

# Impact of Technological Innovation on Product and Distribution Strategies in Mobile Phone Industry



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## ABSTRACT

Technological innovation is considered to be an important driver of productivity growth. It also influences the marketing in numerous ways. To promote and sales of the products, there are many ways in which technological innovation influences creating innovative products on reasonable prices with advanced virtual platforms. The mobile phone industry undoubtedly has evolved over time with an enormous speed in all the manufacturing industries based on technology. The study has been done with the objective to discover the impact of technological innovation on product and distribution strategies in mobile phone industry. The research has been done using empirical research design. The study found that there is positive and significant impact of level of technological innovation used in mobile phone industry on product and distribution strategies.

**Keywords:** Technological innovation, Product strategies, Distribution strategies, Virtual platform

## 1. INTRODUCTION

Every business has to create the customer base to build the market so as to survive and ensure growth in the market. The business enterprise has to perform two functions namely innovation and marketing. Innovation is considered primary source to gain competitive advantage [1]. Marketing strategy allows companies to innovate for providing satisfaction more effectively in comparison to competitors [2].

There is a common concept that firm should enhance innovation so as to maintain competitive strength in the target market for effectively including innovative promotion strategy to incorporate firm's overall strategic framework. Contemporary research has proved that mobile telephony has become beneficial in many ways to provide advantages using the technology in many industries. The common advantages of mobile telephony in relations to different communication systems requires less all-round infrastructure facilities to work than available mobile networks. There is an exponential increase in the services diversities, area coverage and financial investments of mobile phone technology.

Mobile technology has become biggest driver responsible of economic growth of any county. The growth of Indian

mobile phone industry has witnessed of tremendous growth since its origin. Mobile phones are regarded as more valuable than any other available communication device and this is supporting convergence of technologies and other devices enormously in the growth at social, economic, and technological level. The technological innovation is providing support in the expansion of mobile phone industry.

Technological innovation is known as advancement through which innovative technical features are prolonged and brought into broad applications in technical devices and instruments. Innovation is a constant process which is initiated by the perception of new market and new services benefits are created by the technology which has led the production, growth, and marketing functions to strive for the commercial achievements due to inventio [3]. Usually, innovation is not considered as linear system; it includes many interconnections and responses feedback in all expansion stages. The technological innovation has completely modified from a singular innovation project to an effective and accessible innovation system [4]. There has been increase in the importance of networks and collaborations of technical advancements [5, 6].

## 2. LITERATURE REVIEW

The technological innovations include a series of scientific, commercial, organizational, financial, and technical activities [7]. Before submission of a technology in commercial purpose, there requires so many advancements and innovations [8]. Complementary resources are crucial to beat the competition level which decides the firm's business strategy for sourcing and fulfilment of complementary assets [9]. Technological innovation not only playing a keen role in the improvement of firms' performance [10]but also functions as an important competitive technique [11]. Innovation has six types ofnamely innovative products, services, production methods, new markets, supply sources and innovative ways of organising [12].Innovation objects create organization for the growth of products and services for serving the customers [13]. Technological innovation is classified as radical and incremental innovation and comprises the scope from sustainable innovation to disruptive innovation [14].

Radical innovation involves all significant innovative technologies which requires necessary changes in consumption avenues and are regarded as an offer to increase the benefits. There are many firms related to market which may try themselves to extensively use of incremental innovation related to modifications of existing technical and designs that is called dominant design. Many empirical studies had shown that products attributes have effect on the growing patterns of products and services [15].

Innovation depends on characteristics of products and how does it influence the rate of adoption of technical capabilities [16]. There are many characteristics of innovation consisting relative advantages, complexity and compatibilities which encourage customers of mobile marketing acceptance [17]. Innovation comprises both technological like innovative products, services and administrative innovation related to new procedures, policies. The main significant factor related to successful business strategy and an essential element which have affect the marketing process [18]. Sharing of global information has enhanced the firm's competence and assisted in meeting the customers need to modify an international organization into a famous global firm [19].

Technological convergence has evolved the telecom industry in modifying the mobile phones and altered the digital marketplace and has given birth to next generation mobile phones [20]. Markets are transferring to intensive research for knowing the customer's buying decision process and found the most essential factors having direct influence on customers' choices in the mobile phone market [21]. [22] described the relationship between firms' value and new product development in the mobile handset manufacturing from 1992-2002. Radical and incremental innovations enhance the firm's market share if they adopt the new product development in mobile industry. Mobile phone adopts the innovative marketing strategies so as to provide great facilities and comfort to consumers [23].

The conventional ecosystems have controlled the mobile operators and handsets producers which have diversified the demands of mobile handsets in the markets all around the world and increasing the growth pattern of mobile telecommunication [24]. Innovation have capabilities to affect the different dimensions of personalities of customers which may control the buying decision and customer buying behavior [25]. There are direct effects of rate of innovation introduction on product component, design, and innovative platforms for selling and distributing the mobile handsets [26]. Technological advancements have completely changed the patterns in which a customer acts and obtains information to communicate the other people by which marketing of firms have been completely changed [27].

Consumers' perception for using the high technologically developed products is determined by the extrinsic and intrinsic motivations [28]. Customer's switching behavior depends on various push factors like satisfaction and value in the mobile phone market which determine the growth patterns and overall satisfaction in the [29]. Consumption of mobile phone has increased the demand of mobile

handsets in the market which ultimately has brought the trend quicker and personalized the public communication supporting the new facet of virtual mobility in the Indian mobile phone market. Consumer innovativeness, perceived usefulness and personal attachments have directly influenced the customer attitude for mobile marketing. The research belongs to high innovation category form positive attitudes in the mobile marketing areas in the application of virtual programme by engaging the consumers in different innovative platforms [30].

Innovative technology is radically modifying the approach which companies target the market and help web-based marketing techniques [31]. Strategic capabilities facilitate the influence of technology on firm's performance in new ventures [32]. The technological innovation capabilities directly influence the product competitiveness of Chinese production firms and recognize the key components of technical innovations [33].

There are two variables which have direct influence on variables which affect the buying through mobile advertising. First variable is the customer's attitude for mobile advertising which show significant positive effects on buying using mobile advertising. Second variable is social factor which have a good response on mobile advertising and a have high social effect on mobile advertising [34]. It was demonstrated to measure the user's productivity through mapping the design implication of process related to cognition for the user interface of application. The output of this mapping was to set the guidelines which support the designer using the designing the mobile application in diverting environment [35].

### 3. RESEARCH METHODOLOGY

The study adopted the empirical research design to work upon the research problem and an intended questionnaire was applied to collect data to test hypotheses framed established on the analysis of literature. The study collected data from companies' executives and officers working in mobile phone companies on different designations. A survey response of 195 was taken in Rajasthan and Delhi and for testing the research constructs and data was analysed using SPSS 20.0. The research utilized five-point rating level varying from strongly disagree to strongly agree. The online and personal survey was conducted and after doing comprehensive data cleaning, 195 responses were considered for the analysis.

#### 3.1 Hypotheses

H<sub>1</sub>: There is a significant and positive impact of technological innovation product strategies.

H<sub>2</sub>: There is a significant and positive impact of technological innovation on distribution strategies.

### 4. DATA ANALYSIS AND INTERPRETATION

#### 4.1 Reliability Analysis

This analysis was conducted through the use of Cronbach's alpha to analyse the internal consistency among various research items utilized in the

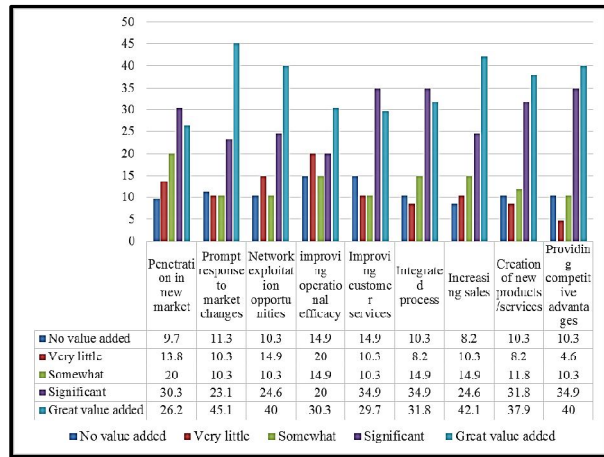
questionnaire for the study. The research items which did not fulfil the internal consistency of reliability analysis, they were removed. Below table no. 1 shows reliability analysis.

**Table 1: Analysis of Reliability**

Reliability Statistics	
Value of Cronbach Alpha	Number of Items
.966	30

**4.2 Level of Value Addition by Technological Innovation to Different Aspects of Business**

Following figure 1 shows that technological innovation plays a significant role in the improvement of overall performance of the business and helps to gain the competitive advantages to the company.



**Figure 1: Technological Innovation and Business Aspects**

**4.3 Normality of Data**

Two different tests of normality, first Kolmogorov-Smirnov and Shapiro-Wilk test were conducted to check the normality. Both the tests compared the shape of the sample distribution using the shape of normal bell-shaped curve.

As per below mentioned table no. 2, it is clear that collected data shows that factors related to product and distribution shows significance value (p) .000. As the significant value (p-value) is less than 0.05 then null hypothesis is rejected and the alternative hypothesis is accepted for the non-normal fashion of data.

**Table 2: Tests of Normality**

Items	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Product	.190	195	.000	.868	195	.000
Distribution(Place)	.172	195	.000	.879	195	.000

**4.4 Correlation Analysis:**

Correlation analysis was conducted to find out the correlation among different variables used to conduct the study. This analysis represented the complex web of associations among variables. Kendall's Tau Correlation was calculated to analysis of series of variables. This coefficient analysis indicated a positive association among different factors. As it is clear in table no. 3, the value comes in green cells are less than 0.05 which shows that that correlation is statistically significant.

**Table 3: Correlation Analysis**

		Technological Innovation	Product	Distribution(Place)
Kendall's tau_b	Technological Innovation	r	1.000	0.577
		Sig. Value	.	.000
	Product	r	0.577	1.000
		Sig. Value	.000	.
	Distribution (Place)	r	0.510	0.865
		Sig. Value	.000	.000

**4.5 Hypotheses Testing**

**H<sub>1</sub>: There is a significant and positive impact of technological innovation product strategies.**

To test the above hypothesis linear regression analysis was conducted. Results of the analysis are exhibited in the following table no. 4 related to effect of technological innovation and product strategies. This analysis was done at the significance level of 0.05.

**Table 4: Summary of model for Regression Analysis**

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.597	.357	.352	1.35069	1.536
Predictors: (Constant), Technological Innovation				
Dependent Variable: Product				

The R value in table 4 shows bivariate correlation between technological innovation and product is .597. The Rsquare value was found .357 or 35.7% and the adjusted R square was found .352. 35.2% variation was explained by the technological innovation into product. Durbin Watson value was found 1.536 which is in between -2 and +2 that proves that there is no auto correlation in technological innovation and product.

**Table 5 : Results of ANOVA of Regression Analysis**

ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	24.923	1	24.923	13.661	.000
Residual	352.104	193	1.824		
Total	377.027	194			
Predictors: (Constant), Technological Innovation					
Dependent Variable: Product					

The impact of technological innovation on product strategies was found significantly fit ( $p < .05$ ) as shown in the ANOVA table 5 due to  $F(1,193) = 13.661$  and significance value is .000. The relationship deemed to be linear as computed significance level is .000 which is less than the anticipated level (Significance level 0.05).

**Table 6: Significance Test**

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
(Constant)	2.655	.242	10.976	.000
Technological Innovation	.246	.067	3.696	.000
Predictors: (Constant), Technological Innovation				
Dependent Variable: Product				

As per above table no. 6, the coefficient of technological innovation was found significantly effecting the product. The magnitude of this coefficient was found .246. The significance value was found .000 which is less than .05 then the variable deemed to be significant. Equation after the application of regression model;

$$Y(\text{product}) = 2.655 + .246(\text{technological innovation})$$

The technological innovation is positively associated with the product as per the result of regression model. The regression coefficient is .246. The significance level .000 ( $p < 0.05$ ) indicates that regression co-efficient is statistically significant and the factor significantly contributes in the variations of dependent variable i.e. product. So that null hypothesis is not accepted, and alternate hypothesis is accepted i.e. there is a positive and significant impact of technological innovation on product strategies.

**H<sub>2</sub>: There is a significant and positive impact of technological innovation on distribution strategies.**

To test the above hypothesis linear regression analysis was conducted. The results of the analysis are shown in the following table no.7 related to effect of technological innovation and product. This analysis was done at the significance level of 0.05.

**Table7 : Model Summary for Regression Analysis**

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.530	.262	.257	1.36406	1.549
Predictors: (Constant), Technological Innovation				
Dependent Variable: Distribution (Place)				

The R value in table 7 shows bivariate correlation between technological innovation and place (distribution) is .530. The R square value was found .262 or 26.2% and the adjusted R square was found .257. 25.7% variation was explained by the technological innovation into the distribution. Durbin Watson value was found 1.549 which is in between -2 and +2 explains that there is no auto correlation in technological innovation and distribution.

**Table 8: ANOVA Results for Regression Analysis**

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	19.200	1	19.200	10.319	.002
Residual	359.105	193	1.861		
Total	378.305	194			
Predictors: (Constant), Technological Innovation					
Dependent Variable: Distribution (Place)					

The impact of technological innovation on distribution was found significantly fit ( $p < .05$ ) as shown in the ANOVA table 8 due to  $F(1,193) = 10.319$  and significance value is .002. The relationship deemed to be linear as calculated significance level is .002 which is less than the desired level (Significance level 0.05).

**Table 9 : Significance Test**

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
(Constant)	2.669	.244	10.923	.000
Technological Innovation	.216	.067	3.212	.002
Predictors: (Constant), Technological Innovation				
Dependent Variable: Distribution(Place)				

As per above table no. 9, the coefficient of technological innovation was found significant effecting positively the distribution. The magnitude of this coefficient was found .216. The significance value was

found .002 which is less than .05 then the variable deemed to be significant.

Equation after the application of regression model.

$$Y(\text{distribution}) = 2.669 + .216(\text{technological innovation})$$

The technological innovation is positively associated with the distribution as per the result of regression model. The regression coefficient is .216. The significance level .002 ( $p < 0.05$ ) suggests that regression co-efficient is statistically substantial and the factor significantly contributes to the variations of dependent variable i.e. place (distribution). So null hypothesis is not accepted, and alternate hypothesis is accepted which states that there is a significant and positive impact of technological innovation on distribution (place) strategies.

## 5 CONCLUSION

The companies have to introduce several product innovations for stimulating demand for the additional purchases. The pace of innovative product innovations requires continually restructured the scope of product over the time being. It has been observed that introduction of several revolutionary product technologies has given birth to smartphone devices. With regard to significant impact of technological innovation on product strategies, the results have shown the positive response of technological innovation. Technological innovation comprising product and process innovations have changed the mobile phone from a simple communication device to a multitasking converging product. The rising demand for the technologically converged product known as smartphone. Increasing number of consumer segments have forced the companies to expand their product portfolio with innovative models and also to transform their manufacturing process for the enhancement of product quality.

With regard to the impact of technological innovation on distributions strategies, responses have shown the positive findings. The technological innovation has changed the traditional dimensions of distribution into the digital. The place of physical store has been taken by the virtual stores which have enabled the companies to deliver the product to consumer more rapidly. For the efficient inbound logistics system, the organizations are using computerized scanning systems to inform the suppliers to get the supplies on time. More recent developments in electronic technologies are further improving the efficiency and effectiveness with which the logistical activities are managed and implemented. The accuracy and speedy billing and invoicing customers have become vital important for better customer relationships so that automated emails enabled by the innovative technologies to customers have initiated the online purchase.

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