

Study of the Failure of HP TouchPad

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Abstract: On July 1st, 2011, HP launched its tablet computer called HP TouchPad in the US. Within two weeks, the product was launched in Germany, UK, Canada, and France. However, it faced huge challenges with the launch of Apple's iPad 2. The sales of the product declined very fast. Finally, HP decided to discontinue the product on August 18, 2011. The tablet computer was run by an open-source operating system called webOS. The software was developed by a team at HP. Initially it was announced that HP would re-use the operating system for their future products from 2013. However, in 2013, HP sold the source code of the operating system to LG. Thus, this is an interesting case depicting the failure of a product developed by a market leader. After this failure, HP never entered the market of tablet computers. In this research project, the case is analyzed in depth. The root cause of the failure is investigated by defining and analyzing research questions. Survey data is gathered to analyze the research questions. Several tools and methods of product analytics are used to analyze the survey data. In addition, effectiveness of several product strategies and agile product management principles to solve the problem are evaluated. The results of this research work provide lots of insights and understanding of the management's decision problems and help us prevent such failures in the future.

Introduction: In this research project, the failure of HP's product called TouchPad¹ is studied. HP, the Hewlett-Packard Company, was established in 1993. It is a market leader in desktop computers for home, office and gaming applications, monitors, printers and their accessories, etc. HP developed a tablet computer called TouchPad. On July 1st, 2011, HP launched the product in the US. Within two weeks, the product was launched in Germany, UK, Canada, and France. However, the product faced a huge challenge from Apple's iPad 2. The users did not accept the product by HP and the sales of TouchPad started declining within a couple of weeks. TouchPad was powered by HP's in-house developed operating system called webOS. Finally, HP decided to discontinue the product on August 18, 2011. Later, in 2013, HP also sold the operating system webOS to LG.

¹ Wikipedia. "HP TouchPad." In https://en.wikipedia.org/wiki/HP_TouchPad.

This was a big failure for HP. After this incident, HP never developed a tablet computer again. This is an interesting case of failure of a product developed by a market leader. Proper study of this case can help understand the flaws in product management to prevent such failure in the future. Thus, the result of this study can help product managers understand the best practices to prevent such failure.

The objective of this research project is to find the root cause of this failure and to study the effectiveness of different product strategies and agile product management principles to solve the problem. To analyze the root cause of failure, the following research questions are defined.

- *What is the impact of releasing two products by two different brands at the same time, given that one brand is more popular than the other one?*
- *What are the least features needed in a new product to make it successful when other similar products are already accepted by the users?*

For this research project, freely available data from HP and its competitors' websites are analyzed. Data from other relevant websites is also analyzed. In addition, a detailed review of prior work is also done. Literature [1] shows that around more than 66% of new products are affected by their competitors during the launch. The authors studied a diverse range of products to analyze it. Competitive interactions are studied, and a regression model is proposed for quantifying the interactions. Literature [2] shows the statistics of different product launches. Also, it shows different strategies to maximize the success of product launch. In literature [3], the authors discuss the nature of competitions before and after stretching the product lines. Literature [4] describes the case study on the failure of the product. Literature [5] first describes the case study of HP Touchpad and then recommends solutions to improve product strategy. Literature [6] tries to find the root cause of the failure of HP Touchpad. However, no other literature has been found which addressed the exact research questions defined in this project.

Thus, in this research work, root cause of the failure of TouchPad is analyzed and effectiveness of different product strategies and agile product management theories to solve the problem are analyzed. To do so, the following steps are followed in this research project.

1. Data is collected from several sources like the company's website, competitor's websites, other relevant websites, and surveys.
2. The data is analyzed to find answers to the research questions.

3. Different product strategies are analyzed to solve the problem.
4. Different agile product management principles, methods and frameworks are analyzed to solve the problem.
5. The results are critically analyzed to propose the best practices.

Methodology: The methodology designed for this research project is explained below.

1. Sampling: In this research project, we have used non-probabilistic judgmental sampling. The population of our interest is from any demographic, having an age range from 18 to 45 years. The advantage of this sampling is that it covers a large demographics. The disadvantage of the sampling method is that there is room for human error, including bias. However, in our case, due to time-constraints, the size of the samples is also small.
2. Measurement and Scaling: We use Microsoft Form as a tool to record measurement. We have used Ratio scale in this questionnaire. Ratio scale captures continuous information which helps do detailed analytics.
3. Quantitative Method: We have used a quantitative approach in this research project. In this approach, a questionnaire is prepared. The questionnaire is shared with a survey agency to collect the response as per the decided sampling method.

In this research work, we use Excel software and Python libraries. Appendix 1 contains the questionnaire. This questionnaire is used in hypothesis testing, predictive analytics, etc. In addition, Appendix 2 contains the questionnaire for Conjoint Design. After getting survey data, we pre-process the data to eliminate rows having NaNs or undefined values.

Analysis and Result: In this section, first we do a detailed analysis of the data received from surveys. Next, we analyze the product strategies. Finally, we analyze the principles, methods, and frameworks of agile product management to solve the problem.

First, we start with Product Analytics. Hypothesis testing is done on the data received from survey. The null hypothesis, the alternate hypothesis and the p-value are given below. In this test, Z-test is considered as the data received has samples more than 30 (the data has 54 samples).

Hypothesis Test 1:

- H0: People do not consider software functionalities while buying tablet computers.
- H1: People do consider software functionalities while buying tablet computers.

- p-value: 5.33921E-09

Hypothesis Test 2:

- H0: People do not buy HP tablet computers if they have a smaller number of features compared with that of Apple's iPads.
- H1: People do buy HP tablet computers if they have a smaller number of features compared with that of Apple's iPads.
- p-value: 0.264876626

Hypothesis Test 3:

- H0: People do not buy HP tablet computers if they have a greater number of features compared with that of Apple's iPad.
- H1: People do buy HP tablet computers if they have a greater number of features compared with that of Apple's iPad.
- p-value: 0.000433266

Hypothesis Test 4:

- H0: People do not buy HP tablet computers if there will be a launch of Apple's iPad shortly and the price of iPad is within budget.
- H1: People do buy HP tablet computers even if there will be a launch of Apple's iPad shortly and the price is within budget.
- p-value: 0.943076851

Hypothesis Test 5:

- H0: People do not buy HP tablet computers if there will be a launch of Apple's iPad shortly and the price of iPad is not within budget.
- H1: People do buy HP tablet computers even if there will be a launch of Apple's iPad shortly and the price is not within budget.
- p-value: 2.16204E-06

Next, we do regression analysis to predict the features. For this Excel software is used. The results of Regression Statistics are given below.

Regression Statistics	
Multiple R	0.905588485
R Square	0.820090505
Adjusted R Square	0.788106595
Standard Error	0.98662872
Observations	54

Figure 3: Regression statistics showing R Square and Adjusted R Square

ANOVA		df	SS	MS	F	Significance F
Regression		8	199.6768511	24.95960638	25.6407206	2.40511E-14
Residual		45	43.80463041	0.973436231		
Total		53	243.4814815			

Figure 4: ANOVA Analysis of Regression

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.498047924	0.897679748	1.668799556	0.10210112	-0.309971899	3.306067747	-0.3099713	3.306067747
How likely are you to use a tablet computer while travelling?	0.015320126	0.070778181	0.21645266	0.82961319	-0.127234448	0.157874699	-0.12723445	0.157874699
How likely are you to follow release of new technical gadgets?	0.020298178	0.090231419	0.224956871	0.82303126	-0.161437229	0.202033585	-0.16143723	0.202033585
How likely are you to spend money on shopping and travelling?	-0.18172137	0.060900559	-2.98390316	0.00458636	-0.304381394	-0.05906135	-0.30438139	-0.05906135
How likely are you to use tablet computers for gaming?	0.515335573	0.077119515	6.682297886	3.0197E-08	0.360008896	0.670662249	0.360008894	0.670662249
How likely are you to watch movies in a tablet computer?	0.286414367	0.088534936	3.235043477	0.00228242	0.108095852	0.464732882	0.108095852	0.464732882
How likely are you to do confidential activities like financial activities, etc. in a tablet com	0.031711655	0.079027301	0.401274684	0.69011712	-0.1274575	0.190880811	-0.1274575	0.190880811
How likely are you to edit videos in a tablet computer?	0.028231157	0.080871054	0.34908853	0.72865109	-0.134651507	0.191113822	-0.13465151	0.191113822
How likely are you to do painting in a tablet computer?	0.125502814	0.077637484	1.616523465	0.1129711	-0.030867105	0.281872733	-0.0308671	0.281872733

Figure 5: Regression coefficients and their p-values

Figure 3 shows that the regression accuracy is quite good. Figure 4 shows that the significance of regression is also good as the significance value is less than 0.05. Figure 5 shows the coefficients and their p-values. Variables having p-values less than 0.05 are significant.

Next, we do Conjoint Analysis to understand buyers' preferences. Conjoint Analysis is carried out in Excel software. Figure 6 shows the reference variables and abbreviations of all the variables. The ratings are taken from 0-10.

References	Weight Light	WL
	Display Medium	DM
	Battery Medium Range	BMR
Others	Weight Ultra Light	WUL
	Display Large	DL
	Battery High Range	BHR

Figure 6: Reference variables and abbreviations of all the variables used in Conjoint Analysis

Figure 7 shows the summary of the regression. It shows that R Square and Adjusted R Square values are good. Also, the significance value in ANOVA is also less than 0.05. Thus, the Conjoint Analysis is reliable. Further, the model is validated with both training and validation

datasets. With training dataset, the Mean Absolute Error is 0.6 (in a range of rating 0-10).

With validation dataset, the Mean Absolute Error is 1.25 (in a range of rating 0-10).

SUMMARY OUTPUT							
Regression Statistics							
Multiple R	0.971305484						
R Square	0.943434343						
Adjusted R Square	0.901010101						
Standard Error	0.935414347						
Observations	8						
ANOVA							
	df	SS	MS	F	Significance F		
Regression	3	58.375	19.45833	22.23809524	0.00588504		
Residual	4	3.5	0.875				
Total	7	61.875					
Coefficients							
Intercept	4.25	0.661437828	6.425396	0.003016383	2.413554181	6.086445819	
WUL	1.25	0.661437828	1.889822	0.131777567	-0.586445819	3.086445819	0.086445819
DL	-0.25	0.661437828	-0.37796	0.724658636	-2.086445819	1.586445819	-2.086445819
BHR	5.25	0.661437828	7.937254	0.00136413	3.413554181	7.086445819	3.413554181

Figure 7: Summary of regression for Conjoint Analysis

Figure 8 shows the summary of Conjoint Analysis. It includes the part-worth, Range of Utility and Importance. The result shows that battery life of tablet computers has the highest importance.

Part-worth/Utilities	
WUL	1.25
DL	-0.25
BHR	5.25
Range of Utility	
Weight	1.25
Display	0.25
Battery	5.25
Importance	
Weight	0.185185185
Display	0.037037037
Battery	0.777777778

Figure 8: Summary of Conjoint Analysis

Next, we do Market Basket Analysis. This analysis tells us the probability of occurrence of multiple events and its comparison with actual number of events occurred. In this we case, we have done Two Way Lift analysis and results are given in Figure 9.

Two Way Lift	LHS Frequency	RHS	RHS Frequency	Total	Predicted Count	Actual Count	Lift
How likely are you to use a tablet computer while travelling?	0.24	How likely are you to buy a tablet computer by HP?	0.4	54	5.184	8	1.543209877
How likely are you to do painting in a tablet computer?	0.2	How likely are you to buy a tablet computer by HP?	0.4	54	4.32	5	1.157407407
How likely are you to edit videos in a tablet computer?	0.14	How likely are you to buy a tablet computer by HP?	0.4	54	3.024	5	1.653433153

Figure 9: Market Basket Analysis

Next, we do K-Means clustering with Scikit-Learn Python library. In cluster-based analysis, we try to group those who follow latest technological trends frequently and who use tablet computers for confidential activities like financial activities, etc. as per different clusters of likeliness to buy tablet computers from HP. To do the analysis, first we create three clusters of the variable called 'How likely are you to buy a tablet computer by HP?' using Scikit-Learn. The clusters are given below.

- Cluster 0: Highly likely to buy a tablet computer by HP (center of cluster is 7.8125)
- Cluster 1: Highly likely to buy a tablet computer by HP (center of cluster is 4.5625)
- Cluster 2: Highly likely to buy a tablet computer by HP (center of cluster is 9.36363636)

Scikit-Learn also gives the labels of the clusters. As per the labels, we manually create clusters of the variables 'How likely are you to do confidential activities like financial activities, etc. in a tablet computer?' and 'How likely are you to follow release of new technical gadgets?' in Excel. Figure 17 and Figure 18 show the results of cluster analysis. It is observed from Figure 17 that the average values of 'How likely are you to do confidential activities like financial activities, etc. in a tablet computer?' falling in the clusters (Cluster 0, Cluster 1, and Cluster 2) have no significant difference among them as their p-values are more than 0.05. Similarly, it is observed from 18 that the average values of 'How likely are you to follow release of new technical gadgets?' falling in the clusters (Cluster 0, Cluster 1, and Cluster 2) have no significant difference among them as their p-values are more than 0.05.

Anova: Single Factor						
How likely are you to follow release of new technical gadgets?						
SUMMARY						
Groups	Count	Sum	Average	Variance		
Cluster 0	16	105	6.5625	0.929166667		
Cluster 1	16	98	6.125	1.983333333		
Cluster 2	22	155	7.045454545	5.75974026		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	7.950547138	2	3.975273569	1.23139233	0.300417	3.178799
Within Groups	164.6420455	51	3.228275401			
Total	172.5925926	53				

Figure 17: Cluster Analysis

Anova: Single Factor					
How likely are you to do confidential activities like financial activities, etc. in a tablet computer?					
SUMMARY					
Groups	Count	Sum	Average	Variance	
Cluster 0	16	109	6.8125	3.3625	
Cluster 1	16	95	5.9375	3.795833333	
Cluster 2	22	155	7.045454545	4.426406926	
ANOVA					
Source of Variation	SS	df	MS	F	P-value
Between Groups	11.98526936	2	5.99263468	1.525608057	0.22724797
Within Groups	200.3295455	51	3.928030303		3.178799292
Total	212.3148148	53			

Figure 18: Cluster Analysis

Next, we discuss the results of the above analysis. Using Hypothesis tests, the research questions are investigated as follows.

- *What is the impact of releasing two products by two different brands at the same time, given that one brand is more popular than the other one?*
 - In Hypothesis Test 4, the alternate hypothesis is disproved, and, in Hypothesis Test 5, the alternate hypothesis is proved. Both these hypotheses jointly prove that if the price of a tablet computer is less than the price of iPad by Apple, the launch of iPad does not affect the other tablet computer. Thus, price is a crucial factor when multiple related products are launched in the market at the same time.
- *What are the least features needed in a new product to make it successful when other similar products are already accepted by the users?*
 - In Hypothesis Test 1, the alternate hypothesis is proved. This proves that people consider software functionalities a lot while buying a tablet computer. Thus, a tablet computer should have more software functionalities to attract customers. In Hypothesis Test 2, the alternate hypothesis is disproved. Thus, buyers prefer buying tablet computers by other brands only if they have more features than iPad by Apple. This is further proved in Hypothesis Test 3.

Next, the result of predictive analytics, which is presented in Figure 5, shows the following.

1. People, who spend less money on shopping and travelling, are more likely to buy tablet computers from HP.
2. People, who spend time on playing games in tablet computers, are more likely to buy tablet computers from HP.
3. People, who spend time on watching movies in tablet computers, are more likely to buy tablet computers from HP.

In this analysis, we do not consider other variables as their p-values are more than 0.05 and, hence, they are not significant. Thus, proper conclusions cannot be drawn from the variables.

Next, the result of Conjoint Analysis shows the features users prefer in tablet computers. The results are given in Figure 8. The *Importance* of different utilities show that battery quality has the highest importance.

Next, Figure 9 shows the result of Market Basket Analysis. It is summarized below.

1. People, who use tablet computers while travelling, are likely to buy HP tablet computers.
2. People, who use tablet computers for painting, are likely to buy HP tablet computers.
3. People, who use tablet computers to edit videos, are likely to buy HP tablet computers.

Thus, the results of Product Analytics show which features are useful in tablet computers.

Next, we analyze HP, its competitors, and the market. The long term² goals of HP are to improve the financials of the company, increase portfolio, enable digital transformation, disrupt the new markets, and create sustainable impact. In 2022, the key growth areas of HP were gaming, hybrid-systems, and workforce services, etc. The key competitors of HP are Lenovo, Apple, ASUS, Samsung, and Dell, etc. Apple manufactures a wide variety of products like computers, phones, tablets, etc. However, as shown in Figure 10 of Appendix 3, the net sales of the financial report of Apple shows that there is a trend of lower number of sales of iPhone, Mac, and iPad. Next, the popularity of varied brands is analyzed in Figure 12 of Appendix 3. It is observed that HP leads the popularity of laptops in the U.S. Next, the popularity of iOS and Android is analyzed in Figure 13 of Appendix 3. It is observed that, in Japan and the U.S., iOS is more popular than Android. However, in the case of tablet computers, Apple captures most of the market as shown in Figure 14 of Appendix 3. The comparison of HP's TouchPad and Apple's iPad 2 is given in Figure 15 of Appendix 3. Figure 16 of Appendix 3 shows the market segment analysis of tablet computers.

The result of this analysis is given below.

1. It is observed that HP is a leader in the market of laptop computers in the U.S. and Apple is the global leader in tablet computers.
2. It is observed that, in Japan and the U.S., users prefer iOS to Android.

² HP. "2022 Annual Report and 2023 Proxy Statement." In *HP*, 2022.

3. It is observed that, from 2023-2039, the market of tablet computers will grow at a forecasted CAGR of 6.7%.
4. TouchPad's battery rating was inferior to that of Apple's iPad 2.
5. TouchPad did not have a video camera and a selfie-camera while Apple's iPad 2 had.

Discussion: In this section, we discuss the outcomes of the results of the analysis. First, we discuss the results of Product Analytics, then we discuss the product strategies and the principles of agile product management to solve the problem.

We draw the following conclusions from the results of Product Analytics.

1. Using Hypothesis test, it has been proved that when two tablet computers by two different brands at the same time are released where one brand is more popular than the other one, the brand which is less popular should sell the product at a lower price compared to the more popular one.
2. Using Hypothesis test, it has been proved that when two tablet computers by two different brands at the same time are released where one brand is more popular than the other one, the brand which is less popular should have more features compared to the more popular one.
3. From predictive analytics, it is proved that users are expected to play games and watch movies on HP's tablet computers. HP should have developed its tablet computers taking these into consideration because playing games and watching movies need more power and energy from battery.
4. From Market Basket Analysis, it is proved that users are expected to use HP's tablet computer for painting and video editing. In addition, travelers are also expected to use HP's tablet computers. HP should have designed its tablet computer as per these user personas. All these users need a good camera – as travelers need to take photographs – and a good battery in their tablet computers.

From the above conclusions, it is observed that HP should have considered adding a superior quality camera and battery to TouchPad to create value to its users. It is also observed from Figure 15 of Appendix 3 that HP's TouchPad had no video camera and selfie camera. In addition, HP's TouchPad gave 300 hours of stand-by mode while Apple's iPad 2 gave 720 hours of stand-by mode. Hence, HP's TouchPad could not create any value to its users.

Next, we discuss different product strategies. In this discussion, we highlight the wrong strategies executed by HP and discuss strategies which could solve this problem.

First, we discuss the factors influencing the product strategy of TouchPad. In the *external factors category*, it is observed the mindset of buyers did not favor the product called TouchPad. The users did not like the product much and it impacted the product strategy a lot. Similarly, in the *internal factors category*, it could have found more areas of technological and innovative improvement of the product. Both these factors impacted the product strategy of TouchPad adversely.

Next, we discuss the failure of TouchPad with Porter's Value Chain Model. The product called TouchPad could not create and deliver a value. This has been analyzed with Porter's Value Chain Model as shown below. The model has the following key elements.

1. Identify the inbound logistics: HP could not successfully identify the raw materials needed to develop the product. It should have identified inbound logistics for a better video and selfie camera for the tablet computer and a good battery for TouchPad. Also, HP should have thought of optimizing the cost of inbound logistics.
2. Identify the operations and create a value: In this case, HP failed to create value through their product. They could not solve the issues faced by the users.
3. Outbound logistics: HP could have optimized the outbound logistics further to deliver the product to everywhere at the same time.
4. Communicate the value: HP could not communicate the value created by its product. Hence, users could not connect themselves to the product.
5. Co-create: To provide a service, it should co-create with its users with innovative feedback methods. On the other hand, in this case, HP abruptly discontinued the product. This severely impacted the tablet business of HP. After this failure, HP never entered the tablet business again.

Next, we discuss the business model of HP using Porter's Five Force Model. The following forces are used to analyze the case.

1. Competitive rivalry: Apple and other tablet computer manufacturers were the competitors of HP in the business of tablet computers. Apple has a strong presence in the field of tablet computers.
2. Potential new entrants: At the time when TouchPad was introduced, no other new entrants were in this field. This was an advantage for HP.
3. Power of supplier: HP Touchpad was built with Qualcomm's Snapdragon processor. So, HP was dependent on Qualcomm to get the processors.

4. Power of customer: HP should have analyzed the price sensitivity and buyers' ability to substitute through different analytics-based approaches. Already Apple's iPad captured the market. So, buyers of tablet computers had alternate choices.
5. Threat of substitute: The threat of substitute was mainly from Apple. The popularity of its iPads produced a threat to HP's TouchPad.

Next, HP is analyzed with SWOT matrix as follows.

Strength (Internal, Helpful):

- Core competency in developing computers, printers, and monitors for different applications.
- Strong marketing and sales network in Europe, Asia, and America.
- Core competency in developing accessories for computers.

Weakness (Internal, Not Helpful):

- Did not have own Operating System.

Opportunity (External, Helpful):

- To start business in tablet computers as the market was growing.

Threats (External, Not Helpful):

- Strong players existed in the tablet computer business.

HP had an opportunity to grow in the field of tablet computers like it did for laptops, monitors, printers, etc. In addition, it has core competencies in the computer business and has a strong marketing network. Now, it could have used Ansoff's Product-market Expansion Grid to analyze the product strategy of TouchPad. Since TouchPad was a new product by HP for an existing market, as per Ansoff's matrix, HP should have focused on extensive research and development to differentiate TouchPad from others. However, in reality, HP failed to differentiate its product from iPad 2.

Finally, we propose some strategies which either HP could have followed or can be used as best practices to avoid such product failure in the future.

- Interactions with customers: HP should have done customer surveys and identified the categories of its brands which fell into Mind Share Brand, Heart Share Brand, Spirit

Share Brand. Based on this analysis, HP should have decided on the interaction with its customers regarding TouchPad.

- Creating value: As per Philipp Cotler's concept, HP should have concentrated on creating value. Figure 15 of Appendix 3 shows the comparison between HP's TouchPad and Apple's iPad 2. It clearly shows that TouchPad could not create value for users who wanted a video camera, selfie camera and a superior quality battery. It should have concentrated on these features.
- Benchmarking and other practices: It should have benchmarked its products and processes against other brands and processes from its competitors and found out the best practices. Then it could have been identified that the quality of the battery in HP's TouchPad was inferior to the battery of Apple's iPad.
- Generic strategy: As per Michael Porter's Strategy, HP should have concentrated on cost reduction. It could be achieved by digitalization, automation of the manufacturing process, building in-house infrastructure and improving inbound and outbound logistics. It should also have concentrated on differentiation strategy and development of core competencies in the field of tablet computers. To do so, it should have hired people with proper competencies, it should have developed technologies which were applicable for different markets, and it should have kept the technologies confidential so that they cannot be imitated. SWOT analysis and Ansoff's Matrix also showed that HP should have concentrated on differentiating its product from iPad 2.
- Strategic gap: To reduce or overcome the strategic gap, HP should have concentrated on the following.
 1. Intensive growth: Penetrate the existing market by developing a better product than its competitors, giving limited period offers, and expanding the distribution channel.
 2. Integrative growth: Do backward integration. It could have acquired a better battery manufacturer for TouchPad.
- Market segment analysis: HP should have identified its market segment from geographic, demographic, psychological and behavioral information from its customers. From its analysis, it should have developed buyers' persona.
- Product development process: HP should have applied the following strategies while developing TouchPad:

1. Focused group discussion and depth interview to understand the needs of customers.
 2. Product Analytics to find the key features.
 3. Generate ideas and compare them against the reference in terms of varied factors.
Select ideas with high scores.
 4. Develop MVPs and get feedback from users to improve the product further.
- Go-to-market Strategy: HP should have developed the go-to-market strategy for TouchPad. To do so, it should have considered the following.
 1. Product market fit: HP should have concentrated on improving the battery capacity and integration of superior quality camera to TouchPad.
 2. Identify the target market and users: HP should have identified who all needed the features developed in TouchPad to solve their problems. Figure 19 of Appendix 4 shows the target buyer persona.
 3. Analyze the competition and demand: It should analyze its competitors' demand, strategy, and growth areas.
 4. Distribution: Since HP had a strong distribution channel, it could reuse it to sell TouchPad. This reduces effort and the cost of distribution.
 5. HP should have applied Pull Effort through its advertisements and publicity to attract its customers.
 - Sales Channel: HP should have used Level 0, Level 1, and Level 2 sales channel. It is a good practice to hold programs and offers to motivate its sales channels and try to stay away from any type of conflicts. Using the existing channels can reduce the cost. Also, HP should have tried to expand its channels for TouchPad.
 - Product positioning: Proper positioning of the product is crucial to its success. First, HP should have developed the product with better features to solve users' real-life problems and then it should have positioned TouchPad accordingly in market.
 - Point of Parity analysis: HP should have tried to find which category analysis was common and critical for establishing the credibility to highlight them.
 - Point of Difference analysis: HP should have identified the potential of its products and competitive differences to highlight them while brand positioning.
 - Brand equity: HP already had good brand equity for its products like computers, laptops, printers, and other computer accessories. Similarly, now it should have started developing brand equity for tablet computers.

- Integrated Marketing Communication: It should use AIDA (Awareness-Interest-Desire-Action) framework for integrated marketing communication. It can generate awareness about its new product through advertisements, generate interest by highlighting the values the products deliver, desire by advertisements using puffery.
- Product pricing: As per the results of Product Analytics, it should keep the price of TouchPad little less than the price of iPad 2. Also, it should use the psychological pricing method to influence its buyers' minds. It can give offers for a limited period for TouchPad in the beginning. However, HP did it when the sales of the product started falling fast.

In the last section, we discuss how HP could have used principles, methods, and frameworks from agile product management to develop TouchPad with more innovative features and solve user-centric issues to create more value. If Touchpad had been designed to solve user-centric problems. It would have been a successful product.

First, we discuss how HP could have used Design Thinking to make the product TouchPad more innovative and solve users' real-life problems. The core principles of Design Thinking are user empathy, collaboration, innovative idea generation, prototyping, and feedback.

Design Thing is used to solve user-centric problems with innovative approaches. The key stages of Design Thinking are empathize (engage users regularly to understand their problem and pain areas), define (observations and analysis of data are synthesized to define core problems), ideate (generate ideas by brainstorming, etc.), prototype (create a low-cost, basic version of the product) and testing (get user feedback to improve product). HP could apply Design Thinking to the development of TouchPad as follows.

- Conduct user research or develop user personas: HP should have engaged its target users regularly and collect data by one-one interviews, facilitated workshops, user observations, surveys, and group discussions. With this 50% job of product development is done. With this data, HP should have first analyzed the pain areas of the users.
- Discover problem points: In this stage, HP should have synthesized the observations and analyzed data (collected from its users, employees, and stakeholders, etc.) to find core problems in a human-centric way. In this phase, both core problems and solutions are defined. The objective is to create a solution for the users which is better than its competitors. Once the ideas are collected, they are prioritized. Thus, HP

should have used this phase of Design Thinking to define features needed in the products called TouchPad and webOS to solve human-centric problems collected via user research.

- Design prototypes and test: In this phase, a prototype of TouchPad with webOS needed to be developed. In Design Thinking, the first prototype should be a low-fidelity or a basic prototype. The prototype is then subjected to testing. In this phase, the users give their valuable feedback. Based on that, a prototype can continue to iterate and improve. Thus, in this phase, HP could have evaluated and investigated TouchPad before it was finalized.
- Develop the product: This is the final stage of product development. In this phase, a Minimum Viable Product is developed and delivered to the customers. It is ensured to deliver a differentiated customer and product experience. In this phase, HP could have developed a Minimum Viable Product version of TouchPad which was better and different from its competitors.

Thus, with Design Thinking, HP could have solved the human-centric problems innovatively and increased the value of the product. The drawbacks of Design Thinking approaches are as follows.

1. This approach is costly.
2. The approach is time-consuming.

In Design Thinking approach, HP could have used innovative communication methods as follows.

1. HP could use different visualization software to develop a low fidelity prototype digitally. This saves cost and time to create the prototype for feedback from users.
2. HP could use different innovative communication techniques to interpret the data, users' pain areas, etc. Visualization is a powerful tool. Proper visualization can help understand problems better.

In Design Thinking, prototyping is an important thing. Prototyping is not just a collection of artifacts. Prototypes are interactive and simulate the final product. It is needed to solve function problems in the product, prioritize potential features, get user feedback, reduce risk, etc. Prototypes can be of low-fidelity, mid-fidelity, high-fidelity and mixed-fidelity. Fidelity levels are gradually increased in Design Thinking. Different dimensions of fidelity are Visual (it tells how close the prototype is to the actual product), Interaction (it presents the clickable

elements to the user), Breadth (it shows the functionalities/features included in the prototype), Depth (it shows the details of the individual features of the prototype), Content/Data Model (it shows the level of context of the prototype for a user. The prototypes should be developed with real content).

Thus, the Design Thinking approach tells how to find user-centric problems and solve them innovatively. Once the problem statement and innovative solutions are defined, HP could create virtual prototype of the TouchPad first to get users' feedback. Slowly the fidelity of the prototype needs to be increased and finally the Minimum Viable Product can be developed. This approach would have helped HP develop an innovative product, which is different from its competitors, and solve user-centric problems.

Next, we discuss how HP could have used Lean principles can be applied along with Design Thinking to further eliminate wastes while creating the prototype of TouchPad.

Lean Thinking was proposed by Toyota Production System to improve manufacturing efficiency and product quality. The key objective of Lean Thinking is to eliminate waste from the product. Lean processes are Six Sigma, Kaizen, Kanban, etc. Six Sigma is a process improvement and controlling method. Kaizen helps determine if a process is needed or not. Kanban is all about visual monitoring of the workflow/process. The core values of Lean are creating value, delivering more with less, and delivering just enough just in time, empowering people and building trust, building a continuous improvement cycle and measuring everything. Lean promotes developing MVPs which guarantees the fast release of the products to the market, helps evaluate a market before the product is completely developed, and helps understand the target market. There are Lean metrics defined. The Lean metrics are used to measure the quality continuously, detect and measure the amount of waste and identify new opportunities. Examples are Process Time, Waiting Time, lead time, Work-in-Progress, etc. Lean is a set of principles and best practices. Some of the best practices as per the Lean principle are to eliminate waste, to keep the floor clean, to maintain quality at source, to get all resources ready and to deliver just enough just in time. Thus, Lean principles could help HP manufacture tablet computers within a short time span and include features what is exactly needed. With this principle, HP could invest more effort in developing the useful features, eliminating the waste. However, initially it might be challenging for HP to implement a Lean Thinking based approach. Lean principles could be applied to develop TouchPad as follows.

1. Apply the Lean principle to design TouchPad's MVP and use it for users' feedback.
2. Apply the Lean principles to design the operating system called webOS's MVP and use it for users' feedback.
3. Apply Lean principles to eliminate the waste from the products and concentrate on developing only useful features. This eliminates distractions.
4. Use Lean principles to keep only useful features while developing the prototype and the Minimum Viable Product.

Thus, Lean principles tell the best practices to eliminate waste from the products. This would have helped HP in reducing development costs on unnecessary things and in the release of the product in a short span of time.

Next, we discuss how Scrum framework, while is an agile framework, could be used by HP to develop the prototype and MVP of TouchPad. Scrum framework helps implement the development of the product. Scrum framework does not talk about user research, defining and solving problems like Design Thinking does. Once the problems and solutions are defined using Design Thinking and wastes are eliminated using Lean principles, Product Backlogs can be defined to create the Minimum Viable Product. Product Backlogs are the to-do tasks in Scrum framework. Thus, Scrum provides an agile framework to develop a product incrementally and collaboratively.

Scrum was originally designed for the software industry. It is a lightweight framework which solves complex problems iteratively. Scrum framework implements the Agile principles. It helps develop products with regular increments and adjust the next product increments product as per the feedback. Empiricism and Lean thinking are the basis of Scrum framework. It controls the risk as well. The values of Scrum are commitment, courage, respect, focus and openness. Scrum framework defines the following events.

- The Sprint: For the given case, the length of the Sprint should be 7 days to develop the product quickly.
- Sprint Planning: Developers, based on empiricism, decide the Sprint Goal.
- Daily Scrum: Developers discuss and adapt the plan to reach Sprint Goal.
- Sprint Review: Stakeholders and Scrum team review the increments and decide what to do next.
- Sprint Retrospective: Scrum team discusses what went well and what did not.

A Scrum framework has the following artifacts.

- Product Backlog: The Product Backlogs are defined from User Stories. These are the to-do tasks to be done to develop the product incrementally. They are prioritized using different approaches like RICE framework, Desirability-Feasibility-Viability, and RoI scorecard, etc. Product Goal is to maximize the value of the product.
- Sprint Backlog: It has Sprint Goal, and a set of Product Backlogs selected for the Sprint using empiricism, Velocity Chart, etc.
- Increment: The product increments are the deliverables of the product. A useful increment happens in a product when Definition-of-Done is met. Definition-of-Done can be a checklist, metrics, etc.

The fundamental unit of Scrum framework is Scrum team. A Scrum team is formed with members less than or equal to 10. A Scrum team has the following roles.

- Product Owner: Product Owner is accountable for developing and communicating the goal, ordering Product Backlogs, and communicating them.
- Developers: They are responsible for developing the Sprint Backlog and useful increments at the end of the Sprints. They adapt their plan to reach Sprint Goal which cannot be changed during the Sprint.
- Scrum Master: Scrum Master is accountable for the Scrum team's effectiveness, ensuring all Scrum events take place within the timebox and impediments are removed.

Thus, Scrum framework also helps reduce the waste from the products. It just creates as much as needed in every Sprint, ensuring the product increments are released in time. Also, it adjusts its next Product Backlogs based on feedback, ensuring that the product delivers its maximum value to its users. Hence, Scrum framework could have helped HP to develop TouchPad within a short time span, deliver what users exactly want and continuously improve the product based on the feedback. However, Scrum framework is limited to a small team with members less than or equal to ten. For larger teams, a scaled version called Nexus Scrum is defined, which is a complicated framework compared to Scrum.

Thus, Scrum framework could have helped develop the prototypes and the Minimum Viable Product version of TouchPad collaboratively and incrementally, reducing the risk of failure of development of the product.

To summarize, the agile product management either could have been used in the following steps by HP or can be followed by product managers to develop similar products, avoiding any product failure.

1. Use Design Thinking to identify user-centric problems and to find innovative solutions.
2. Next, use Lean Startup to further eliminate waste.
3. Finally, use Agile framework to develop the prototype and the Minimum Viable Product version of TouchPad collaboratively and iteratively.
4. When the product is finalized, launch the product using go-to-market strategies.

Thus, we discuss the outcomes of Product Analytics, identify the loopholes in the product strategy of HP and identify product strategies and agile product management principles, methods, and frameworks to solve the aforementioned problem of TouchPad.

Limitations: The limitations of this project are as follows.

1. The survey data collected for the project is limited due to time constraint. To prevent it, multiple survey agencies can be contacted simultaneously. In this project, only one survey agency is contacted to collect survey data.
2. The actual product strategies followed by HP for Touchpad are not known because no open data is available. To prevent this, in future, similar projects should be carried out jointly with the respective company or organization.

Conclusion: In this research project, we have analyzed the case of failure of HP's TouchPad. From the scenario, research questions are derived, and they are analyzed with survey data. Further different product strategies and principles and frameworks of agile product management are thoroughly discussed to solve the issue. This research work finally highlights the best practices to avoid such product failure in future.

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Appendix 1

A survey form is created. A link to the survey form is given below.

<https://forms.office.com/r/b4gktDWrgQ>

The form is shared with an agency to collect the responses. The scale is from 0 to 10. The questions from the survey are given below.

1. How likely are you to buy a tablet computer by HP?
2. How likely are you to buy a tablet computer (iPad) from Apple?
3. How likely are you to consider software functionalities installed in the tablet computer while buying it?
4. How likely are you to buy an HP tablet computer even if it has lesser number of features as compared to Apple's iPad?
5. How likely are you to buy an HP tablet computer if it has more features than Apple's iPad?
6. How likely are you to buy an HP tablet computer if a new iPad is to be launched within a couple of months and the price of Apple's iPad IS within your budget?
7. How likely are you to buy an HP tablet computer if a new iPad is to be launched within a couple of months but the price of Apple's iPad IS NOT within your budget?
8. How likely are you to use a tablet computer while travelling?
9. How likely are you to follow the release of new technical gadgets?
10. How likely are you to spend money on shopping and travelling?
11. How likely are you to use tablet computers for gaming?
12. How likely are you to watch movies on a tablet computer?
13. How likely are you to do confidential activities like financial activities, etc. on a tablet computer?
14. How likely are you to edit videos on a tablet computer?
15. How likely are you to do painting on a tablet computer?

Appendix 2

A survey is created to collect responses for the conjoint analysis. For this, first the Conjoint Design is made. The attribute and the levels are shown in Figure 1.

Weight	Display	Battery
Ultra light	Large	Medium range mAh
Light	Medium	High range mAh

Figure 1: Attributes and levels for Conjoint Design

Next, the stimuli or the profiles are created. Rating data (in the scale of 0-10) is collected for these profiles. The profiles are shown in Figure 2.

Observations	Total No of Product Combinations (stimuli)		
	Weight	Display	Battery
Profile 1	Ultra light	Large	Medium range mAh
Profile 2	Ultra light	Large	High range mAh
Profile 3	Ultra light	Medium	Medium range mAh
Profile 4	Ultra light	Medium	High range mAh
Profile 5	Light	Large	Medium range mAh
Profile 6	Light	Large	High range mAh
Profile 7	Light	Medium	Medium range mAh
Profile 8	Light	Medium	High range mAh

Figure 2: Generated stimuli for Conjoint Analysis

Appendix 3

Category	July 1, 2023	June 25, 2022
iPhone	39669	40665
Mac	6840	7382
iPad	5791	7224
Wearables, Home and Accessories	8284	8084
Services	21213	19604

Figure 10: Three months ended net sales by category (in million dollars) of Apple products.

Source: Apple's Annual Financial Report

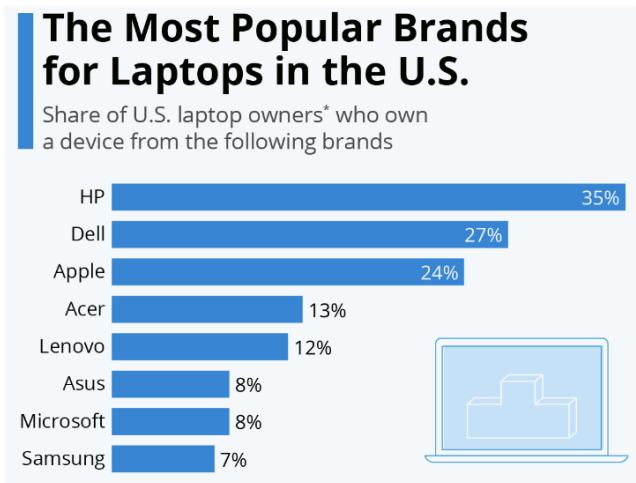


Figure 12: Comparison of popularity of brands of laptops

Source: [Chart: The Most Popular Laptop Brands in the U.S. | Statista](#)

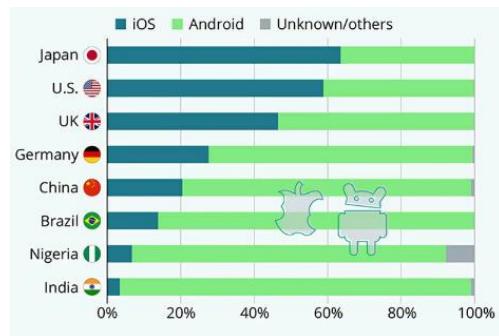


Figure 13: Comparison of popularity of iOS and Android

Source: [iOS More Popular in Japan and US, Android Dominates in China and India | PCMag](#)

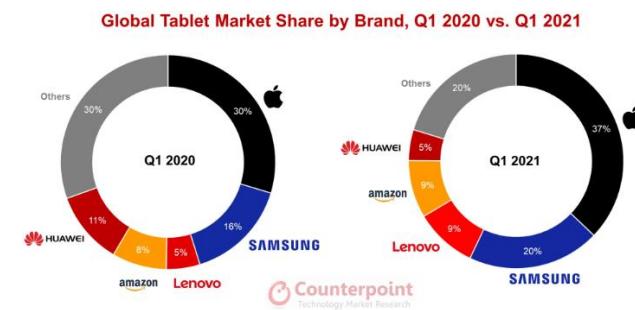


Figure 14: Global Tablet Market Share by Brand

Source: [Apple's basic iPad is by far the world's most popular tablet - PhoneArena](#)

Brand	Resolution	Camera	RAM	Battery	Screen	Weight	OS	Video Cam	Selfie Cam	Stand-by
HP Touchpad	768X1024	1.3 MP	1 GB	6300 mAh	9.7"	1.63 lb	HP webOS 3.0	No	No	300 hours
Apple iPad 2	768X1024	0.7 MP	512 MB	6930 mAh	9.7"	1.32 lb	iOS 4	720p	VGA	720 hours

Figure 15: Comparison between HP's Touchpad and Apple's iPad 2.

Source: <https://www.gsmarena.com/>

Tablet PC Market Scope: Inquire before buying			
Global Tablet PC Market			
Report Coverage		Details	
Base Year:	2022	Forecast Period:	2023-2029
Historical Data:	2018 to 2022	Market Size in 2022:	US \$ 930.14 Mn.
Forecast Period 2023 to 2029 CAGR:	6.7 %	Market Size in 2029:	US \$ 1464.53 Mn.
Segments Covered:	by Operating System		
	Android iOS Windows		
	by Screen Size		
	7 inch 7 inch & above		
by Application		Education Work Entertainment Others	
by Distribution Channel		Online Offline	

Figure 16: Market segment analysis of tablet computers.

Source: [Tablet PC Market: Global Industry Analysis And Forecast \(2022-2029\)](#)

(maximizemarketresearch.com)

Appendix 4

Target Buyer Persona



Name: Mark Designation: Engineer Age: 35 years Gender: Male Location: India	Hobbies: <ul style="list-style-type: none">1. Loves to play computer games2. Loves to travel3. Loves to watch movies4. Loves to do digital painting5. Loves to edit videos
Pain areas: <ul style="list-style-type: none">1. Does not have a superior quality camera which is light weight.2. Cannot play games while travelling.3. Charge in the battery of a tablet computer does not last long if it is used intensively.4. Cannot carry a laptop everywhere.5. Cannot edit videos while travelling or sitting in a café.	
Needs: <p>Needs a lightweight tablet computer which has superior quality battery, big display, high-end processor and a good camera so he can use it anywhere and anytime.</p>	

Figure 19: Target Buyer Persona.