

Validation of Factors Affecting Customer Purchase Behavior in Digital Marketing: Insights from EFA and CFA



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Abstract

Purpose: The purpose of this study is to validate the key factors influencing customer purchase behavior in the context of digital marketing using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

Design/ Methodology/Approach: In this study sample size was 400 respondents and used Quantitative research design.

Findings: The study employed Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM) to validate and assess the impact of key digital marketing factors on customer purchase behavior. EFA identified five major dimensions—website design, price offerings, security and privacy, innovation, and delivery—as significant constructs influencing purchase decisions, while CFA confirmed the model's validity, reliability, and goodness-of-fit. SEM results further revealed that all five factors positively and significantly affect customer purchase behavior, indicating that enhancing these digital marketing dimensions can effectively improve customers' online purchase decisions.

Research Limitations: Numerous factors of Digital marketing have been included in this study, but we can investigate other factors influencing both Digital marketing and purchase decision in the future.

Practical Implications: With the Purpose to create the long term stability and competitive edge in the online marketplace, the findings also approach to focus on the customer requirement and fulfill the need as well. In addition to create the trust and also motivate the consumer to regularly interact with the Digital marketing platforms.

Social Implications: It emphasizing the social dynamics of digital interactions, trust, and community influence. It also promotes the benefit of social media, online feedback, to motivate the purchase decision.

Originality/Value: This study provide original contributions identifying the factors affecting the purchase decision via digital marketing using advanced analytical methods such as Structural Equation Modeling (SEM).

Article Type: Research paper

Funding Statement: No grant funding was received.

Keywords: Accessibility, Consumers, Delivery, Digital marketing, Price Offerings, Purchase Decision.

Introduction

Digital marketing is term which defines the steps involved in marketing and marketing of product or services with the help of digital platforms. DM is the market-place where marketers marketing the product for the large number of audience. With the help of internet numbers of digital buyers are increasing. According to survey of ASSOCHAM (2016), buyers are moving towards digitalization because of the prices/discounts, time consuming, easily shopping at anytime and anywhere, with easily access to the product. In the era of digitalization, buyers have gained lot of experience and accessing to the various aspects which consumer has become imperative (Jaiswal & Singh, 2020). DM also includes internet marketing techniques SEO, SEM, influencer marketing, social media optimization etc. SMS and MMS is part of non internet channels. Online marketing is the subset of DM; it also changed the living standard of people

from traditional shopping to digital purchasing. The people who are living in the cities, DM became the obligation for individuals. As per the reported by the ASSOCHAM (2016), customers are nowadays shifting from the conventional shopping to digital shopping because of the lowest price, time consuming, purchasing at anytime and anywhere easy accessibility to the number of product, easily comparable among different brands and get to know the specific information about product and services. In the digitalization, customers have gained lot of experience and which helpful to identify the best determinant affecting the consumer decision (Jaiswal & Singh, 2020). Buyers experience as positive and significant aspects that influence the customers for using the digitalized platforms for buying reason (Izogo & Jayawardhena, 2018). In comparison of traditional purchasing, digital purchasing has acquired a lot of success as it defines the more economically strong and good

choice of purchasing mode. It also provides the information to the customers regarding the competitive prices, variety of product selection, and easily accessibility to the required product (Katta & Patro, 2017a). It also provides a good purchasing experience and rapidity in availing the product (Yu & Wu, 2007; Saha & Mathew, 2021). Buyer's satisfaction for the product that totally depends on the buyers experiences throughout the various steps of purchases behavior. It is also proved that consumer satisfaction influenced by the content provided by the e retailers during the searching steps as well as final buying decision steps (Bleier et al., 2019). By providing the best services quality to the consumer, e-retailer must create the unique website which includes the important content, payment option, prices, checkout process, speed-up delivery process and assurance the buyers protection (Rita et al., 2019). With the purpose to know the affecting of various determinants of DM on customers, it is required to identify the factors which helpful for the e retailer to make assessment of consumer perception level. Thus the predicted research question is to understand that how different determinants affected the consumer digitalized shopping experience related with purchase decision.

2 THEORETICAL BACKGROUND

There are number of digital channels which help the consumer decision making at different stages. In which email marketing has a good impact on two steps of customer decision making, one is searching information and another is post purchase behavior. When consumers are purchasing product, digital channels have highly impacted on their decision. With this DM consumer awareness level can be increased for the different product new launches every day. DM is not only limited with the companies but also used by the various educational sectors efficiently. The information shown on the various platforms are very attractive for parents and create good long term relationship with parents as well (Calixto, 2021). There are number of determinants which affect the consumer buying decision, reviews and layout also impacted on the buyers purchasing decision. The study identifies the impact of Digital marketing activities on customer buying decision and found it positive (Dastane 2020). Consumer satisfaction, customer engagement and purchase intention is linked with the Digital marketing practices. The study also shows the dm strategies of LIC companies during Covid 19 time has reshape the purchasing behavior of the consumer. In latest study 18th items were used and analysis was done through the SEM model, shows positive impact on the consumer satisfaction and PI. Customer Interaction and customer happiness were used as a mediating role between Digital marketing techniques and Purchase

intention (Dash and Chakraborty, 2021). Currently most of focused on the customer digital purchasing behavior and experience (Nambisan & Watt, 2011). Website portal are created in accordance that they are flexible and offers high quality features to the customers. Customer digital purchasing behavior is totally impacted by their buying experience (Bridges & Florsheim, 2008). Brewer and Sebby (2021) stated the time period of COVID-19 has a positive attitude towards the easily accessibility and PI for purchasing online food. So study defines the determinants related to the customer's happiness in digital purchasing context and purchase decision as well. The factors are website design, price offerings, security & privacy, Innovation and delivery.

Website Aesthetics:

Website design is a most powerful factor which attracts the consumer towards digital shopping. Movement of consumer from traditional store to digital store, for this design of website is necessary (Katta & Patro, 2020). It shows the required content to the customers that help the business to growing their sales and goodwill of the retailer (Lim et al., 2016). Lee and Lin (2005) stated that good created websites with best features help the customers for successful transaction and repurchase from the online site.

Trust:

It defines the trustworthiness of the sellers in executing the order accurately; provide the goods immediately and keeping record of personal information (Katta & Patro, 2017b). Integrity has shown a good impact on the customer satisfaction (Devaraj et al., 2006). Sethuraman and Thanigan (2019) stated that it is affecting part which helps the customer to repurchase the product. Chang et al. (2013) define the deficiency of trust for the digital shopping form sellers is the restricted the consumer positive experience.

Price offerings

Generally consumer focused on the low price product (Jadhav & Khanna, 2016). Generally e-vendors adopts the discount option strategies to cover the large number of audience (Erdoğan & Çiçek, 2012). Katta and Patro (2016) stated that consumer focused only on the low price product they do not want to purchase product at higher price.

Security

Security is the main factors which encourage the customers to shop online as well as to protect for using the credit/ debit card or financial information (Baubonienė & Gulevičiūtė, 2015). In current system of digital payment mechanism, consumers are secured about the system of transaction and

security (Patro, 2019). Nowadays online vendors more focused on the security aspects for best services (Wang et al., 2015).

Delivery

One of the important determinants of DM is timely delivery of product which enhances the consumer purchases decision. Guaranteed delivery product within specific time period and easily return system give positive sign to the customers to repurchase product (Patro, 2017).

Purchase Decision

According to Soares et al. (2022), purchase Intention has good connection with perceived effectiveness and ease of investment has a good relationship with the PU and PI. Pleasure can be measure by comparison of customer expectation and actual use of the product (Khristianto et al., 2012). Consumer can get more recommendation and suggestion for the product while making purchase decision (Patro, 2018). Patro (2022) define that various determinants influence the purchase decision of the customer's like website features, social characteristics.

3. Research Methodology

3.1 Research Design: In this study quantitative research design was used for the study.

3.2 Research Instruments: For the study data is collected with five Likert Scale used with the help of Structured Questionnaire.

3.3 Data Collection Data Collection Questionnaires were sent to women customer to get first-hand information. Data collection for this study took over four to five months.

3.4 Data Analysis: there are number of data analysis techniques were used LikeEFA, CFA, and AMOS, etc.

4. Result & Discussion

With the help of KMO we can check the appropriateness of the sample Kaiser, (1970). The sampling appropriateness measured by KMO in SPSS Software. As stated by Hutcheson & Sofroniou, (1999) the value between 0.8 and 0.9 of KMO are effective. KMO value is 0.786 that is good according to the standard value. Bartlett's Test shows the either there is any association among the variables are unique from 0 Field, (2009), p value (Significant value) is less than 0.05 than statements are linked for the further analysis in EFA, as the values mentioned in the table 4.1 that all the values are according to the standard values which suggest the values is effective for the next analysis.

Table 4.1 KMO on Digital Marketing

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.786
Bartlett's Test of Sphericity	Approx. Chi-Square	3642.407
	Df	190
	Sig.	0.000

Source: Authors Compilation

EFA of digital marketing

Result indicate that all the factor loading value are greater than the 0.5 that are fit according to the minimum acceptable value so that actual value is fit for the next analysis. Table 4.2 displays result of the findings from the exploratory factor analysis of digital marketing. Factor loadings value between 0.751 and 0.883 (above.50), as the factor loading of 0.50 is thought to preserve the variables. Factors whose Eigen value is greater than 1 were kept as suggested by Comrey & Lee, (1992). The values of Cronbach alpha for overall scale is 0.757 that is greater than the standard value 0.70 and indicated that data is reliable and internal consistency is found in the data George and Mallory, (2018). Below the extracted factors were explained in detail.

Price Offerings

It contains the four variables. Factor loadings for the price offerings factor are from the range of 0.846 to 0.883.

Innovation

It contains the four variables. Factor loadings for the Innovation factor are from the range of 0.799 to 0.852.

Security & Privacy

It contains the four variables. Factor loadings for the security and privacy factor are from the range of 0.761 to 0.859.

Delivery

It contains the four variables. A factor loading for the delivery factor is from the range of 0.751 to 0.872.

Website Design

It contains the four variables. A Factor loading for the website design factors is from the range of 0.775 to 0.830.

Table 4.2 Exploratory Factor Analysis of digital marketing

Sr. No.	Variables	Communalities	Factor Loading	Eigen Value	Variance Explained	Cronbach Alpha
Price Offerings (PO)						
1.	Provides after-delivery payment option	0.609	0.883	3.643	15.331	0.893
2.	Gives Customer discount or exclusive pricing	0.774	0.877			
3.	Accessibility to several online methods of payment	0.737	0.856			
4.	Product are available at a affordable cost	0.739	0.846			
Innovation (I)						
5.	Draws customers with eye-catching promotions like flash sales	0.737	0.852	3.225	14.068	0.856
6.	Provides offers and discounts based on a user's location	0.728	0.849			
7.	Offers membership to make purchases at a discounted cost.	0.682	0.817			
8.	Promptly makes changes to the product line and mix.	0.672	0.799			
Security & Privacy (SP)						
9.	It is preferable to shop in the comfort of one's own home.	0.746	0.859	2.537	13.717	0.841
10.	Prevents misuse and maintains the privacy of personal information.	0.715	0.839			
11.	Offers enough security features to provide them a sense of safety.	0.692	0.824			
12.	Platform for certified transactions featuring a payment gateway	0.589	0.761			
Delivery (D)						
13.	Provides a functional mechanism for tracking shipments.	.765	0.872	2.333	13.155	0.819
14.	The products that were ordered and delivered match exactly.	.678	0.808			
15.	Products are delivered in the time frame stipulated.	.619	0.780			
16.	The items that were shipped out are appropriately packed.	.571	0.751			
Website Design (WD)						
17.	The website has an easy-to-use interface.	0.700	0.830	2.133	13.084	0.821
18.	Website offers easy access to text and graphics	0.676	0.807			
19.	Website shows better-quality content	0.652	0.797			
20.	Websites makes use of dynamic and Interactive Elements	0.609	0.775			
Total					69.355	0.757

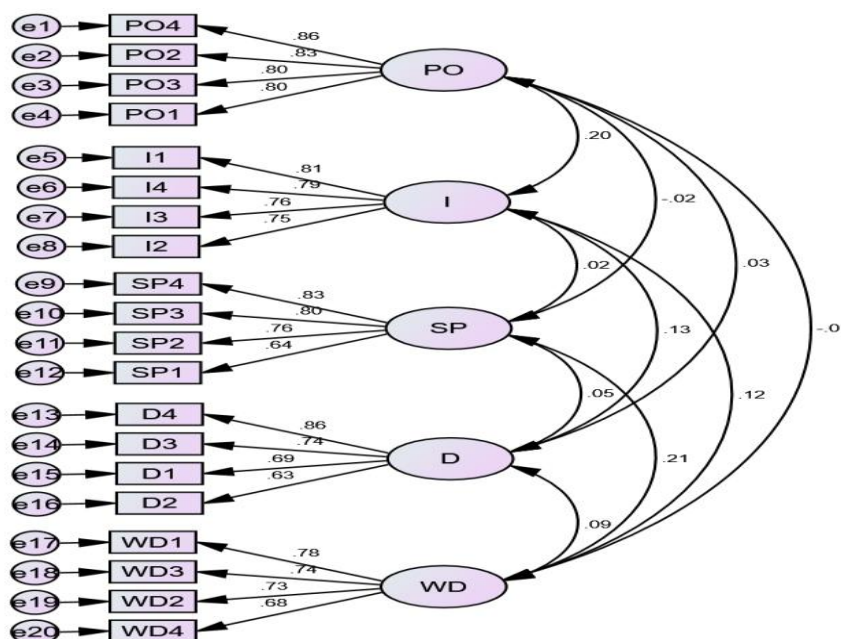
Source: Authors Compilation

Confirmatory Factor Analysis of Digital Marketing

In this research firstly a first order CFA was applied to each of the variables including dependents and independents. It will be calculated after the EFA analysis. Confirmatory Factor Analysis with help of EFA, factors or dimensions are identified, however, to assess the rigor of the theoretical structure which is derived out of EFA, the rigorous statistical techniques are required. CFA has numerous advantages such as taking care of measurement

error which included construct reliability and validity, besides this, it also confirms the factor loadings which is derived from EFA model. As suggested by Brown (2005), CFA is subset of Structural equation model, so all the indices which indicate the goodness of model for SEM, which is applicable to CFA too. Chi square known for sample sensitive so Joreskog, (2007) recommended CMIN, which is Chi square /DF, when CMIN is less than 5, it is sufficient, but if it is less than 2, it is considered to be really good.

Figure: 4.1 first orders CFA on Digital Marketing



Source: Authors Compilation

Figure 4.1 represent the First order Confirmatory factor analysis on digital marketing. As suggested by Hair et al., (2014) standardized estimated value 0.50 is the minimum acceptance value.

To ascertain whether the model was suitably fitting the data, several model fit indices that evaluate both

the goodness and badness of fit were examined using the AMOS output, there is no degree of uncertainty. According to table 4.3 value mentioned as all value are greater than the standard value 0.80, as suggested by Moolla and Bisschoff, (2013).

Table 4.3 Models Fit Indices

Sr. No.	Model Fit Indices	Default Value	Standard Value	Interpretation	Referred
1.	CMIN	316.266	-	-	- Byrne, 2016 - Moolla and Bisschoff, 2013
2	DF	160	-	-	
3	P	0.000	<0.05	Acceptable	
4	CMIN/DF	1.977	Between 1 to 5	Acceptable	
5	GFI	0.924	<3.649	Acceptable	
6	NFI	0.915	>0.800	Acceptable	
7	IFI	0.956	>0.800	Acceptable	
8	TLI	0.947	>0.800	Acceptable	
9	CFI	0.9956	>0.800	Acceptable	
10	RMSEA	0.049	<0.10	Acceptable	

Source: Authors Compilation

Table 4.4 displays the standardized weights that have been calculated for each of the items. These estimate values from 0.635 to 0.861, which shows the positive values. Value of standard regression weight is greater than the 0.5 which is acceptable as stated by Hair et al., (2014). It indicates that the

manifest variables are converging more closely on the same construct. On the basis of these values; it is possible to draw the conclusion that each of the observed items significantly represents the latent factor to which it is most closely related.

Table 4.4 Standardized Regression Weights

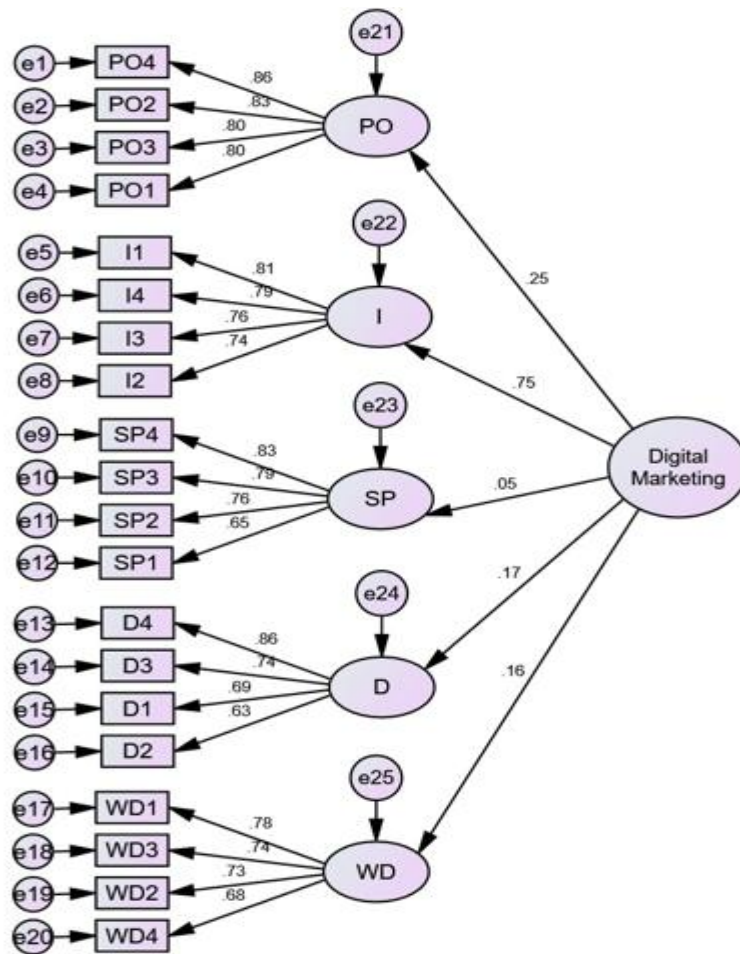
Items	Path	Factors	Estimate	S.E.	C.R.	P
PO4	<---	PO	0.857	-	-	--
PO2	<---	PO	0.834	0.050	19.794	***
PO3	<---	PO	0.802	0.051	18.724	***
PO1	<---	PO	0.797	0.051	18.582	***
I1	<---	I	0.806			
I4	<---	I	0.786	0.060	15.864	***
I3	<---	I	0.759	0.062	15.308	***
I2	<---	I	0.751	0.063	15.130	***
SP4	<---	SP	0.830	-	-	-
SP3	<---	SP	0.796	0.058	16.278	***
SP2	<---	SP	0.764	0.060	15.669	***
SP1	<---	SP	0.645	0.066	12.927	***
D4	<---	D	0.861	-	-	-
D3	<---	D	0.745	0.058	14.710	***
D1	<---	D	0.688	0.063	13.633	***
D2	<---	D	0.635	0.062	12.499	***
WD1	<---	WD	0.780	-	-	-
WD3	<---	WD	0.741	0.065	13.529	***
WD2	<---	WD	0.728	0.065	13.335	***
WD4	<---	WD	0.679	0.070	12.527	***

Source: Authors Compilation

Table 4.5 represents the accuracy & consistency of the digital marketing. Below mentioned are the indicators of validity and reliability. The discussion that follows will concentrate on these measurements and the corresponding outputs they generate the authenticity of the scale. According to the Claes & Larcker, (1981), CR > 0.7 and AVE value must be less than their respective CR value for the acceptance level and determinants are considered discriminant as well when the AVE > SV value.

Table 4.5 Model Validity Measures

Factors	CR	AVE	MSV	MaxR(H)
PO	0.894	0.677	0.041	0.896
I	0.858	0.602	0.041	0.859
SP	0.846	0.581	0.043	0.858
D	0.824	0.543	0.016	0.850
WD	0.822	0.537	0.043	0.826



Source: Authors Compilation

Figure 4.2 Second Order Confirmatory Factor Analysis of Digital Marketing

Figure 4.2 represent the second order Confirmatory factor analysis on digital marketing. As Stated by Hair et al., (2014) standardized estimated value 0.50 is minimum standard value. To ascertain whether the model was suitably fitting the data, several model fit indices that evaluate both the

goodness and badness of fit were examined using the AMOS output, there is no degree of uncertainty. According to table 4.6 value mentioned as all value are greater than the standard value 0.80, as suggested by Moolla and Bisschoff, (2013).

Table 4.6 Models Fit Indices

Sr. No.	Model Indices	Fit	Default Value	Standard Value	Interpretation	Referred
1	CMIN	316.266	-	-	-	- Browne and Cudek, 1993 - Ho, 2006 - Byrne, 2016 - Moolla and Bisschoff, 2013
2	DF	160	-	-	-	
3	P	0.000	<.05		Acceptable	
4	CMIN/DF	1.977	Between 1 to 5		Acceptable	
5	GFI	0.924	<3.649		Acceptable	
6	NFI	0.915	>0.800		Acceptable	
7	IFI	0.956	>0.800		Acceptable	
8	TLI	0.947	>0.800		Acceptable	
9	CFI	0.9956	>0.800		Acceptable	
10	RMSEA	0.049	<0.10		Acceptable	

Source: Authors Compilation

Table 4.7 displays the standardized regression weights that have been calculated for each of the items. These data range from 0.635 to 0.861 is showing significant value. By Hair et al. (2014), value of the standard regression weight is higher than the 0.5 which is acceptable to validate the factor Structure. When the factor loading is higher,

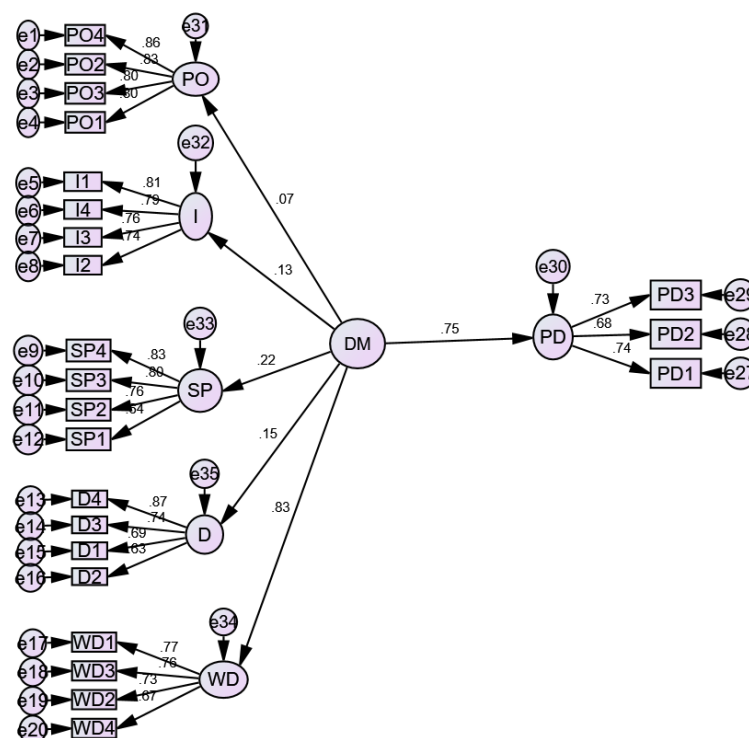
it indicates that the manifest variables are converging more closely on the same construct. On the basis of these values; it is possible to draw the conclusion that each of the observed items significantly represents the latent factor to which it is most closely related.

Table 4.7 Standardized Regression Weights

Items	Path	Factors	Estimate	S.E.	C.R.	P
PO4	<---	PO	0.857	-	-	--
PO2	<---	PO	0.834	0.050	19.794	***
PO3	<---	PO	0.802	0.051	18.724	***
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I1	<---	I	0.806			
I4	<---	I	0.786	0.060	15.864	***
I3	<---	I	0.759	0.062	15.308	***
I2	<---	I	0.751	0.063	15.130	***
SP4	<---	SP	0.830	-	-	-
SP3	<---	SP	0.796	0.058	16.278	***
SP2	<---	SP	0.764	0.060	15.669	***
SP1	<---	SP	0.645	0.066	12.927	***
D4	<---	D	0.861	-	-	-
D3	<---	D	0.745	0.058	14.710	***
D1	<---	D	0.688	0.063	13.633	***
D2	<---	D	0.635	0.062	12.499	***
WD1	<---	WD	0.780	-	-	-
WD3	<---	WD	0.741	0.065	13.529	***
WD2	<---	WD	0.728	0.065	13.335	***
WD4	<---	WD	0.679	0.070	12.527	***

Source: Authors Compilation

Figure: 4.3 Identify the determinant affecting the Purchase decision of customers regarding Digital Marketing



Source: Authors Compilation

Figure 4.3 represent determinants of DM that affect on the PD of the customers. By Hair et al., (2014) standardized estimated value 0.50 is minimum standard value.

To ascertain whether the model was suitably fitting the data, several model fit indices that evaluate both

the goodness and badness of fit were examined using the AMOS output, there is no degree of uncertainty. According to table 4.8 value mentioned as all value are greater than the standard value 0.80, as suggested by Moolla and Bisschoff, (2013).

Table: 4.8 Model Fit Indices

Sr. No.	Model Fit Indices	Default Value	Standard value	Interpretation	Suggested by
1	CMIN	400.291	-	-	- Browne and Cudek, 1993 - Ho, 2006 - Byrne, 2016 - Moolla and Bisschoff, 2013
2	DF	225	-	-	
3	P	0.000	<.05	Acceptable	
4	CMIN/DF	1.779	>5	Acceptable	
5	GFI	0.918	<3.649	Acceptable	
6	NFI	0.904	>.800	Acceptable	
7	IFI	0.956	>.800	Acceptable	
8	TLI	0.950	>.800	Acceptable	
9	CFI	0.955	>.800	Acceptable	
10	RMSEA	0.044	<0.10	Acceptable	

Source: Authors Compilation

Table 4.9 displays the standardized regression weights that have been calculated for each of the items. When the factor loading is higher, it indicates that the manifest variables are converging more closely on the same construct. On the basis of these values; it is possible to draw the conclusion that

each of the observed items significantly represents the latent factor to which it is most closely related. Data Presented in the table 4.9 are related with the factors of Digital marketing that are directly impact on the Purchase decision of the customers.

Table: 4.9 Standardized Regression Weight

Factors			Estimate	S.E.	C.R.	P
PO	<---	DM	0.069	0.095	1.059	.290
I	<---	DM	0.127	0.090	1.835	.066
SP	<---	DM	0.222	0.075	2.931	.003
D	<---	DM	0.151	0.089	2.138	.032
WD	<---	DM	0.826			
PD	<---	DM	0.751	0.195	3.743	***
PO4	<---	PO	0.858			
PO2	<---	PO	0.835	0.050	19.802	***
PO3	<---	PO	0.802	0.051	18.741	***
PO1	<---	PO	0.796	0.051	18.517	***
I1	<---	I	0.806			
I4	<---	I	0.792	0.061	15.910	***
I3	<---	I	0.757	0.062	15.226	***
I2	<---	I	0.739	0.063	14.830	***
SP4	<---	SP	0.831			
SP3	<---	SP	0.795	0.058	16.270	***
SP2	<---	SP	0.765	0.060	15.680	***
SP1	<---	SP	0.644	0.066	12.923	***
D4	<---	D	0.866			
D3	<---	D	0.741	0.057	14.680	***
D1	<---	D	0.685	0.062	13.601	***
D2	<---	D	0.635	0.061	12.522	***
WD1	<---	WD	0.769			

Factors			Estimate	S.E.	C.R.	P
WD3	<---	WD	0.756	0.065	14.005	***
WD2	<---	WD	0.729	0.065	13.565	***
WD4	<---	WD	0.672	0.070	12.534	***
PD2	<---	PD	0.676	0.074	12.611	***
PD3	<---	PD	0.728			
PD1	<---	PD	0.742			

Source: Authors Compilation

Findings & Conclusion

The study employed Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM) to validate and assess the impact of key digital marketing factors on customer purchase behavior. EFA identified five major dimensions—website design, price offerings, security and privacy, innovation, and delivery—as significant constructs influencing purchase decisions, while CFA confirmed the model's validity, reliability, and goodness-of-fit. SEM results further revealed that all five factors positively and significantly affect customer purchase behavior, indicating that enhancing these digital marketing dimensions can effectively improve customers' online purchase decisions.

Implication of the Study

The research contributes the existing body of knowledge by systematically exploring and validating the factors influencing PD in the context of digital marketing. Insights from validated factors help marketers allocate resources more efficiently—for example, investing in personalized digital campaigns, transparent communication, and engaging content. The findings guide firms to strengthen digital touch points that directly influence purchase decision, such as website design, ease of navigation, and digital trust. Ultimately, validated model define as a decision-making technique for marketers to predict and impact on consumer behavior in a competitive digital environment.

Limitation and Future Research Directions

Numerous factors of Digital marketing have been included in this study, but we can investigate other factors influencing both Digital marketing and purchase decision in the future.

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