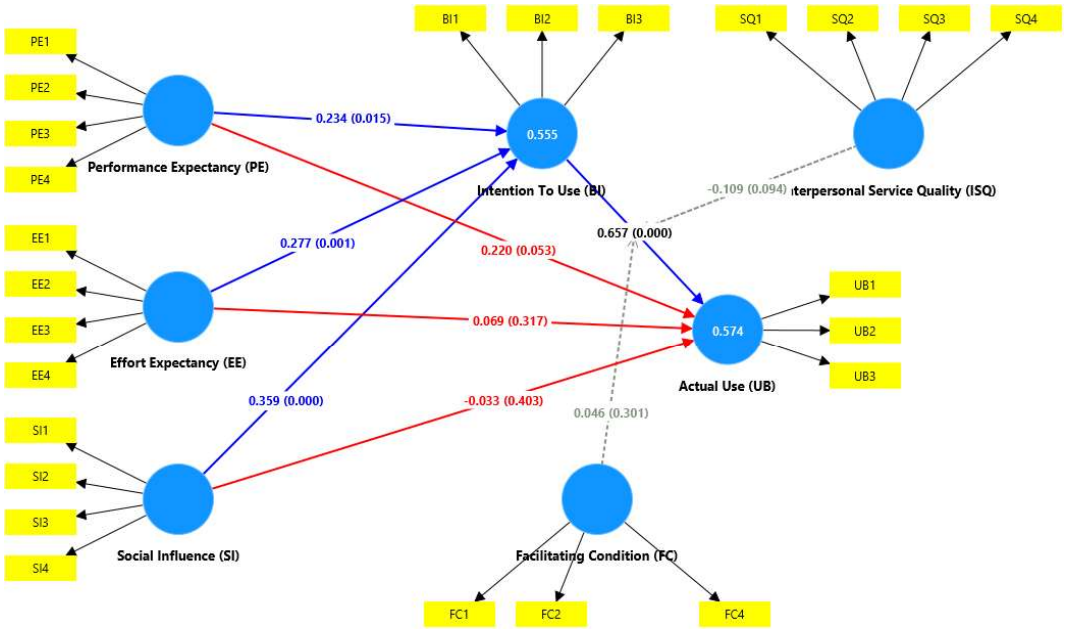

Figure 4.2 Research Model With PE, EE, SI Direct Effect

Source: SmartPLS Model Report

This study also evaluated the model if PE, EE, and SI has a direct effect toward UB. This means that the total influence of each factor on UB is now partially mediated instead of fully mediated. The relationship addition is shown in Figure 4.2, and the result is shown in Table 4.14.

Table 4.14 Direct and Indirect Effects for PE, EE, SI

Source: SmartPLS Bootstrapping Path Coefficients Report

	Path Coefficient (β)	Sample mean (M)	Standard deviation (σ)	T statistics (|β/σ|)	P values
Direct Effect					
PE -> UB	0.220	0.209	0.136	1.620	0.053
EE -> UB	0.069	0.075	0.144	0.477	0.317
SI -> UB	-0.033	-0.010	0.134	0.247	0.403

Indirect / Mediating Effect					
PE -> BI -> UB	0.170	0.169	0.082	2.072	0.019
EE -> BI -> UB	0.200	0.192	0.075	2.683	0.004
SI -> BI -> UB	0.260	0.260	0.073	3.552	0.000
Total Effect					
PE -> UB	0.374	0.353	0.156	2.393	0.008
EE -> UB	0.251	0.247	0.159	1.578	0.057
SI -> UB	0.203	0.220	0.141	1.436	0.076

The direct effects analysis shows that PE has a weak direct influence on UB with a path coefficient of 0.220, a t-statistic of 1.620, and a p-value of 0.053, indicating marginal insignificance at the 5% significance level.

EE and SI do not have significant direct effects on UB, as their respective p-values are 0.317 and 0.403, suggesting that PE, EE, and SI impact on actual usage behavior does not occur directly.

The total effects analysis, which accounts for both direct and indirect effects, highlights that PE's total impact on UB is 0.374, with a t-statistic of 2.393 and a p-value of 0.008, making it the only predictor with a statistically significant total effect. EE's total effect on UB is 0.251, but it remains marginally insignificant with a p-value of 0.057.

SI's total effect on UB is 0.203, but it does not reach statistical significance (p-value = 0.076). These results suggest that while PE significantly influences UB overall, EE and SI primarily affect UB through BI rather than directly.

In summary, BI remains the key driver of actual use behavior, with PE showing partial mediation, while EE and SI are almost fully mediated through BI.

Table 4.15 PE, EE, and SI Direct, Indirect, and Total Effect

Path	Direct Effect	Indirect Effect	Total Effect	VAF	Mediation Type
PE → UB	*0.220 (p=0.053)*	*0.154*	*0.374*	*41.20%*	Partial Mediation
EE → UB	0.069 (p=0.317)	0.182	0.251	72.50%	Strong Partial Mediation
SI → UB	-0.033 (p=0.403)	0.236	0.203	≈100%	Full Mediation
BI → UB	0.657 (p=0.000)	N/A	0.657	N/A	Direct Effect

4.8 Summary of Results

The summary of results provided a concise overview of the key findings and outcomes of the study. It highlighted significant data points, observed trends, and conclusions drawn from the research, offering a clear picture of the overall results. This section was aligned with the main objectives of the investigation and presented both quantitative and qualitative findings, emphasizing their relevance to the research questions or hypotheses.

The purpose of this summary was to enable readers to quickly grasp the main outcomes and implications without requiring an in-depth review of the methodology or raw data. The summary of results for this research was presented as follows:

4.8.1 H_1: Performance Expectancy has positive effect on Intention of Using SST.

For H_1 (Performance Expectancy → Behavioral Intention), the path coefficient for PE → BI was 0.235, with a t-statistic of 2.187 and a p-value of 0.014, making this relationship statistically significant at the 0.05 level. The f^2 effect size was 0.064, indicating a small effect. This suggested that Performance

Expectancy influenced Behavioral Intention to some degree. The evidence was strong enough to confirm this effect definitively. The small effect size ($f^2 = 0.064$) indicated a small but relevant contribution to the model.

Since the relationship was significant, it confirmed that users who perceived self-service technology as beneficial and efficient were more likely to intend to use it. This meant that features such as ease of ordering, faster service, and better customization options positively influenced adoption.

Conclusion: H_1 is supported, but the effect size is weak.

4.8.2 H_2: Effort Expectancy has positive effect on Intention of Using SST.

For H_2 (Effort Expectancy → Behavioral Intention), the path coefficient for EE → BI was 0.276, with a t-statistic of 2.912 and a p-value of 0.002, making this relationship statistically significant at the 0.05 level. The f^2 effect size was 0.093, indicating a small effect. This confirmed that Effort Expectancy played a meaningful role in shaping Behavioral Intention, meaning that ease of use was an important factor in users' willingness to adopt self-service technology. The effect size ($f^2 = 0.093$) indicated a small but relevant contribution to the model.

This result suggested that users were more likely to adopt self-service technology if they found it easy to use. This confirmed that intuitive interfaces, clear instructions, and minimal learning curves were crucial for adoption.

Conclusion: H_2 is strongly supported with a weak effect.

4.8.3 H_3: Social Influence has positive effect on Intention of Using SST.

For H_3 (Social Influence → Behavioral Intention), the path coefficient for SI → BI was 0.358, with a t-statistic of 4.129 and a p-value of 0.000, indicating high statistical significance. The f^2 effect size was 0.167, indicating a moderate effect. This confirmed that social pressure, recommendations, and perceived norms strongly influenced users' intention to adopt self-service technology. The medium effect size ($f^2 = 0.167$) further validated the substantial impact of Social Influence in driving Behavioral Intention.

This result indicated that users were more likely to adopt self-service technology if they saw others using it or if it was perceived as a social norm. This suggested that people felt motivated to use these systems when they were encouraged by peers, employees, or when the technology was widespread in society.

Conclusion: H_3 is strongly supported with a moderate effect.

4.8.4 H_4: Intention of Using Self-Service Technology has significantly positive effect on Actual Use of SST.

For H_4 (Behavioral Intention → Use Behavior), the path coefficient for BI → UB was 0.725, with a t-statistic of 6.247 and a p-value of 0.000, indicating high statistical significance.

The f^2 effect size was 0.589, indicating a large effect. This strongly supported the claim that Behavioral Intention significantly drove actual technology use. This was the strongest relationship in the model, confirming that higher intention led to actual usage.

This result confirmed that intention strongly translated into action. This meant that if users had a positive intention toward self-service technology, they were highly likely to follow through and use it.

Conclusion: H_4 is strongly supported with a strong effect.

4.8.5 H_5: Interpersonal Service Quality moderate the effects of Intention of using SST on Actual Use of SST.

In contrast, H5 (Interpersonal Service Quality moderating Behavioral Intention → Use Behavior) was not supported. The path coefficient for SQ × BI → UB was -0.071, with a t-statistic of 0.834 and a p-value of 0.405, making it insignificant. The f^2 effect size was 0.010, indicating a negligible effect.

These values indicated no statistical significance, meaning that Service Quality did not meaningfully alter the relationship between Behavioral Intention and Use Behavior. The near-zero effect size (f^2 = 0.007) reinforced this

conclusion, showing that users' perceptions of service quality had little to no influence on whether they acted on their intention to use self-service technology.

This meant that good customer service did not significantly influence whether users acted on their intention to use self-service technology. This suggested that people who already intended to use self-service systems did so regardless of whether staff were helpful or friendly.

Conclusion: H_5 is not supported.

4.8.6 H_6: Facilitating Conditions moderate the effects of Intention of using SST on Actual Use of SST.

Similarly, H_6 (Facilitating Conditions moderating Behavioral Intention → Use Behavior) was also not supported, with a p-value of 0.153 and a t-value of 1.430. Although this result was closer to significance than H_5, it still failed to meet the $p < 0.05$ threshold, indicating that Facilitating Conditions did not significantly strengthen or weaken the relationship between Behavioral Intention and actual Use Behavior. The small effect size ($f^2 = 0.027$) suggested a weak influence that might have become significant with a larger sample size, but in this case, it did not hold strong predictive power.

This result appeared to explain that external support, such as system availability or training, did not significantly strengthen or weaken the relationship between Behavioral Intention and Use Behavior. This suggested that users who intended to use self-service technology did so regardless of external conditions.

Conclusion: H_6 is not supported.

4.8.7 H_7: Intention of Using SST mediates the effect of Performance Expectancy on Actual Use of SST.

For H_7, the mediation results showed that Performance Expectancy (PE) had an indirect effect on Use Behavior (UB) through Behavioral Intention (BI), with $\beta = 0.170$, $p = 0.019$, and $t = 2.072$. Since the p-value was below 0.05, the mediation effect was statistically significant.

This meant that users who believed self-service technology improved efficiency and productivity were more likely to develop an intention to use it, which then translated into actual adoption. However, the effect size was relatively small, indicating that PE alone was not a major driver of self-service technology usage.

Conclusion: H_7 is supported with a weak effect.

4.8.8 H_8: Intention of Using SST mediates the effect of Effort Expectancy on Actual Use of SST.

For H_8, the mediation results for Effort Expectancy (EE) showed $\beta = 0.200$, $p = 0.004$, and $t = 2.683$, confirming that this indirect effect was statistically significant.

This suggested that users who found self-service technology easy to use were more likely to intend to use it, which then translated into actual adoption. The effect size was slightly stronger than PE's, indicating that ease of use was a more influential factor than performance expectations in driving intention and behavior.

Conclusion: H_8 is strongly supported with a weak effect.

4.8.9 H_9: Intention of Using SST mediates the effect of Effort Expectancy on Actual Use of SST.

For H_9, the strongest mediation effect was observed in Social Influence (SI), with $\beta = 0.260$, $p = 0.000$, and $t = 3.552$. This confirmed that SI significantly influenced UB through BI.

This meant that when users saw their peers using self-service technology or perceived it as socially accepted, they were more likely to develop the intention to use it, which then led to actual adoption. This effect size was the largest among the three mediators, highlighting that social norms and peer influence were crucial in technology adoption.

Conclusion: H_9 is strongly supported with a weak effect.