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Factors Influencing the Success of a Social Media Marketing Campaign

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Factors Influencing the Success of a Social Media Marketing Campaign

by

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The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this creative component. The Graduate College will ensure this creative component is globally accessible and will not permit alterations after a degree is conferred.

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DEDICATION

I would like to dedicate this creative component to my parents and teachers without whom I would not be the person I am today. I would also like to dedicate this to my teammates from Denim Labs for always being there to support me, sharing thought-provoking ideas and bringing out the best in me. Lastly, I would like to dedicate this research to Iowa State University, the school that has given me so many new learnings and golden memories that I will truly cherish.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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ABSTRACT

The purpose of this research paper is to investigate the influence of input parameters like audience demographics (viz. age, gender, smart device type), and the duration of campaign on its success, to help marketers effectively design and launch social media marketing campaigns. It is hypothesized that the selection of a specific target audience in terms of age, gender, and smart devices they use to interact with the ads has a positive influence on the success of a marketing campaign and the duration for which the campaign is run has an inverted U-relationship with its success.

The social media platform chosen for this study is Facebook, since a large majority of the firms in the insurance industry run marketing campaigns on this platform. This could be attributed to Facebook's popularity against other social media platforms like Twitter, Instagram, Snapchat, Google AdWords, and Pinterest. Another reason for selecting Facebook is that the data collected by Denim Labs, the company providing the data for this study, consists of campaign data run by Denim users on Facebook. This helps in narrowing the scope of the study but might also pose as a limitation to the generalization of the research results to social media platforms besides Facebook. It will be interesting to note if and how the results vary for firms outside the insurance.

Keywords: Facebook, social media marketing campaigns, target audience, insurance industry

CHAPTER 1. INTRODUCTION

Since the advent of social media to its explosive growth, the social media ecosystem has been bustling with ads from various industries all over the globe. Not to be left behind, the insurance industry has been riding the wave of success of social media platforms and utilizing their capabilities to the fullest. The last 2 years have been quite eventful for the US insurance industry. According to a study by Statista (Statista, n.d.), a company that provides statistics and data within 600 industries and 50+ countries, the top 10 US firms in the insurance industry spent a whopping 3.8 Billion USD just on advertising in 2017, and in 2018, mobile ad spending surpassed that of television for the first time. Another study by the same firm reported that out of the 224 million smartphone users in the US, 1 in 2 users shop for insurance based on life events with a daily social media use of 2 hours on mobile. Capitalizing on this fact, more and more insurance firms are adhering to social media for advertising their insurance products.

While the industry is spending billions on advertising, marketers in these firms are constantly challenged to design and launch social media campaigns with the right set of parameters to help the firms achieve a healthy return on investment (ROI). They are expected to understand the full breadth of all the output key performance indicators (KPIs) on various ad campaigns launched on various social media platforms and utilize that information to tweak input parameters to ensure that each campaign is successful, and ROI is maximized. To aid marketers to make right decisions, it is important to investigate the influence of input parameters like audience age, gender, their smart device preferences and campaign length on its success so that they can be tweaked accordingly to achieve optimal results.

Denim provides a proprietary platform for firms in insurance industry to run micro-targeted and localized ads at scale through the agents' and advisors' Facebook pages in an easy and intuitive manner. Through the Denim platform, users can choose to select one of three campaign objectives- Awareness, Engagement or Conversion. The objective of a campaign helps the marketers set a concrete theme and decide on the content of the ads that run under it. Awareness, the first type of campaign objective, is usually selected if the marketers wish to publicize about new products or offerings and have a goal of just making the audience aware of the brand offerings. Engagement, the next type of campaign objective is usually selected if the marketers wish to target an already aware and interested audience with different products or services, that the audience may or may not necessarily know about. Conversion, the third type of campaign objective, is chosen by marketers who wish to motivate their engaged audience to buy their products or services. Apart from setting the campaign objective, Denim users can select and set several input parameters like type of audiences with respect to gender, age and smart device type who will receive the ad, ad creatives like text with images, or videos that comprise of the content of the ad, decide the budget and duration of the campaign, and finally decide the devices on which the ad should be shown and the areas of the screen on those devices where it should be shown. Once a campaign is launched, it is monitored closely by marketers to understand how various Key Performance Indicators (KPIs) like Cost Per Click, Click Through Rate, Relevance Score, Impressions, etc. change over the course of the campaign. All such data points, including the campaign input parameters, are stored in the Denim Platform. At present, the stored data is still raw and inactivated i.e. it has not been analyzed in depth to reveal meaningful insights. This fact is the primary motivation for this research, which is focused on investigating what types of trends and patterns can be unearthed by studying the data.

After analyzing how input parameters like audience demographics, and the length of a social media marketing campaign influence its outcome, the implementation of a model that predicts the impact of the input parameters is proposed. The model will then be utilized to automatically set the input parameters to optimal values each time an ad is being designed to maximize ROI. While the predictive modeling is out of scope for this research, there is interest in gauging the extent to which the model is able to aid marketers in designing campaigns, especially in the Denim Platform.

CHAPTER 2. LITERATURE REVIEW

With explosive growth in less than five years since its birth, social media has established itself as the media of choice for businesses across the world (Dong-Hun, 2010). Considering its rapid development, social media may become the most important media channel for brands to reach their clients in the near future (Mangold & Faulds, 2009; Korschun and Du, 2013). Already, in 2018, mobile ad spending surpassed that of television for the first time and this ad spending is projected to grow by 19 percent in 2019. Facebook tops the list of the most popular social media platform for advertisers, with 1.32 billion daily active users. Sensing the power of social media and Facebook's popularity and wide user base, a lot of firms across different industries are increasingly using it for advertisements. While ads do influence the users to become aware of a brand, engage with its products and/or services and make purchase decisions, measuring the impact of advertisement is an important issue to be included in a global social media strategy (Lariscy et al., 2009).

In the last couple of years, there has been considerable amount of research in the area of social media marketing. Several studies have focused on finding the relationships between online publications on social networks and the impact of such publications measured by users' interactions (Cvijikj et al., 2011). Several studies have also focused on gauging the impact of ads on users' purchase behaviors. Most of these studies have dived deep on performing an evaluation of change in various metrics of social media campaigns after users have interacted with various ads. Some research studies have adopted the use of data mining which provides an interesting approach for extracting predictive knowledge from raw data (Turban et al., 2011). Its application to social media has been studied, especially for evaluating market trends from users' inputs (Trainor et al., 2014).

Marketers across the world are trying to understand their target audience and how they are influenced by ads in order to develop effective marketing strategies that provide the highest possible return on investment. Click prediction systems are central to most online advertising systems (Xinran et al, 2014) and click-stream models have been implemented to test the appeal of content by measuring the click-through rates (CTR) or website stickiness (Bucklin and Sismeiro, 2003). Mobile advertising Click-Through Rate (CTR) estimation has become a hot research direction in the field of computational advertising, which is used to achieve accurate advertisement delivery for the best benefits in the three-side game between media, advertisers, and audiences (Chen et al 2017).

With the advent of Artificial Intelligence and Machine Learning combined with powerful predictive modelling, firms, and researchers in these firms are now looking to predict the right set of parameters to maximize the success of a campaign. An example of such a case is the Topix Facebook Ad Classifier, which can algorithmically determine how any given Facebook ad campaign will perform. According to Topix, their Ad Classifier uses a supervised machine learning algorithm that uses historical data to identify which set of categories, called "classes," a new observation-- in this case, an ad campaign-- belongs to. The classes in Topix's Facebook ad classifier are defined in terms of profitability: The goal is for the algorithm to recognize whether a specific ad campaign will be profitable or unprofitable in the long run. The Topix Ad Classifier relies solely on profit margin or Cost Per Click and was implemented specifically to encourage people to view more content on Topix’s website.

CHAPTER 3. RESEARCH QUESTIONS AND HYPOTHESIS

Considering all the prior research conducted in the area of social media marketing, this research study seeks to answer the following question:

"How do input parameters like audience demographics (age, gender), their smart device preference and length of a social media marketing campaign influence the outcome of its success?"

Suppose that an insurance firm based in Des Moines wants to advertise its auto insurance products on Facebook to people in Santa Cruz, California. The typical questions that would creep up in the mind of the marketers of that firm are (a) What demographics (age, gender, zip-codes) of the target audience should we set? (b) Should we use only text with images? Facebook's new idea of using multiple images in a carousel like design seems to work like a charm, right? How about 10 or 20-second-long videos? They're sure to grab eye-balls on Facebook, right? (c) Oh, and what about the optimal length of campaign? Would 2 weeks be good enough to create the required awareness? (d) Should we showcase our ads for all mobile and desktop users in the area? (e) What if we just show the ad in the Facebook news feed and right column of the intended audience?

Data could suggest that when other firms advertised similar products to males and females between ages 20-45 using videos on mobile and in their Facebook news feed, their campaigns turned out to be most influential. Having the knowledge of what has happened in the past to predict what the outcome of a micro-targeted campaign could be, will help marketers effectively answer a lot of questions in their mind and eventually help them make better decisions in designing and launching campaigns.

Extending the research question posed in the above section, the following 2 hypotheses for a social media campaign on Facebook are proposed -

H1: *Selection of a specific audience has a positive influence on the success of a social media marketing campaign*

H2: *Campaign length has an inverted U-relationship with its success*

The research model in figure 1 outlines the proposed hypotheses by showing the effect of the independent variables on the outcome of the campaign.

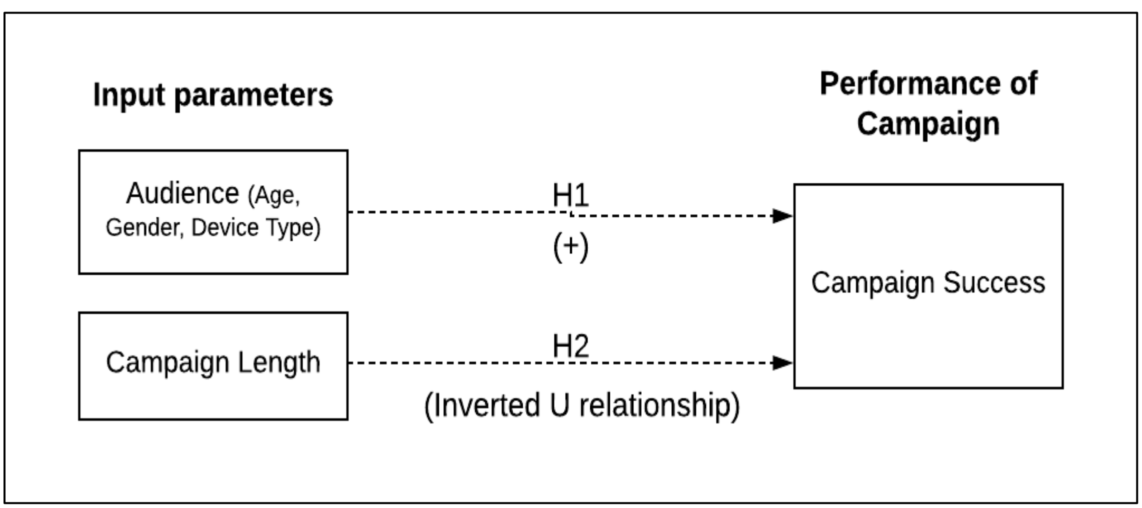

Figure 1 *Research Model.*

CHAPTER 4. RESEARCH METHODOLOGY

One of the biggest challenges for a quantitative study is obtaining good quality data to study. For the purpose of this research, the data collected by the Denim Platform for 101 campaigns run all over the United States of America on Facebook by 8 of Denim's customers has been analyzed. This data contains several campaign attributes that describe the demographic information (viz. age, gender, regions) of the audience that was selected, the desktop and mobile device using which they interacted with the ads, text, image and video data of the ad creative that was selected, duration for which the campaign was run, and key performance indicators like cost per click, click through rate, reach, impressions, and frequency. The type and description of each variable is defined in Table 1 below.

Variable	**Type**	**Description**
Overall Campaign Output	Dependent	The CPC/CTR of each campaign
Age Range	Independent	The age range of the audience
Gender	Independent	The gender of the audience
Region	Independent	The area in which the audience resides
Smart Device Type	Independent	The smart device type- mobile/tablet/desktop
Text	Independent	The text script used in an ad
Image	Independent	The image/s used in an ad. This could be a single image, or multiple images organized in a catalogue, carousel or slideshow
Video	Independent	The video/s used in an ad. This could be a single video, or multiple videos organized in a catalogue, carousel or slideshow
Campaign Length	Independent	The duration for which the campaign is run
Cost per click (CPC)		The average cost of each click from the ad over to your website
Click through rate (CTR)		The percent of people who saw the ad and

		clicked over to an opt-in page.
Impressions		The total number of times an ad was shown
Reach		The total number of people who saw the ad content
Frequency		The average number of times each individual has seen the ad
Amount Spent		Amount spent in running the ads so far.
Ad Objective		The goal of the campaign viz. Awareness, Engagement or Conversion

Table 1 *Description of variables.*

The Click Through Rate (CTR) and Cost Per Click (CPC) are standard parameters to measure the success of a campaign. Facebook provides a breakdown of the contribution made by each independent variable to the overall CTR and CPC of the campaign. In the insurance industry, the average Facebook ad CTR is 0.56 and the average Facebook ad CPC is 3.77, according to Wordstream. The goal for any ad campaign is to increase the CTR thereby lowering the CPC. If the CTR number is low (below 0.56) or the CPC is high (above 3.77), either the ad creative is not compelling enough or the wrong audience was targeted, or the campaign was run for too long and people were turned off by the *stale* ads.

For the purpose of this research, the threshold for campaign success was chosen as a CPC lower than 3.77 or CTR higher than 0.56 or both. Table 2 below details the success of a campaign based on the CPC and CTR-

Is CPC lower than industry average?	Is CTR greater than industry average?	Is Campaign Successful
Yes	Yes	Yes
No	Yes	Yes
Yes	No	Yes
No	No	No

Table 2 *Truth-False table for deeming a campaign as successful.*

A noteworthy observation is that all 101 campaigns powered by the Denim Platform were successful and hence, the entire data set provided by Denim labs was studied without exclusions or omissions prior to analysis. Tables 3.1 and 3.2 below represent the minimum, maximum and average values of CPC and CTR for the 101 campaigns-

CPC	***%***
Min	0.110836
Max	2.607054
Average	0.605071

Table 3.1 *Min, Max, and Average CPC for all campaigns.*

CTR	***%***
Min	0.199153
Max	5.855486
Average	1.517666

Table 3.2 *Min, Max, and Average CTR for all campaigns.*

Data Analysis

To determine the equation of the influence between the audience demographics, and the duration on the outcome of the campaign, a set of linear regressions were performed. The results of the regressions and data analysis are presented below. Each of the results are sectioned under the specific hypothesis that it seeks to defend/reject.

Analysis for Hypothesis 1

The first hypothesis proposed in the research and hypothesis section above was-

H1: *Selection of a specific audience has a positive influence on the success of a social media marketing campaign*

For analyzing data to support this hypothesis, the following input (independent) parameters were considered-

Parameter	**Type**
Overall Campaign CTR	Dependent
Breakdown of CTR due to Males and Females (respectively)	Independent
Breakdown of CTR due to audience in ages 18-24, 25-34, 35-44, 45-54, 55-64, and 65+ (respectively)	Independent
Breakdown of CTR due to smart device type- android smartphone, android tablet, desktop, ipad, iphone, and ipod (respectively)	Independent
Overall Campaign CPC	Dependent

Breakdown of CPC due to Males and Females (respectively)	Independent
Breakdown of CPC due to audience in ages 18-24, 25-34, 35-44, 45-54, 55-64, and 65+ (respectively)	Independent
Breakdown of CPC due to smart device type- android smartphone, android tablet, desktop, ipad, iphone, and ipod (respectively)	Independent

Table 4 *Description of parameters with their type used for linear regression.*

Further, a linear regression was conducted for each case of the breakdown of input parameters' influence on the overall campaign KPI. The results of the two regressions are detailed below.

Results

(a) Using CTR as overall campaign output, the regression result shows that out of all the input parameters describing audience demographics, both genders- males and females- who are in the age range of 18-24 and who interacted with the ads on their android tablet and desktop explain the variability in CTR very well. This conclusion was derived by looking at the P-values of the regression results in areas where it was significant (i.e. P-value < 0.05). Table 5 below lists the various parameters and their P-values-

Input Parameter	***P-value***
Male	5.81E-44
Female	1.05E-45
18-24	1.19E-15
android_tablet	0.003744
desktop	0.012121

Table 5 *P-values of the significant input parameters that affect the overall campaign CTR.*

Out of the 14 input parameters, only 5 parameters appear to significantly explain the variability in the CTR of the campaigns. Figure 2 below represents the results of the complete linear regression.

Regression Statistics	
Multiple R	0.999599935
R Square	0.99920003
Adjusted R Square	0.999069802
Standard Error	0.034243592
Observations	101

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	14	125.9609019	8.997207276	7672.71541	9.4571E-127
Residual	86	0.100845631	0.001172624		
Total	100	126.0617475			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.01828484	0.0084804	-2.15612959	0.03386585	-0.035143318	-0.00142636	-0.03514332	-0.00142636
Male	0.505912825	0.018627876	27.15891097	5.8115E-44	0.468881833	0.542943816	0.468881833	0.542943816
Female	0.44964833	0.015720055	28.60348322	1.046E-45	0.418397895	0.480898765	0.418397895	0.480898765
18-24	0.081128366	0.008282498	9.79515706	1.1859E-15	0.064663305	0.097593427	0.064663305	0.097593427
25-34	-0.0059355	0.007395003	-0.8026362	0.42439762	-0.020636278	0.008765283	-0.02063628	0.008765283
35-44	0.006679132	0.009907151	0.674172817	0.5020096	-0.013015633	0.026373897	-0.01301563	0.026373897
45-54	-0.0035906	0.006129147	-0.58582455	0.55952771	-0.015774946	0.008593736	-0.01577495	0.008593736
55-64	-0.00903537	0.005323796	-1.69716601	0.0932817	-0.019618724	0.001547991	-0.01961872	0.001547991
65+	-0.00214426	0.006345776	-0.33790386	0.73625909	-0.014759248	0.010470723	-0.01475925	0.010470723
android_smartphone	0.037197427	0.019418909	1.915526108	0.05874854	-0.001406086	0.07580094	-0.00140609	0.07580094
android_tablet	0.010514409	0.003527985	2.980287193	0.00374363	0.003501006	0.017527811	0.003501006	0.017527811
desktop	-0.02159265	0.008425233	-2.56285468	0.01212146	-0.038341457	-0.00484384	-0.03834146	-0.00484384
ipad	0.002729203	0.002542846	1.073286707	0.28614488	-0.002325808	0.007784213	-0.00232581	0.007784213
iphone	0.000187551	0.007912477	0.023703135	0.98114432	-0.015541932	0.015917033	-0.01554193	0.015917033
ipod	0.003305852	0.002067019	1.599333077	0.11341423	-0.000803246	0.007414951	-0.00080325	0.007414951

Figure 2 *Full regression model of input parameters affecting variability in overall campaign CTR.*

(b) Using CPC as overall campaign output, the regression result shows that out of all the input parameters describing audience demographics, both genders- males and females- who are in the age range of 25-34 and who interacted with the ads on their android smartphone explain the variability in CPC very well. This conclusion was derived by looking at the P-values of the regression results in areas where it was significant (i.e. P-value < 0.05). Table 6 below lists the various parameters and their P-values-

Input Parameter	***P-value***
Male	4.99E-37
Female	3.21E-35
25-34	0.009998
android_smartphone	4.12E-16

Table 6 *P-values of the significant input parameters that affect the overall campaign CPC.*

Out of the 14 input parameters, only 4 parameters can significantly explain the variability in the CPC of the campaigns. Figure 3 below represents the results of the overall linear regression.

Regression Statistics								
Multiple R	0.999226112							
R Square	0.998452824							
Adjusted R Square	0.998200958							
Standard Error	0.016395102							
Observations	101							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	14	14.91813156	1.065580825	3964.22357	1.9584E-114			
Residual	86	0.023116746	0.000268799					
Total	100	14.9412483						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.003812586	0.003741155	1.019093244	0.31101706	-0.003624584	0.01124976	-0.00362458	0.011249756
Male	0.279833043	0.012739257	21.96619831	4.9858E-37	0.254508239	0.30515785	0.254508239	0.305157848
Female	0.507675866	0.024478384	20.73976249	3.2102E-35	0.45901445	0.55633728	0.45901445	0.556337283
18-24	-0.00222471	0.008162454	-0.27255397	0.78584945	-0.01845113	0.01400171	-0.01845113	0.014001712
25-34	0.019878659	0.007546101	2.634295507	0.00999774	0.004877507	0.03487981	0.004877507	0.03487981
35-44	-0.01174492	0.007275072	-1.61440543	0.11010282	-0.026207279	0.00271745	-0.02620728	0.002717449
45-54	0.015998241	0.008108175	1.973100009	0.05169579	-0.000120278	0.03211676	-0.00012028	0.03211676
55-64	0.01601991	0.009185685	1.744008304	0.08473078	-0.002240626	0.03428045	-0.00224063	0.034280447
65+	-0.00610546	0.006673891	-0.91482766	0.36284004	-0.019372717	0.0071618	-0.01937272	0.007161796
android_smartphone	0.170488424	0.017012211	10.02153254	4.1188E-16	0.136669268	0.20430758	0.136669268	0.20430758
android_tablet	0.001299588	0.007688665	0.169026428	0.86617278	-0.013984973	0.01658415	-0.01398497	0.016584148
desktop	0.003004605	0.001813076	1.657186935	0.10112559	-0.00059967	0.00660888	-0.00059967	0.00660888
ipad	0.004476842	0.003652994	1.225526613	0.22372251	-0.002785071	0.01173875	-0.00278507	0.011738754
iphone	0.012275913	0.008561484	1.4338534	0.15524008	-0.004743754	0.02929558	-0.00474375	0.029295581
ipod	-0.00851963	0.009333107	-0.91283989	0.36387872	-0.027073234	0.01003397	-0.02707323	0.01003397

Figure 3 *Full regression model of input parameters affecting variability in overall campaign CPC.*

The above results show that for an ad campaign to be successful, it's ads should be targeted towards males and females in the age range of 18-24 and 25-34 and who use desktop or android smartphones and tablets to interact with ads on Facebook. It is surprising to know that users with android phones interact more with ads than those with iphones. The gender and age range results were expected as they include millennials, who are the biggest targets of the insurance firms to showcase ads.

The overall results of both regressions provide support for the fact that selection of a specific audience has a positive influence on the success of a social media marketing campaign. *Thus, the results fail to reject H1.*

Analysis for Hypothesis 2

The second hypothesis proposed in the research and hypothesis section above was-

H2: *Campaign length has an inverted U-relationship with its success*

For analyzing data to support this hypothesis, campaign duration was studied against Overall campaign CTR and Overall campaign CPC, respectively.

Parameter	**Type**
Overall Campaign CTR	Dependent
Breakdown of CTR due to campaign duration	Independent
Overall Campaign CPC	Dependent
Breakdown of CPC due to campaign duration	Independent

Table 7 *Description of parameters with their type used for scattered chart plot.*

A scattered chart was plotted for each case of the breakdown of campaign duration's influence on the overall campaign KPI. The results of the two graphs are detailed below.

Results

Figure 4 shows the variation of Cost Per Click as the campaign progresses.

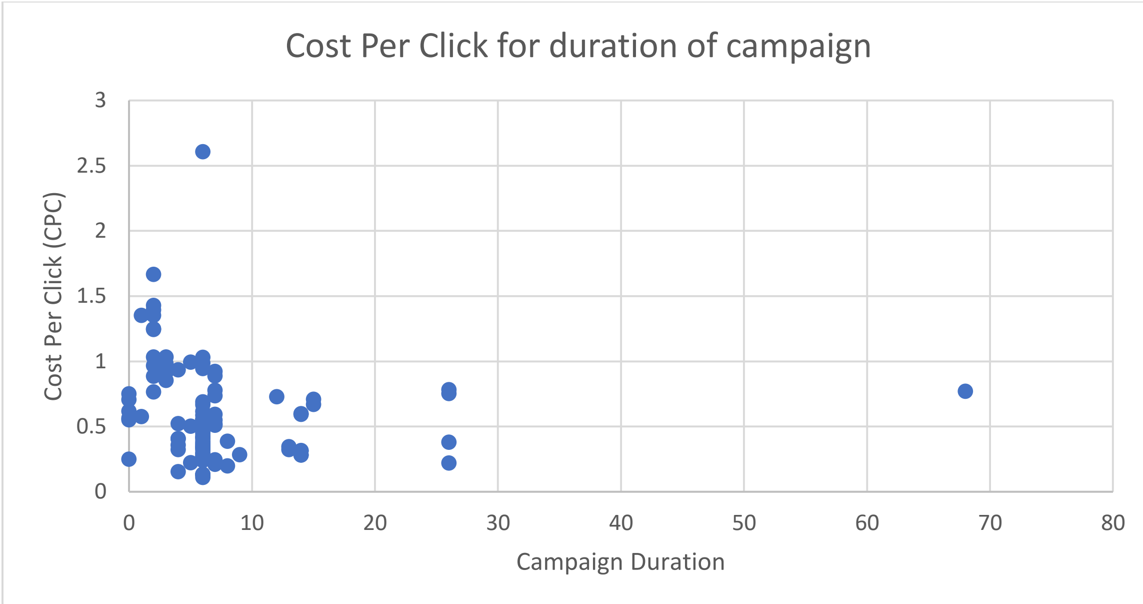

Figure 4 *Graph showing the Cost Per Click for duration of campaign.*

The CPC steeply spikes up to 2 from 0 for most campaigns in the first 3-4 days and then gradually falls to 1 when the campaign duration reaches a week. As the campaign progresses, the CPC keeps falling gently. Barring a few exceptions and outliers, the general shape of the CPC curve resembles an inverted-U.

Figure 5 shows the variation of Click Through Rate as the campaign progresses.

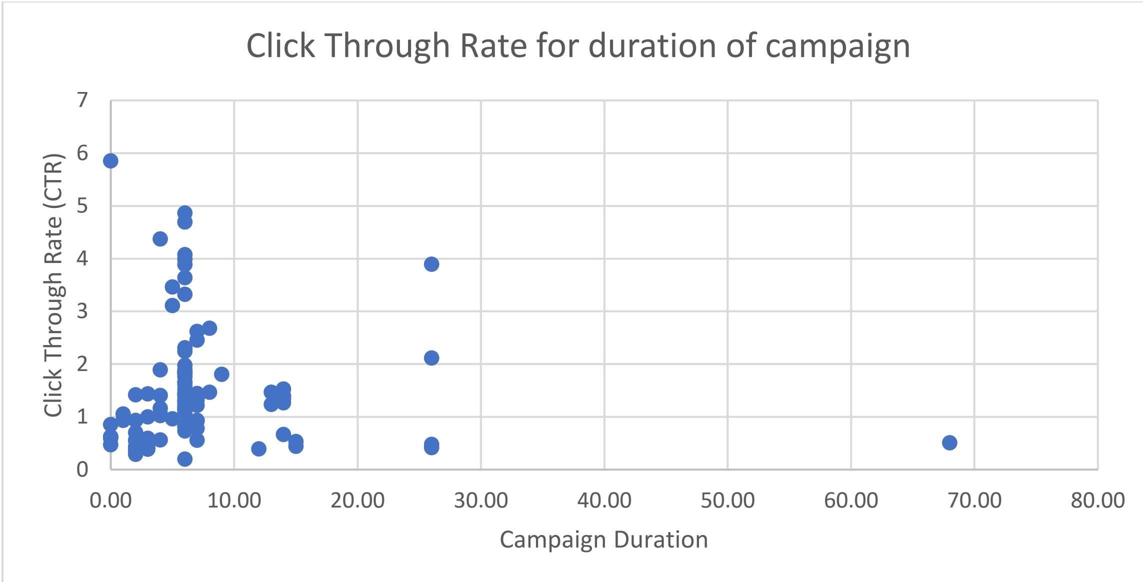

Figure 5 *Graph showing the Click Through Rate for duration of campaign.*

The CTR rises from 0 to 2 for most campaigns in the first 3-4 days and the spikes up to 5 when the campaign duration reaches a week. The first week is the best time for the audience to see the ads since they are 'fresh' and full of 'new content' that the audience may like to interact with. As the campaign duration increases, the CTR starts falling from 5 to below 2. This can be attributed to the fact that the ads become 'stale' and if the users have seen the ad once, they may choose not to interact with it again.

The overall results of both plots provide support for the fact that campaign duration has an inverted-U relationship with the success of a social media marketing campaign. *Thus, the results fail to reject H2.*

CHAPTER 5. DISCUSSION, LIMITATION, FUTURE SCOPE

Having knowledge of how the input parameters influence the success of a campaign, I anticipate that this study will assist the marketers working in firms in the insurance industry to set the right combination of input parameters to design successful campaigns. While the data of only some firms in the insurance industry (Denim's customers) were in scope for this study, I believe the results can be extrapolated to apply to all firms in the insurance industry who choose to advertise on Facebook. The extrapolation must be done carefully though because sometimes the true effects of some campaigns may be realized in future campaigns when the same audience is retargeted. Since this effect is difficult to capture and measure, it could be a possible limitation of this research study. I have also considered the CPC and CTR to determine the success of a campaign. As Facebook remodels existing KPIs and introduces new ones, it will be interesting to observe how accurately the input parameters influence those KPIs. As next steps to this study, I would like to (a) implement a model that predicts the impact of the audience demographics and length of campaigns using metrics like Cost per Click, Click through Rate, Reach, Impressions, Relevance Score, Frequency (b) Measure the predictive power of the model by evaluating the difference between actual and predicted values (c) Assess the knowledge provided by the model to tweak different input parameters that influence each campaign. I hope that development of the predictive model will help Denim make better recommendations to its customers and consult non-customers. As Denim grows, it will be interesting to see how the results of this research study apply to firms outside the insurance industry and social media platforms besides Facebook.

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